

A REVIEW OF EU MEMBER STATES' 2020 LONG-TERM RENOVATION STRATEGIES



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INTRODUCTION

With building renovations being crucial for climate mitigation, tackling energy poverty and now economic recovery from the Covid-19 pandemic, long-term renovation strategies (LTRS) are an even more an essential planning tool than ever. They offer opportunities to decarbonise the building sector, improve living and working conditions of EU citizens and support economic recovery through new local jobs.

However, six months after the deadline for their submission to the European Commission on 10 March 2020, more than half of EU Member States have still not yet presented their strategies.

This report assesses the compliance of the 14 available LTRS (as published on the website of the European Commission on 15 September 2020) against the provisions in Article 2a of the amended 2018 Energy Performance of Buildings Directive¹ (EPBD). It concludes that only one strategy is fully compliant with the EPBD requirements and that most of the Member States have submitted strategies that are not in line with the EPBD requirements, with many of them being deficient in assessing the wider benefits of building renovations, in presenting the implementation details of the 2017 renovation strategies, or in consulting with the public on the strategy and its implementation.

MORE THAN HALF OF EU MEMBER STATES HAVE MISSED THE DEADLINE TO SUBMIT THEIR LONG TERM RENOVATION STRATEGY

The European Green Deal²:

“ **THE COMMISSION WILL RIGOROUSLY ENFORCE THE LEGISLATION RELATED TO THE ENERGY PERFORMANCE OF BUILDINGS. THIS WILL START WITH AN ASSESSMENT IN 2020 OF MEMBER STATES' NATIONAL LONG-TERM RENOVATION STRATEGIES** ”

While the European Green Deal stresses clearly that action in the building sector should start from implementation of existing legislation, at the time of writing (15 September 2020), only 12 countries (Austria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Luxembourg, the Netherlands, Spain, Sweden) and two of the three regions of Belgium (Flanders and Brussels Capital Region) had submitted their LTRS to the European Commission. This delay is problematic for several reasons.

First, it shows that many Member States still do not seem to prioritise action in the building sector, which is central to climate mitigation and to improving living conditions of Europeans, with the urgency that is needed. The long-term renovation strategies, with their objective of achieving a highly energy efficient and decarbonised building stock by 2050 at their core, have the potential to be the backbone for national and EU-level reductions in emissions from the building sector in line with the EU climate neutrality objective.

¹ Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

² Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal, COM(2019) 640 final.

Additionally, renovation strategies can help unlock the wider benefits of a more efficient building stock, such as improved health and comfort for its occupants, reduced air pollution and energy poverty, and increased economic activity.

Second, those Member States that still do not have a fully-fledged LTRS could miss the opportunity to access new funds from the EU Recovery and Resilience Facility to help finance its implementation. Building renovations can be financed with these new additional resources in recognition of their support for a green economic recovery; to take advantage of this, by October 2020, Member States must submit to the European Commission their draft national recovery and resilience plans in which they outline their investment plan and agenda of reforms. While every Member State is strongly encouraged to prioritise building renovations in its draft recovery plan irrespective of whether it has submitted its LTRS or not, it is evident that those countries that currently have a well thought-out strategy in place are already able to direct those additional resources toward implementing the strategy and act faster in that direction.

Third, a delay in LTRS submission hampers and slows down the work of the European Commission, which still lacks a full up-to date picture of progress (and future plans) on building renovations in each EU country. A complete overview of Member State LTRS would have served as the ideal input and contribution to the Commission's Renovation Wave, a strategic communication to unlock refurbishment in the EU, expected in autumn 2020, and to the communication "Stepping up Europe's 2030 climate ambition",³ published on 17 September 2020. Moreover, the assessment of long-term renovation strategies, announced in the EU Green Deal, risks being pushed back or left incomplete.

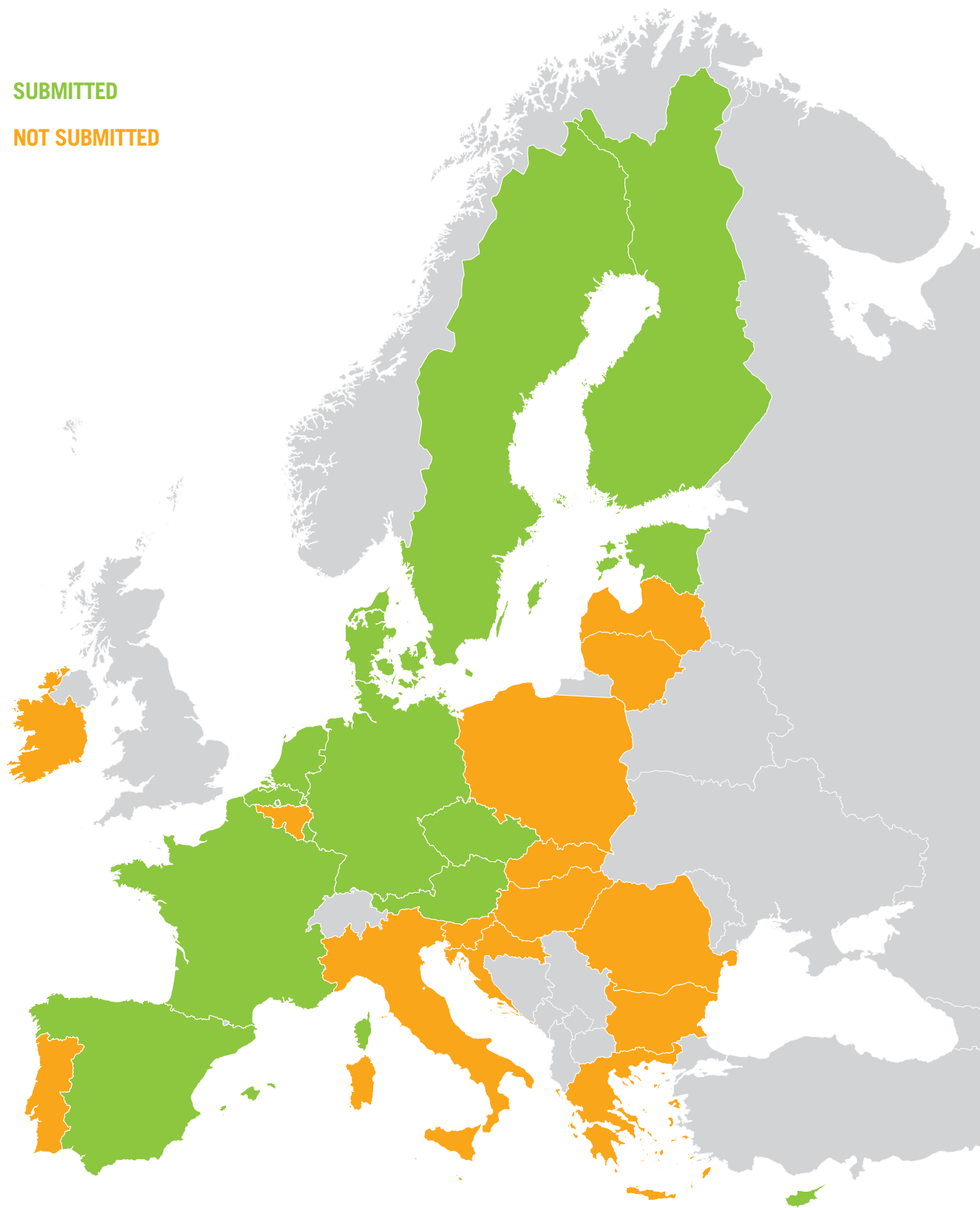
With these considerations in mind, it is now high time for the European Commission to start showing its commitment to rigorously enforcing legislation as stated in the European Green Deal. At the same time, the missing LTRS should be finalised and submitted as quickly as possible.

³ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people, COM(2020) 562 final.

Figure 1 - Overview of submission of LTRS by country. Status on 15 September 2020.

✓ SUBMITTED

✗ NOT SUBMITTED



MAIN REQUIREMENTS FOR LONG-TERM RENOVATION STRATEGIES

Under the Clean Energy for All Europeans package, the EPBD was revised in 2018 to ensure that the buildings sector could meaningfully contribute to a clean energy transition by 2030. A key pillar of that revision is the strengthening of the requirement on building renovation strategies. These are now considered a key tool to support the transition to a highly energy efficient and decarbonised building stock by 2050, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings.

According to EPBD Article 2a, each Member State must prepare a new comprehensive long-term renovation strategy and submit this to the European Commission by 10 March 2020. The LTRS must cover the following topics:

Table 1 - Summary of EPBD Article 2a requirements

ARTICLE 2A CLAUSE + REQUIREMENTS

<p>1a</p> <p>Overview of the national building stock and expected share of renovated buildings in 2020</p>	<p>1b</p> <p>Cost-effective approaches to renovation considering potential relevant trigger points</p>	<p>1c</p> <p>Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports</p>	<p>1d</p> <p>Overview of policies and actions to target worst performing segments of the building stock, split-incentive dilemmas and market failures, and an outline of actions that contribute to alleviation of energy poverty</p>
<p>1e</p> <p>Policies and actions to target all public buildings</p>	<p>1f</p> <p>Overview of national initiatives to promote smart technologies and well-connected buildings and communities, as well as skills and education in the construction and energy efficiency sectors</p>	<p>1g</p> <p>Evidence-based estimate of expected energy savings and wider benefits, such as those related to health, safety and air quality</p>	<p>2</p> <p>Roadmap with measures and progress indicators, with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050</p>
<p>3</p> <p>To support mobilisation of investments, facilitate access to appropriate mechanisms for:</p> <ul style="list-style-type: none"> a. Aggregation of projects and packaged solutions b. Reduction of perceived risk for investors and the private sector c. Use of public funding to leverage additional private-sector investment or address specific market failures d. Guiding investments into an energy-efficient public building stock e. Accessible and transparent advisory tools 		<p>5</p> <p>Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation</p>	<p>6</p> <p>Include implementation details of latest LTRS</p>

In May 2019, the European Commission also published specific guidance⁴ to help Member States preparing long-term renovation strategies.

⁴ Commission Recommendation (EU) 2019/786 of 8 May 2019 on building renovation.

Methodology for our assessment

Following on from previous evaluations undertaken in 2014⁵ and 2017⁶, this BPIE report examines how the new enhanced EPBD Article 2a (formerly Article 4 of the Energy Efficiency Directive) is planned to be implemented by Member States. Our focus is on compliance aspects: the assessments examine to what extent the LTRS comply with the provisions of Article 2a. This means that the evaluation judges the completeness of the strategy and the quality of details provided, but will not assess, for example, whether the policies, measures and roadmap suggested are ambitious, credible or have the potential of being well implemented. Also, our assessment is only based on the information Member States have reported in their LTRS, without recourse to other sources.

All 14 of the strategies that have been published by the Commission⁷ to date have been reviewed against each of the clauses in Article 2a, as summarised above. For each clause, we have assigned a score ranging from 0 = *not addressed* to 5 = *exemplary* (see Table 3 for full scoring details), with 3 being an acceptable submission.

It should be stressed that the score reflects the extent to which a clause has been addressed from a compliance perspective. It does not of itself reflect whether the approach presented by a Member State to a given topic is appropriate to the prevailing conditions and conducive to delivering an energy efficient and decarbonised building stock. Likewise, a strategy could be quite impactful in delivery, as a result of the policies and financing mechanisms it contains, even if it receives a low aggregate score because some of the individual clauses are inadequately addressed or missing.

In scoring each of the sections, every effort has been made to accurately interpret the submissions; however, this was not always easy, particularly where Member States did not follow the structure of Article 2a or the Commission's guidance. For example, on mobilisation of investments, clause 2 lists five specific dimensions, though in most cases Member States did not present their financial measures according to these dimensions. Difficulties in judging the level of compliance also occurred where Member States discussed a topic, such as smart technology and well-connected communities, but were then not specific about their initiatives in these areas.

On a particular note, we used the following rationale for scoring compliance with the obligation that Member States present a roadmap with measures and progress indicators, with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. A score of 3 was granted when a Member State articulated clearly the 2050 goal, the intermediate milestones and progress indicators. As this analysis judges compliance, and not ambition, we considered that a long-term goal of at least 80% was compliant with the EPBD requirements. However, we note that the Commission's guidance states that a decarbonised building stock "can be considered as one whose carbon emissions have been reduced to zero, by reducing energy needs and ensuring that remaining needs are met to the extent possible from zero carbon sources". Consequently, emissions reductions need to be at or very close to 100% to fully contribute to the climate neutrality objective of the EU Green Deal.

