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Assessment of the final national energy and climate plan of Hungary

Table of contents

1. SUMMARY

Hungary's final integrated national energy and climate plan (NECP)[1] sets a 2030 target for **greenhouse gas (GHG) emissions** not covered by the EU Emissions Trading System (non-ETS). The target is -7% compared to 2005, as set out in the Effort Sharing Regulation (ESR)[2]. With existing and additional measures, respectively, that target is on course to be over-achieved by 1.1 and an additional 14.6 percentage points, excluding land use, land-use change, and forestry (LULUCF). There is no information about whether the planned over-achievement is cost-efficient compared with the option of transferring annual emission allocations to other Member States. Hungary has provided no information on how it intends to achieve its no-debit commitment under the LULUCF Regulation[3], i.e. ensuring that accounted emissions from this sector do not exceed accounted removals. The plan specifies the same adaptation goals as the national adaptation strategy.

As regards **renewables**, the final plan provides for a renewable contribution of 21%. This is considered unambitious, as it lies below the minimum share of 23% resulting from the formula in Annex II to Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action (the Governance Regulation)[4]. The plan explains and quantifies the measures required to achieve the national renewables contribution and increase renewable shares in the electricity, heating and transport sectors.

Hungary's contribution to the EU's **energy efficiency** target shows a very low level of ambition[5], amounting to 18.8 Mtoe of final energy consumption (translating into 30.7 Mtoe of primary energy consumption). Hungary claims there was no scope for greater ambition under the economic and budgetary conditions prevailing at the time it submitted the plan. However, it does acknowledge that energy efficiency is important for GHG emission reductions and energy security, although the report does not elaborate on the application of the 'energy efficiency first' principle. The final national energy and climate plan provides some information about energy efficiency in buildings. Hungary has not yet submitted the long-term renovation strategy.

As regards the **internal market and energy security**, Hungary refers to the need to keep flexible power generation assets in the system. The plan describes ongoing projects to diversify supply routes and sources of natural gas, including a timeline for their implementation. It includes some measures to ensure the security of nuclear fuel supply (requirements for a certain level of fuel stocks). The planned **electricity interconnection** level by 2030 is 60%.

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

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

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

4 The Commission's recommendations with regard to the Member States' renewable ambitions are based on a formula set out in this Regulation. The formula is based on objective criteria.

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

National objectives and funding targets for **research, innovation and competitiveness** are mainstreamed and consistent with the other dimensions. However, detailed figures and timelines are often lacking. In terms of quantified targets, Hungary aims to have implemented at least 20 pilot innovation projects by 2030, with a minimum of 10 patents registered in the course of their implementation.

As regards **investment needs,** additional expenditure associated with existing and additional policy measures is estimated at HUF 20,400bn (EUR 61bn) overall between 2016 and 2040.[6] This expenditure arises from the implementation of both existing and additional policies and measures. The energy sector, households' energy use, the tertiary sector, transport, industry, and agriculture are all taken into account. The plan identifies investment needs by 2030. These come to EUR 41.7bn, rising to EUR 53.6bn if the Paks power plant's two new nuclear blocks are included. On the matter of funding sources, the plan looks at existing and forthcoming EU spending programmes, plus expected ETS auction revenues, including the forthcoming Modernisation Fund. Little consideration is given to public funding provided by Hungary itself.

The plan does not provide a detailed list of **energy subsidies**. Hungary refers in the plan to the existence of indirect fossil fuel subsidies (without specifying their nature), and states that there are no direct subsidies for fossil fuels. However, recent Commission analyses of energy subsidies have identified significant fossil fuel subsidies. The final plan contains no information about any action taken or planned to phase out fossil fuel subsidies.

The final plan does not analyse the **impact on air quality** of the new measures, nor does it provide any information on interactions with air quality. Although the projected increase in bioenergy makes it particularly important to look at air quality impacts, the plan contains no detailed information on air quality.

As regards aspects relating to the need for a **just and fair transition**, the final plan lists a number of qualitative objectives associated with the labour market dimension of the forthcoming structural change without however identifying specific policies or measures. There is no consideration of the social, employment or skills impacts of any policies, apart from a description of the socioeconomic impact associated with the activity of the single lignite power plant and of possible workforce shortages in the energy industry.

As regards measures to tackle **energy poverty**, the final national energy and climate plan states that, as a result of the 'utility cost reduction' campaign of 2013, Hungarian households' energy expenditure is among the lowest in Europe[7]. It also explains that the government is going to draw up a special strategic plan to review vulnerable customers' needs and prepare targeted programmes.

Hungary's final energy and climate plan contains some **good practices**, notably the specification of fixed and operational costs for investments.

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[6] Discounted at a rate of 5% up to 2016, while the inflation rate exceeded 5% only once in the preceding decade, in 2012. Costs are calculated in euro and converted to HUF at a constant 310 HUF/EUR, which is significantly below the exchange rate of around 340 HUF/EUR prevailing in June 2020.

[7] The claim is underpinned by a reference to a comparative information sheet on household energy expenditure across EU countries, using Eurostat data on household incomes, but the sources of information on different components of energy expenditure are not specified.

The table below shows Hungary's objectives, targets and contributions under the Governance Regulation[8]:

	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) (%)	-10%	+10%	-7%	As in ESR
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	12.5%	13%	21%	Unambitious (23% is the result of RES formula)
	National contribution for energy efficiency: Primary energy consumption (Mtoe)	24.5 Mtoe	24.1 Mtoe	No target set	Very low
	Final energy consumption (Mtoe)	18.5 Mtoe	14.4 Mtoe	785 PJ (18.7 Mtoe)	Very low
	Level of electricity interconnectivity (%)	50%	55%	60%	N.A.

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

2. FINALISATION OF THE PLAN AND CONSIDERATION OF COMMISSION RECOMMENDATIONS

Preparation and submission of the final plan

Hungary **notified** its final national energy and climate plan to the Commission on 22 January 2020.

