



Assessment of the national Long-Term Strategies of the Baltic State countries

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Summary

As amply demonstrated by each passing year, the decarbonisation of our economies is the key societal challenge of the 21st century. In response, each EU member state is required to adopt and regularly update a holistic decarbonisation strategy until 2050, known as a long-term strategy (LTS). This report seeks to analyse the respective documents for each of the Baltic states (Estonia, Latvia, and Lithuania), to assess their respective strengths and weaknesses, and highlight a series of cross-cutting issues and recommendations ahead of subsequent updates.

The obligation to develop plans for decarbonisation is formalised within the European Union by regulation 2018/1999¹ (Governance Regulation hereafter) of the European parliament and Council on 11th December 2018. Given the rather ambiguous and sparse guidance regarding content and format set out therein (Annex IV), a great deal of divergence between individual strategies is expected. Moreover, the respective Baltic strategies were published between 2017 and 2021, during which time the environment related to climate mitigation has continued to evolve, most recently with the European Green Deal and the 'Fit for 55' package of measures, as well as the energy policy response to the Russian war on Ukraine (REPowerEU)².

The individual strategies do indeed differ in several aspects. Where they in fact scored somewhat similarly due to the adopted methodology (outlined below) despite these differences, it should not be seen as a contradiction. Rather, it is a reflection of the scoring being a vehicle for the qualitative discussion found hereafter. For example, the strategies range in length from less than ten to more than 50 pages, with the structure of each being unique. This notwithstanding, it is interesting to note that the strategies did also show certain similarities. All three countries emphasised the role of research and development (R&D) to a greater or lesser extent, and each, behind the structural differences, covered similar areas and suffered from similar weaknesses in terms of relatively limited emphasis on pathway modelling or socioeconomic aspects.

As the countries are relatively small it is important to mention that so far, no attempts have been made to synthesise or integrate efforts across the region. This and the diverging interpretations of the requirements for the LTS further complicate the analysis. Furthermore, each strategy is missing several aspects. On the other hand, there is a silver lining in the requirement for strategies to be further updated, which affords the opportunity to help guide the process and seek best practices across all member states.

Our methodology sought to expand upon the framework set out in Annex IV of the Governance Regulation, separating individual requirements into categories, and scoring them on a 3-point scale (shown below in Table 1). Further details on the methodology are described in the annex.

¹ The European Parliament and the European Council. (2018). [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](#).

² Council of the EU and European Council. 2022 [REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition](#).

Table 1: Overall scoreboard for the Baltic states

Category	Subcategory	Lithuania	Latvia	Estonia
General information and targets	Adherence to Governance Regulation	2	2	2
	Up-to-date document	3	3	3
	Net-zero target	3	3	3
	GHG emissions reduction	3	3	3
	Renewable energy share	3	2	2
	Energy efficiency	3	2	1
Sectoral details	Energy	2	2	2
	Buildings	2	2	1
	Transport	2	2	2
	Industry	2	2	1
	Agriculture	2	2	1
	LULUCF	2	2	1
	Carbon removal technologies	3	2	1
Financing and enabling policies and measures	Investment needs assessment	1	3	1
	Financing	2	2	1
	R&D	3	2	2
Economic assessment	Socio-economics impacts	2	2	1
	Distributive impacts	1	1	1
Strategy preparation and implementation	Analytical tools	1	2	2
	Governance	3	2	3
	Public consultation	1	2	2

General Conclusions

- **Heterogeneity** – The ostensive similarities in scores outlined below belie large differences in adopted structure. **Each country has applied their own strategy** for fulfilling the requirements of the governance regulation. This **complicates the comparison** between each of the countries in the regional analysis. At times, **readability and legibility could also be improved**.
- **Targets** – All the countries adopt the goal of **climate neutrality by 2050** at the latest, at least if the EE2035 document is interpreted as an update to the original Estonian LTS. However, beyond this high-level target, there is a **large discrepancy between the countries** in the details of other required targets, either at a high (Renewable Energy System (RES) share, energy efficiency) or sectoral level. Often, where such detail is provided, it is only directly transplanted from the NECP and **does not cover the period after 2030**, which the LTSs should specifically provide. Considering that the long-term direction (in the LTS) should inform near- to medium term targets and policy, this indicates a process that has worked the wrong way around.
- **Sectoral detail** – In general, **no country has provided sufficient detail at the sectoral level**. In some cases, sectors are only briefly integrated into others or are not addressed at all. This also applies to sectors where net emissions are increasing and significant challenges exist, such as agriculture and LULUCF. This high-level conclusion also masks significant differences between countries, with some including significantly more detail without capturing all the necessary aspects for a fully comprehensive sectoral approach.
- **Modelling weaknesses** – Based only on the information contained in the LTSs, **none of the countries appear to have performed modelling at the sectoral level** that includes the explicit goal of climate neutrality. Where modelling is included, it is not adequately described, making it unclear what has been modelled and what is or is not included. It is not certain in some cases if a projection of future emissions is based on a rigorous assessment or is simply indicative of a future target. Additionally, **not enough care has been given to data presentation** and figures are not always adequately described.
- **Economic aspects** – **Investment needs or socioeconomic aspects of each country are hardly integrated** at all into the strategies. This could result from the lack of modelling, but such aspects are expected to be included according to the Governance Regulation. It is often unclear from the documents where the necessary funding for the plans will come from, and how it will be shared between the public and private sector. Additionally, each country has a GDP per capita below the EU average that could lead to increased risk of poverty amongst the population. However, the burden on households, if any, has not been described. A consequence is that **no country has adequately considered aspects of a just transition**, where negative aspects can be anticipated and mitigated to the greatest possible extent.

- **Limited specificity** – The limited specificity in projections and measures means that the **documents read as aspirational**, rather than an envisioning of relatively clear guidelines to direct each country towards climate neutrality. **The directions the region will take post-2030 remain opaque.** But the lead time of many developments, such as infrastructure projects, mean that decisions affecting post-2030 scenarios must be made soon.
- **Research and Development** – Each country **identifies an increasing need for investment into Research & Development (R&D).** In some cases, specific areas are also highlighted, as well as the additional need to increase the proportion of specialists in the workforce. However, as with other sectors, the reports lack detail into sources of funding and what new research programmes or institutions are to be established.
- **Collaboration** – Developments associated with Russian aggression in Ukraine have demonstrated that the region suffers from significant energy dependency. This is one area where **regional cooperation could be beneficial.** The size of each country and their economy suggests there could be many other situations, where collaboration could lead to pooling of resources and reduced risk. Whilst this is included to some extent in the corresponding NECPs, there is almost no discussion of these aspects in the LTS.
- **Governance and Consultation** – Governance is included in all the Baltic strategies. However, it is **not always explicitly clear who is overseeing the strategic implementation** and how this will be monitored. A positive example is the Estonian case, where an online website has been developed to monitor progress towards the EE2035 goals. Such transparency could be replicated across the region. Finally, aspects of stakeholder consultation are referenced. But at present, these sections do not always indicate whether the consultations that took place were seriously considered, and whether they led to any changes.

The assessed strategies help formalise the commitments of each country to climate neutrality by 2050 and provide a basis from which more detailed strategies can be developed. Most of the required sections are included, up to a point. However, the lack of analysis of investment needs, socioeconomic impacts and specific modelling scenarios give the impression that the countries lack a clear vision for low carbon development after 2030. The efficacy of these documents relies on these aspects being incorporated in the future. Hence, all three countries should ideally update their strategies to bring them fully in line with the Governance Regulation.

Recommendations

- **Structural harmonisation** – The structure of the strategies varies greatly from country to country. **A more rigorous or detailed mandatory template in the Governance Regulation** would enhance the comparability between the documents. Additional guidance, and a **more active European Commission**, may also assist countries to update their strategies and provide greater relevance to the national LTS.
- **Coverage** – At the sectoral level, **details should be provided on the current situation and past trends**, to place the (at times) comprehensive sectoral targets into context. In some cases, greater care must also be placed on the **readability of the documents**.
- **Comprehensive modelling** – Future updates should place **significantly more emphasis on modelling**. This should be at the sectoral level. Furthermore, emissions should be predicted under different scenarios, at least one of which should reach the stated goal of all countries: climate neutrality by 2050. However, it is also **not apparent whether alleviating these issues will be a priority** in subsequent updates. More care also must be given to data presentation. Where figures or projections are provided, it should **clearly be stated what is represented and how the data has been derived**.
- **Integration of socioeconomic factors** – Expected costs and other challenges associated with BAU and transition scenarios should be described in the documents. Ideally, this could show dependency on different pathways towards climate neutrality. To do so, system-wide modelling would have to be integrated into the documents. **Economic assessments and distributive impacts should be analysed at a sectoral level**. Moreover, effects are likely to be geographically heterogeneous and this should also be considered in the assessments. This is needed to isolate potential problems in sensitive areas, such as the Ida-Viru region of Estonia and the oil-shale industry there. Moreover, more emphasis needs to be placed on distribution. **The cost burden, if any, placed on households in financing the transition remains unclear and must be clarified**.
- **Collaboration and energy independence** – Future updates could assess or **comment on the viability of increased collaboration**. Such areas could be in energy security (as the LNG developments have shown) and large-scale projects (for example in nuclear energy or hydrogen infrastructure), or through establishing research institutes and programmes in regional areas of interest. With or without this cooperative aspect, future updates should ensure that the **issue of energy dependency is fully considered**.
- **Accountability** – The development process for each strategy could be described in more detail, including a **greater elaboration of any interactions with stakeholders and the public**. Including this would also help to improve the accountability of the documents. Governance and specific responsibilities should always be clearly listed. Finally, efforts should be made to ensure monitoring of specific targets are widely and easily available.

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Abbreviations

BAU	Business as usual
BRELL	Belarus, Russia, Estonia, Latvia and Lithuania
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Utilisation
EC	European Commission
EEA	European Environment Agency
EE2035	Estonia 2035 development plan
EIONET	The European Environment Information and Observation Network
ETS	Emission Trading Scheme
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse gas
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt hour
LNG	Liquefied Natural Gas
LTS	Long-term Strategy
LULUCF	Land-Use, Land-Use Change, and Forestry
MARKAL	Market Allocation energy model
Mt CO ₂ e	Megatonne Carbon Dioxide Equivalent
Mtoe	Megatonne Oil Equivalent
NECP	National Energy and Climate Plan
NGO	Non-Governmental Organisation
PJ	Petajoule
R&D	Research and Development
R&D&I	Research, Development, and Innovation
RES	Renewable Energy System
SWOT	Strengths, Weaknesses, Opportunities, Threats

TWh	Terawatt hour
WAM	With Additional Measures
WEM	With Existing Measures

1 Background

1.1. Regulatory framework

The accelerating climate crisis necessitates economy-wide planning and governance strategies and plans to drive efforts towards decarbonisation. Ideally, this should describe the present situation and effort required by individual sectors regarding climate action, the associated costs and benefits of such action, and also how these effects will be distributed across society. It should also elaborate on a broad series of enabling policies and measures and, to the extent possible, provide a quantitative basis for the details included. Such a strategy would also improve regulatory stability and provide a consistent basis for attracting investment. Finally, it would allow the impacts of the transformation to be predicted and, if necessary, alleviated.

Within the EU, the framework for such strategies and plans is described by Regulation 2018/1999 of the European Parliament and of the Council³. This Governance Regulation establishes the requirement upon member states to produce two plans: a national Energy and Climate Plan (NECP)⁴ that looks at the five dimensions of the energy union⁵ over a 10-year time horizon, and a long-term strategy (LTS) that seeks to describe decarbonisation for the whole economy over a period of 30 years. This takes the strategy up to 2050, a date by which many countries, and the EU as a whole,⁶ have the stated ambition of achieving climate neutrality. The LTS, therefore, takes on additional importance, as it extends up to a point where it must substantiate this target.

However, the framework provided by the European Commission for the LTS (annex IV of the Governance Regulation) provides considerably less detail than that respectively found for the NECPs. The governance process is also weaker: there is no assessment of the implementation of the LTS by the European Commission, whereas this is included for the NECPs. Moreover, the date of publication by individual countries has varied over several years. During this time, climate rhetoric and policy have not been static. Thus, the LTSs differ considerably in structure, content, and ambition across member states. Indeed, some countries have yet to publish an initial LTS, despite the deadline for doing so has passed at the end of 2019, whilst others have already updated their initial contributions. These factors imply there is significant scope to seek best practices from the published strategies, in order to provide guidance and an additional impetus ahead of the next generation of climate plans.

1.2. Report scope and background

This report presents the assessment and comparative analysis of the LTSs of the Baltic states (Estonia, Latvia and Lithuania) and aims to identify the best approaches and

³ The European Parliament and the European Council. (2018). [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](#).

⁴ National Climate and Energy Plans are available [here](#).

⁵ The five dimensions of the energy union are: security of supply, the internal energy market, energy efficiency, decarbonisation of the economy, and research, innovation and competitiveness, respectively.

⁶ The European Parliament and the European Council (2021). [Regulation \(EU\) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations \(EC\) No 401/2009 and \(EU\) 2018/1999 \('European Climate Law'\)](#).

weaknesses of those strategies⁷. It forms part of a larger package of analysis covering different geographic areas, aiming to build a comprehensive understanding of the current state of play regarding national LTSs, known as Climate Recon 2050.⁸

The Baltic states were all part of the 2004 European Union and NATO enlargements, and each country has since adopted the Euro. The countries are small by European standards and, following re-independence in 1990 or 1991, have undergone relatively rapid economic transformations. However, the GDP per capita of the region is still below the European average. The period following re-independence has also seen shrinking populations across the region and a legacy of energy insecurity. The states formally collaborate through the Baltic assembly, and this occupies a similar position to and cooperates, with the Visegrád group and Nordic council. Based on the findings, the analysis also provides guidance for future updates, which, in line with the Governance Regulation, should be done every 5 years, if necessary.

1.3. Further developments

After the regulation was adopted in 2018, the European Council committed to the goal of climate neutrality by 2050, increasing the ambition to reduce emissions by 55% by 2030 and presenting the related “Fit for 55” package⁹. This tightening of the climate and energy policy, as well as the COVID-19 pandemic and the creation of NextGenerationEU for green recovery, mean most strategies will require updating. The EU policy response to the Russian invasion of Ukraine has further strengthened this, with the proposal for REPowerEU being published in May 2022 by the Commission,¹⁰ further underlines this fact.

Locally, history and geography dictate that the war has a large bearing on the region. Although energy security has always been a major topic in the Baltics, the war has brought this into sharper focus. One possibility is that energy security could be met through a stronger drive towards decarbonisation through developing renewable energy systems (RES), more political pressure on speeding up the processes and reducing bureaucracy, for example. Such aspects are also part of the EC’s (European Commission) plan with RePowerEU. Simultaneously, increasing prices (year on year inflation values are around 20 %, double the EU average)¹¹ may risk short-term solutions with negative climate impacts or grow opposition towards measures with higher upfront costs. This could also be towards new renewable energy developments if the link between this and ultimately lower price is not made clear.

In June 2022, the Baltic states as pioneers in the EU, agreed to no longer buy Russian electricity. In order to manage the electricity balance, the Baltic system operators will now only use the reserve capacities provided by the market participants in the EU, especially the Baltic and Nordic countries¹². To take only the Estonian example, the shortage in the gas supply has brought oil shale back into the market. Considering the war, the previous government also decided to keep 1000 MW of oil shale electricity in reserve¹³ to secure the energy supply. Currently, there’s wide support for this as a temporary solution both among the public and the politicians across the political spectrum. However, as there have been discussions in keeping

⁷ Detailed assessment of individual countries are presented in the Annex II.

⁸ The website for the Climate Recon 2050 project is available [here](#).

⁹ Council of the EU and the European Council. 2021 [Fit for 55. The EU's plan for a green transition](#).

¹⁰ Council of the EU and European Council. 2022 [REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition](#).

¹¹ Eurostat 2022. Euro indicators – annual inflation June 2022.