BPIE intends to publish a more detailed review of selected LTRS later in 2020 examining their ambition, in particular whether the roadmap is consistent with the EPBD requirement of delivering an energy efficient and decarbonised building stock by 2050, and whether the LTRS has a credible strategy and policy framework to mobilise action for and investment in building renovations.

⁵ <http://bpie.eu/wp-content/uploads/2015/10/Renovation-Strategies-EU-BPIE-2014.pdf>

⁶ http://bpie.eu/wp-content/uploads/2017/11/Renovation-Strategies_Final.pdf

⁷ https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies_en#national-long-term-renovation-strategies-2020

SUMMARY RESULTS

Only one strategy – Spain – was fully compliant with Article 2a and Flanders – was partially deficient only in the area of public consultation (clause 5).

Overall, the requirement to provide implementation details of the latest LTRS (clause 6) received the lowest average score, as half of all strategies did not address this requirement, while the obligation to report on the public consultation (clause 5) was also poorly addressed: two strategies (Brussels Capital Region and Czechia) omitted this altogether, while many failed to detail how ongoing consultations would be carried out.

Also, most strategies reported adequately the energy savings that the LTRS is expected to deliver, but failed to quantify the wider benefits associated with these, such as those related to health, safety and air quality.

On the use of trigger points for renovation there is a mixed picture: not all strategies clearly identify and present trigger points, which are crucial to make the most of renovations (often non-energy related) that are happening anyway. When those trigger points are highlighted, some Member States use them to design specific policy measures to increase energy renovations, but others do not go the extra mile of linking them with a clear requirement to carry out upgrades.

In their LTRS, Member States are also required to develop and present policies and actions to stimulate cost-effective deep renovation (clause 1c). In the European Commission's guidance on strategy development⁸ "deep renovation" is described as renovation that leads to significant (typically more than 60%) efficiency improvements. While Member States generally provided reasonable details on their renovation policies (existing or proposed), few explicitly geared these towards achieving deep renovation.

Regarding policies and actions to target all public buildings (1e), the European Commission guidance is explicit that this *"should include, for example, buildings that are occupied (e.g. leased or rented) by local or regional authorities and buildings that are owned by central government and regional or local authorities, but not necessarily occupied by them"*. However, many Member States are not explicit about the coverage of their policies targeting public buildings.

On a more positive note, the following strategies deserve singling out for overall performance, or for sections that were addressed particularly well.

⁸ <https://op.europa.eu/en/publication-detail/-/publication/4a4ce303-77a6-11e9-9f05-01aa75ed71a1/language-en/format-HTML/source-119405586>

FINLAND

presented a detailed roadmap to 2050, with a comprehensive range of milestones and indicators.

BELGIUM

The **Flemish** strategy was well written, following the structure of Article 2a. Most sections achieved a score of 4, and the strategy was only let down by the absence of a public consultation on the final LTRS (though previous consultation took place within the context of the "Renovation Pact").

DENMARK

had strong sections on the building stock, cost-effective renovation options and progress with implementing the 2017 strategy.

The consultation process in **THE NETHERLANDS** was highly collaborative, building on a long-standing approach to engage the public in national climate and energy policy.

SPAIN

delivered the best overall strategy, receiving a high score (4 or 5) against most clauses. Generally, the level of detail provided was excellent. Of particular note is the treatment of energy savings and wider benefits, and a detailed exposition of progress with implementing the 2017 strategy.

CONCLUSIONS

From our analysis the following general conclusions can be highlighted:

1

Despite Member States having two years' notice of the impending deadline for submission of their LTRS, only a handful met that deadline, while even six months later, less than half have been submitted. This tardiness mirrors to a significant degree the experience witnessed in 2014 and 2017, and is disappointing, given the importance of the climate change agenda and the multiple benefits that arise from building renovation. **The European Commission should take appropriate and immediate steps to enforce the implementation of European legislation fully, to the benefit of European citizens.**

2

Only one strategy was fully compliant with all the clauses in Article 2a. Any Member State receiving a score of 0 (missing) or 1 (only addressed superficially) should ensure that those shortcomings are resolved in the implementation phase and that the planning gaps are filled in with effective actions that materialise on the ground.

3

Some Member States broadly followed the structure of Article 2a; others adopted a different approach. While there is no requirement for strategies to follow a **specific** structure, those Member States that did not mirror Article 2a tended to have more omissions or incomplete submissions.

4

Few, if any, Member States **consistently** followed the European Commission's guidance in transposing the requirements laid down by Article 2a, for example on designing policies to explicitly target deep renovation. The Commission should consider providing a standard template that Member States could use to ensure they address all requirements of Article 2a.

5

Finally, and perhaps most importantly, this is the third round of renovation strategies,⁹ yet in addition to the delays in submission, most Member States are still failing to adequately address the Directive's requirements. The European Commission should engage with Member States to understand what the issues are, and what assistance might be provided to help in strategy development and implementation. A proactive and permanent network (such as the Concerted Action format) of those responsible for drafting strategies at Member State level might be usefully deployed to provide practical hands-on support from topic experts.

⁹ The 2014 and 2017 renovation strategies were submitted pursuant to Article 4 of the Energy Efficiency Directive.

More specifically on the content of the submitted LTRS, our analysis concludes the following:

- 6 The overview of national building stocks was generally presented quite well by most Member States, receiving the highest overall average score; however, many strategies failed to clearly describe the current share of renovated buildings.

- 7 The requirement with the lowest average score was the provision of details of implementation of the latest LTRS (clause 6), with 8 out of 14 strategies not addressing this point at all. This is worrying as the absence of any tracking of implementation or progress poses the question on whether the LTRS remains just a paper exercise or whether the planned policies and measures are effectively implemented on the ground.

- 8 The obligation to carry out a public consultation and report on its modalities (clause 5) was also poorly addressed. Two Member States either failed to hold a consultation process or failed to submit details of the consultation. Many Member States also failed to describe the modalities for the ongoing, inclusive consultation that is expected to take place during the implementation of the LTRS. A well-run and open public consultation process is the basis to get buy-in from stakeholders and the general public about building renovations, which are a societal challenge that must be achieved through collective effort; it is therefore particularly concerning that, in most cases, this exercise is absent or poorly done. However, Member States can still ensure that the public and relevant stakeholders are involved and regularly consulted in the implementation of the LTRS.