A **public consultation** on the plan was held in November 2019. The final plan was available on the government's website. There was also further consultation with academic organisations, industry, civil society and the public sector. Hungary has submitted a lengthy separate document reporting on the results of the public consultation and on how public opinion was taken into account in the final plan. Hungary has also carried out a strategic environmental impact assessment (SEA) on the NECP under Directive 2001/42/EC.

[8] 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.

Consideration of Commission recommendations

In June 2019 the Commission issued 10 recommendations to be taken into account in Hungary's final plan[9]. Annex II to this staff working document details how the various aspects of the Commission's recommendations are reflected in the plan. The final plan **partially addresses** most of the Commission's recommendations. In particular, Hungary responded to the Commission's recommendations on its draft plan as outlined below.

On **renewables**, Hungary has **partially addressed** the recommendation to raise the level of ambition for 2030 to a renewable energy share of at least 23%, as indicated by the formula in Annex II to Regulation (EU) 2018/1999. In the final plan, Hungary increased the national renewables contribution from 20% to 21% by 2030. Considerable improvements were also made in describing, explaining and quantifying the planned measures, and in providing information on trajectories and technologies.

The Commission's recommendations on **energy efficiency** are **partially addressed**. The recommendation to raise the level of ambition was not taken up, final contributions to the EU-level target being even less ambitious than in the draft plan. Although new policy instruments are now described more clearly, there is still no information on the energy savings to be achieved through specific measures. The information about buildings in the final plan is improved, but remains limited. The long-term renovation strategy has not been submitted yet.

As regards **energy security**, Hungary has **partially addressed** the recommendation to specify the measures supporting the energy security objectives of diversifying and reducing energy dependency. These include measures to ensure flexibility, and the strategy to ensure the long-term supply of nuclear materials and fuel, particularly given the prospective expansion of Hungary's nuclear power generation capacity.

As regards the **internal energy market**, Hungary has **partially addressed** the recommendation to set clear objectives, milestones and timelines. In particular, the final plan now outlines the measures planned for the integration of the electricity and gas markets more clearly. It also promotes the participation of all available resources in the market, better integration of renewables, and an active role for, and the protection of, prosumers and consumers.

In the field of **research, innovation and competitiveness**, Hungary has **partially addressed** the recommendation to quantify national objectives and funding targets in more detail. The description of how this dimension will contribute to the national climate and energy targets has been improved. However, the lack of detailed figures and targets for investment in research, innovation and competitiveness makes it difficult to assess the link with national objectives or consistency with those objectives.

The Commission's recommendation to Hungary on **regional cooperation** was **partially addressed**. The plan describes the potential for regional cooperation. However, it says little about cooperation on renewables and decarbonisation. As regards climate change mitigation and flood prevention, more cooperation with neighbouring Romania and Ukraine (along the river Tisza) would be beneficial. Nor does Hungary assess the regional impact of its policies sufficiently.

[9] Commission Recommendation of 18 June 2019 on the draft integrated national energy and climate plan of Hungary covering the period 2021-2030, C/2019/4417.

Hungary has **largely addressed** the recommendation to improve and extend its analysis of **investment needs**. In particular, the section examining investment needs has been significantly improved. However, it does not include the planned funding structure, nor does it provide any detail about the potential funding gap or of whether Hungary considers the cost-effective generation of transfers to other Member States under Regulation (EU) 2018/842 to be a possible source of funding.

Hungary has **partially addressed** the recommendation to list energy subsidies and action taken and plans to **phase out energy subsidies, in particular for fossil fuels.** The final plan provides more information about energy subsidies. However, the plan provides no information about any actions or plans to phase out fossil fuel subsidies.

Hungary **has not addressed** the recommendation to complement the analysis of the interactions with **air quality and air emissions policy** with more quantitative information either.

Finally, Hungary **has not addressed** the recommendation to better integrate **just and fair transition** aspects. The plan lacks sufficient detail on the social, employment and skills impact on the planned objectives. On the energy poverty side, it lacks details of measures to protect vulnerable households.

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 2019[10], Hungary received one country-specific recommendation[11] on climate and energy. This recommended that the country 'focus investment-related economic policy on research and innovation, low-carbon energy and transport, waste infrastructure and energy and resource efficiency, taking into account regional disparities'. In the 2020 country report[12] adopted on 20 February 2020, the Commission found that Hungary had achieved limited progress on this recommendation.

The European Semester country-specific recommendations for 2020, which addressed Member States' responses to the COVID-19 pandemic, dealt with ways to foster economic recovery. They focused particularly on the need to start mature public investment projects as soon as possible and promote private investment, including through appropriate reforms, particularly in the digital and green sectors. Hungary's country-specific recommendation[13] stressed the importance of focusing investment on 'the green and digital transition, in particular clean and efficient production and use of energy, sustainable transport […]'.

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. Hungary's national energy and climate plan has the potential to support the implementation of the recommendations made in the context of the European Semester, as it identifies investment needs and financial resources to meet them.

[10] 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.

[11] Recommendation for a Council Recommendation on the 2019 National Reform Programme of Hungary and delivering a Council opinion on the 2019 Convergence Programme of Hungary. COM (2019) 517 final.

[12] Commission staff working document, Country Report Hungary 2020. SWD (2020) 516 final.