¹² ERR news, [The Baltic countries are going to maintain an electricity balance with Russia](#).

¹³ ERR news, [Enefit Power is ready to keep 1000 MW indefinitely in reserve](#).

the reserve capacity indefinitely, it needs to be emphasized that this must remain a temporary solution in order to achieve the climate goals.

Another aspect that needs underlining is energy sufficiency. Due to the reimbursement of gas and electricity prices by the government during the 2021/22 heating period, the overall consumption of electricity remained the same. As the government of Estonia is planning to do the same for 2022/23, the necessary decrease in consumption may not happen. Similar planning and discussions are also taking place in Latvia and Lithuania. For example, the Lithuanian government has agreed to compensate household energy customers in the second half of 2022.¹⁴ Nevertheless, the exceptionally high prices caused by the lack of energy security both underline the need for the transition and for its distributive and socioeconomic aspects to be properly understood and sensitively managed.

With their strategies, all three of the Baltic States will formally adopt the position of climate neutrality latest by 2050. Although each LTS assessed in this report differs substantially in length and detail, the coverage of the required aspects under the Governance Regulation is, in fact, rather similar. Most notably, none of the strategies provides sufficient detail on the financial and socioeconomic aspects associated with each of the plans. Moreover, the documents do not include significant detail on the modelling of future scenarios and how this may be dependent on the implementation of sectoral policies. This is true even of the newest document (Lithuania) published in 2021, despite providing substantially more detail on reduction targets, both nationally and for each sector. The lack of sufficient modelling, therefore, underlines the need for each country to subsequently update their strategies, thereby strengthening the guidelines governing the respective trajectories towards climate neutrality post-2030.

¹⁴ DELFI, [Lithuanian parliament approves electricity, gas price compensation plan](#)

2 Assessment of the Baltic state countries long-term strategies

2.1 Overview of the key climate and energy indicators in the Baltic countries.

The Baltic states are similarly sized countries situated within north-eastern Europe and exhibit somewhat similar socio-economic characteristics, albeit with distinct cultural identities. The region's population density is lower than the European average¹⁵, and each country has seen a notable decrease in population since regaining independence. Current population growth rates are also either negative or broadly static. All three countries have GDP (gross domestic product) per capita and energy intensities somewhat below and above the EU average, respectively^{16,17}.

Lithuania has the largest economy and population of the three countries, contributing slightly less than 50 % of the regional totals in both cases. It, therefore, also has the largest GHG (greenhouse gas) emissions¹⁸. However, Estonia has the highest emissions on a per capita basis, driven by the use of oil shale in the energy sector. In Estonia, this sector contributes close to 50 % of emissions, whereas in Latvia and Lithuania, it is much less significant (at least discounting the role of trade). The emission profiles beyond energy have some similarities. Transport is responsible for the largest emissions in Lithuania and Latvia (second in Estonia), with agriculture also amongst the top 3 in each country. Finally, LULUCF (Land-use, Land-use change, and Forestry) is a carbon sink in all three states based on data from 2019.¹⁹ However, in Estonia, recent evidence suggests LULUCF has now transitioned to a net source of emissions (from over 4 million tonnes in 2012 to emitting almost 1,3 million tonnes in 2020).²⁰

Even discounting oil shale, all the Baltic states are highly dependent on fossil fuels and are currently net energy importers. Coupled with this is their location. Energy infrastructure, such as gas pipelines, has flown from Russia and the countries' electricity grid is currently (until the end of 2024) synchronised in the BRELL system (Belarus, Russia, Estonia, Latvia and Lithuania), rather than the rest of Europe. The Russian invasion of Ukraine has made energy security an even more pressing issue, which highlights the difficulties (along with the opportunities) associated with the transition to climate neutrality.

Due to the history with Russia, the Baltic states have always been aware of the geopolitical threat to energy security. This has been integrated into the LTS-s as well as other strategies/development plans, but progress has been slow. The European Commission's initiative REPowerEU helps to accelerate the processes of installing RES solutions and reducing bureaucracy, putting more pressure on the governments in the Baltics as well as other member states. After the call by the Baltics states and Finland to no longer buy Russian electricity, there's been a lack of supply in the market, which, together with low RES availability

¹⁵ Eurostat 2021. [Population density – data viewer](#)

¹⁶ Eurostat 2021. [Real GDP per capita – data viewer](#)

¹⁷ Eurostat 2021 Defined as [Gross Inland Consumption / GDP](#).

¹⁸ European Environment Agency (EEA) 2021. [EEA greenhouse gases – data viewer](#)

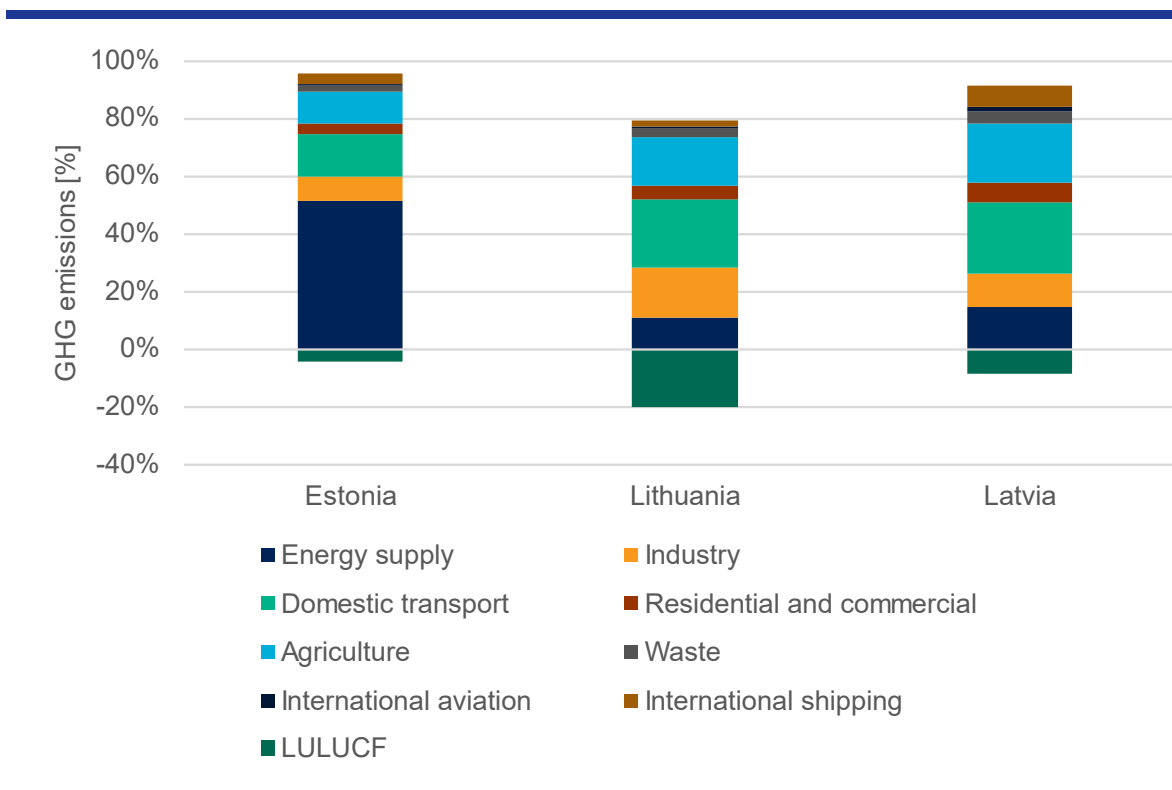
¹⁹ European Environment Agency (EEA) 2021. [EEA greenhouse gases – data viewer](#)

²⁰ Greenhousegases in Estonia. Ministry of Environment.

<https://envir.ee/kliima/kliima/kasvuhoonegaasid-eestis#kasvuhoonegaaside-in> (Accessed: 18.08.2022)

due to the weather conditions and maintenance of key power plants in the region, has significantly increased the prices to consumers in the region.²¹ The war has also led to the decision to stop gas imports.²² Although not as pressing as some other countries, alternative gas sources have, for example, been sought through proposals to develop additional liquified natural gas (LNG) terminals in Estonia²³ (with Latvia also considering one in the future) to go along with the already existing terminal at Klaipeda. However, extreme care must be taken to mitigate any lock-in associated with these developments.

Figure 1: Share of total GHG emissions by sector in 2019



Source: WiseEuropa based on EEA (European Environment Agency) data

Figure 1 shows the proportion of emissions by sector for each country. Figure 2 also shows the changes in emissions for each sector between 2005 and 2019. Partly driven by the demographic decreases, all the Baltic states have seen significant declines in emissions since 1990. For Lithuania and Estonia, this has persisted since 2005, and by far, the largest absolute reductions have been in the energy sector. Other significant reductions have been in industry and waste. Latvia has seen an increase in total emissions since 2005 and consequently had larger per capita emissions in 2019 than in 1990, whereas Estonia and Lithuania have decreased by over 50 %. However, per capita territorial emissions are still almost twice as high in Estonia than the two other Baltic states. The increase in Latvia is driven significantly by a substantial relative increase in emissions from LULUCF (although the sector remains a sink as a whole). The magnitude of the LULUCF sink has decreased since 1990 for Latvia and Estonia,

²¹ This can be seen through a time series of the NordPool day ahead prices – [available here](#).

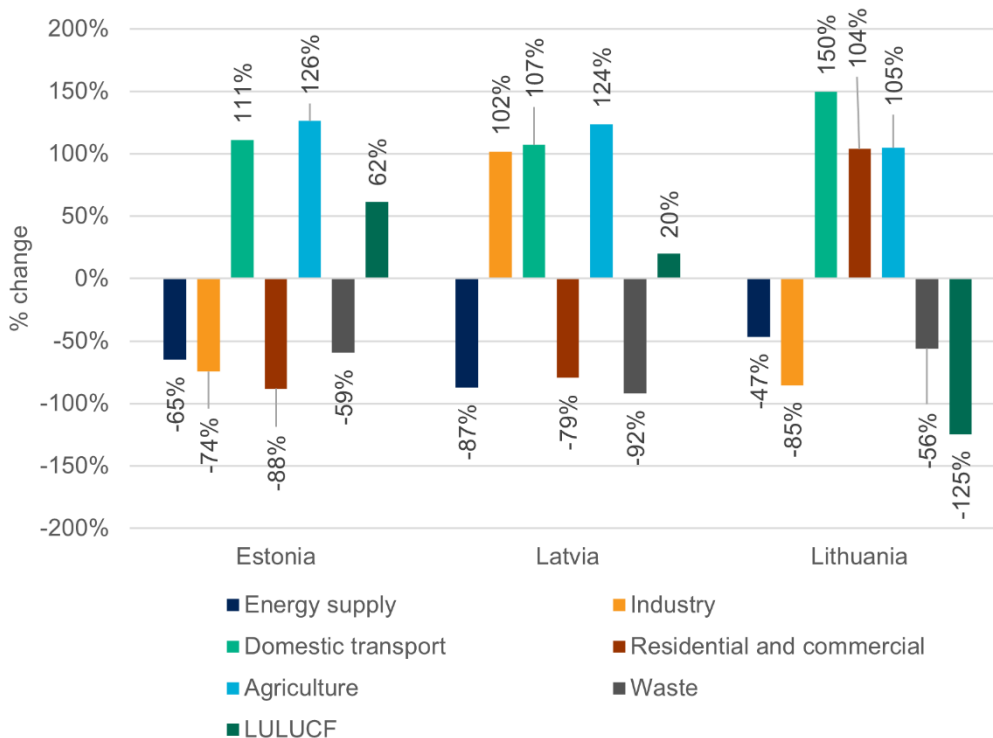
²² LSM, [Baltic states stop importing Russian gas](#)

²³ ERR, [LNG capacity due to be ready in Estonia by end of November](#)

whereas it has been increasing most recently for Lithuania. The Latvian LTS states that the decrease in the size of the LULUCF sink is primarily driven by an increase in forest land that has reached maturity. This has contributed to increased exploitation and emissions related to natural tree mortality. A second stated factor is deforestation related to infrastructure projects.

Both agriculture and transport emissions have been increasing recently for all countries. The increases in transport may be related to the growth in wealth experienced in the region²⁴. These sectors thus pose significant decarbonisation challenges.

Figure 2: GHG emissions change 2005 - 2019 in selected sectors



Source: WiseEuropa based on EEA data

Gross inland energy consumption by source for each country in 2019 is displayed in Figure 3. Each country shows a rather similar (and high) dependency on fossil fuels when considering the energy mix. The higher proportion of liquid-based fossil fuels in Estonia reflects the use of oil shale, but this is covered somewhat in Latvia and Lithuania by larger shares of natural gas (although the emission factor for natural gas is twice as low as for shale oil, 15.3 t CO₂/TJ²⁵ and 30.95 t CO₂/TJ²⁶ respectively). Bioenergy also contributes significantly to each country and is the largest in Latvia, leading to a slightly reduced share of total fossil fuels. A second

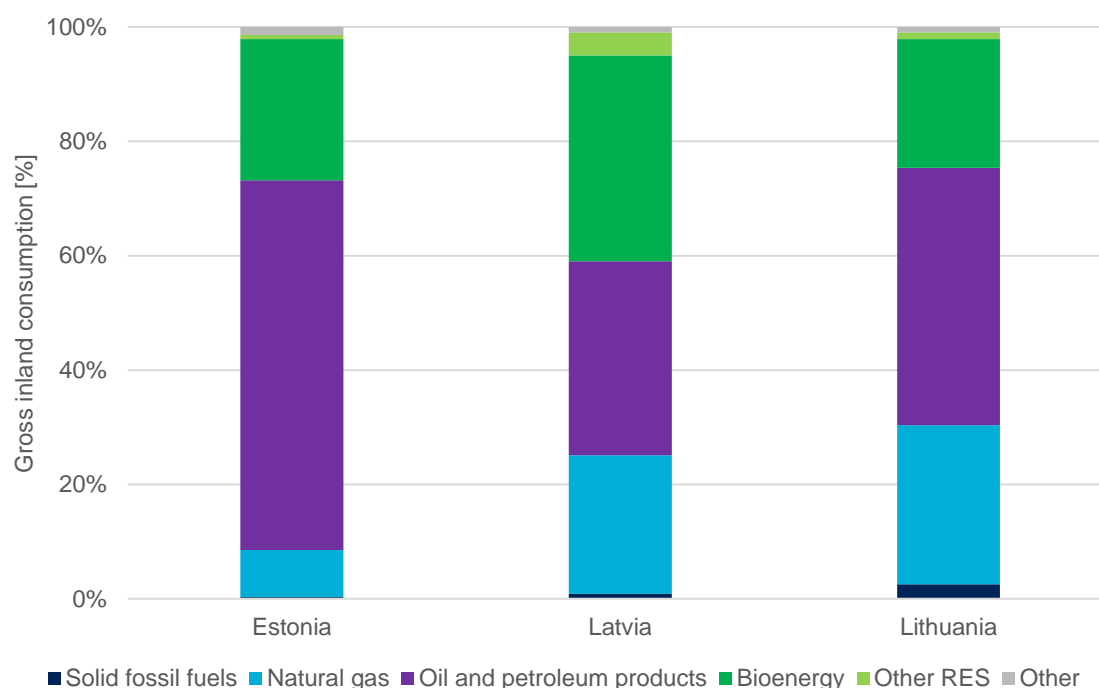
²⁴ Sims R., Schaeffer R. et al. Intergovernmental Panel on Climate Change (IPCC). (2014). *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC, Cambridge / New York, chapter 8, p. 5.

²⁵ Natural gas emission factor [Available here](#)

²⁶ Shale oil emission factor [Available here](#)

difference in the profiles is the larger share of RES in Latvia, a result of the considerable proportion of hydropower in national electricity generation.