- 9 Very few Member States quantified wider benefits (clause 1g), and those that did typically only addressed one or two benefits (e.g. job creation). With non-energy benefits of building renovations still overlooked and not properly quantified, Member States miss the great opportunity of using LTRS as a key tool to serve multiple policy objectives, including those of health, environmental, economic and social policies. Additionally, a better quantification and explanation of wider benefits, such as positive impact on air quality or reduction of energy poverty, also helps get buy-in on renovation policies from citizens and improves the societal cost-effectiveness.

- 10 One of the new requirements was for Member States to set out a roadmap to 2050, with measures, progress indicators and indicative milestones (clause 2). This is an essential point, given the overall objective of the LTRS to achieve a highly energy efficient and decarbonised building stock by 2050, but only a minority of strategies addressed it adequately. The long-term decarbonisation objective, and a roadmap on how to reach it, are vital to support the achievement of the EU climate neutrality goal.

In conclusion, the European Commission in its Renovation Wave should clearly put an emphasis on the need for Member States to submit their LTRS and to ensure that these meet at least the minimum compliance requirements. Even more importantly, it should ensure that strategies are implemented, kick-starting the renovation market in each country.

Table 2 - Summary evaluation of Member States' compliance with Article 2a of EPBD

Clause	Description	Austria	Belgium-Brussels	Belgium-Flanders	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Luxembourg	Netherlands	Spain	Sweden	Average
1a	Overview of the national building stock	2	2	4	3	4	4	3	4	4	3	3	3	5	3	3.4
1b	Cost-effective approaches to renovation, including trigger points	1	2	4	3	2	4	2	3	4	3	2	3	4	2	2.8
1c	Policies and actions to stimulate cost-effective deep renovation	2	4	4	3	4	3	1	2	3	4	4	4	5	3	3.3
1d	Policies to target worst performing segments, split-incentives, market failures, alleviation of energy poverty	2	3	4	3	1	3	1	3	3	3	4	3	4	3	2.9
1e	Policies and actions to target all public buildings	3	3	4	2	2	2	1	2	3	2	3	4	4	2	2.6
1f	Smart technologies; well-connected communities; skills education	3	2	3		3	3	1	3	2	3	3	3	3	3	2.6
1g	Expected energy savings and wider benefits	2	0	2	2	2	2	2	2	2	2	2	2	5	2	2.1
2	Roadmap with measures, progress indicators, and indicative milestones	3	2	4	1	1	0		5	3	2	2	4	4	3	2.5
3	Mechanisms for mobilising investments	2	3	3	3	2	3	1	3	3	2	3	3	4	3	2.7
5	Consultation	2	0	1	2	0	2	2	4	3	2	2	4	3	3	2.1
6	Implementation details of latest LTRS	0	0	3	0	0	4	0	5	0	1	0	0	5	3	1.5
	Aggregate score	2	1.9	3.3	2.2	1.9	2.7	1.5	3.3	2.7	2.5	2.5	3	4.2	2.6	

0 missing
 1 very superficial
 2 incomplete
 3 adequate
 4 good
 5 exemplary

Table 3 - Guide to compliance scoring

SCORING GUIDE

Each Member State is assessed against the individual clauses contained within Article 2a. The score reflects the degree to which the submission complies with the EPBD requirement. Scores range from 0 to 5 according to the following criteria, with a score of 3 or more equating to compliance.

- 0** = missing/not addressed
- 1** = addressed in only a very superficial manner (non-compliant)
- 2** = partially or poorly addressed (non-compliant)
- 3** = minimum requirements met
- 4** = additional insight or detail provided
- 5** = exceptional/exemplary

AUSTRIA^{10,11}



SUMMARY

Because Austria is a federal country with competences divided between the national government and the Länder (federal states, henceforward referred to as states), the strategy itself reads as a mix of a national and state-level policies and modelling. For this reason, the strategy is complex to read and it is hard to determine whether all requirements, including objectives, policies, and measures, are well covered and will be implemented across all states.

Even if the structure of the LTRS follows the requirements of Article 2a, there is no comprehensive national strategy with a clear long-term goal with regionally supported commitments, aligned with the overall national strategy laid out in the Austrian national energy and climate plan (NECP). While a number of the Article 2a requirements are covered adequately (achieving a score of 3), many fall short of the mark, in particular the area of cost-effectiveness.

The Austrian LTRS sets out a goal of 80% reduction in building sector GHG emissions by 2050, derived through a process of consultation with selected stakeholders and each of the Länder. This target is supported by a combination of national laws (e.g. federal energy efficiency act¹²) and initiatives (e.g. klimaktiv), and implemented by individual state-level policy measures. Also in this case, as mentioned above, a complete overview of the process to achieve the overall long-term goal through shared responsibilities among the different governance levels is missing.

On the positive side, the document delves deeply into the problems of the ownership structure, cost aspects and the innovative policy measures in the Austrian building sector.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	A partial analysis of the building stock is presented. Residential buildings are described with an extensive analysis of the floor area and by primary/secondary residence. Lacking are non-residential buildings and the disaggregation by type, location, occupancy, date of construction, energy consumption for heating, and renovations undertaken.	2

¹⁰ Austrian LTRS in German https://ec.europa.eu/energy/sites/ener/files/documents/at_2020_ltrs.pdf

¹¹ Austrian LTRS in English https://ec.europa.eu/energy/sites/ener/files/documents/at_2020_ltrs_en.pdf

¹² German: Energieeffizienzgesetz (EEffG) <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20008914>