[13] Recommendation for a Council Recommendation on the 2020 National Reform Programme of Hungary and delivering a Council opinion on the 2020 Convergence Programme of Hungary. COM (2020) 517 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

The greenhouse gas (GHG) emissions target under the Effort Sharing Regulation[14] for sectors outside the EU Emission Trading System (**non-ETS sectors**) for 2030 is -7% compared to 2005. Hungary also has a national economy-wide target of cutting GHG emissions by at least 40%GHG emissions by 2030 compared to 1990. This corresponds to gross greenhouse gas emissions of no more than 56.19 mtCO2eq in 2030. For 2030, existing measures leave a gap of 6.64 mtCO2eq, or 7 percentage points. Additional measures are needed to close this gap. On the basis of existing measures, Hungary is set to overachieve its ESR target by 1.1 percentage points, and additional measures set out in the plan are projected to cut GHG emissions by 22.7% overall relative to 2005, amounting to an over-achievement by 15.7 percentage points (excluding LULUCF).

Hungary's final national energy and climate plan provides no information about an **estimated trajectory of annual emission levels** for 2020-2030. The plan notes that the emissions value for 2018, needed for the calculation according to Regulation (EU) 2018/842[15], is not yet available.

The plan is designed to contain emissions in the **transport** sector by 2030, noting though that energy demand in transport (and industry) cannot be constrained in a growing economy. Hungary's policy framework for alternative fuel infrastructure development sets out measures to develop the necessary infrastructure. Electromobility is expected to develop strongly by 2030. It is already being promoted through subsidies and tax incentives. Electromobility and charging infrastructure are supported by the electromobility act (2019), which includes financial aid to support more widespread use of electric vehicles. The 'green economy financing scheme' funds additional electromobility programmes. The energy and climate plan also looks at promoting public transport and freight transport by rail. A 'green bus' programme (already adopted) is designed to shift local public transport to low-carbon vehicles, while still allowing the use of (compressed) natural gas. The energy and climate plan sets forth the objective of ensuring that the consumption of petroleum products in transport does not increase by more than 10% by 2030.

As regards the **building sector**, the final plan states that existing measures will result in total GHG gas emissions of 11.6 MtCO2eq in 2030. Additional measures would reduce these by 5.2 MtCO2eq. This would be achieved through energy efficiency measures and by substituting clean energy technology for the use of natural gas in heating.

Existing policies in the **waste sector** are expected to cut the sector's emissions by 38% compared to 2005 levels. No additional measures have been specified in this sector; reductions in the 'with additional measures' (WAM) framework are the result of changes in other sectors. The plan does not deal with the waste hierarchy or issues relating to the circular economy.

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[14] Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions.

[15] 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.

The plan mentions the intention to reduce emissions from **agriculture**, but no specific measures are mentioned; moreover, it states that agricultural emissions are projected to be 10% higher by 2030. In the **forestry** sector, the plan focuses on afforestation and forest resilience. GHG emissions in 'with existing measures' (WEM) and WAM scenarios are spelled out, both including and excluding the LULUCF sector. Although the sector is expected to remain a net sink in 2030, its CO_2 absorption capacity is expected to decline. Hungary has not indicated whether it intends to use the flexibility from land use, land use change, and forestry (LULUCF) to the effort-sharing sectors. Forest biomass is considered an important feedstock for renewables, and biomass supply is analysed in detail.

Other energy policies designed to help meet the 2030 total GHG national target are: phasing out conventional power plants, expanding a nuclear power plant by adding two new nuclear reactor blocks (Paks 2), scheduled for completion by 2030, and adding more renewables.

The energy and climate plan has no information on how climate change risks might affect energy supply (e.g. drought and storms destroying biomass resources and power networks), although Hungary's national **adaptation** strategy identifies the energy sector as a priority sector for adaptation. The objectives of the national adaptation strategy that are referred to in the plan include the preservation of natural ecosystems. However, there is no discussion of biodiversity, including aspects like synergies and trade-offs with respect to climate policy, and the role of ecosystem services in mitigation and adaptation.

Hungary notified its draft long-term strategy to the Commission on 22 January 2020. It aims to achieve climate neutrality by 2050. This objective covers GHGs emitted in all sectors of the economy, with natural sinks offsetting those emissions that are most difficult to abate. The long-term strategy addresses many elements required under Article 15 of the Governance Regulation, but puts forward no specific objectives for sectoral emission reductions.

Renewable energy

Hungary has increased its planned renewables contribution to 21% (from 20% in its draft NECP). This remains unambitious compared with the renewable share of 23% calculated using the formula in Annex II to the Governance Regulation. Hungary improved the information on renewables considerably in its final NECP, especially in describing, explaining and quantifying the planned measures, and providing information on such matters as trajectories and technologies, and biomass sustainability, as well as the analytical background. More data are provided, except for the reference points for 2022 and 2027.

The plan explains and quantifies several policies and measures. The main measure relating to **renewables in electricity** is the increase in solar power from the current 680 MW to around 6500 MW by 2030. This is to be achieved through a combination of measures, such as the national support scheme and regulation on minimum requirements for buildings as part of the nearly zero-energy buildings (NZEB) requirement that will apply from 2021.

The share of renewables in **heating** will be raised from 18.2% in 2020 to 28.7% by 2030. Since waste heat is not part of the planned increase in the share of renewables, the applicable rate for Hungary is an indicative average annual increase of 1.1 percentage points. The planned increase translates to an average annual increase of 1.05 percentage points, which, given the indicative

nature of the target for renewables in heating under Article 23(1) of the Renewable Energy Directive[16], falls within the range of acceptable compliance rates.

The final plan envisages that renewables will account for 14% of the final energy consumption of **transport** by 2030, with one half from first-generation biofuels and one quarter each from advanced biofuels and biogas respectively. Renewables in transport are supported through a package of measures for first- and second-generation biofuels, electromobility, and green public and freight transport. First-generation biofuels will be kept at 7%, while the share of second-generation biofuels will be raised to 3.5% by 2030. These will be complemented by measures including the expansion of electric vehicles, green public transport,green public procurement,alternative energy freight transport,financial support and tax benefits, and the expansion of charging points.

The plan includes detailed information on the supply and use of biomass and sustainable forest management.