Figure 3: Gross inland consumption of energy carriers in 2019



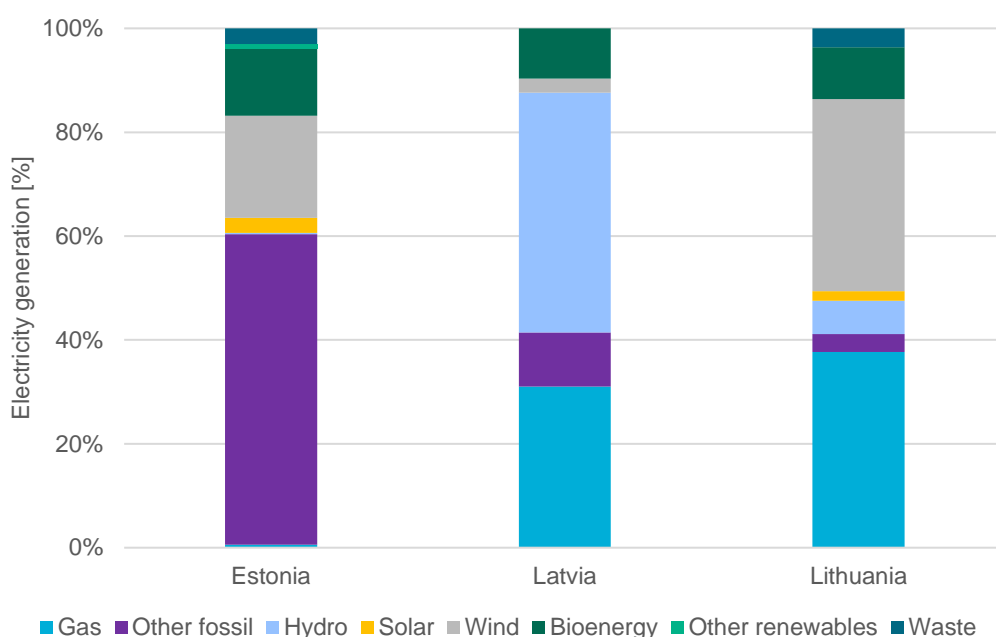
Source: WiseEuropa based on EEA data

The electricity sectors, shown in Figure 4, of Latvia and Lithuania, are broadly comparable, with around 40 % of generation being from fossil sources. In the latter case, the region’s largest share of wind power’s electricity covers the reduced amount from hydropower. The amount of fossil fuels in Estonia’s electricity mix is closer to 60 %, almost all of which comes from oil shale. This sector is geographically concentrated in a single region (Ida-Viru) and requires significant emphasis also to be placed on the socio-economic aspects of the energy transition. Bioenergy also contributes to electricity in each country.

Finally, it is important to stress that each country is a net electricity importer. The amount of demand covered by local production was, respectively, only 56, 72 and 34 % for Estonia, Latvia and Lithuania in 2020²⁷. Taken together, these points underline the issue of energy security and the opportunities inherent in the transition to net zero.

²⁷ EMBER 2020 [Europe power sector 2020](#)

Figure 4: Electricity generation by source in 2020



Source: WiseEuropa based on Ember data

2.2 General information and targets

Although containing many of the required elements, the evaluated strategies are only partially in line with the framework set out in the Governance Regulation. Notably, the economic assessments or financial description of the transition are typically extremely limited, and the use of analytical tools is either sparse or completely missing. The descriptions of any public consultations could also be slightly strengthened, particularly emphasising whether these led to any changes in the relevant strategies.

The interpretation of the guidelines has led to substantial differences in the structure of the documents. The Estonian LTS is a bare 6-page document with very general descriptions and a complete lack of quantitative detail beyond the high level GHG reduction targets. It was also established in 2017 (before the Governance Regulation) and only includes a target for an 80 % reduction in emissions by 2050. The Estonia 2035 agenda, adopted in 2021, is now interpreted in this report as an update to the LTS, as it includes a climate neutrality target by 2050. However, this is a holistic strategy for the whole of the Estonian society²⁸ and was not based on the guidelines of the Governance Regulation.

The Latvian and Lithuanian strategies are both more recent and more substantial. The Latvian document provides a more detailed breakdown of the high-level targets with and without LULUCF. There is also a non-binding target for sectors not included in the EU Emissions Trading System²⁹ (ETS) by 2030 if the NECP is also considered. This contrasts with Estonia, which only provides a single target. Perhaps resulting from its more recent adoption, the Lithuanian LTS includes by far the most detailed targets, including for 2030 and 2040, and contains a new target for total emissions not covered by the ETS. Moreover, only the Lithuanian

²⁸ Eesti 2035, Estonian Government (2021) [Available here](#).

²⁹ The sectors and gases included in the ETS are available [here](#)

document provides targets for energy efficiency and RES share by 2050. However, present and historical emissions are generally not well described, both at the national and sectoral levels. At times, this makes the targets hard to contextualise. The document is introduced through a ‘SWOT’ (Strengths, Weaknesses, Opportunities, Threats) analysis of the readiness of the country to mitigate and adapt to climate change, but the lack of a sectoral sub-structure hinders readability. In turn, the Latvian document does contextualise the expected reductions through a depiction of current and historical emissions. However, it contains much less detail regarding targets for individual sectors and no targets for energy efficiency or RES share.

It is interesting to note that there are similarities in the missing sections for each country. The limitations with regard to the economic assessment and financial requirements in the plans are especially notable, given the pronounced transitions required. This arises from the other shortcomings in economy-wide modelling, which makes such aspects challenging to assess. Further revisions will be required to bring each strategy fully aligned with the regulations.

There are also additional similarities that should be highlighted. All three countries commit to climate rather than carbon neutrality.³⁰ Additionally, each provides sections on adaptation and not just mitigation, despite this not being included in the guidelines set out in the Governance Regulation. In keeping with the rest of the document, the Estonian LTS only includes a few lines on this issue. For Latvia, it is mainly dealt with in a section on necessary changes to the urban environment. In the Lithuanian case, however, it is given almost equal weight as mitigation. Beyond the SWOT analysis, there is a dedicated chapter with specific targets and goals, although these are generally less quantitative than the corresponding section on mitigation. A final note is that each LTS reads as an independent strategy – there are little to no references to collaboration between the countries throughout the documents.

Table 2: Scoreboard on general information and targets

Subcategory	Lithuania	Latvia	Estonia
Adherence to Governance Regulation	2	2	2
Up-to-date document	3	3	3*
Net-zero target	3	3	3
GHG emissions reduction	3	3	3
Renewable energy share	3	2	2
Energy efficiency	3	2	1

(*) If EE2035 is used

³⁰ Carbon neutrality places no limits on greenhouse gases that do not contain carbon, such as N₂O. Climate neutrality requires net emissions across all greenhouse gases to be zero.

Table 3: Year of adoption or draft release of LTS

Country	Date of adoption	Responsible administration unit
Lithuania	July 2021	Ministry of Environment
Latvia	December 2019	Ministry for Environment and Regional Development
Estonia	April 2017 / April 2021 *	Ministry of Economic Affairs and Communications / Government Office

*EE2035 was released in 2021 and is interpreted as an updated LTS for this report.

Table 4: High-level targets for 2050 and 2030 for each country

	Targets 2050			Targets 2030			
	GHG emission reduction	RES share	Energy efficiency	GHG emission reduction	RES share	Energy efficiency / Mtoe	
						Primary energy consumption	Final energy consumption
Lithuania	Climate neutrality	90 %	2.4 x reduction in primary and final energy consumption compared to 2017	70 %	45 %	5.4*	4.5 ³¹
Latvia	Climate neutrality	-	-	65 %	50 %	3.9 – 4.1*	3.46 – 3.56*
Estonia	Climate neutrality	-	-	80 % (in 2035)	55 % (in 2035)	5.1*	3 ^{32*}

*In the NECP of the respective country. Mtoe (Megatonnes of oil equivalent)

³¹ The LTS states final energy savings of 27 TWh in 2030. It is assumed this is cumulative, based on the same figure in the NECP.

³² The exact target was the same level as 2019, according to the NECP.

General information and targets – cross-cutting issues

- The strategies were published between 2017 and 2021. This is reflected in the detail and scope of the documents, with the original Estonian LTS consisting of only 6 pages. Lithuania’s document is the most recent, and thus the only one to reference the updated ambitions of the “Fit for 55” package³³. The 2030 targets in this document exceed the NECP in some cases (although this is also the case for EE2035).
- Lithuania provides a breakdown in terms of ETS and non-ETS sectors. This is not done by Latvia and Estonia in the LTS. Moreover, it is the only country to provide targets for RES share and energy efficiency up to 2050. All countries provide energy efficiency targets for 2030, but these appear to be essentially the NECP targets. Even so, the savings expected are not the same (14 % for Estonia and estimated as 11 % and 18 % for Latvia and Lithuania, respectively, for final energy consumption).
- Adherence to the Governance Regulation is incomplete - including targets beyond 2030 for RES share and energy efficiency.
- All countries include the topic of adaptation, not just mitigation. Each strategy contains individual sections. However, there are discrepancies in detail. The Estonian LTS includes only a few bullet points, whilst the Latvian and Lithuanian documents are more substantial.
- All three countries have seen GHG decreases since 1990, driven at least in part by demographic changes. In this context, it would have been beneficial to peg targets to both 1990 and another date to increase accountability.

2.3 Sectoral pathways and measures

The general framework of long-term strategies set out in Annex IV of the Governance Regulation requires sector-specific related content to be included. Providing sectoral context is of crucial importance, which gives meaning to the planned transformation; the background should include the presentation of various sector indicators, the presentation of policies and measures, and the various factors influencing the current situation.

Some of the ostensible similarities in table 5 reflect the nature of the methodology rather than an exact equivalency in the sectoral coverage between the Baltic states. For example, with a few exceptions, all the sectors are referenced to some extent in each LTS without fully incorporating all the necessary components for a score of 3. Nevertheless, discrepancies in structure, detail and ambition are pronounced.

³³ Basic information on fit for 55 can be found [here](#).

Table 5: Scoreboard on sectoral details

Subcategory	Lithuania	Latvia	Estonia
Energy	2	2	2
Buildings	2	2	1
Transport	2	2	2
Industry	2	2	1
Agriculture	2	2	1
LULUCF	2	2	1
Carbon removal technologies	3	2	1

For example, the Estonian LTS presents an extremely limited coverage of a few points for each sector, even when EE2035 is considered. Some sectors are also missing altogether. These are industry (integrated with energy) and buildings, which are barely addressed at all. Historical emissions are only presented graphically and are not interpreted in the text or contextualised within the socio-economic and demographic changes after 1990. Descriptions offer a relatively vague vision of future developments without specific, quantitative targets. EE2035 does somewhat raise the ambition for the transport and energy sectors, but still does not include provisions or policies to any great extent. Moreover, there is a notable omission with respect to the oil-shale industry. This is not addressed in the original LTS beyond a desire to move to products of higher energetic value, such as retort gas. EE2035 only refers to a gradual reduction in the share of oil shale energy and a package of supporting measures, without describing what this means.

Similarly, the Lithuanian strategy does not have a detailed description of the current or historical situation in each sector. However, it has comprehensive targets to be achieved in each decade. This often includes sub-targets that are not direct GHG reduction targets, such as afforestation or reduced inorganic fertiliser use. Whilst this is impressive, the lack of background information makes them hard to contextualise, and policies and measures are absent behind the headline targets. This notwithstanding, the precise targets set down in the LTS are welcome, even if the high-level targets are ultimately less ambitious than those found in EE2035.

Latvia, in turn, gives a much more detailed description of current emissions from each sector along with historical context. This makes it the most legible of the three documents. For most sectors, there is a projection for emissions in 2050, but only under what appears to be a business-as-usual (BAU) scenario. Descriptive targets for each are given, but these remain at a high level and generally do not include more prescriptive measures to reduce emissions. The level of detail in terms of targets between the three states largely follows the date of adoption, at least at the sectoral level.

A further point is the emphasis given to energy security. This is particularly true for the Latvian document, as well as the Estonian LTS to a lesser extent. The electricity grid of the Baltic states is currently synchronised with Russia and Belarus but will soon be aligned with continental Europe. The role that increased RES can play in this is highlighted.

Certain sections are also absent in some of the strategies. For example, a discussion of building emissions is missing from the Estonian strategy and Industry is integrated with Energy. For

Latvia, there is no separate sections on agriculture or buildings. The omission of agriculture is particularly notable given it is the second largest source of territorial emissions.

Taken together, all three documents lack more specific detail on policies that should be enacted for each sector, as well as modelling to project emissions into the future in light of these (e.g. a ‘with additional measures’ (WAM) versus a ‘with existing measures’ (WEM) or BAU scenario. This means there is no analysis of changes or reductions that can be expected and makes it difficult to gauge what is required in each sector.

Sector pathways and measures – cross-cutting issues

- A background of the current situation is often missing, which hinders legibility and makes it hard to put targets into context.
- Documents read too often like aspirations. They lack a degree of strategic planning, perhaps because more importance has been placed on the corresponding NECP. However, the lifetime of energy and other infrastructure is long, and the lack of emphasis on the longer-term perspective is notable.
- Specific policies and projections tend to be lacking. For a score of 3 in our methodology, projections for each sector should be included, perhaps with an emphasis on different policy options. It may be true that more detail can be found in the respective NECP, but this typically only provides detail until 2030. The longer-term perspective for individual sectors is missing.

2.4 Financing and enabling policies and measures

The Governance regulation requires each country to consider estimates of investment and financing needed to facilitate the transition. There is also an obligation to consider policies and measures related to research, development, and innovation (R&D&I). To achieve a score of 3 in these sub-categories, countries should provide and review potential measures and financing instruments to the extent that is currently possible. They should also assess the role that R&D&I can play in facilitating the transition.

Table 6: Scoreboard on financing and enabling policies and measures

Subcategory	Lithuania	Latvia	Estonia
Investment needs assessment	1	3	1
Financing	2	2	1
R&D	3	2	2

2.4.1 Investment needs assessment and financing

None of the LTSs discusses financing in detail. The investment needs are only estimated in the Latvian case and are not referred to in the Lithuanian or Estonian LTSs. Indeed, the quoted investment needs for Latvia are not based on the LTS specifically. It instead references a separate study that looked at the cost of climate neutrality in Latvia³⁴. Similar work has also been conducted for Estonia,³⁵ with similar overall costs, but this was not referenced in any of the Estonian documents analysed. Options for financial instruments are missing or only briefly listed and do not include information on the number of funds expected to be raised. There is also no breakdown of how the burden shall be shared between the state and municipalities, supra-national organisations, the private sector, and households. The lack of information precludes further analysis of this section.

2.4.2 R&D and innovation

All the documents point to the importance of R&D and include the general target of raising funding to the EU average of 2 % (by 2030 for Lithuania and Latvia; 2035 for Estonia³⁶). The Lithuanian strategy also includes the goal of reaching 4 % by 2040. Research areas to be prioritised are highlighted together with a desire to improve valorisation and collaboration between business and research institutions. For example, the Lithuanian strategy consistently emphasises the development of green hydrogen. However, beyond listing potential areas of interest, there is little critical appraisal of the potential and level of readiness of each technology within the country. One exception to this is CCS (carbon capture and storage) / CCU (carbon capture and utilisation) within the Latvian LTS, where it is stated that this technology is unlikely to be economically viable at this time.

As with other aspects, there is also a lack of detail about where the additional funding will be found or what programmes or strategies will be enacted to reach the stated goals. The strategies do not typically include more detailed strategic goals beneath the GDP headline. There is also no discussion of collaboration between the three countries in strategically important research areas.

Table 7: Scoreboard on financing and enabling policies and measures

Subcategory	Lithuania	Latvia	Estonia
Investment needs assessment	1	3	1
Financing	2	2	1
R&D	3	2	2

³⁴ Institute of Physical Energetics 2019. [Report published here.](#)

³⁵ SEI Tallinn 2019. [Report published here.](#)

³⁶ It is not always clear whether these targets are referring to public or private sector investments. Estonia makes it clear that the goal refers to private sector investment in R&D; Lithuania states it's target applies to both the public and private sector, but it is not known if the number reflects a combined target or two individual ones.