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1b	Cost-effective approaches to renovation considering potential relevant trigger points	The concept of cost-effectiveness is theoretically studied with special attention on the difference between a single comprehensive versus a staged renovation, but there is no assessment of what this means for the Austrian building stock. A presentation of building-stock renovation options, costs and benefits, or relevant trigger points, is missing.	1
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The strategy presents the initiatives and support schemes of the Austrian states to stimulate renovation. In the LTRS we found such policies and measures in three of the nine states: Burgenland, Vorarlberg, Vienna. While many of the states provide tailored advice to citizens, including a roadmap for renovation, only the state of Steiermark is introducing a building renovation passport. Because there is not strategic approach for the implementation across all Austrian states and there are gaps in the geographic coverage, this part of the strategy cannot be considered compliant.	2
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	The renovation of the worst-performing buildings and the alleviation of energy poverty are considered as overlapping problems and therefore addressed jointly. In particular, the LTRS refers to actions and measures foreseen by the Austria efficiency law. The national efficiency law obligates energy suppliers to perform energy efficiency measures, with 40% in homes and an incentive for poor households and social projects. In addition, most states point to free advice for poor households and to household appliance exchanges, which are subsidised or sometimes free, funded by obligations on energy suppliers. The split-incentive dilemma or market failures were addressed by only one of nine states (Steiermark). Because there is no strategic approach for the implementation across all Austrian states and there are gaps in the geographic coverage, this clause receives a score of 2.	2
1e	Policies and actions to target all public buildings	Energy performance of public buildings is managed through a group of energy consultants that have worked for federal buildings since 1980; they continue to analyse, optimise and digitise the national public buildings and issue energy certificates and thermographic reports. Nationwide, Austria has signed 10-year contracts with companies guaranteeing energy savings that cover the requirements of Article 5 of the Energy Efficiency Directive. Energy savings contracting is being extended to further municipalities. However, most public buildings are heritage-protected and thus excluded from the goal; the plan for measures addressing these buildings has yet to be developed.	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Several projects are dedicated to innovation in the fields of renovation and renewable energies. The flagship project for smart technologies is the smart readiness indicator, which assesses options for national implementation and the integration in the energy certificates. All states conduct their own smart city projects. The Austrian law for energy efficiency requires qualification for energy audits and consultants for public buildings and companies. The klimaktiv framework develops education programmes for all areas related to renovation and offers e-learning.	3
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Expected savings in energy consumption from 2015 levels are 31% by 2030, 52% by 2040, and 68% by 2050. There is some discussion on air quality, comfort, health, security, fire protection, increased services (lift, parking), though a specific quantification of the wider benefits is missing.	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	Austria has a scenario covering the long-term objective of reducing emissions in the building sector by 80% compared to 1990. Indicative milestones for a reduction in energy consumption from 1990 levels are 56% by 2030 and 70% by 2040. The following indicators have been set at the national level to monitor progress: (i) demographic development (ii) used area per person (iii) energy demand for heating cooling, hot water, ventilation, and lighting (iv) energy mix for the same scope (v) financing volume for new buildings and renovations. These quantitative indicators are accompanied by regulatory measures and national plans, namely, updated regulation for building technology from April 2019, requirements for new buildings and renovations and current funding guidelines.	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	<p>To support mobilisation of investments, facilitate access to appropriate mechanisms for:</p> <p>a) Aggregation of projects and packaged solutions</p> <p>b) Reduction of perceived risk for investors and the private sector</p> <p>c) Use of public funding to leverage additional private-sector investment or address specific market failures</p> <p>d) Guiding investments into an energy efficient public building stock</p> <p>e) Accessible and transparent advisory tools</p>	<p>There are very limited examples of mechanisms to aggregate renovation projects and reduce the perceived risk.</p> <p>One state, Oberösterreich, implements energy contracting, with 240 projects having been contracted so far, which has triggered €70 M in investment. There are projects to develop energy performance contracting and a platform for energy contracting among SMEs is being developed to support aggregation of projects.</p> <p>All states have programme to subsidise the renovation of residential buildings. Examples include THEWOSAN (thermal residential renovation) in Vienna and the subsidy for thermal renovation and densification of residential buildings in Vorarlberg.</p> <p>Also, several states have advisory tools in the form of one-stop-shops for building owners.</p> <p>While Austria addresses all areas related to the mobilisation of investment, the information provided is not fully comprehensive, so this clause receives a score of 2.</p>	2
5	<p>Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation</p>	<p>A consultation with invited stakeholders was held in the second half of 2019. Among the selected stakeholders, there is a high representation of public authorities and industry associations.</p> <p>The consultation process included providing input for a stakeholder scenario for decarbonisation (Stakeholder Experten Modell); a summary of stakeholder interactions is included in the LTRS.</p> <p>The process for consulting stakeholders during the LTRS implementation is not described.</p>	2
6	<p>Include implementation details of latest LTRS</p>	<p>Not provided.</p>	0

BRUSSELS CAPITAL REGION, BELGIUM^{13,14}



SUMMARY

The introduction to the Brussels Capital Region LTRS sets the scene for what appears to be an ambitious strategy: *“In order to drastically reduce the environmental impact of buildings, three main angles of attack must be fully pursued: **increasing the rate of renovation, improving the quality of renovations and making rational use of energy within buildings. The entire arsenal of public policies must also be deployed:** documentation, communication, regulation, support, encouragement, financial assistance, innovation, etc. However, achieving these objectives will only be truly feasible if the following two elements exist: **clear and firm requirements** that can raise the performance of the entire stock to a high level, and an **unprecedented mobilisation of public and private finances.**”* However, there isn’t a clear roadmap to 2050 with milestones and progress indicators for the building sector.

The presentation of the document is unusual, as it gives an executive summary-style overview, followed by a detailed description of 34 policies which make up the bulk of the strategy. While the clarity of policy descriptions is commendable, the strategy fails to address a number of the essential EPBD requirements, namely the expected savings and wider benefits, the public consultation, and progress with implementing the 2017 strategy. Some other clauses have been addressed only partially. There is extensive coverage of the residential sector and its renovation potential, but there is neither an overview of the non-residential sector, nor a description of cost-effective approaches to renovation.

