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Assessment of the draft National Energy and Climate Plan of Sweden

Accompanying the document

Commission Recommendation

on the draft integrated National Energy and Climate Plan of Sweden covering the period 2021-2030

{C(2019) 4427 final}

Table of contents

1. SUMMARY

Main observations[1]

- ✓ The draft integrated National Energy and Climate Plan (NECP) is largely based on the energy bill and the existing climate framework. It describes a wide range of existing policies for reducing greenhouse gas emissions, as part of an overall framework to promote the transformation of the Swedish economy to become sustainable and climate neutral by 2045. This transformation needs to be underpinned by equally ambitious policies on the security of supply, internal market dimensions and research, innovation and competitiveness dimensions.
- ✓ Sweden's 2030 target for **greenhouse gas (GHG) emissions** not covered by the EU Emissions Trading System (non-ETS), is -40 % compared to 2005, as set in the Effort Sharing Regulation (ESR)[2]. Based on the Swedish projections, the European Commission estimates that existing policies may be sufficient to achieve this target. However, the final plan would benefit from including assessments of the impact of individual or groups of policies and measures. Sweden has also set a national 2030 target for emissions not included in the emissions trading system (non-ETS emissions), which is more ambitious than its ESR target. This high ambition of Swedish climate policy is well noted. Sweden has an ambitious target for reducing emissions from transport. The draft NECP shows that Sweden uses carbon and energy taxes as important policies to achieve its targets.
- ✓ **Land use, land use change and forestry** (LULUCF) is important in Sweden due to its large forested area. There is an active policy in this area. However, the draft plan does not clearly explain how Sweden would comply with the no-debit commitment under the LULUCF Regulation that accounted emissions do not exceed accounted removals[3].
- ✓ The draft NECP illustrates that the existing policies and measures will result in a 65 % share of **renewable energy** in final energy consumption. This would be a significant share, slightly above the share of 64 % that results from the formula. However, it is not clearly stated whether this share - resulting from a scenario based on already adopted measures - can be considered a contribution to the EU renewable energy target for 2030. For the reference points of the indicative trajectory that Sweden put forward, the expected share reached in 2025 falls short by 3 percentage points. The final plan would benefit from elaborating further on the policies and measures allowing the achievement of the contribution and on other relevant sectorial measures. Sweden aims at generation 100 % of its electricity from renewable energy sources by 2040.

[1] In addition to the notified draft NECP this assessment also considers informal bilateral exchanges, which are part of the iterative process established under the Governance Regulation.

[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.

- ✓ The Swedish draft plan states that Sweden's energy use in 2030 is to be 50 % more efficient than in 2005. The target is expressed in terms of primary energy use in relation to gross domestic product (GDP), and is based on a scenario reflecting existing measures adopted before 30 June 2016. Sweden's contribution to the EU headline target for 2030 translates into 42.5 Mtoe of **primary** and 32.3 Mtoe of **final energy consumption**. The proposed reductions in energy consumption are modest in comparison to the efforts needed to reach the EU headline target, in particular the ambition for final energy consumption appears to be low. This risks missing opportunities in terms of growth and jobs. The final plan would benefit from more on details on adequate policies and measures.
- ✓ In the **energy security dimension**, the Swedish draft NECP relies on well-functioning energy markets to prevent and mitigate disruptions and shortages of energy, and describes some policies regarding security of supply measures of different energy sources. The final plan would benefit from an analysis of the implications on energy security of the ambitious renewable energy target for electricity.
- ✓ Sweden's interconnectivity level is well above the EU-wide interconnection level of 15 %. Yet, the draft NECP does not present any interconnection level for 2030, but refers to a projected interconnection level of 27 %. For **internal market**, there are specific policies presented for distributed generation, storage, demand response and flexibility. There is little information presented on the current situation in the electricity and gas markets.
- ✓ The draft plan describes the objective for public research and innovation, which is to contribute to Sweden's energy and climate targets and hence the transformation of the industry and economy. However, additional insights are needed in the final plan as regards **research, innovation and competitiveness,** in particular specific objectives and funding targets where available and applicable, and a description of policies and measures until 2030.
- ✓ Sweden's draft plan includes some references to projected **investment needs**, expenditures and funding sources to reach the 2030 targets, mainly qualitative. A systematic analysis of investment needs and funding sources will be needed in the final plan to allow fully taking advantage of the role NECPs can play in providing clarity to investors and attracting additional investments in the clean energy transition.
- ✓ The draft NECP only uses climate and energy scenarios based on existing policies and measures adopted before 30 June 2016. The draft plan announces that for the final plan the scenarios will be updated based on recent developments and will include also scenarios with additional measures.
- ✓ **Regional cooperation** across the Energy Union dimensions is already taking place between Sweden and neighbouring Member States. There is potential for intensifying the existing cooperation arrangements between Nordic countries, especially in the internal market and energy security dimension, extending them to new areas and broadening the geographic reach to include the Baltic States.
- ✓ The final plan would benefit from an analysis of the interactions with **air quality and air emissions policy** and a presentation of impacts of policies and measures on air pollution. The projected increase in bioenergy would make air impacts especially important to consider.
- ✓ The final plan would benefit from details on the **just transition aspects**, and if applicable, considerations in terms of the costs and benefits as well as the cost effectiveness of planned