Financing and enabling policies and measures – cross-cutting issues

- For all countries, financing and investment needs are hardly integrated at all into the LTS. These omissions are particularly notable. Once the respective documents are revised, this section will need to be substantially strengthened in all cases to fulfil the requirements of the Governance Regulation.
- More specifically, sources and estimates of funding against the expected total cost are missing. This means the gap between the two is not stated and nor is how the cost burden will be distributed. Not including this gives the indication that each LTS is aspirational and precludes their interpretation as the needed strategic documents to guide the transition to net zero.
- All countries highlight the desire of increasing R&D spending to 2 % of GDP. In some cases, the targeted priorities for R&D are given. However, more detail could still be added in terms of specific sources and distribution of funding, as well as potential programmes or institutions to be established.

2.5 Economic assessment

A socioeconomic impact assessment is a necessary requirement in the Governance Regulation. To achieve a score of 3, the plans should attempt to describe expected impacts, negative or otherwise and how they will be shared across impacted groups. It should also, to the extent that is possible, give detail on what measures could be taken to relieve or compensate for any negative aspects.

Table 8: Scoreboard on financing and enabling policies and measures

Subcategory	Lithuania	Latvia	Estonia
Socio-economics impacts	2	2	1
Distributive impacts	1	1	1

2.5.1 Socio-economic impacts

All three countries have only considered economic aspects to a limited extent. Lithuania quotes the NECP in saying that employment should increase by 1.56 % up to 2030³⁷. Latvia has a description of expected costs against GDP and that climate neutrality will boost GDP by 2.5 billion Euros. It also suggests that changes in the energy sector will increase GDP, based on a

³⁷ Lithuanian NECP 2020 – [Published here](#).

referenced Eurofound³⁸ study applicable to the whole of the EU³⁹. However, this was not based on an assessment of the LTS, but on EU-wide policies implemented by 2030 under a 2-degree warming scenario. Estonia includes very little detail on these aspects. More information can be found in the NECP (as is also the case for Latvia and Lithuania), but these only cover the period until 2030.

Beyond this, energy poverty is highlighted along with the role energy efficiency improvements can play in its alleviation. A lack of economy wide modelling of measures may prohibit a detailed economic assessment in each case. Below several socio-economic aspects are highlighted, alongside the extent that they are integrated within each country’s respective LTS.

Table 9: Issues included by B3 countries in the assessment of socio-economic impacts

Gross Domestic Product	X		X
Employment	X	X	X
Salaries	X	X	X
Government revenues	X	X	X
International trade	X	X	X
Energy security			
Impact on households	X	X	X
Energy poverty			X

GDP growth prediction: Latvia implicitly states that the transition to carbon neutrality will have a net positive effect of 2.5 billion euros by 2050. This is based on the difference between the assessment of the economic needs with and without the positive effects on GDP (16 and 13.5 billion euros, respectively). The difference between these two values is 2.5 billion euros, implying that the expected additional growth in GDP is equivalent to this difference. The aforementioned Eurofound study suggests that, in keeping with the Paris agreement, Latvia would experience the largest GDP growth from 2015 to 2030 of all the countries in the EU. However, it is unclear whether the specific policies outlined in such a document reflect those currently envisaged in the LTS/NECP. In turn, Lithuania again bases the findings on the NECP, stating that GDP would be 1.72 % higher if all the policies were implemented in the period between 2020 and 2030. The corresponding values for the policies from 2030 to 2040 were 0.23 %. However, as the LTS appears to show increased ambition over the NECP, it is not clear if these values are still valid. Estonia provides no assessment of expected changes to GDP and does not quote the corresponding values from the NECP, which appears to be an increase of 3.6 % by 2030 if measures are implemented⁴⁰.

³⁸ Eurofound is the European Foundation for the improvement of living and working conditions

³⁹ Eurofound 2019. [Energy scenario: Employment implications of the Paris Climate Agreement](#).

⁴⁰ Estonian NECP 2019 - [Published here](#).

Employment impacts: Latvia includes details of this in the NECP up to 2030 but does not include it in the LTS. The NECP states that RES and energy efficiency measures will generate 4600 additional direct jobs in this period and states a further 6100 would be created indirectly. Similarly, Lithuania quotes the results from the NECP and states that jobs will increase to 2030 (this is also found in the Estonian NECP but is not stated in the LTS). There are no details or projections on changes to employment beyond this point.

Salaries: No detail in any of the documents.

Government revenues: Little specific detail in any of the plans. Estonia states that the overall tax burden should not increase. All documents discuss polluter liability/polluter pays principle, but without extensive information on what this will entail (e.g. road usage tax).

International trade: No detail in any of the documents

Energy security: This is a key issue for all countries. However, only Latvia provides detail on the current level of energy dependence (43 %, already down from 89 % in 1990)⁴¹ and states that this should be further improved. Lithuania and Estonia only raise this topic more vaguely. This is despite it being a sensitive issue for all countries and a requirement for the NECP. It is also a cross-sectoral issue – all energy efficiency policies should also be seen in the context of energy security.

Energy poverty: This is especially highlighted by both Lithuania and Latvia, whereas it is emphasised somewhat less strongly by Estonia (which doesn't separate this issue from general poverty in EE2035). However, this issue is also less important in Estonia, according to a 2021 study⁴². Lithuania states that energy poverty within the country is the second highest in the EU, whilst Latvia indicates the level is twice the northern European average. These findings are supported by Bouzarovski et al 2021. Only Lithuania talks about alleviating energy poverty through financial measures and education, but specific detail is still lacking.

2.5.2 Distributive impacts

The section on distributive impacts should include who will (and to what extent) bear the costs of transition. However, this is not really discussed in any detail beyond the discussion of energy poverty (see 2.5.1). A small exception is EE2035, which highlights the need for supportive measures in the Ida-Viru region due to the Oil-shale industry there. However, there is still a lack of detail behind this statement.

⁴¹ Energy dependence is calculated as net imports (imports minus exports) divided by gross available energy

⁴² Bourazarovski. S, Thomson. H, et al, Confronting Energy Poverty in Europe: A research and Policy Agenda, *Energetics* 2021, 14(4), 858. [Available here](#).

Economic assessment – cross-cutting issues

- Beyond general descriptions, the plans lack information on socioeconomic aspects. There is little detail on what the effects of the transition will be compared to current policies. Where information can be found, it is often directly taken from the respective NECP or from a study conducted outside the LTS. These problems may arise from the lack of modelling in the strategies.
- All countries highlight the importance of energy security. This is something to which they all have potential vulnerabilities, partly due to geography. The advantages of the use of local RES in this context are highlighted. However, again there is a lack of specific detail and expected quantitative effects. This is a cross-sectoral issue: energy efficiency measures should also be seen in the context of security.
- Energy poverty is high in Lithuania and Latvia. However, in the respective LTSs, little reference is given to how this will be impacted by the plans or to specific poverty-alleviating measures
- Distributive impacts are not discussed in the LTSs. All 3 countries have GDP per capita below the EU average. Yet how the costs and benefits of the green transition are shared is not described. The cost burden on households (e.g., to what extent households will be responsible for the roll-out of new technology (such as EV (electric vehicles)) or other important measures, like energy efficiency improvements to apartments, is still not clear.

2.6 Strategy preparation and implementation

Table 10: Scoreboard on strategy preparation and implementation

	Lithuania	Latvia	Estonia
Analytical tools	1	2	2
Governance	3	2	3
Public consultation	1	2	2

2.6.1 Analytical tools

Limited detail on analytical tools is included in any of the plans. The most information is found in the Latvian LTS, where some assumptions are listed, and a projection is given for all sectors until 2050 under current policies and available technologies (taken from the 2019 submission to EIONET (European Environment Information and Observation Network) and expert

evaluation)⁴³. But even here, the values are simply presented without directly explaining how they were calculated. The submission provides only values up to 2040, but the LTS projects up to 2050. Separately, the source of the projections is also given as a November 2019 document by the Latvian Institute of physical energetics⁴⁴ (in reference 50 of the LTS) using the MARKAL model.⁴⁵ It may be the case that subsequent updates make clear that this is the true source of the projected emissions. This is followed by a discussion of potential solutions and the same figure also shows an aggregated (i.e., without sectoral detail) projection leading to climate neutrality by 2050. This suggests the greatest reductions occurring between 2030 and 2040. However, it is unclear if this is based on any underlying modelling or is just included as indicative of what reductions could look like under a hypothetical scenario. In the original LTS, Estonia provides a cumulative projection until 2050 under a BAU scenario and then shows a prospective decrease to 2050 with some sectoral detail (4 in total). But again, it is not clear what has been modelled and what may be simply illustrative. It also does not include LULUCF is now outdated, given only the more recent EE2035 document includes the goal of climate neutrality. Precise details regarding how the modelling was carried out are lacking for both countries. Lithuania does not include any visible model at all within the LTS.

2.6.2 Governance

Effective governance tools are essential for the plans to be implemented successfully in each country. The LTS and NECP provide the basis for the European Commission’s monitoring of this process, but it itself relies on the strength of governance and monitoring within the individual countries.

As can be seen from **Tõrge! Ei leia viiteallikat**. Table 11, each Baltic state includes details on governance to some extent. Estonia and Lithuania provide more detail in this section, and clearly state when plans will be updated, and which department oversees specific actions. Governance is also included in the Latvian document but to a lesser degree. These issues are summarised in the following table that highlights specific governance tools and their use within the climate plans of each country. It can thus be seen that each country needs to further strengthen their governance procedures. One notable inclusion for Estonia is the online tool, Tree of Truth⁴⁶, which shows the progress towards each of the stated goals in EE2035, including those relevant to the long-term strategy.

Table 11: Governance details included in each LTS

	Lithuania	Latvia	Estonia
Implementing body	Coordinator: Ministry of Interior. Implementor: Specific ministries responsible for sectors.	<i>Unclearly specified, likely Ministry for Environmental Protection and Regional Development</i>	<i>Specific ministries responsible for specific actions.</i>

⁴³ Latvian 2019 submission to EIONET - [available here](#). The Expert evaluations were not elaborated upon.

⁴⁴ Latvian Institute of Physical Energetics 2019 – [available here](#).

⁴⁵ The MARKAL model was developed by the IEA (International Energy Agency). Details are [available here](#).

⁴⁶ The online tool is available [here](#).

Implementation tools	X	By preparing and adopting climate and energy plans. Series of implementation tools listed (e.g., legal acts, financial instruments, etc). However, these are listed only generally.	X
Monitoring	Monitoring system to be set up based on analysis of indicators, but lack of further detail.	X	Plan monitored annually. Online tool for monitoring specific indicators.
Evaluation	LTS includes many policy indicators by which plan can be assessed.	Four indicators selected for measuring implementation	Several specific indicators related to climate neutrality in EE2035. Many other unrelated indicators also included.
Update	Updated every 10 years (Required by Governance Regulation)	Updated every 10 years (Required by Governance Regulation)	The original LTS should be reviewed and potentially updated every 4 years. EE2035 is monitored (and potentially updated) annually.

X – a given tool was not included in the LTS

2.6.3 Stakeholder participation and public consultation

There is no description of public consultation or stakeholder participation in the Lithuanian LTS. This is also the case in the original Estonian LTS, but details are included in the EE2035 document. It states that a series of different organisations, NGOs (non-governmental organisations) and experts have been involved in the process. It is also stated that the document was drawn up considering the views of 17000 people, including determining the strategic goals for the plan. Draft plans were also published online.

Similarly, the Latvian LTS states that there has been public consultation – including on the draft document - since 2016 and provides the most detail of the three countries. The first stage included the dissemination of materials related to the development of the LTS at educational institutions and NGOs interested in climate issues, as well as including public consultations and discussions. Specific stakeholders, such as local governments, local public interest groups and academics, were involved through five interactive seminars. Consultations in 2019 with various stakeholders were also held during a visit from the Director of Climate strategy of the EC

(European Commission) Directorate-General for climate action. Finally, the draft strategy was published online for consultation.

However, for both Latvia and Estonia, it is not clear to what extent these consultations were considered by the parties drawing up the documents. The Lithuanian document will have to be revised in the future to include stakeholders and public participation in the development process.

Strategy preparation and implementation – cross-cutting issues

- There is a lack of system-wide modelling of different scenarios, linking emission reductions, economic aspects, and policy measures. This makes the LTSs read as purely aspirational, and not strategic documents to guide each country towards climate neutrality.
- This lack of detail makes any modelling that is included difficult to assess. For example, Latvia omits any detail and includes only a reference, which suggests the MARKAL model was used. But what has or hasn't been modelled under what set of assumptions and what series of policies is not clear. The original Estonian LTS does not describe the projection that is included at all.
- Lithuania states that modelling capabilities must be strengthened. If this is the reason for the lack of detail, then such aspects could be sourced from other organisations with experience in this area. However, modelling is included in the Lithuanian NECP.
- Governance is included in each of the documents. However, at times, more specificity is also needed – it is not always clear who is overseeing the strategies and how the results will be monitored.
- Estonia has developed an online tool for monitoring specific indicators related to EE2035. This includes detail on emissions reduction. This may help to enhance accountability and the visibility of progress towards climate neutrality.
- Public consultation is included for Estonia and Latvia but is missing enough detail to assess how strongly it influenced the plans of each country.

3 Conclusions

This report sought to analyse and critically compare the long-term strategies of the Baltic states, describing their respective plans for decarbonisation up to 2050. The environment within Europe regarding climate mitigation is not static. Significant changes have taken place since the Governance Regulation was adopted, such as the European Green Deal and the 'Fit for 55' package of measures. The oldest of the three long-term strategies from the Baltic states, the Estonian LTS, was published in 2017, years before climate neutrality was agreed upon at the EU level. Clearly, **the strategies analysed in this report will have to be updated** in light of the changes in climate policy in the past 3-5 years. Ahead of these updates, it is therefore of significant value to assess the currently published strategies for each country, to expand on weak or missing elements, and highlight points that could be replicated across the region.

Given this, it is notable that despite the differences between the strategies, they all appear to have similar weaknesses with similar omissions. This may imply that each country interpreted the requirements similarly, in spite of the limited guidelines within the Governance Regulation. Furthermore, it is possible that each country viewed the LTS as a document with less weight than the corresponding NECP. It is **presently unclear what is offered as specific added value by the LTS over the NECP** beyond a formalisation of the climate neutrality target.

Many missing elements or considerations arise from the **lack of systematic economic wide modelling** of policies. This makes the documents read as aspirational, rather than relatively robust guides towards climate neutrality. For example, the absence of such modelling precludes a proper understanding of the costs of transition, and the corresponding financial and economic sections are particularly weak. A second possibility is that the missing sections relate to a lack of expertise, something that would need to be urgently addressed.

Even if the countries have given significantly more weight to the NECP (judging by the respective lengths of the documents), **additional emphasis should also be placed on the longer-term perspective**. Pathways towards climate neutrality should inform the actions for the coming decade, not the other way around. Some decisions need to be made now, especially given the long lead time of infrastructure projects. Doing so would also provide clarity to the private sector.

The next round of updates would also provide concrete opportunities to **strengthen and illuminate public and stakeholder involvement**. Where such detail was given, often, the documents did not discuss what had been taken on board via such consultations and what changes, if any, had been enacted. Including this would help to alleviate any concerns that wider involvement was undertaken simply as a superficial exercise. This is also one section where clearer guidance in the Governance Regulation would be useful.

As a whole, **regional cooperation between the three states is only briefly touched on**. This is generally on energy security measures but could be highlighted in greater detail. In reality, the size of each country could and will incentivise collaboration, such as in energy infrastructures like nuclear power or offshore wind.

Annex I: Methodology

The Annex IV framework set out for the LTS is much less detailed than for the NECP. The details in annex IV are also not binding, unlike the equivalent template for the NECPs. This may have resulted in the widely differing structures the three Baltic states have pursued. This complicates the assessment as the different structures could still comply with the guidelines. Moreover, a more comprehensive section in one strategy could still be missing some aspects and receive the same score as a sparse discussion in another.