While there appears to be a determined effort to address the renovation challenge within the Brussels Capital Region, from a compliance perspective, the strategy does not meet the basic requirements of EPBD Article 2a

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	A partial analysis of the building stock is presented. Residential buildings are described with an extensive analysis of the floor area and by primary/secondary residence. Lacking are non-residential buildings and the disaggregation by type, location, occupancy, date of construction, energy consumption for heating, and renovations undertaken.	2

¹³ LTRS in French - https://ec.europa.eu/energy/sites/ener/files/documents/bruxelles_capitale_2020_ltrs.pdf

¹⁴ LTRS in English - https://ec.europa.eu/energy/sites/ener/files/documents/be_brussels_2020_ltrs_official_translation_en.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1b	<p>Cost-effective approaches to renovation considering potential relevant trigger points</p>	<p>Cost-effectiveness is only addressed for the residential sector, but not for the non-residential (see comment above on scoring).</p> <p>Trigger points are recognised as an important moment to influence building owners. Tailored communications, tools and finance are directed at such events. Consideration is being given to require professionals involved in property transfers to inform those involved in the transaction of energy saving opportunities.</p>	2
1c	<p>Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports</p>	<p>The majority of the strategy is devoted to describing 34 individual policies and actions including obligations, financial incentives, other forms of support, administrative simplification, documentation and innovation.</p> <p>An individual building renovation roadmap tool will be created by 2024, consisting of two parts: an “EPC 3.0” and a renovation plan. All owners, regardless of any transaction, will have to complete the 3.0 certification process to determine the technical measures necessary to achieve the overall energy performance objective set by the Brussels Capital Region. In addition, a renovation plan will be produced for the work and will be mandatory in the case of projects requiring planning permission.</p>	4
1d	<p>Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures, and an outline of actions that contribute to alleviation of energy poverty</p>	<p>All residential buildings must meet mandatory minimum performance levels in five stages, the first being in 2030, and every five years thereafter. The necessary regulatory framework will be developed by 2021. A similar measure for non-residential buildings is under consideration.</p> <p>A Jointly Owned Building Facilitator service will assist those in multi-occupancy buildings with financial, legal, sociological, technical and administrative support.</p> <p>The main focus on tackling energy poverty is on measures to improve the energy performance of the rented social housing sector. For example, any renovation must meet the prevailing new-build standard.</p>	3
1e	<p>Policies and actions to target all public buildings</p>	<p>To lead by example, public authorities are required to purchase and lease energy efficient buildings. Those with building stocks above 50,000m² are required to develop local action plans for energy management.</p> <p>The aim for the public building sector as a whole is carbon neutrality by 2040.</p>	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Training is provided for professionals to achieve the necessary installer qualifications. The Sustainable Building Facilitator service, which offers ad hoc advice to developers and building managers, will be reinforced so that it becomes the single “one-stop-shop” entry point for building professionals. A renovation laboratory “RenoLab” will be set up by 2024 to help the construction sector with various aspects of sustainable renovation. While the overview of initiatives in support of skills and education is comprehensive, there is no specific focus on smart technologies or connected buildings.	2
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Not provided.	0
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	The overall goal for the region is an economy-wide 80% reduction in GHG emissions by 2050. However, the role of reducing buildings’ emissions in achieving this target is not clearly specified, even though buildings account for over half (56%) of the region’s emissions. The residential sector is to achieve an average specific consumption level of 100 kWh/m ² /year by 2050. The service sector goal is energy neutrality in terms of heating, production of domestic hot water, cooling and lighting. Because there are no milestones or progress indicators, this clause receives a score of 2.	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	<p>To support mobilisation of investments, facilitate access to appropriate mechanisms for:</p> <p>a) Aggregation of projects and packaged solutions</p> <p>b) Reduction of perceived risk for investors and the private sector</p> <p>c) Use of public funding to leverage additional private-sector investment or address specific market failures</p> <p>d) Guiding investments into an energy efficient public building stock</p> <p>e) Accessible and transparent advisory tools</p>	<p>The region deploys an array of financial incentives and initiatives to mobilise investment in renovation, including:</p> <ul style="list-style-type: none"> • Encouraging development and formation of energy service companies (ESCOs), possibly coupled with public funding • Mobilising community savings and encouraging the development of community cooperatives and third-party investments • Creating tax incentives and revising the energy incentive mechanism • Increasing accessibility and attractiveness of the low-interest Brussels Green Loan (Prêt Vert Bruxellois) • Supporting roll-out of renewable heat and electricity • Developing a one-stop-shop for individuals 	3
5	<p>Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation</p>	Not provided	0
6	<p>Include implementation details of latest LTRS</p>	Not provided	0

FLANDERS, BELGIUM^{15,16}



SUMMARY

The Flemish government has published a valuable long-term renovation strategy that encapsulates the objectives set out in the current coalition agreement¹⁷ and the Flemish Energy and Climate Plan. Clearly written and following the structure of Article 2a, it is a strategy that largely complies with EPBD requirements, save for the absence of a public consultation on the final draft of the strategy (though prior consultation within the context of the Renovation Pact did inform its content – hence the score of 1).

Among the highlights of this strategy is the recognition of the important role that trigger points can play in accelerating the rate of renovation and improving cost-effectiveness, potentially responsible for 70% of the required renovations to achieve the target 3% annual renovation rate. For non-residential buildings, in order to eliminate the worst-performing share of the stock, there is a mandatory renovation requirement after transfer of ownership and a mandatory minimum energy performance from 2030.

In terms of ambition, the strategy aims for a 70% reduction in residential energy use compared to 2020, but only 33% in the non-residential sector, including public buildings. And, while the non-residential sector is expected to be carbon neutral by 2050 through phasing out the use of fossil fuels, a reduction of only 74% in GHG emissions on 2020 levels in the residential sector is envisaged. These goals fall short of the EPBD requirement for an energy efficient and decarbonised building stock.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	Very detailed characteristics of the Flemish building stock are presented in terms of energy use, GHG emissions, breakdown by date of construction, typology, ownership, energy performance and housing quality.	4
1b	Cost-effective approaches to renovation considering potential relevant trigger points	Cost optimality and cost neutrality for housing are presented in detail, including a discussion on applicability of individual measures and trigger points. Less information is provided on non-residential properties. Trigger points are clearly identified: sale, transfer, change of tenancy, application for building permit, demolition, and making use of vacant properties. In developing its renovation strategy, the Flemish government demonstrates the positive impact that use of trigger points has on cost-effectiveness and potential uptake rates. Between them, property sales, rental, inheritance and demolition could deliver over two-thirds of the target 3% annual renovation rate.	4

¹⁵ TRS in Dutch - https://ec.europa.eu/energy/sites/ener/files/documents/be_flanders_ltrs_2020.pdf

¹⁶ LTRS in English - https://ec.europa.eu/energy/sites/ener/files/beflanders_ltrs_2020_en.pdf

¹⁷ The coalition agreement of the new Flemish government formed in 2019 sets out the administration's economic and other plans for the region. In the field of climate and energy, it includes the transition to a climate-neutral and sustainable society, with the aim of at least 80% reduction in GHG emissions by 2050. <https://www.vlaanderen.be/publicaties/government-of-flanders-2019-2024-summary-of-the-coalition-agreement>