policies and measures in relation to the issue of just transition. The draft plan envisages only training programmes for energy-efficiency of residential buildings to be continued. .

- ✓ A list of all **energy subsidies** and actions undertaken and planned to phase them out, in particular for fossil fuels, need to be included in the final plan.
- ✓ An example of **good practice**, providing a national framework for achieving the objectives of the draft NECP, is Sweden's Climate Act. It sets legally binding long-term targets, requires annual climate reports and establishes an independent climate advisory board. Sweden's long-term climate strategy is consistent with national objectives of the draft NECP and in line with the Governance Regulation.

Preparation and submission of the draft plan

Sweden notified its draft National Energy and Climate Plan (NECP) to the European Commission on 17 January 2019. The Swedish draft NECP follows the structure in Annex I of the Governance Regulation.

The Swedish draft NECP is largely based on the energy bill adopted in 2017[4] and the climate policy framework[5], both adopted by the *Riksdag* in 2017. The Swedish government presented the draft to stakeholders, including local authorities, in early 2018, and they were given the opportunity to comment. An early version of the Swedish draft has been discussed in the Nordic Council of Ministers, reflecting the cross-border relevance of many energy and climate issues. Further **consultations** are planned in time for the finalisation of the NECP.

Overview of the key objectives, targets and contributions

The following table presents an overview of Sweden's objectives, targets and contributions under the Governance Regulation[6] as presented in the Swedish draft NECP:

[4] Government Bill 2016/17:146

[5] Government Bill 2017/18:228

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

	National targets and contributions	Latest available data	2020	2030	Assessment of 2030 ambition level
	Binding target for greenhouse gas emissions compared to 2005 under the Effort Sharing Regulation (ESR) (%)	-25	-17	-40	2030 national: -50 to -59 %
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	54.5	49	65	Slightly above 64 % (result of RES formula)
	National contribution for energy efficiency: Primary energy consumption (Mtoe) Final energy consumption (Mtoe)	46.1 32.6	43.4 30.3	42.5 32.3	Modest Low
	Level of electricity interconnectivity (%)	26	28	27[7]	N/A

Sources: EU Commission, ENERGY STATISTICS, Energy datasheets: EU28 countries; SWD(2018)453; European Semester by country[8]; COM/2017/718; Swedish draft NECP.

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

Dimension decarbonisation

Greenhouse gas emissions and removals

According to the Climate Act adopted in 2017, Sweden shall achieve net zero emissions of greenhouse gases by 2045; and negative emissions thereafter. A good practice, providing a national framework for achieving the greenhouse gas reduction objectives of the draft NECP, is that the Act includes an obligation for the government to include a climate report to its annual budget bill. This climate report shall include an assessment of whether additional policies and measures are needed to achieve the long-term target. Every fourth year the government needs to present a climate action plan specifying planned measures in more detail. The Act establishes a Climate Policy Advisory Board (*Klimatpolitiskt råd*) that monitors the progress of Sweden's climate policy independently of the government.