However, the assessment does follow the general logic of Annex IV. Elements that should be included in the LTS are listed as 21 separate subcategories; similar elements are grouped together into five broader categories. Each category is rated on a 3-point scale. There are specific requirements for certain categories, but in general, a score of 3 is awarded when the LTS covers an issue in a way that can serve as an example for future updated strategies. If a subcategory is included to some extent, but certain key elements are missing, then it is marked as 2. A score of one is received when a particular category is not included or is only described to a very limited extent. Assessment is straightforward for some categories, but for more descriptive categories, such as individual sectors, several elements must be included in enough detail for the maximum score to be awarded.

The analysis does not focus on individual policies or measures. It is not feasible to make specific quantitative or qualitative assessments of the individual details of each strategy. Rather, the scoring considers the general structure and content of the strategies, which details are included and omitted, and the overall presentation and readability of the documents. The methodology is the same as used to assess the strategies of the Visegrád 4 countries by WiseEuropa that was previously published within the framework of the ClimateRecon2050 project.⁴⁷

Table 12: Scoreboard guidelines

Category	Subcategory	Score guidelines
General information and targets	Adherence to Governance Regulation	1 - the document cannot be considered a strategy (e.g. different type of document - short declaration, study etc.), 2 - the strategy is broadly consistent with regulation, but has major discrepancies (e.g. only partial sectoral coverage), 3 - the strategy is consistent with the regulation, with potential minor deviations.
	Up-to-date document	1 - the document was published before 2015, 2 - the document was published between 2015 and 2018, 3 - the document was published in 2019 or later.
	Net zero target	1 - the document does not consider net zero target, 2 - the document considers net zero target, but does not commit to it, 3 - the document commits to net zero target.

⁴⁷ Wise Europa 2022 – [available here](#).

	GHG emissions reduction	<p>1 - the document has no high-level targets,</p> <p>2 - the document presents a range of potential (indicative) targets by 2050 beyond already established NECP targets,</p> <p>3 - the document sets specific targets for individual indicator along with interim targets.</p>
	Renewable energy share	
	Energy efficiency	
Sectoral details	Energy	<p>1 - the document provides no sectoral detail,</p> <p>2 - the document presents limited sectoral detail. It outlines historical and future trajectories of GHG emissions and discuss current state and policies and measures for decarbonisation,</p> <p>3 - the document presents comprehensive overview of the sector and its contribution to long-term decarbonisation. It provides quantitative and qualitative analysis beyond criteria for score 2.</p>
	Buildings	
	Transport	
	Industry	
	Agriculture	
	LULUCF	
	Carbon removal technologies	
Financing and enabling policies and measures	Investment needs assessment	<p>1 - no assessment of investment needs,</p> <p>2 - partial assessment of investment needs (e.g. only energy sector),</p> <p>3 - full assessment of investment needs (all sectors).</p>
	Financing	<p>1 - no overview of financing instruments,</p> <p>2 – partial or/and descriptive review of financing instruments,</p> <p>3 - prescriptive provisions, linking investment needs with the necessary evolution of financing instruments.</p>
	R&D	<p>1 - no overview of R&D state and role in decarbonisation,</p> <p>2 - descriptive review of R&D state and role,</p> <p>3 - prescriptive provisions, policies and measures for R&D sector.</p>
Economic assessment	Socio-economics impacts	<p>1 - no overview of socio-economics impact,</p> <p>2 - descriptive review of socio-economics impacts,</p> <p>3 - prescriptive provisions, policies and measures for mitigation negative impact.</p>
	Distributive impacts	<p>1 - no overview of distributive impact,</p> <p>2 - descriptive review of distributive impact,</p> <p>3 - prescriptive provisions, policies and measures for mitigation negative impact.</p>

Strategy preparation and implementation	Analytical tools	<p>1 - no analytical tools used,</p> <p>2 - partial/qualitative assessment tools used,</p> <p>3 - comprehensive modelling tools used to support qualitative analysis.</p>
	Governance	<p>1 – the document does not provide information on governance,</p> <p>2 – partial review of the governance mechanisms,</p> <p>3 – prescriptive provisions, indicating or establishing institution governing and assessing the implementation of the strategy, defining framework for its action.</p>
	Public consultation	<p>1 – the document was not subjected to public dialogue,</p> <p>2 – the document was subjected to public consultations (comments on draft),</p> <p>3 – the document was consulted on an ongoing basis with the public, dialogue with the public.</p>

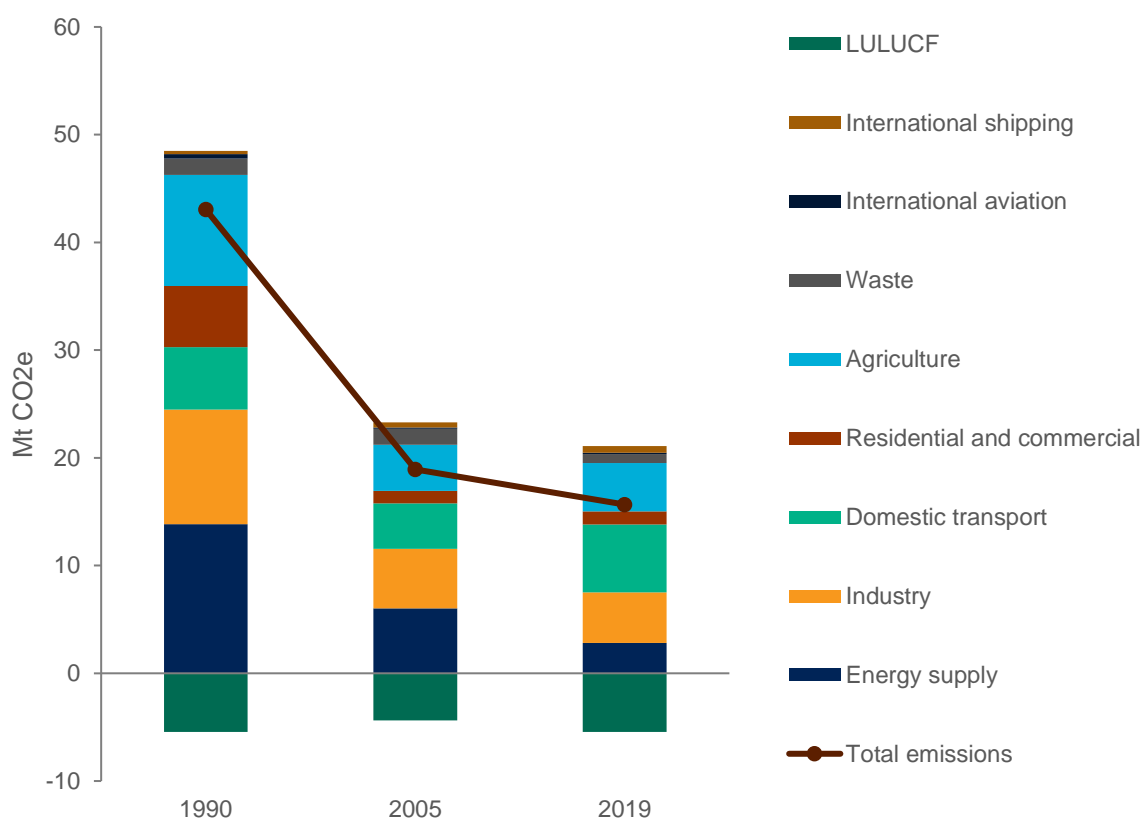
Annex II: Country details

1. Lithuania

1.1. Overview of the key national climate and energy indicators

Changes to territorial emissions in Lithuania over time are shown in Figure 5. Net emissions were 15.6 Mt CO₂e in 2019. This compares to 18.9 Mt CO₂e in 2005. The largest decrease was seen in the energy supply, which is approximately equal to the total change in emissions, meaning that the collective changes in other sectors were broadly static. Other sectors with substantial net reductions in emissions were LULUCF (which became a larger sink equal to – 5.4 Mt CO₂e), industry, and waste. However, these reductions were largely counteracted by increases in other sectors. Most notably, domestic transport showed a large increase during the period from 2005 to 2019. Smaller increases were also seen in agriculture and international shipping.

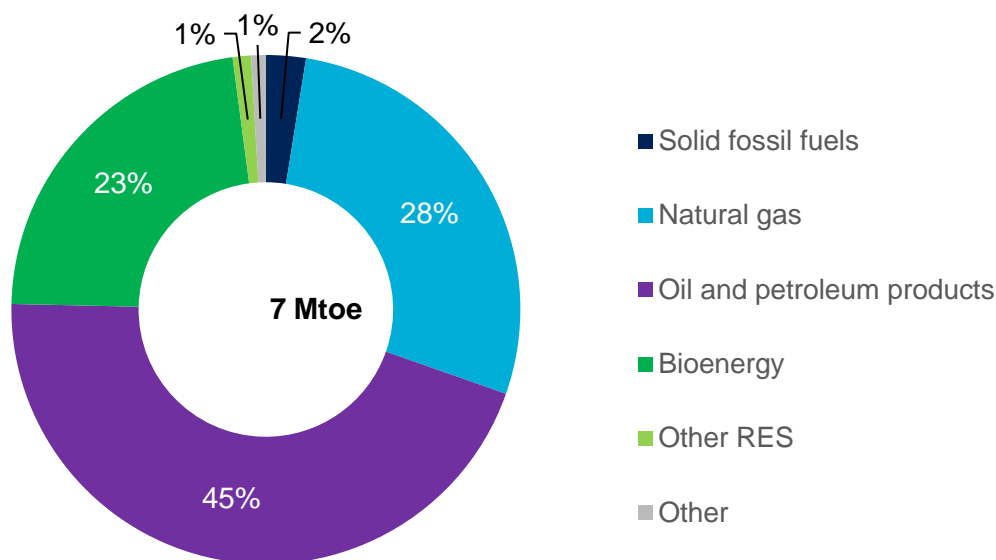
Figure 5: Total GHG emissions by sector in Lithuania 1990-2019



Source: WiseEuropa based on EEA data

Figure 6 shows the distribution of energy sources in gross inland consumption for Lithuania. Figures 7 and 8 respectively illustrate final energy consumption and electricity generation by source. Biofuels are used extensively in district heating, as seen through the proportion of bioenergy in gross energy consumption (gas is the other major source of heat). National electricity production relied heavily on wind and natural gas. These sources provided 75 % of production in 2019. However, Lithuania is a major net importer of electricity. Oil and petroleum products are still the most significant energy source. These products are mainly used in domestic transport and have been increasing rapidly in recent years⁴⁸.

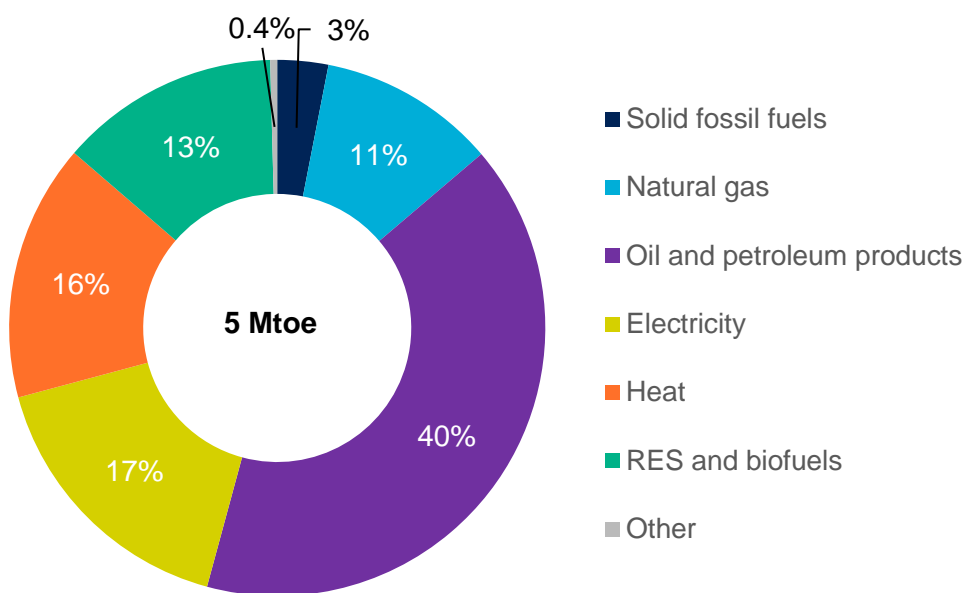
Figure 6: Gross inland consumption of energy carriers in Lithuania in 2019



Source: WiseEuropa based on Eurostat data

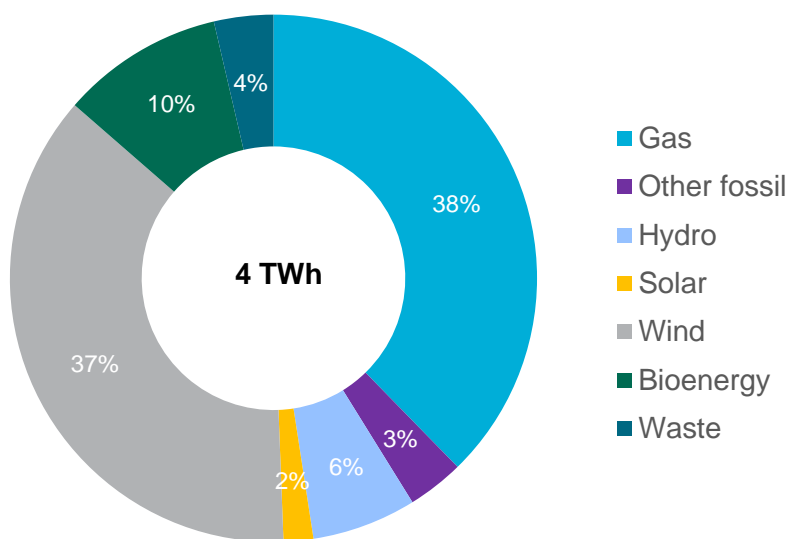
⁴⁸ IEA analysis 2019. Oil consumption by sector – Data Viewer.

Figure 7: Final energy consumption (energy use) in Lithuania in 2019



Source: WiseEuropa based on Eurostat data

Figure 8: Electricity generation by source in the Lithuania in 2020



Source: WiseEuropa based on Ember data

1.2. Lithuania assessment details

The Lithuanian LTS was updated in July 2021. The updated document includes the specific goal of climate neutrality by 2050 at the latest and has detailed and specific high-level and

(sub)-sectoral targets. This also includes additional indicators than just GHG emissions (e.g. energy efficiency, waste reduction, reduced fertiliser use, etc).

The structure of the LTS also stands out in comparison to the other two Baltic states. In general, there is a lack of detail on the structure of current emissions broken down by sector. There is instead a ‘SWOT’ analysis of the Lithuanian economy and society in terms of mitigation and adaptation to climate change. But this structure tends to inhibit rather than enhance the readability of the plan. Thereafter follows comprehensive and detailed targets for specific sectors (again in contrast to Estonia and Latvia). However, these targets are, at times, difficult to contextualise due to the lack of sectoral structure and historical detail.

Moreover, the LTS omits specifics on the financial and investment needs of the targets in the LTS and the socio-economic effects that may arise from the proposed measures. The LTS also does not include either economy-wide or sectoral modelling to project emissions into the future. It is unclear if any modelling was used to inform on the targets in the LTS.