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	Flanders has a wide and diverse range of well thought-out policies, financing and support measures in place to stimulate deep renovations. "Housing ID" is a new, free digital passport with all available information concerning a building, and offering targeted advice to help owners plan renovation works. A "Building ID" and data platform is in development for the non-residential sector.	4
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	Measures to address the worst-performing housing segment include interest-free loans for improving to a C energy label or better. Encouragement is given to demolish poor quality housing and replace it with low-energy stock through a €7,500 grant and elimination of regulatory obstacles. For non-residential buildings, measures include mandatory renovation after transfer of ownership; mandatory energy performance label from 2025; mandatory minimum energy performance from 2030 (yet to be defined). To address split incentives, the Flemish Rented Accommodation Decree permits increased rents if the value of a property is improved by renovation. Financial support measures under the Energy Poverty Programme include interest-free loans and cashbacks for insulation and low-emission glazing.	4
1e	Policies and actions to target all public buildings	Various action plans, support measures and targets are described individually for the range of public buildings – education, healthcare, central government, leisure, and local authorities.	4
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Legal and policy frameworks are being developed to encourage own consumption of renewable energy, demand management integration with electric vehicles, as well as the development of local energy communities. The 2019-2024 coalition agreement committed to developing an action plan with the construction sector to ensure the supply of tradespeople so that high-quality implementation of ambitious renovation targets can be guaranteed, though it is not clear whether this has been developed yet.	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	<p>The strategy is expected to deliver reductions in energy consumption of 70% (residential) and 33% (non-residential) by 2050 compared to 2020. For housing, this equates to all dwellings achieving energy class A by 2050. For the non-residential sector, including public buildings, greater emphasis is placed on achieving carbon neutrality in heating, domestic hot water, cooling and lighting.</p> <p>As far as other benefits are concerned, the strategy only quantifies the possible job creation resulting from its implementation: the renovation strategy could create 25,000 local jobs in the next four years, growing to 40,000 and more by 2030. For other benefits, these are mentioned, but not specifically quantified for Flanders. As most wider benefits remain unquantified, the score is 2.</p>	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	<p>The LTRS sets two different headline targets, the combined impact of which would see a GHG emission reduction in excess of 80%:</p> <ol style="list-style-type: none"> 1. Reduce emissions from residential buildings to 2.3 Mt CO₂e by 2050 (from 8.9 Mt CO₂e in 2020) – a 74% reduction 2. Achieve carbon neutrality for the non-residential building stock for heating, domestic hot water, cooling and lighting. <p>The government also has an objective for all houses achieve energy label A by 2050.</p> <p>Over 30 indicators to monitor progress against different aspects of the strategy are listed, including for example major energy renovations per year, % of buildings with poor energy label, number of demolition permits granted, employment and turnover in the construction sector.</p> <p>Detailed milestones to 2030, 2040 and 2050 are presented.</p>	4

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	<p>To support mobilisation of investments, facilitate access to appropriate mechanisms for:</p> <p>a) Aggregation of projects and packaged solutions</p> <p>b) Reduction of perceived risk for investors and the private sector</p> <p>c) Use of public funding to leverage additional private-sector investment or address specific market failures</p> <p>d) Guiding investments into an energy efficient public building stock</p> <p>e) Accessible and transparent advisory tools</p>	<p>The strategy quantifies €207 billion in investment is required to renovate all existing buildings to the 2050 objective (€150 billion for residential; €57 billion for non-residential).</p> <p>a) A “neighbours’ premium” is offered for supervisors of projects with at least 10 dwellings. The supervisor leads on energy audits, advice provision, developing an action plan, searching for contractors, and administrative support for premium applications and financing.</p> <p>b) Flanders is participating in two European de-risking initiatives: the Horizon 2020 Energy Efficient Mortgages Initiative and the De-risking Energy Efficiency Platform (DEEP).</p> <p>c) Several public funding schemes are listed: the Flemish Energy Fund, green bonds, interest-free energy loans, and a rolling fund for the renovation of apartments.</p> <p>d) The level of funding required to renovate each of the subsectors of the public sector is identified, though it is not stated whether the required funding will be made available, nor from which sources.</p> <p>e) Trained renovation coaches provide advice and support for renovation projects, including preparation of financing proposals. In addition, a network of “energy houses” throughout the region offers integrated services for renovation and financing.</p>	3
5	<p>Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation</p>	<p>No public consultation specifically on the LTRS has taken place. However, the strategy has benefited from the ongoing consultation within the Renovation Pact – a wide-ranging partnership with 34 organisations from the construction and energy sectors – active since 2014. The process to consult stakeholders during LTRS implementation is not described.</p>	1
6	<p>Include implementation details of latest LTRS</p>	<p>The strategy includes an update on developments since the 2017 LTRS.</p>	3

CYPRUS^{18,19}



SUMMARY

The Cypriot renovation strategy addresses most of the Article 2a requirements adequately, though there are areas of weakness from a compliance perspective – smart technologies, energy savings and wider benefits, the roadmap to 2050. Also, a review of implementation progress of the 2017 strategy is missing. Even though this analysis is primarily meant to check compliance with EPBD requirements, the lack of ambition of the strategy is evident; this is exemplified by the fact that the ‘realistic’ scenario for the energy upgrading of buildings, according to the strategy, is an annual renovation rate of 1%, taking into account economic and technical limitations. At this rate, sectoral energy consumption will be higher in 2050 than it is today. Achieving carbon neutrality by 2050 would require a tripling of the renovation rate, which the LTRS considers unrealistic at the present time.²⁰

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	Figures are provided for the number of buildings by type, location, floor area, date of construction, main energy systems and fuels for heating and air conditioning, and energy consumption. The vast majority (94%) of homes in Cyprus were built prior to the introduction in 2006 of minimum energy performance requirements.	3
1b	Cost-effective approaches to renovation considering potential relevant trigger points	An annex gives worked examples of renovation for four building typologies. Costs are provided but no savings, so it is not clear what is cost-optimal. The report states that the economically optimal thing to do is to upgrade residential buildings undergoing renovation anyway to energy class A and non-residential buildings to energy class B+. Key trigger points are identified (new owner or tenant; structural upgrade; change of use) and recognised as reducing the cost of renovation.	3
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The LTRS describes legislative measures, incentives, training measures and information measures, including an online energy saving tool to help citizens to easily identify the costs and benefits from different energy-saving and renewable energy measures. Most of the legislative measures reflect the minimum requirements of the EPBD. New measures include an energy efficiency obligation scheme, combining energy upgrades with anti-seismic upgrades, measures for special buildings (e.g. historic), green tax reform, installation of smart electricity meters, and funding for nearly zero-energy buildings, SMEs and municipalities from European Structural Funds 2021-2027.	3