Energy efficiency

Hungary's national contribution to the EU's 2030 **energy efficiency** target is set at maximum 18.8 Mtoe of final energy consumption, translating into 30.7 Mtoe for primary energy consumption. These contributions are of very low ambition compared to the EU level of efforts. Moreover, the indicative trajectiories and translation of the contribution into primary energy consumption are not clearly presented in the plan.

The plan provides information on **policies and measures beyond 2020**, targeting all sectors, with the biggest impact on the energy consumption of the residential sector. Most importantly, it announces the introduction of an energy efficiency obligation scheme (EEOS). Other new measures mostly focus on the residential sector (heating), the renovation of public buildings, and transport (incentives for electric vehicles, modal shift, eco-driving, and others). The new measures in the transport sector combine economic incentives for energy-efficient vehicles with regulatory requirements and information/education measures. The measures for residential and public buildings combine economic incentives for heat exchange/efficient district heating and regulations on nearly zero-energy buildings (NZEB). However, these measures may not fully exploit the energy-saving potential of Hungarian building stock, and their contribution to reaching the overall target is not quantified. Besides, their impact will depend on the design and implementation of the energy efficiency obligation scheme.

Hungary indicates that the 7.9 Mtoe of **cumulative savings** referred to in Article 7 of the Energy Efficiency Directive[17] will be achieved by the EEOS (around 30% of savings) and alternative measures. The specifics of that scheme are unknown as yet. This means it is not possible to assess whether the policies and measures proposed will suffice to reach the target.

The national long-term renovation strategy has not been submitted yet. The final plan provides information on buildings. Hungary's NECP highlights several paths to improving the energy performance of buildings in the areas of district heating; renewables; and the modernisation of buildings, heating systems and public buildings.

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

[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.

Energy security

As regards energy security risks, the plan refers to the need to keep flexible power generation assets in the system. However, it does not explain why a well-integrated Hungarian wholesale power market could not ensure the capacities needed to ascertain energy security.

The plan describes ongoing projets **to diversify routes and sources** of natural gas, including a timeline for their implementation. This is an important objective, given Hungary's current dependency on Russian gas.

The plan envisages phasing out the Mátra lignite power plant, one of Hungary's main power stations. The Mátra region has been singled out for Hungary's just transition policies. Hungary intends to diversify its economy and labour market, taking advantage of the potential for further exploitation of the site and the power plant value chain. Hungary also plans to replace coal-based district heating with cleaner energy and energy efficiency, to minimise the impact on households. Actions will be financed through receipts from the modernisation fund to be set up after ETS allowances have been auctioned in 2021. However, no details of the objectives and policies planned are provided.

The final plan also contains some measures to ensure the security of the nuclear fuel supply (requirements for a certain stock of nuclear fuels). However, issues to do with diversification and the reduction of dependency remain to be resolved.

Internal energy market

According to the plan, the **level of interconnectivity** with neighbouring counties is currently at 50% of gross total installed capacity. This is significantly above the EU-level target set for 2030. Hungary plans to increase interconnectivity further, to 60% by 2030. To this end, the national development plan looks at a number of cross-border transmission projects. It discusses how growing electricity demand will affect electricity interconnectivity, and the infrastructure needs that implies.

In view of the renewables target in electricity of 21% in 2030, the development of **flexibility** sources needed to integrate renewables into the system is projected. However, there is no roadmap for the implementation of the required flexibility measures.

The plan provides a sufficient overview of current wholesale **market conditions** for gas and electricity, in particular regarding levels of competition, the liquidity of markets, the level and likely availability of capacities. It includes objectives, policies and measures related, in particular, to wholesale electricity markets, such as joining regional and EU day-ahead market coupling or joining EU platforms for integrating balancing markets, and removing price caps on balancing energy markets. The plan indicates that a large share of power generation capacity is controlled by the state-owned group of MVM, but does not assess MVM's market share from a competition policy perspective.

For the **retail market,** the plan specifies the objective to improve market functioning. However, it does not clearly describe the current situation and provides only a very generic description of the planned policies and measures, such as phasing out regulated prices and boosting competition. Specific timelines and measurable targets for the implementation of the measures planned are not spelled out. The plan recognises the role of demand response and smart meters, but does not detail specific measures or objectives.

As regards **energy poverty**, Hungary reports that 9.8% of households in 2016 spent at least 25% of their income on energy, which it considers as the main indicator of energy poverty. The plan

refers to the current system that makes energy affordable through regulated prices, but provides little information on the current situation and planned objectives. The plan refers to actions to address energy poverty (no specific details are given), to be coordinated with planned market reforms. The envisaged policies and measures are not described in detail. No measurable targets are set.

Research, innovation and competitiveness

The research, innovation and competitiveness dimension is mainstreamed and consistent with the other dimensions. However, it remains vague. Quantified targets for energy research and innovation, timelines, action plans, or specific budgets have yet to be specified.

Under national objectives for **competitiveness,** the plan defines the need to strengthen conditions for growth and competitiveness by innovation as a priority. The plan considers that innovation-based competitiveness could be enabled by leading domestic companies in electrical engineering, automotives, and IT solutions, which could make Hungary an active player in the innovative energy market rather than just an adopter of new technology. In terms of quantified targets, by 2030 Hungary wants to have at least 20 pilot innovation projects implemented, with a minimum of 10 registered patents.

The plan stresses its leading position in electromobility and batteries with major research and development capacities and top Asian producers establishing production centres in the country.

The NECP states the intention to enable the integration of hydrogen in the Hungarian economy. New regulatory measures are announced in the gas, storage and transport sectors addressing the entire hydrogen value chain. The NECP also includes a 2030 target of a renewable electricity-based hydrogen consumption of 51ktoe in the heating and cooling sector and the expectation to use renewable hydrogen as an alternative fuel for transport. With the NECP's additional measures (WAM) scenario, renewable hydrogen could cover about 1% of the total transport energy needs by 2030.