[7] Projection included in Sweden's draft NECP.

[8] https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/european-semester-your-country_en.

The Climate Act sets a target for Sweden's **greenhouse gas emissions not covered by the EU ETS** in 2030 at -55 to -63 % compared to 1990 emissions. This corresponds to -50 to -59 % compared to 2005 and **is** likely more ambitious than Sweden's -40 % -target under the ESR[9], depending on how the LULUCF sector is included.

The draft NECP includes a wide range of existing **GHG reduction policies** at both EU and national level. The Commission estimates, based on the Swedish projections, that these policies may be sufficient to achieve the Swedish ESR target. However, the draft plan does not provide any information on the impact of individual or groups of policies. Policies adopted after June 2016 are described, but are not included in the projections.

The objectives of the land use and forestry policies are described in a way which shows the importance of these sectors for Sweden. However, with respect to **the LULUCF Regulation[10]**, the draft plan does not clearly address the reduction of emissions by land and forests, and how existing policies contribute towards achieving Sweden's obligations under the regulation and towards its national climate objectives in general. The discussion concerning agriculture and forests would benefit from a better analysis of the trends of forest sinks, and the impact of different policies and measures on these sectors, including how the provision of biomass for renewable energy will affect the availability of biomass and its sustainability.

The draft plan does not apply the accounting rules as set in the LULUCF Regulation[11], which are necessary to assess whether Sweden would achieve its LULUCF commitment and overall non-ETS target in 2030. With respect to the National Forestry Accounting Plan including the national Forest Reference Level, submitted by Sweden as required by Article 8(3) of the LULUCF Regulation, the Commission has put forward substantial technical recommendations requesting action on a range of issues, detailed in SWD(2019)213.

Sweden has an ambitious target of reducing GHG emissions in the **transport** sector by 70 % by 2030, compared to 2010. A large number of key policies in the transport sector are identified, which are well described in the draft NECP. However, the expected emission reduction contribution to the target is provided for only one policy (emission reduction obligations for fuels). **Electromobility** is supported via different measures including vehicle taxation, a *bonus-malus* system[12], benefits for electric company cars, and support to charging. However, it is not clear to which extent other alternative fuels are incentivised and how related policies will be further developed in the future, for which further investments in infrastructure could be needed.

The draft NECP refers to the National Adaptation Strategy adopted by the Government in March 2018 and includes information on the overall institutional framework and how adaptation is considered in different sectors. However, it does not clearly define the adaptation goals.

[9] Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.
[10] Regulation (EU) 2018/841 on greenhouse gas emissions and removals from land use, land use change and forestry.
[11] Regulation (EU) 2018/841 on greenhouse gas emissions and removals from land use, land use change and forestry.
[12] https://www.government.se/press-releases/2017/05/bonusmalus-system-for-new-vehicles/.

Renewable energy

On **renewable energy**, there is an estimated share of 65 % in gross final energy consumption presented in the draft plan. This would be a significant share, slightly above the share of 64 % that results from the formula in Annex II of the Governance Regulation. This share is on a basis of a with existing measures scenario. This share is not set out as an explicit national contribution to the EU 2030 target for renewable energy.

For the indicative trajectory put forward for the 65 % estimated share in 2030, Sweden sets the initial figure in 2020 at 50 % which is higher than the 49 % target for 2020 expected under Directive 2009/28/EC[13]. For the reference points of the indicative trajectory that Sweden put forward, the expected share reached in 2025 falls short by 3 percentage points (40 % vs 43 %). There is a planned surplus of 38 TWh above the 2020 target, but the plan does not make clear if this will be fed in as an early effort or if it would be available for other Member States as statistical transfers.

The plan provides main elements of the national renewable objectives and trajectories but only in the form of historic shares or projections. There is however a slightly more specific commitment for the electricity sector. In order to validate that sectoral contributions are coherent with the overall renewable energy share, more information is needed on the sectorial shares of renewable energy and the contributions of each sector to gross final energy consumption. The same should be included for the renewable energy technologies to achieve the overall sectoral trajectories for renewable energy from 2021 to 2030.