Table 13: Lithuania assessment

General	Adherence to Governance Regulation	2	The document refers to the regulation 2018/1999 and includes most of the necessary sections set out in annex IV. Given that the LTS was updated in 2021, there is also an explicit discussion of the “fit for 55” agenda in point 7. However, there are missing sections on the socio-economic impacts of the proposed plan, as well as the financing and investment needs, which are only discussed very generally. The document also does not include any modelling or projections of emissions and their dependency on the proposed measures. Finally, a discussion of any public consultation that took place is also absent.
	Up-to-date document	3	An updated LTS was published in 2021. It is the most recent LTS from the Baltic state region.
Targets	Net zero target	3	There is an explicit target for net zero by at least 2050. The full target refers to a 100 % reduction from 1990 levels, covering up to 20 % of emissions with natural sinks in the LULUCF sector, as well as environmentally friendly CCS/CCU.
	GHG emissions reduction	3	There is a full series of emission reduction targets for 2030, including sectors both covered and not covered by the EU ETS, and considering both 1990 and 2005 emissions. These targets are upgrades on the NECP. There is also an intermediate target for 2040.
	Renewable energy share	3	The LTS includes specific RES targets for 2030 and 2040. By 2050, the share of RES in final energy consumption should be 90 %, with 100 % in both electricity and district heating. There is an explicit phase out of fossil fuels by 2040 in EU ETS sectors
	Energy efficiency	3	There are specific targets for energy efficiency for 2030, 2040, and 2050. The 2030 targets also include a sectoral breakdown but appear to be the same as the NECP targets.
Sectoral details	Energy	2	The structure of the LTS makes it difficult to discern the current emissions picture from individual sectors. The lack of this context or the inclusion of

		<p>any modelling scenarios based on the implementation of specific policies means the strategy is not comprehensive.</p> <p>Nevertheless, there are specific targets for the energy sector, largely as discussed above. The LTS also touches on energy dependency (in point 12.5), though this is given less emphasis than in the Estonian and Latvian LTS.</p>
Buildings	2	<p>Buildings are not presented as a separate section, but sectoral detail is largely embedded in the discussion relating to the energy sector. The current high use of solid (bio)fuels is described along with the lack of choice in the energy market and the high level of energy poverty.</p> <p>Targets are integrated into the sectors on other sections. For example, there is a target to double the number of houses connected to environmentally friendly district heating by 2040. By 2050, 74 % of buildings shall have been renovated and 30 % of households will generate electricity. By 2024 all new public buildings shall require a 50 % share of wood, other organic materials, and secondary raw materials.</p>
Transport	2	<p>Transport accounts for the greatest share in the national GHG inventory. Of this, the largest proportion arises from passenger cars, with emissions currently increasing, and with cars having an average age of over 15 years. It is also stated that this is the sector most at risk of not reducing emissions, due to high socioeconomic sensitivity, and highlights a need to also focus on behavioural change. Greater emphasis could still be given to the current details of the sector and future projections beyond the targets.</p> <p>The LTS includes detailed and specific targets for the transport sector, distributed across all modalities apart from air travel. These include a nation-wide installation of charging points for electric vehicles and use of biofuels. It proposed that by 2030 all annual purchases of N1 type vehicles (trucks) and 50 % of M1 (passenger cars) will be electric. There shall be no fossil fuels in road transport by 2045.</p>
Industry	2	<p>As with other sectors, additional sectoral background and a projection of emissions based on modelling is missing. But there are extensive targets for reducing the emissions from industry and waste. This includes targets for 2030 and 2040. For example, GHG emissions shall be reduced by 19 % compared to 2005 in non-ETS industry.</p> <p>Moreover, there is also a description promoting modern technological solutions with lower GHG emissions, adapting business models, and applying the principles of circular economy and reducing waste. The use of hydrogen as a replacement in hard to decarbonise sectors, such as fertiliser production, is highlighted.</p>
Agriculture	2	<p>Agriculture is the third largest source of emissions in the national GHG inventory.</p> <p>Whilst there is less of a discussion into the current state of emissions, there are specific targets for the sector for 2030 and 2040. By 2030, an 11 % reduction in GHG compared to 2005 is aimed for. Other indicators such as</p>

			<p>fertiliser use, and slurry management are included. By 2040, there should be no use of fossil fuels in the sector.</p> <p>Finally, the weaknesses of the sector in adapting to climate changed is also remarked upon.</p>
	LULUCF	2	<p>As with other sectors, the LTS omits a detailed description of the current state of the sector. There are specific targets for total GHG removals by 2030 of 6.5 Mt CO₂e. There are also secondary targets, such as to increase woodland areas, to increase permanent grassland to 8000 ha, and to use agricultural land for biodiversity (10 % by 2030).</p>
	Carbon removal technologies	3	<p>CCS and CCU are discussed throughout the document and are targeted to contribute to net zero (20 % of emissions to be removed by LULUCF and CCS/CCU in 2050 – although the specific share of CCS/CCU is not stated). Such technologies are also discussed in the context of R&D. It is stated that only 'environmentally safe' CCS/CCU shall be utilised.</p>
Financing and enabling policies and measures	Investment needs assessment	1	<p>There is no assessment of investment needs in the LTS. It is only stated that damages caused by the climate crisis will lead to a reduction in investment.</p>
	Financing	2	<p>Points 13.8 – 13.9 highlight the threats of not having the right financial system. Point 42 describes different funding sources: state budget, municipal budgets, EU, international organisations, private sector and other sources. However, there is no breakdown amongst these.</p> <p>It is stated that environmental impact shall become a key criterion for the ministry of finance in assessing the investment of public funds.</p>
	R&D	3	<p>The LTS has a specific section focussed on R&D&I. There are targets to increase R&D funding from public and private sources should reach 2 % of GDP in 2030, and 4 % in 2040, as well as more descriptive targets to promote R&D and inter-sector collaboration. However, it is not stated what the current level of R&D spending is, which complicates assessment. As with other sections, the description of the current state of play is limited.</p> <p>There is a discussion around prioritising R&D in specific sectors related to the transition to net zero. An additional priority is in the production of green hydrogen, and a target by 2030 to develop pilot projects using hydrogen as an energy carrier to balance excess electricity from RES, as select other topics like reducing the impact of industrial processes. Specifics are missing in terms of the allocation of funds or programmes expected to be set up.</p>
Economic assessment	Socio-economics impacts	2	<p>The LTS does not discuss socio-economic aspects in a comprehensive way, and the document lacks a specific section related to this section. It is stated that energy poverty is a problem in Lithuania, and that this could be alleviated through improvements to the energy efficiency of buildings. There is a reference to the NECP, which suggests that GDP will be 1.72 % higher in 2030 due to the implementation of measures. For the period 2030 – 2040, the increase is 0.23 %. However, these figures do not relate to any specific scenario in the LTS, which shows enhanced ambition in some cases.</p>
	Distributive impacts	1	

			<p>There is very little detail on distributive aspects. With regards to employment, it is at one point stated that implementing the NECP is expected to increase employment by 1.56 % up to 2030.</p> <p>It should be noted that there is a substantial section on adaptation to climate change and targets to be achieved therein. For example, there is a desire to develop different local and national socio-economic development forecasts in the context of the effects of climate change. But this is different to the distributive impacts associated with the transition.</p>
Strategy preparation and implementation	Analytical tools	1	<p>The LTS does not reference any analytical tools. There are no projections of emissions up to 2050 under any scenarios.</p> <p>Under implementation and accountability, it is further stated that efforts will be made to strengthen the national capacity for GHG projections and assessing the impact of policies.</p>
	Governance	3	<p>Chapter 9 is about implementation and accountability. Responsibilities are clearly laid out. The Environment ministry is the coordinator of the plan developed in the LTS, with one or several ministries having responsibility for specific sectors. It is also stated that the NECP plan will be approved by the government and drawn up by both the environment and economic ministries.</p> <p>A system will be put in place for monitoring policies and analysing data related to the relevant indicators in each case. Working groups will be established that include state and municipal government, industry, and science to coordinate implementation of policies and targets in each economic sector. The LTS also includes detail on how public awareness into climate change and environmental issues will be improved, along with efforts to invest in improving the capacity and skills of specialists in fields related to the green and digital transitions.</p> <p>The agenda in the LTS will be updated every 10 years or sooner subject to changes in circumstances</p>
	Public consultation	1	<p>There is no detail on any public consultation included in the LTS.</p>

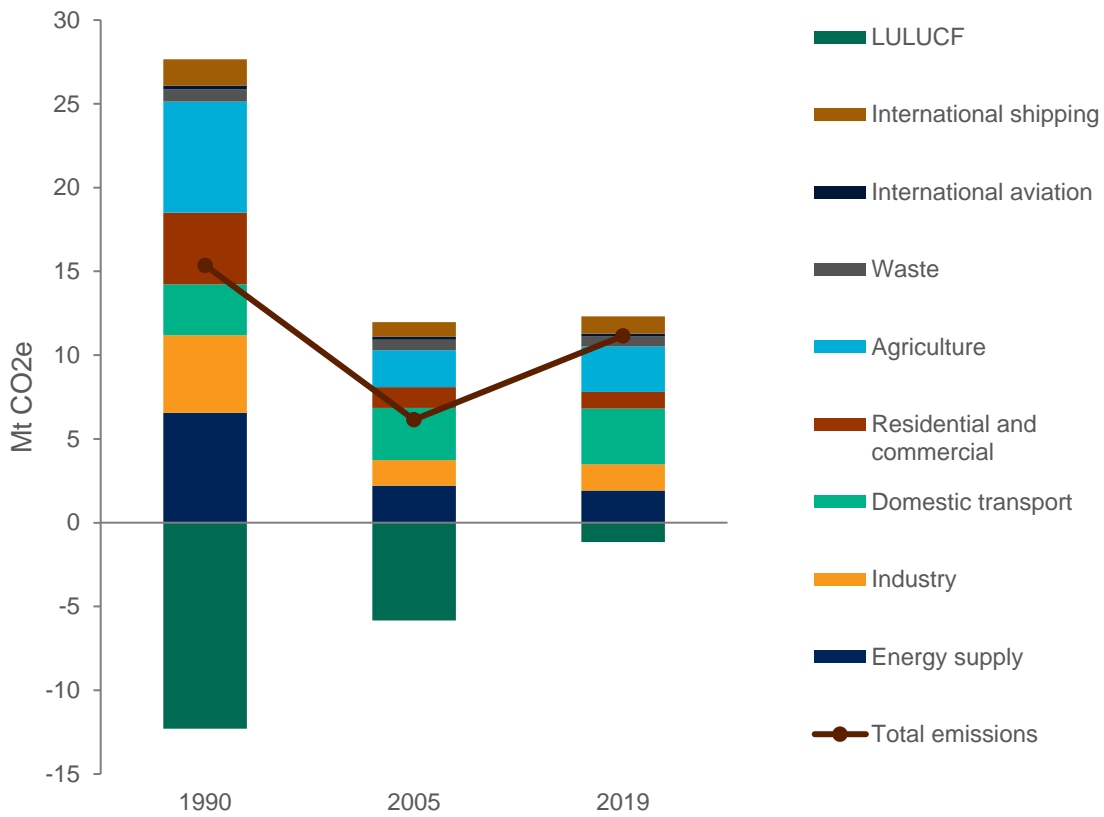
2. Latvia

2.1. Overview of the key national climate and energy indicators

Changes in Latvian territorial emissions over time are shown in Figure 9. Emissions were 11.2 Mt CO₂e in 2019. This represents an almost doubling of emissions since 2005 (6.1 Mt CO₂e), driven by the continued decrease in the size of the LULUCF sink since 1990. Between 2005 and 2019, this change was equivalent to an additional 4.7 Mt CO₂e in annual emissions. Other sectors that increased in emissions were Agriculture and Domestic transport. The sector

showing the largest decrease was energy supply, followed by residential energy (proportionally, the decrease here was much larger than energy).

Figure 9: Total GHG emissions by sector in Latvia in 1990-2019

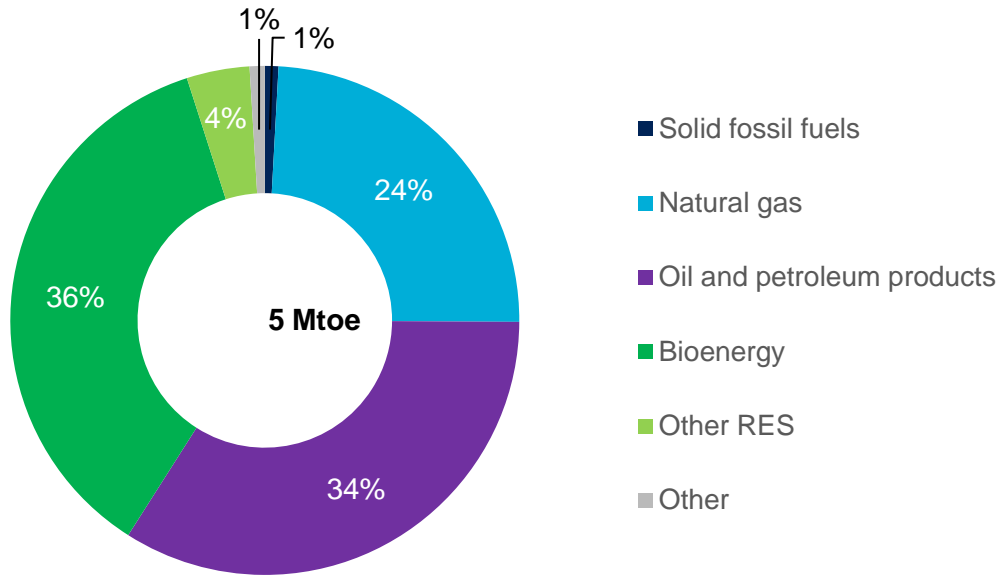


Source: WiseEuropa based on EEA data

Figure 10 describes the distribution of gross inland energy consumption in Latvia by source. Bioenergy fulfils an even larger proportion of inland energy consumption than Lithuania, representing 36 % of gross energy consumption. The use of biogas and biomass in cogeneration plants increased substantially in the five years up to 2019. Natural gas is the other significant source in the transformation sector, though its weight is decreasing over time. Final energy consumption and electricity production are respectively shown by source in Figures 11 and 12. Electricity production is dominated by hydropower, which has been increasing according to the LTS. Apart from bioenergy, oil and petroleum products are the next most significant energy sources, mainly used in domestic transport.⁴⁹

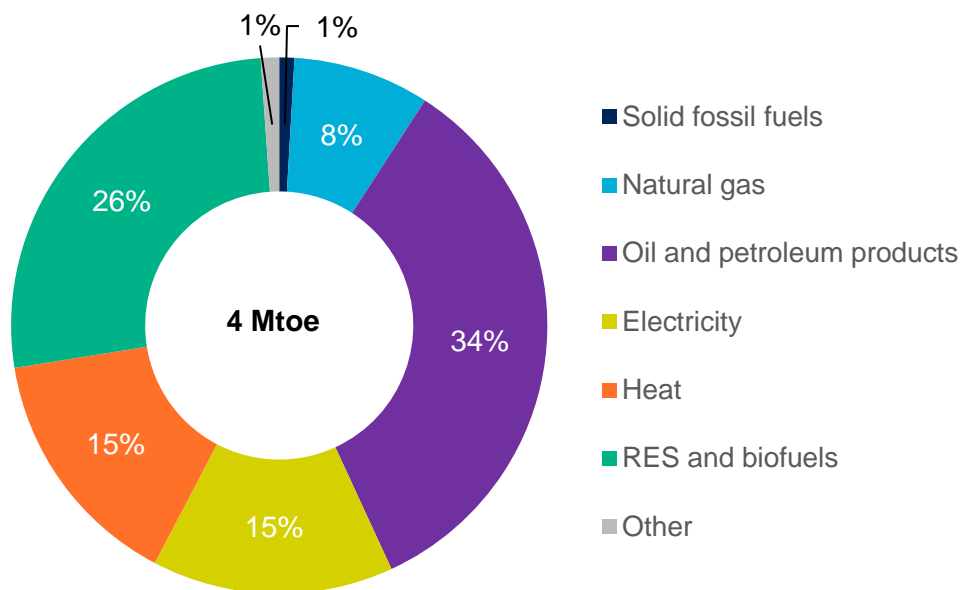
⁴⁹ IEA analysis 2019. Oil consumption by sector – Data Viewer.