Hungary mentions the s**trategic energy technology (SET) plan** and provides a rich overview of Hungary's participation in the working groups on carbon capture utilisation and storage as well as nuclear safety. Furthermore, it lists competitive EU energy and climate-related programmes for 2014-2020 in Hungary, including ERA-Net projects. However, it does not indicate national funds or activities under the programmes, and does not specify how the SET plan would contribute to achieve Hungary's national energy and climate objectives.

4. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS

As regards **interlinkages** between policies and measures, the final NECP lacks detailed information on the synergies between the decarbonisation, energy security and internal market dimensions and the 'energy efficiency first' principle. The links between the planned increase in biomass use for heating and cooling and accounted emissions and removals from LULUCF and sustainability requirements, respectively, are not specified in detail either.

The national energy and climate plan has no information on how climate change risks might affect energy supply (e.g., draught and storms destroying biomass resources and power networks), although Hungary's national adaptation strategy identifies the energy sector as a priority sector for adaptation. Nor does the final plan provide any information on adaptation co-benefits for energy efficiency, such as in the thermal management of buildings.

The plan recommends backloading **investment** to achieve cost savings thanks to falling prices for clean technologies. This might be counterintuitive, as most investment needs have been identified in the residential sector, where the falling prices of technology are less relevant. Investment priorities are renewable energy sources (mainly solar, while wind energy is disadvantaged by current regulation), energy efficiency measures, and electromobility. The final plan estimates a high level of expected EU funding for investment. No detailed consideration is given to private funding sources. The plan also lacks a consolidated quantitative macroeconomic assessment of the impact of the planned policies and measures, neither in terms of description, nor as quantitative estimates, on (i.a.) GDP, consumption, and employment.

There is no detailed description of existing **energy subsidies, in particular for fossil fuels**. Although the plan does not mention this explicitly, internationally used definitions appear to be used for indirect fossil fuel subsidies (there is a reference to the OECD). The final plan makes no reference to a timeline for phasing out energy subsidies, in particular for fossil fuels.

Policies planned under the instrument for **just and fair transition** relate to the phasing out of lignite for electricity generation in Hungary's only lignite-based power plant, Mátrai Erômû. The plan recognises the restructuring needs of the region concerned, including sectoral specialisation and labour market aspects. It lists qualitative objectives associated with the labour market dimension of the structural change. However, insufficient consideration is given to the social, employment and skills impacts of planned objectives, policies and measures. More specifically, the impact on the populations in the carbon-intensive or industrial regions has not been addressed.

The plan provides very limited information on the **circular economy,** its potential for GHG emissions reduction, or interactions with relevant policies. Similarly, the plan lacks information on the interactions with **biodiversity**.

It does not provide projections of air quality impacts of the policies and measures planned and does not specifically consider the likely air pollution effects of the projected **increased reliance on bioenergy.**

The application of the '**energy efficiency first' principle** is not well developed, although the importance of energy efficiency in helping reduce import dependency is recognised. Energy efficiency is also mentioned as one of the elements helping to improve energy security along with demand response. However, it is not much considered in the internal market dimension. There is no consideration of the co-benefits of energy savings or how these could be reflected in budget allocation.

The final plan complies fully 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

Hungary needs to swiftly proceed with implementing its final integrated national energy and climate plan, notified to the Commission on 22 January 2020. This section provides some guidance to Hungary 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 Hungary could consider when developing its national recovery and resilience plan in the context of the Recovery and Resilience Facility[18].

Guidance on the implementation of the national energy and climate plan

In the plan, Hungary confirms the non-ETS target for greenhouse gas emissions reduction by 2030, compared to 2005, of -7%, in line with the provisions of the Effort Sharing Regulation. This overall reduction would just be reached with existing measures, while the additional measures specified in the plan would lead to higher emission reductions.

The Hungarian contribution to the EU 2030 renewables target is unambitious when compared to the share resulting from the formula in Annex II to the Governance Regulation, while the country's contributions to energy efficiency show a very low level of ambition. Hungary's plan leaves scope to increase its ambition on both **renewables** and **energy efficiency,** to contribute more to the EU climate and energy targets and strengthen the green transition.

Hungary has committed to increasing the share of **renewables** in gross final energy consumption to 21% by 2030. This calls for additional policies and measures, based on more specific and detailed planning of the renewable energy generation sources. Furthermore, implementing the initiatives to overcome administrative burden is important for the swift implementation of the measures. Hungary might consider tapping into the potential of wind energy, a source left out of consideration so far. The electricity sector will require significant investment in renewables, but also renewable heating and cooling systems for buildings and transport. An increased empowerment of renewable energy self-consumption and renewable energy communities would be a powerful leverage to expand renewables and contribute to reducing energy poverty and import.

As regards **energy efficiency**, Hungary would benefit from adopting and implementing additional policies and measures that would deliver additional energy savings by 2030. Rapid and full implementation of the newly proposed energy-efficiency obligation scheme will be vital to achieve the energy savings expected without delay. In this context, a detailed elaboration of all the elements required by Annex III of the Governance Regulation would also be beneficial for ensuring achievement of energy-saving obligation target under Article 7 of the Energy Efficiency Directive (EED). Similarly, a clear target and approach for the renovation of central government buildings are needed to ensure that obligations under Article 5 of the EED can be met. Furthermore, Hungary is invited to implement the 'energy efficiency first' principle across all areas of the energy system, taking into account the co-benefits of energy efficiency when prioritising investments. Making use of the funding earmarked for the green transition to finance energy efficiency policy, in particular targeting renovation of buildings and sustainability of the transport sector, could help achieve higher ambition.

[18] 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).