For **renewable electricity**, the plan refers to the energy agreement from 2017 and the target for a 100 % renewable electricity production in 2040. Based on policies adopted before 30 June 2016, the projected share in 2030 is 85 %. The increase is expected to be mainly driven by an increase in solar power and wind power. The existing policies and measures for the electricity sector are appropriately described, but more specificity is required for the investment values, the timeframes for the measures together with size, technology, competitive/direct allocation), as well as the schemes' intended working mechanism. As regards enabling renewable energy communities and facilitating self-consumption, there are policies and measures e.g. for micro-production of renewable electricity and energy storage for individual customers, but with limited information.

The plan describes **renewable energy in heating and cooling** as projections. There is already a relatively high share of 69 % in 2017 and in 2030 this is expected to remain at the same level according to the with existing measures scenario. The main contributor to the increased share will come from heat pumps. According to the same with existing measures scenario the plan projects a slight decrease of the overall district heating production from 54.7 TWh in 2011 to 51 TWh in 2030. However, plan does not contain any new policies or measures in this sector.

With a current share of 38.6 % **renewable energy in the transport sector** for 2017 and an expected share of 46 % in 2030, Sweden is well above the 14 % minimum share. The calculation of this target is missing and more information in the final plan should include the contributions of

[13] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

all eligible fuels as well as the limits for conventional fuels produced from food and feed crops, applicable multipliers and the sub target for advanced biofuels.

As a consequence the plan does not meet the general requirements from Annex I of the Governance Regulation[14]. The projections indicate that between 2020 and 2040 there will be practically no increase in the use of bio-energy for electricity, heating and cooling or transport. For policies and measures on bioenergy availability and bioenergy sustainability, there are no specific measures to promote biomass.

For the streamlining of administrative procedures there is only specific policy and it addresses the development of marine plans. In the final plan more information on why other measures to introduce more contact points and to streamline administrative procedures on other sectors/technologies are not necessary would need to be further elaborated. Policies and measures concerning information and training are only targeted wind power; research on its impact on humans and nature and guidance on appropriate disposal. In the final plan more information on why other measures on other sectors/technologies are not necessary would need to be further elaborated.

Dimension energy efficiency

The Swedish draft plan states that Sweden's energy use in 2030 is to be 50 % more efficient than in 2005. The target is expressed in terms of primary energy use in relation to gross domestic product (GDP). The target was set using the same methodological approach as for the 2020 target, which aims at a reduction of the country's energy intensity from 2008 onwards to reach a 20 % reduction. The trajectory is not expressed in terms of absolute energy consumption but in a percentual reduction of energy intensity, assuming linear progress.

The conversion into absolute levels of primary and final energy consumption (482 TWh and 364 TWh, respectively) is based on projected consumption levels from the scenario with existing measures used in the draft NECP. This scenario reflects policies and measures adopted before 30 June 2016, which resulted in a 49 % reduction in Sweden's energy intensity by 2030, thus roughly corresponding to the target.

In **primary energy** terms, Sweden's contribution to the EU headline target for 2030 corresponds to 42.5 Mtoe. This level would be 4.5 % below Sweden's own indicative target for 2020. Compared to Sweden's actual consumption in 2017, its proposed contribution for 2030 would represent a decrease in primary energy consumption of 10.5 %. In **final energy** terms, Sweden's proposed contribution to the EU headline target for 2030 translates into 32.3 Mtoe. This consumption level would be 3.3 % above Sweden's own indicative target for 2020, but would represent a decrease in final energy consumption by 3.9 % compared to the 2017 data. Overall, Sweden's contributions are modest in comparison to the ambition level of the EU headline target and in particular the ambition for final energy consumption appears to be low. The plan makes references to ongoing work to develop strategies and platforms to achieve energy- and climate goals and energy efficiency goals in particular. No details or timetables are given on how further measures might be developed from these platforms. In the area of transport, the plan would benefit from covering measures that contribute towards more efficient organisation of the mobility system and thus towards improved energy efficiency and emissions reductions (e.g.

[14] Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

incentivising multimodality and modal shift, intelligent transport systems, digitalisation and automation).