Figure 10: Gross inland consumption of energy carriers in Latvia in 2019



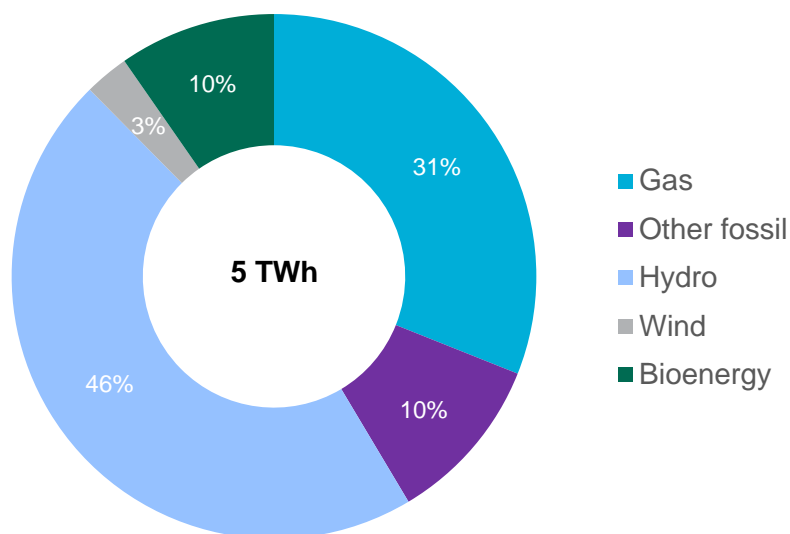
Source: WiseEuropa based on Eurostat data

Figure 11: Final energy consumption (energy use) in Latvia in 2019



Source: WiseEuropa based on Eurostat data

Figure 12: Electricity generation by source in Latvia in 2020



Source: WiseEuropa based on Ember data

2.2. Latvia assessment details

The Latvian strategy was published in 2019. This means it was before the most recent EU package of measures related to climate mitigation ('fit for 55'). However, the LTS does include the target of climate neutrality by 2050 and intermediate targets for 2030 and 2040, although without fully specifying which gases and sectors the coverage extends to. The document is also arguably the most legible of the Baltic states.

The document includes some information on modelling, including a projection until 2050 that appears to be under a BAU-type scenario. A pathway to climate neutrality is also included on the same graph, but it is not clear what this represents and if it is the result of modelling. It is also challenging to find the documentation containing the projections from the available references. Beyond this, sectors are described with historical context, but without individual targets. The LTS has the most complete discussion of investment needs in the region, although this is simply referenced from another document rather than being inclusive of the strategy. Socioeconomic impacts are not included, besides a claim that climate neutrality will have a net positive effect on GDP.

Table 14: Latvia assessment

Category	Score	Comment
General	2	The document makes reference to the Governance Regulation 2018/1999 and includes most of the necessary sections set out in annex IV. However, the LTS also includes a discussion on (the albeit similar) commitments under the Paris agreement (page 6) and national policy. Hence, it does not appear to have only been formed on the basis of regulation 2018/1999. This may in turn, explain the missing elements, which are respectively, a discussion of socio-economic impacts, and a lack of explicit targets (as opposed to projections) related to energy efficiency and RES.
	3	The LTS was published in 2019. The Latvian NECP was also published in 2019 and includes far greater detail of plans up to 2030. The LTS still requires updating in light of the raised pan-European ambitions, such as the “Fit for 55” measures.
Targets	3	The document explicitly includes a net zero target (page 9). Any outstanding emissions shall be offset by removals in the LULUCF sector. Although it is a statement of climate neutrality, it is not clear which gases are covered by this commitment.
	3	GHG emissions targets are given for 2050 with and without LULUCF. Intermediate targets are also provided for 2030 and 2040 in both cases, although these may be changed based on future studies. In the NECP, the emissions reduction target also includes a (non-binding) reduction of 6 % for non-ETS sectors from 2005. The LTS anticipates the greatest reductions in the decade from 2030, despite the cumulative effect of past emissions meaning it is better to have the greatest cuts occurring earlier.
	2	No explicit target is given for RES in the LTS (although it is stated that RES should have replaced fossil fuels by 2050). The NECP states that by 2030 the RES share in gross final energy consumption of 50 % (including bioenergy)
	2	No specific targets are set for energy efficiency in the LTS. Projections for primary energy consumption in 2050 are 118 PJ (petajoules). The NECP sets a binding target of 1.76 Mtoe / 73.73 PJ savings by 2030 for final energy consumption.
Sectoral details	2	The document does not set out any specific targets for the sector. Projections show an 86 % reduction from 1990 by 2050. There is a broad discussion on the current situation that also highlights energy security within the region. Section 6 includes a descriptive overview of potential solutions (or rather, what the sector may look like under conditions that fulfil the climate neutrality target). The “energy efficiency first“ principle is highlighted.

			<p>The NECP includes greater detail, and has specific targets, and states that under the target scenario the share of RES in national electricity production should be at least 67 %. However, there is no specific target for the elimination of fossil fuels.</p>
	Buildings	2	<p>The document does not set out any specific targets for the sector. The sector is also not separately included in the projection of figure 5. There is a broad description, detailing how the majority of residential buildings are over 25 years old and have an energy rating of E or F. The “energy efficiency first” principle is highlighted. The NECP includes specific targets for 2030 including a target for building renovation and a reduction in the average specific heat consumption in buildings to 120 kWh (kilowatt hour) / m² / year (150 kWh / m² / year in 2020).</p>
	Transport	2	<p>There is no specific target for the sector in the LTS. It is stated that projections suggest a 47 % decrease by 2050 compared to 1990. There is a broad description of the current state of the sector (e.g. emissions have increased by 9.4 % since 1990), and a discussion of alternative fuel solutions, choice of cars and use habits. The targeted situation in 2050 is described, but without specific policy interventions.</p> <p>The NECP includes a binding 2030 target for the share of energy from RES in gross final energy consumption in transport and a GHG reduction target for the sector</p>
	Industry	2	<p>There is no specific target for the sector in the LTS. The projection shown in figure 5 shows a 22 % increase compared to 1990. The current situation is described: 6.5 % of emissions arose from industry in 2017, primarily due to the manufacture of building materials.</p> <p>There is a general description of the target scenario in 2050, such as replacement of materials with climate friendly alternatives, more circular resource use and changes in societal consumption patterns to adopt more environmentally friendly goods. However, the discussion of specific policy interventions is more limited.</p> <p>The NECP is also more limited in terms of industrial processes, only discussing specific policies in terms of fluorinated gases.</p> <p>Waste is also discussed and is projected to decrease by 66 % compared to 1990 in 2050.</p>
	Agriculture	2	<p>There is no specific section for the sector in the LTS. The projection shown in figure 5 (and section 4.1) shows emissions decreasing in 2050 by 43 % compared to 1990.⁵⁰</p> <p>There is a general description of the current situation. Agriculture is the third largest source of emissions in Latvia, but in 2017 emissions had decreased by 50.5 % compared to 1990 (though more recently emissions have increased again, which is blamed on an increase in mineral fertiliser</p>

⁵⁰ The text states that emissions will increase by 43 % in 2050 compared to 1990. However, emissions in figure 5 appear to be significantly lower in 2050 relative to 1990 and so it has been assumed that there is a typing error in the LTS on this point.

			<p>use). The targeted situation in 2050 is generally described, but without details on specific policy interventions (e.g., improved fertiliser use).</p> <p>The NECP also projects an increase in emissions to 2030. There are no targets related to this sector, apart from a non-binding objective to have 3.5 % of gross final energy consumption in transport arising from so-called advanced biofuels (ref 13).</p>
	LULUCF	2	<p>Emissions should be below 1.057 Mt CO₂e by 2030 (- 36 %) compared to 1990 and net zero by 2050, though this would preclude the balancing of outstanding emissions in other sectors.</p> <p>There is a general description of the sector – emissions have increased since 1990 due to forest ageing and deforestation and the sector is projected to have transitioned from a source to a sink, although total forest area is also projected to increase. There is not a detailed list of policies, but an outline of the targeted situation in 2050. Here, all land use changes shall be 'seriously evaluated' and support shall be given for reforestation. The NECP further discusses improving the quality of soils.</p> <p>The LTS states that, based on indicative projections, the sector would have to be a sink of around 3.6 Mt CO₂e for climate neutrality to be achieved.</p>
	Carbon removal technologies	2	<p>There is a dedicated sub-section in the LTS regarding CCS/CCU. In section 5.5 it is stated that no CO₂ storage sites in Latvia would not be economically feasible at present, but with no discussion beyond this point in terms of developing mechanisms to increase its viability, and suggests it is presently not strongly considered as a solution. It is stated that additional research into CCS and CCU needs to be carried out.</p>
Financing and enabling policies and measures	Investment needs assessment	3	<p>There is some discussion of the investment needs for achieving carbon neutrality in comparison to the base scenario. This is expected to be 1.35 % of GDP per year from 2020 – 2050. Taking into account the potential benefits, this reduces to 1.1 % of GDP per year over the same period.</p> <p>These indicative projections were derived from the 2019 report by the Latvian Institute of Physical Energetics (reference 50 / 70 in the LTS)</p>
	Financing	2	<p>Specific financing arrangements are not examined and there is no quantitative assessment. Different potential mechanisms are discussed, however, in section 7.2, such as new market mechanisms, including a national emissions trading scheme, new fiscal instruments (e.g. the "polluter pays principle") and financial instruments, such as a national energy efficiency fund.</p>
	R&D	2	<p>There are sections on R&D in the LTS. Currently, the level of innovation is low compared to the EU average, and R&D investment in the private sector and number of the population with post-graduate qualifications are both considered low.</p> <p>Research into low carbon technologies is discussed as a solution in 6.1, including enhancing technology transfer and inter-sectoral collaboration (as well as public-private collaboration). This is also in relation to CO₂</p>

			<p>removal technologies. Strategic planning or specific policies are not included.</p> <p>There is a binding target in the NECP for R&D investment to be 2 % of GDP by 2030.</p>
Economic	Socio-economics impacts	2	The document does not have any sections devoted to socio-economic impacts. It is implied that reaching climate neutrality will boost GDP by 2.5 billion euros by 2050.
	Distributive impacts	1	In terms of distributive impacts, content is very limited beyond the potential for energy efficiency measures to reduce fuel poverty.
Strategy preparation and implementation	Analytical tools	2	<p>The report describes a projected scenario until 2050 under WEM/BAU ⁵¹. ⁵² It also shows a potential pathway of total emissions reductions leading to carbon neutrality by 2050, but this is without sectoral detail, and it is unclear if it corresponds to a modelled scenario.</p> <p>References 15⁵³ and 24⁵⁴ describe the expected climatic changes and associated damages, respectively.</p> <p>The NECP also presents modelling, with the MARKAL model (IEA) used for the energy system and its development. The study in reference 37 also uses this model.</p>
	Governance	2	<p>There are descriptions in 7.1 about the role of local government and national departments in drawing up the plans. This also discusses preparing national climate and energy plans that consider the LTS. But there is no discussion of new bodies set up or further details regarding monitoring implementation. There is also some broad discussion on new legal acts and regulatory framework in section 7.2, but without detail.</p> <p>The NECP describes an integrated monitoring and reporting system in section 6 and says a new authority should be set up.</p>
	Public consultation	2	<p>There was public consultation, but it is not clear whether this was acted upon or resulted in any changes.</p> <p>The draft strategy was published online for public consultation, but no detail about whether this led to any changes are given. Interactive seminars were also held in different regions in 2016-2017. During a visit of the EC directorate-general for climate action, meetings with social partners were held.</p>

⁵¹ Latvian Institute of Physical Energetics 2019 – [available here](#).

⁵² Latvian 2019 submission to EIONET - [available here](#). The Expert evaluations were not elaborated upon.

⁵³ Latvian Environment, Geology and Meteorology centre, 2017 – [available here](#).

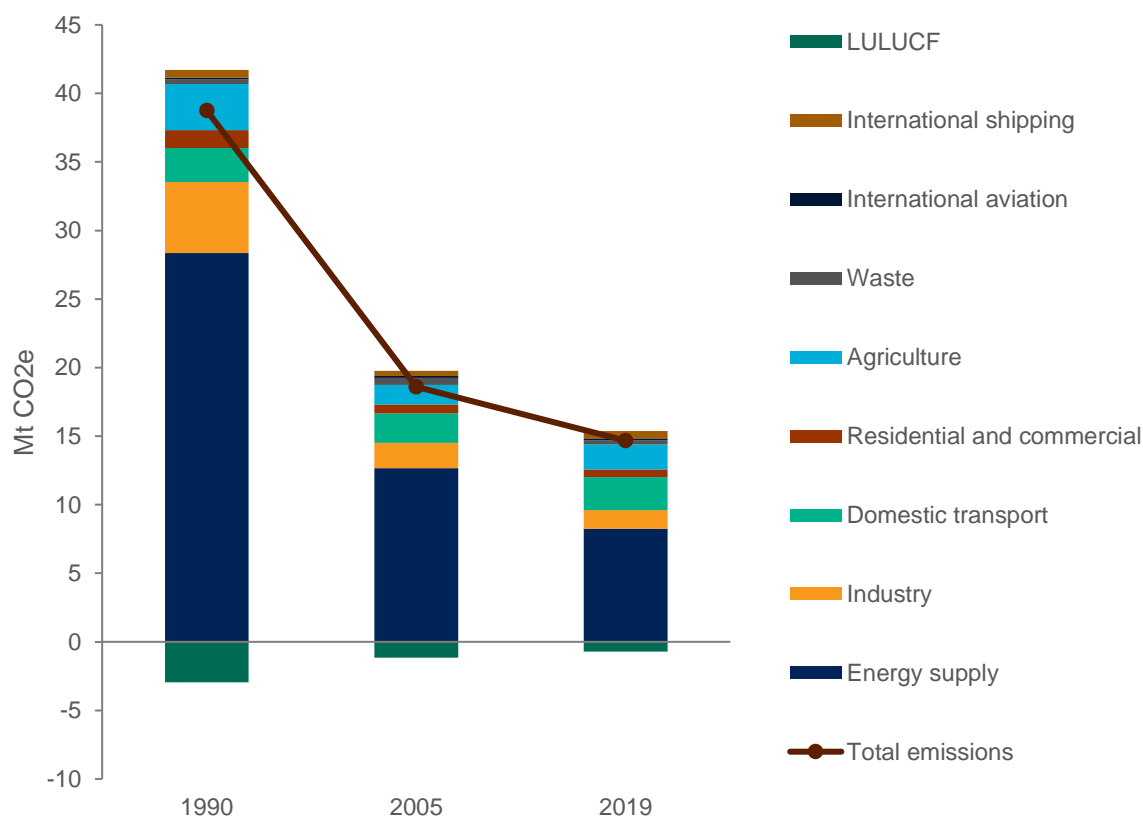
⁵⁴ Latvian Centre of processes analysis and research, 2017 – [available here](#).

3. Estonia

3.1. Overview of the key national climate and energy indicators

Figure 13 shows changes to the national GHG emissions of Estonia over time. Emissions in 2019 were 14.7 Mt CO₂e. This was a decrease from 2005, when the equivalent figure was 18.6 Mt CO₂e, but emissions are still the largest in the Baltic state region on a per capita basis. The reduction in emissions was driven by the energy supply sector, which showed a decrease of 4.4 Mt CO₂e. This value is larger than the total emission reduction, meaning combined emissions in other sectors increased overall during the same time period. The growth in emissions from other sectors was again driven by agriculture and domestic transport, as well as a reduction in the size of the LULUCF sink by 0.4 Mt CO₂e. The LULUCF sink has decreased substantially since 1990.