The improvement of 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** initiative[19], there is scope for Hungary to intensify efforts to improve the energy performance of the building stock with concrete measures, targets and actions further to the intentions put down in the energy and climate plan. Further support to the renovation of public and private buildings could be provided with increased public funding and by leveraging EU and national budgets with private money, combining grants, lending, guarantees and loan subsidies. Hungary is expected to provide a robust and comprehensive long-term renovation strategy, in accordance with Article 2a of the Energy Performance of Buildings Directive. The long-term renovation strategy is prescribed to define a roadmap for decarbonisation by 2050 with ambitious milestones for 2030 and 2040 and 2050, measurable progress indicators, expected energy and wider benefits, measures and actions to renovate the building stock, and a solid finance component with mechanisms for mobilising public and private investment.

As regards **energy security**, in view of the more important role planned for nuclear energy production, Hungary would benefit from implementing a long-term strategy to diversify the supply of nuclear fuels. Likewise, to become operational, the policies and measures planned to underpin energy security need specific time scales, targets, and impacts to be defined.

As regards the **internal energy market**, Hungary has the opportunity to further progress towards market-based prices and a competitive retail market. As regards energy infrastructure, a carbon-free, flexible and intelligent power sector will require the integration of solar power plants, the spread of smart metering, the provision of storage and gas power plant solutions that improve the flexibility of the system, and the replacement of lignite-based generation. Preparations for the electricity infrastructure system of the future need digital investments and smart grid development. Reinforcing electricity interconnections with neighbouring countries would provide access to cheap imports of electricity from renewable sources. Energy system integration (electricity, gas, heat, transport energy, etc.) and promotion of hydrogen could also contribute to the energy transition in the long run.

Hungary would benefit from defining clear indicators to track achievement of milestones towards its **research and innovation and competitiveness** objectives. Over time, the gathering of granular research, innovation and competitiveness data will be useful to strengthen this process.

Hungary estimates that EUR 41.7bn (with the inclusion of Paks-2 nuclear power plant project it amounts to EUR 53.6bn) of additional **investment** is needed by 2030 to implement the national energy and climate plan (total investment needs up to 2040 are estimated to reach EUR 60.7bn). Hungary's approach to investment in the green transition is focused on the building sector, renewables, and electromobility. It intends to postpone the bulk of investment into the years closer to 2030 on the grounds that costs are expected to fall. This approach may need to be overhauled, especially in view of the present economic policy circumstances. The probability that interest rates will remain very low in the medium term highlights the advantages of early investment, both public and private, to secure economic and social resilience and well-being while preserving environmental sustainability. Forward-looking stable policy frameworks might

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

guide enterprises' and households' investment decisions and incentivise early investment in the private sector.

Hungary is invited to continue ongoing efforts on **regional cooperation** with a view to stepping up exchanges and initiatives that will facilitate implementation of its national energy and climate plan, especially as regards relevant cross-border issues, including those in the context of the CESEC High-Level Group. The country would benefit in particular from stepping up regional cooperation on renewables and decarbonisation, as well as its cooperation with Romania and Ukraine, specifically on climate mitigation and flood prevention. Hungary is also invited to exploit the potential of the **multilevel climate and energy dialogues** to a greater extent, by actively engaging with regional and local authorities, social partners, civil society organisations, the business community, investors, and other relevant stakeholders, and to discuss with them the various scenarios envisaged for its energy and climate policies.

Hungary is invited to conduct a deeper analysis of **just and fair transition** aspects, notably by developing a more comprehensive assessment of the social, employment and skills impact of planned objectives, policies and measures, especially in coal regions and carbon-intensive industries. In this regard, the Just Transition Mechanism, as part of the European Green Deal, has the potential to promote intensifying efforts by providing financial and technical assistance.

Hungary is encouraged to continue to carefully monitor developments in **energy poverty**, set an indicative and measurable reduction target, and respond to the issue with a comprehensive set of targeted policies and measures, without, however, interfering with the liberalisation process of the retail market. In this regard, the momentum of the 'renovation wave' initiative of the European Green Deal provides an opportunity to step up efforts to tackle energy poverty by improving the energy performance of the existing building stock through specific measures. Energy poverty could also be, among other measures, addressed through specific support to socially innovative solutions and social enterprises that work on addressing this challenge (e.g. energy-awareness campaigns, retraining unemployed as energy advisors, supporting green installations by co-operatives, buying energy-saving appliances for social enterprises to rent out). Hungary 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.

Hungary is invited to extend and update the identification of **energy subsidies** and reporting on the subject by drawing up a more complete inventory. It is also asked to initiate action to phase them out, particularly subsidies for fossil fuels. The green transition in Hungary 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 detailed 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, Hungary is invited to ensure these are in line with national, regional or local plans for **air pollution** reduction, such as the National Air Pollution Control Programme (NAPCP), and relevant air quality management plans.

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

Link to the recovery from the COVID-19 crisis

The vast majority of Member States' final national energy and climate plans were drafted before the COVID-19 crisis, and the present Staff Working Document assesses Hungary's plan in that context. Nevertheless, the implementation of Hungary'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, **the final plan constitutes a strong basis for Hungary to design climate and energy-related aspects of its national recovery and resilience plan**, and to deliver on broader European Green Deal objectives.

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

In addition, **the Commission strongly encourages Member States to include in their recovery and resilience plans investment and reforms in a number of 'flagship' areas**[20]. 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 Hungary's green transition while contributing to economic recovery. In order to follow the commitment of the European Council to achieve a climate mainstreaming target of 30% for both the multiannual framework and Next Generation EU, Hungary'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'.

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

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

- Measures supporting investments in energy efficiency in residential housing and public buildings;
- Measures in sustainable public transport and alternative transport modes, both in the capital region and across the country;
- Measures to promote renewables in the electricity and heating sectors, including measures to boost electricity production with solar photovoltaics, and measures to upgrade existing infrastructure, storage capacity and smart grids.