Dimension energy security

In the **energy security dimension**, the Swedish draft NECP relies on well-functioning energy markets to prevent and mitigate disruptions and shortages of energy. The draft plan contains no quantitative reliability standard for power markets.

The plan states that objectives for increasing supply of **renewable electricity** will contribute to diversification of energy sources. Since the ambitious 100 % renewables target in the electricity sector in 2040 will also have implications for the security of energy supply, an assessment of both these interlinkages will benefit the final plan. The plan also references requirements for network operators in power outage situations.

In relation to how to cope with a constrained supply situation for oilthe objectives for minimum emergency stocks of oil follow from Council Directive 2009/119/EC and the International Energy Program Agreement that requires International Energy Agency member countries to hold oil stocks equivalent to at least 90 days. As for storage, there is no specific objective.

As for the gas supply, the Swedish implementation of the gas supply security regulation requires that protected customers, i.e. end consumers, have access to gas for at least 30 days in the event of supply disturbances or disruptions.

Dimension internal energy market

The current **interconnection level** in Sweden is 26 %. Sweden is well above the EU interconnection level of 15 %. Yet, the draft plan does not contain any specific interconnection level for 2030, but the plan refers to the projected interconnection level of 27 % by 2030[15]. Even though Sweden is well interconnected, the final plan will benefit from information on the urgency indicators in the 2020-2030 period, and the role of infrastructure projects in this context. This is especially important since Sweden presents ambitious targets of use of renewable energy in the electricity sector.

Sweden presents specific policies for several retail market issues such as distributed generation, storage, demand response, system flexibility, consumer protection and competitiveness in the retail energy sector. The plan would benefit from further information on policies and measures in areas such as real-time price signals, aggregation and smart meters.

The draft plan should include or refer to existing information on current market situation, general market functioning and possible market-related problems, which should set the scene for setting targets and designing policies and measures. Quantitative core parameters, e.g. wholesale and retail market concentration levels, indicators for market liquidity such as traded volumes and market participants, switching rates etc. are needed to assess the functioning of the market and to identify possible remaining obstacles to enter the market.

In addition, the plan would benefit from including concrete indicators upon which future objectives can be benchmarked, such as real-time price signals; increase of system flexibility,

[15] Projection by the Swedish TSO, Svenska Kraftnät.

demand response and aggregation, smart meters, storage, distributed generation, consumer protection and competitiveness in the retail energy sector.

Dimension research, innovation and competitiveness

The draft plan lacks a clear identification of research, innovation or competitiveness objectives to be achieved by 2030 and is limited to a general identification of research domains that could receive attention.

The draft plan mentions the Industrial Leap programme to support breakthrough low carbon innovation in industry. If approved by the Swedish Parliament, the programme will dedicate SEK 300 million per year until 2040.

The draft NECP describes policies and measures until 2020, but does not include a clear description of policies and measures until 2030, beyond a mentioning of an existing 10-year national research program, the content of which cannot be viewed as comprehensively supporting the implementation of the draft NECP. As regards cooperation with other Member States, only limited information is provided on cooperation in Nordic Energy Research. Swedish participation in the **Strategic Energy Technology (SET) Plan** is mentioned, but only very briefly without making clear how Sweden sees its role in implementing the SET-plan and which financial resources it intends to make available to agreed research priorities.

As regards competitiveness, the draft NECP sets a general objective of developing technologies and services that can be commercialised by Swedish enterprises. It moreover provides an overview of areas on which existing research programmes focus keeping in mind areas where Sweden can have a competitive edge such as the biofuels and waste based combined heat and power production, forest carbon sequestration and efficient use of bioenergy sources or decarbonisation and efficiency of certain energy intensive industries. Building on these positive elements, the NECP would benefit from presenting a more comprehensive overview on competitiveness of the low-carbon technologies sector, including for decarbonizing energy and carbon-intensive industrial sectors. It could clarify where Sweden is currently positioned in the global market, highlighting areas of competitive strengths and potential challenges. Measurable objectives for the future should be defined on that basis, together with policies and measures to achieve them, making appropriate links to industrial policy.

3. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS

The draft plan aims to show that it is possible to combine climate transition with welfare and competitiveness, making a clear link with their enterprise and industrial policy. The NECP would benefit from further details on how this ambition is translated into practise, in particular on policy interactions between different areas and Energy Union dimensions and application of the energy efficiency first principle, and with other policy areas such as circular economy or air quality policies.

The draft NECP has no information on how climate change risks might affect the energy supply (e.g., hydropower), and no information on adaptation benefits for energy efficiency such as thermal management of buildings. However, Sweden's national adaptation framework considers the energy sector critical for societal functions and its portal for climate change adaptation provides information on possible climate impacts on this sector. There is no analysis made of the impact of biofuel and renewable energy objectives on removals in the LULUCF sector. The

supply of sustainable **biomass** from forests would also benefit from an assessment from the point of view of biodiversity and air quality.

For the draft plan, the average growth in GDP up to 2030 was projected at 2.28 % a year ("in 2013 prices")[16]. The GDP growth assumptions used in the Swedish forecast[17] appear higher than those in the "Ageing report" projections (1.9-2.0 % per year in real terms). The scenario was "using the recommended EU-parameters" according to the draft NECP (p.12).Considering the relevance for greenhouse gas emission reductions, the final plan could reflect interactions with the **circular economy**, referring to action plans or roadmaps, concrete measures (some are already described, e.g. ambitious Extended Producer Responsibility schemes or bans of landfilling.

The plan includes measures to preserve **biodiversity** such as conservation and protection of areas containing both wetlands and forest ecosystems. Nevertheless, the supply of sustainable **biomass** from forests would require an assessment from the point of view of biodiversity and air quality.

The draft plan lacks information about the interactions with **air quality and air emissions policy**, while the projected increase in bioenergy would make air impacts especially important to consider.

The final plan would benefit from details on the **just transition** aspects, and if applicable, considerations in terms of the costs and benefits as well as the cost effectiveness of planned policies and measures in relation to the issue of just transition. The draft plan envisages only training programmes for energy-efficiency of residential buildings to be continued. Cross-sectoral key policies affecting the national climate target to 2030 include climate change communication in agriculture and forestry; advice and training for landowners and managers play a major role in, for example, reducing greenhouse gas emissions from manure management and use, and improving energy efficiency. However, the plan does not specify which occupations will need which skills.

The plan does not contain a quantitative assessment of the investment needs and expenditures, market risks and barriers or other relevant information. Nevertheless, Sweden's draft plan does include certain references to projected investment needs, expenditures and funding sources, mainly of qualitative nature and scarce beyond 2020. According to the document, further information is to be provided in the final version of the plan.

Links with the European Semester

- Identifying financing needs and securing the necessary funding will be key to deliver on energy and climate objectives. The Commission addressed this question as part of the 2019 European Semester process.

- Based on the 2019 Country Report for Sweden, published on 27 February 2019[18], the European Commission's recommendation for a Council recommendation for Sweden issued on 5 June 2019[19], in the context of the European Semester, highlights in particular the need to

[16] Energimyndigheten, Scenarier över Sveriges energisystem 2016, ER 2017:6, p. 86.
[17] https://ens.dk/sites/ens.dk/files/Analyser/forudsaetningsnotat_til_basisfremskrivning_2018.pdf, p. 24.
[18] SWD(2019) 1026 final: Country Report Sweden 2019.
[19] COM(2019) 527 final: Recommendation for a Council recommendation on the 2019 National Reform Programme of Sweden and delivering a Council opinion on the 2019 Convergence Programme of Swden.

maintain '*investment in sustainable transport to upgrade the different transport modes, in particular railways'*.

- When preparing its overview of investment needs and related sources of finance for the final plan, Sweden should take into account these recommendations and links to the European Semester.

The draft plan makes some references to energy subsidies. Based on internationally used definitions, the European Commission's Energy Prices and Cost report[20] also identifies energy subsidies in Sweden, including subsidies for fossil fuels. It will be important that the complete final plan includes a description of existing energy subsidies, including for fossil fuels (section 4.6iv of the plan) as well as of the national policies, timelines and measures to phase out energy subsidies, in particular for fossil fuels (section 3.1.3iv of the plan).