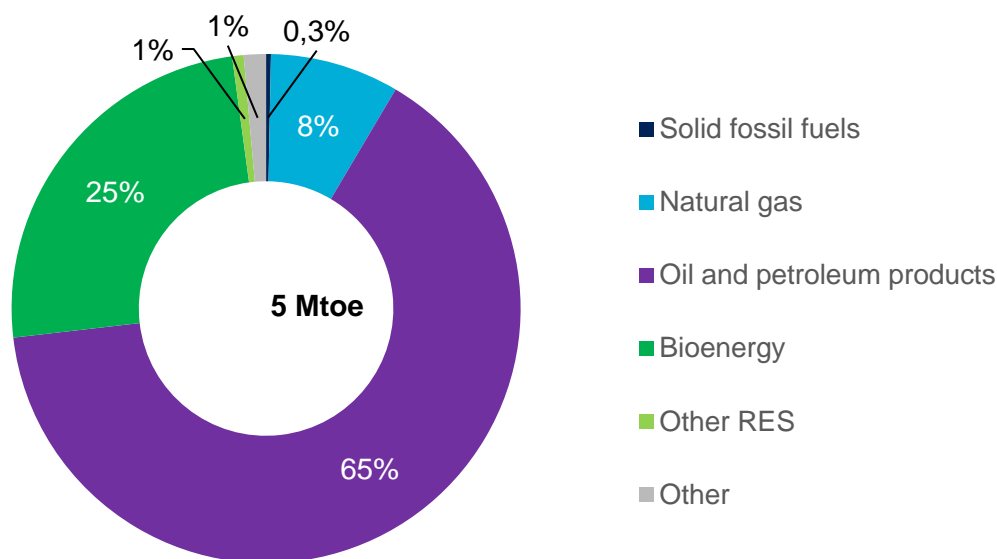
Figure 13: Total GHG emissions by sector in Estonia in 1990-2019



Source: WiseEuropa based on EEA data

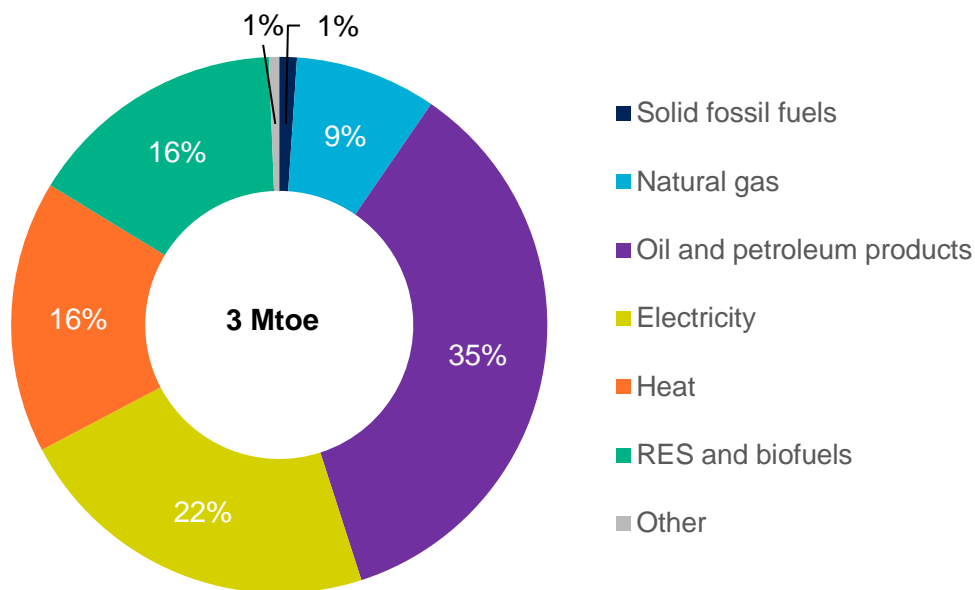
Figure 14 shows the energy source breakdown for gross inland consumption in Estonia, whilst figure 14 displays the breakdown in terms of final energy consumption. Energy consumption is dominated by oil and petroleum-based fossil fuels, which reflects the persistence of oil shale as a source of electricity and heat. Petroleum products in domestic transport are also included here. Biofuels are utilised extensively, including in district heating, though they represent the smallest share of energy consumption in the Baltic states. The share of electricity in final energy consumption is the highest of the three countries. But domestic electricity production was still dominated by oil shale, with 60 % generated from this source in 2020. Wind energy was the next most significant, contributing 20 %, followed by biofuels at 13 %.

Figure 14: Gross inland consumption of energy carriers in Estonia in 2019



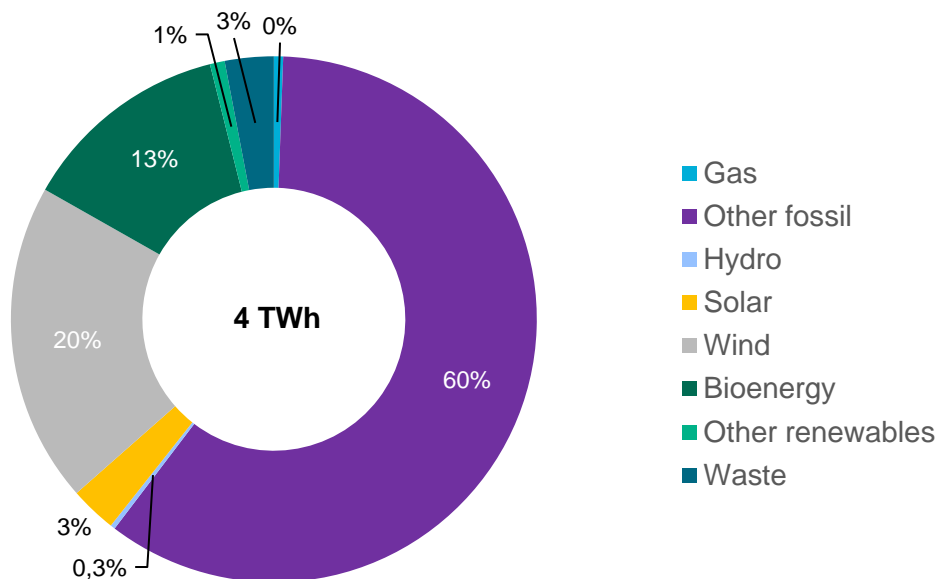
Source: WiseEuropa based on Eurostat data

Figure 15: Final energy consumption (energy use) in Estonia in 2019



Source: WiseEuropa based on Eurostat data

Figure 16: Electricity generation by source in Estonia in 2020



Source: WiseEuropa based on Ember data

3.2. Estonia assessment details

The document submitted as the Estonian LTS was produced in 2017 and included a commitment to reduce emissions by 80 % from 1990 levels in 2050. The adoption of EU-wide climate neutrality goals means this document is now outdated. Given the brevity of the Estonian LTS, it was therefore supplemented in our analysis by the national long-term development strategy “Estonia 2035” (‘Eesti 2035’) (EE2035) adopted by the Estonian Parliament in May 2021. This document is regarded as the long-term strategy for the purposes of the report since it includes the specific target of climate neutrality by 2050. Still, it must be stressed it has not been submitted as an updated strategy and does not abide by the structure of the Governance Regulation, or reference the associated regulation.

In terms of structure, the original Estonian LTS consists of a series of bullet points divided into separate categories. The structure does have some consistency with that stipulated by the Governance Regulation, including a sectoral breakdown and detail on reporting, as well as headline emission reduction targets. However, it is clearly missing several key aspects related to financing and socioeconomic aspects, and the document includes very little modelling detail.

Some additional information can be gleaned from EE2035. EE2035 posits that although the total greenhouse gas emissions in Estonia have decreased by 54% compared to 1990, the Estonian economy is still one of the most emission-intensive in Europe – per euro of GDP is twice the European Union average (in 2017). It touches on socioeconomic aspects by stating that the transition to climate neutrality particularly concerns Ida-Viru County due to the oil-shale industry there. It also states that the share of renewable energy in final energy consumption was 31.9 % in 2019, well above the European average (18%), and gives targets for renewable energy content (by 2035) and energy efficiency.

Table 15: Estonia assessment

Category	Score	Comment
General Adherence to Governance Regulation	2	<p>The original LTS includes some of the required sections under annex 4 of the 2018/1999 regulation. However, there are also many sections that are missing. There is a lack of specific targets for different sectors, no discussion of investment needs and financing, and no impact assessment of the socio-economic impacts of the plans. Whilst projections for total GHG emissions are shown until 2050 with some sectoral breakdown, this is not available for all the sectors listed in annex 4 (for example LULUCF is missing).</p> <p>The EE2035 strategy was not developed to be in line with the LTS guidelines, but as a holistic strategy for the whole country. It does, however, include certain details not seen in the LTS, such as some additional targets. There are still substantial deviations and omissions from the elements required, even when both documents are considered together. It has been stated that the next task is to bring the targets set out in EE2035 in line with the Governance Regulation. The action plan for the implementation of the “Fit for 55” package is also being developed.</p>

	Up-to-date document	3	The Original LTS was adopted in 2017. EE 2035 was published in 2021. The score comes from the newer document.
Targets	Net zero target	3	The LTS currently adopted includes a goal of an 80 % reduction from 1990 levels in 2050. The EE2035 document explicitly includes a climate-neutrality target by 2050.
	GHG emissions reduction	3	The LTS includes targets for a 70 % reduction by 2030 and 72 % by 2040. EE2035 targets emissions of 8 Mt CO ₂ e including LULUCF by 2035. This is approximately equivalent to an 80 % reduction on 1990 levels and a 43 % reduction on 2019 levels.
	Renewable energy share	2	The LTS has no explicit goals for renewable energy share or energy efficiency. EE2035 has specific targets of at least 55 % of final energy consumption by 2035 (31.9 % in 2019) (but no target for 2050).
	Energy efficiency	1	There is no overall target for energy efficiency as such, but there is a 2035 target for energy consumption of residential and non-residential buildings of 14.5 TWh (Terawatt hour) (16.5 TWh in 2019, a reduction of approximately 12 %).
Sectoral details	Energy	2	<p>The LTS does not include a description of the current situation within the sector. There is also no specific target for emissions reductions, and no target for stopping fossil fuel use.</p> <p>Descriptions of measures are described only generally. For example, an ambition (point 11) to move towards oil-shale products with higher energetic value (e.g. retort gas).</p> <p>The EE2035 includes greater policy detail, but without a specific sectoral target beyond 55 % of final energy consumption from RES. The requirement of energy security through European grid synchronisation and development of the infrastructure required for the green transition are both highlighted. It also comments on transitioning to climate neutral energy production by 2050, implying a phase out of fossil fuels and states that oil-shale will be gradually reduced and replaced with climate neutral energy storage and production.</p> <p>Modelling, a sectoral projection, and specific actions/policies are absent, in light of the increased ambition in EE2035.</p>
	Buildings	1	<p>There is no separate section in the LTS and no targets.</p> <p>There is some description under point 9, discussing how energy efficiency of the whole system is considered when renovating or constructing new buildings. This includes identifying market obstructions when renovating.</p> <p>EE2035 discusses a target of reduction of energy intensity, as detailed under the energy efficiency section, but there are no further comments or commitments.</p>
	Transport	2	There is a separate section discussing transport in the LTS, but without any description of the current situation or specific targets for emission reductions.

		<p>There is only a general description of the expected transition, including reducing the dependence on personal car use, adopting energy efficient traffic culture, and utilising tax policies to enhance fuel economy and promote alternative fuels.</p> <p>EE2035 includes further detail, with specific targets to reduce emissions in the transport sector to 1.7 Mt CO_{2e} per annum by 2035 (2.395 Mt CO_{2e} per annum in 2019, a 29 % reduction). There is also a target to increase the share commuting via public transport to 55 % by 2035 (38.7 % in 2019). Certain measures to be implemented are given on page 10 of the accompanying actions document. These include a preference for investment that reduces overall energy use and promotes active mobility and ensuring a synergy between mobility and energy by integrated electric vehicle infrastructure to help buffer demand. There is also a development of alternative fuel infrastructure for heavy infrastructure and buses. Establishing fast and convenient land connections with Europe are also discussed, such as the long-distance Rail Baltic link through the Baltic states.</p> <p>But modelling, a sectoral projection, and a more detailed sectoral breakdown are absent considering the increased ambition in EE2035.</p>
Industry	1	<p>The LTS integrates this section with energy. There is no description of the current situation or specific reduction targets. Policy guidelines are only at a high level: low emission technologies should be prioritised, and legislation used to motivate industry to use fuels and inputs with low emissions.</p> <p>EE2035 does not include a specific section detailing industrial changes, which are instead found in several sections. This is predominately to do with implementing the principles of the circular economy. There is a target to increase circular material use to 30 % (15.1 % in 2019)</p>
Agriculture	1	<p>There is a specific section, but no sectoral target or description of the current situation. There is only a high-level vision of policies to be implemented, such as maintaining soil carbon stock and eco-friendly manure management.</p> <p>EE2035 does not include details on the agriculture sector.</p>
LULUCF	1	<p>There is a specific section in the LTS, but no specific sectoral targets or description of the current situation. The policy descriptions are only at a high level, for example, enhancing growth and sequestration through productive and sustainable forest management.</p> <p>EE2035 does not include significant details on the LULUCF sector. There is some description on developing a sustainable bioeconomy.</p>
Carbon removal technologies	1	<p>There is no discussion of CCS in either the original LTS or EE2035.</p>

Financing and enabling policies and measures	Investment needs assessment	1	There is no discussion of investment needs in the LTS or EE2035.
	Financing	1	<p>The LTS has very limited discussion on financing and financial instruments. Point 12 in the LTS includes implementing novel tax policy for sectors outside the ETS.</p> <p>Financing is also not described in detail in EE2035. There is a description of implementing a polluter/user liability for transport infrastructure and the rolling stock.</p>
	R&D	2	<p>R&D is discussed in each of the individual sectors in the LTS. There is a description of raising the awareness of government and supporting innovation, but no specific details such as for increased financing. The role of Estonian scientists in international climate research should be increased. There is a focus in the energy sector on developing efficient energy technologies and upcycling domestic RES, as well as technologies to reduce the carbon intensity of industry. In the LULUCF sector, research and development that help to increase carbon sequestration and find alternative use for timber will be preferred.</p> <p>EE2035 includes greater detail and specific targets. For example, R&D spending in the private sector should be increased to 2 % of GDP, and the number of researchers and engineers in the private sector should be almost tripled (to 4.53 per 1000 residents) by 2035. There are details on using new technological solutions for implementing the digital and green transitions and ensuring cooperation between institutions in nationally important sectors: oil-shale and wood, food, and technology supporting environmental protection.</p>
Economic assessment	Socio-economics impacts	1	There is very limited discussion of socio-economic impacts in the LTS, although there is a specific section on climate adaptations.
	Distributive impacts	1	The specific impacts of the transition to climate neutrality are also in general not referred to in EE2035. However (page 25) does describe the need for a just transition in the Ida-Viru region.
Strategy preparation and implementation	Analytical tools	2	<p>There is a projection of emissions until 2050 in the LTS including a sectoral breakdown (energy and industry, transport, agriculture, and waste) of the emissions required to reach an 80 % reduction. This also includes a description of the current trend of total national emissions. The LTS does not describe what tools were used for the projection.</p> <p>EE2035 does not include a description or details of any analytical tools.</p>
	Governance	3	<p>The LTS describes a report to parliament of the main principles of climate policy in 2019, and then every 4 years from this point. The policy until 2050 will be reviewed and potentially updated every 4 years.</p> <p>EE2035 led to the adoption of an action plan that is monitored annually. The ministries with responsibilities are clearly stated, although it is unclear what oversight is in place. Adjustments can be made based on both</p>

			<p>national and international factors. Interestingly, an online tool shows the progress made towards each of the goals</p> <p>Both EE2035 and the LTS have been adopted by parliament.</p>
	Public consultation	2	<p>The LTS included no description of any public consultation.</p> <p>EE 2035, on the other hand, describes 17000 people being involved over 2 years. 13903 participated via internet or public libraries, which determined the values upon which the strategic goals have been formulated. but details are lacking about the nature of the consultation and whether it led to any changes. "Co-created" working documents were published on the government website. Separate discussions (discussions, analyses, workshops,...) also took place with stakeholders, including researchers, politicians, and entrepreneurs. But in both cases, more detail on what sort of consultation this was or whether it led to specific changes in the strategy would be beneficial.</p>

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