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

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

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

Programme	Amount	Comments
Cohesion policy funds (ERDF, ESF+, Cohesion Fund)	21.7	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.	11.7	In current prices.
Recovery and Resilience Facility	6.3	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	0.2	In 2018 prices. Commitments both under the multi-annual financial framework (MFF) and Next Generation EU.
Modernisation Fund	0.3	Approximation: 7/10 of the allocations of ETS allowances to provide revenue to the Modernisation Fund tentatively allocated to Member States for 2021-2030 and assuming a carbon price of EUR 20 per tonne.
ETS auction revenue	0.2	Indicative: average of actual 2018 and 2019 auction revenues. 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 Europea 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	140.0	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.

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

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

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

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

Recommendations		Assessment	
Decarbonisation - GHG	No recommendation	n.a.	-
Decarbonisation - renewables	Increase the level of ambition for 2030 to a renewable energy share of at least 23% as Hungary's contribution to the Union's 2030 target for renewable energy, as indicated by the formula in Annex II under Regulation (EU) 2018/1999.	Partially addressed	In the final NECP, Hungary has increased the national renewables contribution from 20% to 21% by 2030.
	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.	Partially addressed	Hungary has included yearly indicative trajectories by sectors, subsectors and technologies in absolute amounts of capacities and trajectories of the increases in the shares of the overall RES contribution, and for the planned sectoral shares of renewables to be achieved by 2030. However, there are no reference points for 2022 and 2027.
	Put forward detailed and quantified policies and measures that are in line with the obligations laid down in Directive (EU) 2018/2001 of the European Parliament and of the Council, to enable a timely and cost-effective achievement of this contribution.	Fully addressed	The plan explains clearly the measures needed to achieve the national RES contribution and increase shares of renewables in the electricity, heating and transport sectors. These measures are quantified. For renewables in electricity, the main measures are (a) increasing solar power from the current 680 MW to about 6500 MW by 2030, a nearly tenfold increase through a combination of measures, such as the national support scheme, and (b) regulation of the minimum level of renewables in buildings as part of the NZEB requirement applicable from 2021.
	Put forward measures to meet the transport target set in its plan and in line with Article 25 of Directive (EU) 2018/2001.	Fully addressed	Renewables in transport have been reduced from 20% in the draft plan to 16.9% in the final plan. An estimate of the consumption of energy has been added in the final version. New measures have been added in relation to: - Electromobility - Share of biocomponents - Increase in low-emission public transport (green bus programme)

			- Alternative fuel infrastructure Renewables in transport are supported via a package of measures for first- and second-generation biofuels, electromobility, green public transport and freight transport. First-generation biofuels will be maintained at 7%, while the share of second generation biofuels will be raised to 3.5% by 2030.
	Provide additional details on the specific measures to ensure sustainability for biomass supply and use in the energy sector, given the important contribution of biomass across the Hungarian energy mix, especially in heating and cooling.	Fully addressed	The plan includes detailed information on the supply of and demand for biomass by sector and the forest management measures to ensure the sustainability of biomass production and use.
	Put in place measures to overcome administrative burden and measures on the enabling frameworks for renewable energy self-consumption and renewable energy communities, in line with Articles 21 and 22 of Directive (EU) 2018/2001.	Fully Addressed	Planned measures use a mix of regulations (building, simplified permitting) and incentives to ensure the expansion of energy self-consumption and the role of renewable energy communities in developing decentralised, local renewable energy.
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 Union's 2030 energy efficiency target.	Not addressed	The level of ambition is even lower in the final plan than in the draft plan (quite substantially for primary energy consumption (PEC) and slightly for final energy consumption (FEC)). The contributions reflect a very low level of ambition compared with the EU level of efforts. Hungary claims there is no scope for increasing ambition under the current economic and budgetary conditions.
	Propose more ambitious policies and measures that would deliver additional energy savings by 2030.	Partially addressed	The introduction of a comprehensive energy efficiency obligation scheme has been identified as a new policy measure to ensure cost-effective achievement of the new savings target of 7 PJ/year to which Hungary committed in the NECP for the next period. This is about twice the energy savings achieved in the previous period. The proposed measures do not raise the overall level of ambition. No measures regarding transport are mentioned in the chapter on energy efficiency.
	In the final plan, make a clear distinction between the existing and additional policies and measures and provide a more comprehensive impact assessment of the planned initiatives and better estimate of the expected energy savings.	Partially addressed	New policies are identified more clearly, but the savings expected have not been calculated. The impact assessment section only compares the energy consumption developments for the With Existing Measures and With Additional Measures scenario, without

			presenting detailed impacts. The NECP provides some information on the renovation of the building stock, but further details will be determined in the long-term renovation strategy, which has not been submitted yet.
Energy security	Specify the measures supporting the energy security objectives on diversification and reduction of energy dependency, including measures ensuring flexibility, and the strategy to ensure the long-term supply of nuclear materials and fuel, in particular in the perspective of the enlargement of its nuclear generation capacity.	Partially addressed	Hungary has included a significant number of policies and measures in the final plan, but most of them lack specific timescales, targets and impacts. When considering risks, the plan refers to the need to keep flexible power generation assets in the system. However, the plan does not demonstrate why a well-integrated Hungarian wholesale power market cannot be expected to ensure the availability of the right amount of capacities in the system. The final NECP lacks a strategy for diversifying the supply of nuclear fuels.
Internal energy market	Further detail forward-looking objectives and targets concerning market integration and put forward adequate policies and measures to achieve them. In addition, allow network operators to recover all their justified and efficiently incurred costs and give network operators access to effective legal review of regulatory decisions. Outline the strategy and timeline for progressing towards fully market based prices.	Partially addressed	The final plan now gives a better description of the measures planned for the integration of the electricity and gas markets. It also promotes the participation of all resources and better integration of renewables. Moreover, it promotes an active role and protection for prosumers and consumers.
Research innovation and competitiveness	Further quantify the 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.	Partially addressed	The plan briefly identifies relevant areas where research and innovation efforts are needed. However, the related objectives lack a specific timeline and are not quantified. Moreover, they are not supported by any specific policy or measures. Hardly any mention is made of competitiveness objectives.
	Underpin such objectives with specific and adequate policies and measures, including those to be developed in cooperation with other Member States, such as the Strategic Energy Technology Plan.	Partially addressed	Cooperation with the SET plan is only broadly addressed.
Investments and funding sources	Improve and extend its analysis of investment needs, which is currently provided for building efficiency, renewables and electromobility, to a general overview of investment needs to modernise its economy by achieving its energy and climate	Largely addressed	The analysis of investment needs has been expanded and improved considerably, and is now largely addressed. The examination of sources of investment remains incomplete, however, and Hungary has provided no information on the cost-effective generation of