4. REGIONAL COOPERATION

Sweden is strongly interconnected with its neighbours allowing for an access to a diverse portfolio of electricity generation facilities across the Nordic region and beyond. Bulk power trade is organized within the EU's market coupling arrangements. Sweden is also engaged in a regional cooperation to deliver a common Nordic balancing market. When completed it will enable Sweden to better integrate intermittent renewable electricity generation in the market while optimising the use of balancing resources across its borders.

There is significant potential for further cooperation in the internal energy market and energy security areas, including in assessing regional system adequacy as foreseen in the Electricity regulation. This will become even more important with a view to the changes in the electricity system accommodating higher shares of renewable energy and electricity imports, and characterised by an increased need for flexibility.

Sweden is contributor to regional fora working with renewable energy such as the Nordic Council of Ministers, the North Sea Energy Cooperation and Baltic Energy Market Interconnection Plan (BEMIP). This includes work on coordinated timing of tenders, spatial planning and best practices on support schemes. The platform for exchanges provided by the North Seas Energy Cooperation also allowed developing concepts for potential joint wind offshore projects and coordinated electricity infrastructure.

Since 2012, there is experience from a joint electricity certificate system with Norway to support renewable electricity generation, which has resulted in a net statistical transfer of renewable energy from Sweden to Norway through a cooperation mechanism[21] under the Renewable Energy Directive[22]. However the draft plan does not provide further specifics on e.g. planned statistical transfers or other co-operation mechanism under the renewable energy directive in the period 2020-30.

[20] Commission Staff Working Document Accompanying the Document Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy prices and costs in Europe, COM(2019) 1.
[21] http://www.energimyndigheten.se/en/sustainability/the-electricity-certificate-system/.
[22] 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.

Decarbonisation of the transport sector plays a significant role in achieving the long-term climate and energy targets. The Nordic countries are aiming to intensify cooperation to reduce transport emissions, for example, by developing a shared set of target indicators relating to different emissions reduction measures. Further coordination with the Baltic States in this area could be highly beneficial as part of regional cooperation on the final plans.

In May 2017, the Clean Energy for EU Islands Initiative was launched, aiming at accelerating the clean energy transition by helping islands reduce their dependency on energy imports and making better use of locally available renewable energy sources. It also provides a forum for exchange of best practices and aims to promote modern and innovative energy systems and reduce greenhouse gas emissions on islands. Although Sweden is a signatory to the political declaration for this initiative, it has not mentioned this in the draft NECP. Sweden could consider doing so in its final plan, and enhance cooperation with other Member States and island regions.

5. COMPLETENESS OF THE DRAFT PLAN

Information provided

The **decarbonisation dimension** of the draft NECP is partially complete with respect to the required information. The estimated ESR trajectory[23] with annual limits for the years 2021-2030 is missing. The inclusion of the LULUCF target in Sweden's non-ETS commitments for 2030 is unclear and its compliance with the no-debit commitment under the LULUCF Regulation is not defined. The draft plan does not apply the accounting rules as set in the LULUCF Regulation[24].

There is no information provided on the intended use of flexibilities, including potential use of flexibilities between ESR and LULUCF. Emission projections are not split into separate GHG emission trends for ETS, Effort Sharing and LULUCF sectors. There is no impact assessment of policies and measures for GHG reductions.

Most of the elements regarding **renewable energy** for the objectives and targets and the policies and measures are partially provided. The sectoral and technology trajectories were only provided as projections and particularly for heating and cooling the information was scarce. This also includes planned capacities that need to be split between new and repowered capacities. Trajectories for the bioenergy demand, their disaggregation between heat, electricity and transport, trajectories of supply by feedstock and origin and trajectories for forest biomass, an assessment of its source and impact on the LULUCF sink need to be included in the final plan. This is especially important given the prominent role of bioenergy in the draft NECP. The policies and measures are generally presented, but only the existing ones and in a format that makes it difficult to validate their impact to the various sectors. Measures regarding power purchase agreements (PPAs) are not yet included..

On **energy efficiency**, Sweden's draft NECP is partially incomplete and is missing information on key points. Only existing policies and measures are presented, but without any impact assessment or indication of investment needs. The cumulative amount of end-use energy savings

[23] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
[24] Regulation (EU) 2018/841 on greenhouse gas emissions and removals from land use, land use change and forestry.

to be achieved over the period 2021-2030 is missing[25], as well as the objectives and expected savings related to the renovation of public buildings[26]. While the energy efficiency target is provided and translated into absolute values of primary and final consumption, international aviation was excluded and the figures need to be adjusted accordingly.

No information is provided in the draft on indicative milestones, domestically established measurable progress indicators, an evidence-based estimate of the expected energy savings and wider benefits and the contribution of the renovation of buildings to the Union's 2030 energy efficiency target.

On **energy security**, information is needed on future electricity generation adequacy in light of the ambitious renewable energy target, including on demand response and storage. On nuclear, information on managing nuclear back-end, how long-term supply of nuclear fuel is ensured and strategic reserves, would inform the final plan. Information on existing risk preparedness plans and the target date for the plans of the Risk Preparedness Regulation will benefit the final plan, as well as a description of measures on cybersecurity. In relation to how Sweden will respond to an interrupted supply of an energy source, references to existing preventive action and emergency plans for gas and oil stocks and emergency procedures will enrich the final plan.

On the **internal market** and on infrastructure, calculation methods for the 15 % interconnection level are not provided, neither other indicators of Annex I. The draft plan contains only limited information on core quantitative parameters on the functioning of the national retail and wholesale gas/electricity markets. The final plan would benefit from additional specific and forward-looking objectives and targets. Additional information is required on the aspects listed under market integration and on ongoing market projects. For energy poverty the description of the current situation is incomplete. No discrete national objectives have been provided. Likewise, no specific policies or measures have been provided, apart from the general statement that energy poverty is treated through social policy.

The information provided related to **research, innovation and competitiveness** is largely incomplete. While identifying very general domains for research, the draft NECP does not provide concrete objectives to be achieved by 2030. Current funding is described, including an annual target for SEK 1.6 billion by 2020. No funding targets up to 2030 have been provided beyond the SEK 130 million planned to be provided up to 2026 under the 10-year national research programme for climate managed by Formas. The draft plan does not include specific objectives related to the deployment of low-carbon technologies, and does not include concrete objectives related to competitiveness.

The notified draft NECP does not contain chapter 5 on impact assessment.

Robustness of the Swedish draft National Energy and Climate Plan

The draft plan contains part of the required information of the **analytical basis**. It reports on a with existing measures (WEM) scenario in the voluntary template, but does not contain a with additional measures (WAM) scenario. Section 3 describes both existing and envisaged policies and measures and clearly indicates key policies that have been included in the WEM scenario.

[25] Article 7 of the 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.
[26] Article 5 of the Directive 2012/27/EU on energy efficiency.

The **WEM projection** largely covers the five dimensions of the Energy Union. Further developing the modelling on the research, innovation and competitiveness dimension would enrich Sweden's final plan. Likewise, more information would be desirable on investment costs, as well as primary and final energy consumption. In terms of GHG emissions, additional information would be desirable on the following variables: (i) the differentiation of sectoral GHG emissions per IPCC gas, (ii) the differentiation of sectoral GHG emissions between those covered by the EU ETS and those falling under the Effort Sharing Regulation, (iii) GHG emissions from international aviation, and (iv) non-GHG air pollutants.

The projections are presented in a largely **transparent** way: key parameters (GDP growth, prices for fuels and emission and technology costs) have been reported, including sources. The transparency of the projections could be further improved in the final plan by adding absolute figures for GDP, the number of households, passenger kilometres, freight ton kilometres or heating and cooling degree days. The draft plan provides references that describe the tools used and the overall modelling approach applied. Replicating this information in the final NECP would further improve the transparency of the plan.

The projections of energy consumption and renewable energy are calibrated to EUROSTAT figures for the base year 2015. More information would be desirable how the fuel and emissions price assumptions relate to the international fuel and EU ETS carbon price assumptions recommended by the Commission as numerical differences can be observed.

The impact assessment of planed policies and measures will be included in the final version of the plan. It should include, Macroeconomic and, to the extent feasible, the health, environmental, employment and education, skills and social impacts, including just transition aspects.