	objectives.		transfers.
	Provide a general assessment of the sources of that investment, including appropriate financing at national, regional and Union level.	Largely addressed	The final plan provides a partial overview of sources of finances to be used at national, regional and EU level. The financing sources for most of the planned investments are presented under each Energy Union dimension. The sources for Projects of Common Interest (energy security dimension) are only partially presented. For the remaining four dimensions they are indicated as follows: decarbonisation (ETS allowances, EU grants, quota revenues, national funding, loans, EIB loans, European Clean Mobility Fund, CEF); energy efficiency (EU grants, EIB loans, ECSO schemes, national funding, financial instruments); internal energy market (CEF); research (national funding, EU grants, quota revenues, EIB loans, direct EU funding instruments i.e. Horizon Europe, CEF). As regards the next cohesion policy programming period, the plan mentions that that the budget for financing the activities under the PO2 is expected to come to HUF 1,300bn. The plan also provides an overview of the funding available under the Modernisation Fund.
	Consider also the cost effective generation of transfers to other Member States under Regulation (EU) 2018/842 of the European Parliament and Council as funding source.	Not addressed	The final plan does not include any information on the cost-effective generation of transfers to other Member States. It notes that Hungary expects to generate HUF 910bn in carbon credit revenues between 2021 and 2030 (assuming an average price per transferred unit of EUR 25 per tonne), of which HUF 363bn could be spent on the green economy development objective.

Regional cooperation	Continue the consultation of neighbouring Member States and regional cooperation within the Central and South-Eastern Europe Energy Connectivity (CESEC) High Level Group and in the context of the Visegrad Group involving Czechia, Hungary, Poland and Slovakia. The focus of regional exchanges could be on further integration in the internal energy market, decarbonisation and renewables deployment as well as research, innovation and competitiveness taking into account common challenges and shared objectives.	Largely addressed	The final plan describes the above-mentioned cooperation frameworks (the CESEC high-level group and the Visegrad group) and mentions conferences held in 2019 at which the NECPs were discussed with other Member States belonging to these regional groups. The final plan includes new information on further regional cooperation schemes to do with interoperability, nuclear energy, gas infrastructure, research and development (nuclear, V4, SET plan WG participation, Horizon 2020, EIT KICs), and the Green Fund for the Western Balkans. More could have been said about cooperation in the field of renewable energy and on planned transfers.
	This includes assessing system adequacy, just transition issues and energy system changes required for accommodating higher shares of renewables and other foreseen developments, which could impact electricity interconnections and trading in the region.	Not addressed	The need for more interconnections with neighbouring countries is understood to address changes in the energy system, and the NECP includes measures to improve connections with neighbouring countries. However, the plan does not provide an assessment as described in the recommendation. Section 5.4 on the effects of planned policies on regional cooperation could have been more detailed.
Energy subsidies	List all energy subsidies.	Partially addressed	The final NECP represents a partial upgrade of the draft plan on energy subsidies. The plan mentions subsidies to support renewable energy (METAR and feed-in system), along with EU funds and other domestic programmes.
	List in particular fossil fuel subsidies.	Partially addressed	The final plan mentions tax refunds and exemptions (indirect fossil fuel subsidies).
	List actions and plans to phase out energy subsidies, in particular for fossil fuels.	Not addressed	No actions and plans to phase out energy subsidies are included. No plans for the phasing out of fossil fuel subsidies are included either.
Air quality	Complement the analysis of the interactions with air quality and air emissions policy with more quantitative information, at least including the required information about the projected air pollutants emissions under the planned policies and measures.	Not addressed	The recommendation has been insufficiently followed, with no assessment of the new measures' effects on air quality. This is all the most worrying with the projected increased reliance on bioenergy and its likely air pollution effects.

Just transition and energy poverty	Integrate just and fair transition aspects better, notably by providing more details on social, employment and skills impacts of planned objectives, policies and measures. More specifically, the impact on the populations in the carbon-intensive or industrial regions should be addressed. Further develop the approach to addressing energy poverty issues, including by providing a dedicated assessment of energy poverty as required by the Regulation (EU) 2018/1999.	Not addressed	On just transition, the final NECP points to general measures for a just transition, but it lacks detail. The social, employment and skills consequences of the transition are not addressed as such. Hungary has only partially planned measures to mitigate the effects that the low-carbon transition will have on the economy, the labour market and households' socioeconomic conditions. Yet these are particularly necessary for carbon-intensive and coal-dependent countries. It would also be relevant to provide a distributional impact assessment on households' income (including impact on housing costs) of the planned transition measures.
	Complete the approach to addressing energy poverty issues by including specific measurable targets, and details on the financial resources for the implementation of the described policies as required by the Regulation (EU) 2018/1999.	Partially addressed	As regards energy poverty, Hungary will continue the existing 'utility cost reduction plan'. It explains that future measures will take account of the interests of vulnerable households. However, no further details are provided.