¹⁸ TRS in Greek - https://ec.europa.eu/energy/sites/ener/files/documents/cy_2020_ltrs.pdf

¹⁹ LTRS in English - https://ec.europa.eu/energy/sites/ener/files/documents/cyprus_2020_ltrs_en.pdf

²⁰ <http://energysavingstool.cea.org.cy>

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	The worst-performing buildings are considered to be those that received construction permits prior to December 2007, when minimum performance standards were introduced for the first time. Accordingly, financial support programmes target these older buildings. A survey of stakeholders concluded that the most effective way to tackle the landlord-tenant barrier would be to set minimum energy performance requirements for rented buildings. This is being considered by the government. Actions to alleviate energy poverty largely focus on measures to protect vulnerable electricity consumers, such as eligibility for a 20% cheaper tariff, non-disconnection of electricity for those facing serious health problems and incentives for solar PV installation and energy upgrades.	3
1e	Policies and actions to target all public buildings	Cyprus has a policy that central government authorities should only occupy energy-efficient buildings, while a new requirement is to have energy saving officers in all public buildings to monitor and report energy use. However, other than an initiative to install solar PV in 430 schools, other types of public buildings are not targeted.	2
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	The strategy repeats the requirements set out in the EPBD, but does not specify what actions the government is taking to promote smart technologies and well-connected buildings and communities. Regarding skills and education, the strategy presents the available training courses and qualification requirements for building professionals.	2
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Tables show a maximum technical potential for energy saving as 51.3% (residential) and 64.7% (tertiary), whereas the realistic potential, which is understood to be the strategy's energy saving target, is just 5.2% and 6% respectively. While wider benefits are discussed, the only one which is quantified is an increase of 0.25% in GDP.	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	A result of implementing the LTRS, energy demand is expected to be 20% lower in 2050 than would otherwise be the case, but still higher than today's level. The impact on GHG emissions is not shown. The two milestones for 2030, 2040 and 2050 are energy use in the residential and tertiary sectors. No other indicators are given.	1
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	The "Fund of Mutual Funds", with €80M from the Cohesion Fund, the European Regional Development Fund, the European Investment Bank and national contributions, will from 2020 provide loans to households, SMEs and local authorities through commercial banks. The Business4Climate initiative provides Cypriot businesses with tools, advice and support, including finance, to reduce GHG emissions from businesses. There are a number of initiatives targeting investments within the public sector, e.g. schools, municipalities. An online energy-saving tool has been set up to help citizens to easily identify the costs and benefits from different energy-saving and renewable energy measures	3
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	The draft LTRS was presented to advisory and technical committees, as well as to stakeholders at a one-day meeting organised by the Cyprus Employers and Industrialists Federation. Stakeholder views were also garnered through a targeted questionnaire. However, there is no mention of how consultation during LTRS implementation will be conducted.	2
6	Include implementation details of latest LTRS	Not provided	0

CZECHIA²¹



SUMMARY

Key strengths of the Czech LTRS are the analysis of the building stock, underpinning the development of three renovation scenarios, and the evaluation of barriers in each building sector as the basis of refining the policy mix and developing new tools to increase the rate and depth of renovation. However, there are too many areas of weakness for this strategy to be considered compliant with the requirements of EPBD Article 2a. Examples are the complete omission of two required annexes – the results of a public consultation into the strategy and a report on implementation of the 2017 strategy.

While there appears to be a clear desire to increase renovation activity, the scenario which has been adopted will only result in a 24% reduction in 2020 energy use by 2050, delivering a 40% reduction in building sector GHG emissions. This falls far short of the stated ambition embodied within the EPBD to deliver an energy efficient and decarbonised building stock by 2050.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	The building stock is presented to a good degree of disaggregation. Graphs show the floor area of renovated stock annually from 2016 to 2020 according to three depths: shallow, medium and deep. Overall, some 25% of single-family houses and 40% of multi-family buildings have been renovated to date.	4
1b	Cost-effective approaches to renovation considering potential relevant trigger points	The broad approach to cost optimality is discussed as an input into the modelling of three renovation scenarios (basic, optimal and hypothetical). However, the impact in terms of typical renovation measures for different building typologies is not provided. Nor is there a discussion on trigger points.	2
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	A detailed analysis of barriers to uptake of measures, together with an evaluation of take-up rates of existing schemes, is presented as the backdrop for the development of the policy landscape. Current support measures (fiscal, legislative, education and awareness raising) are listed, together with a description of how these will be enhanced in future. Detailed plans for a two-year awareness-raising campaign are presented in an annex.	4

²¹ LTRS in Czech (English version not available at time of publication) - https://ec.europa.eu/energy/sites/ener/files/documents/cz_2020_ltrs.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	An overview of policies to target the worst-performing buildings and actions to target energy poverty is missing. There is only a discussion of market failures within the context of the analysis of barriers.	1
1e	Policies and actions to target all public buildings	This is still in development: two ongoing projects – one on energy management in municipalities and one on regional energy planning and technical assistance – aim to set the framework for improving performance in public buildings.	2
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	The Czech Republic has prepared its National Research and Innovation Strategy for Smart Specialisation, one of the aims of which is smart buildings and smart technologies within buildings. Other projects include the creation of a multidisciplinary and interdisciplinary system of cooperation between companies and research organisations to develop energy efficient and environmentally friendly technologies, systems, equipment, components, methodologies and strategies for smart buildings in the regions. On skills, in addition to required minimum qualifications, support programmes offer education in the field of energy saving.	3
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Energy saving forecasts are provided every 10 years from 2020 to 2050, split by building type (single family, multi-family and non-residential) together with associated investment requirements, based on the optimal scenario. Overall, the target reduction in energy use is 24% by 2050 on 2020 levels. Legislative and other measures to improve indoor air quality and the health of building occupants are mentioned, but the value of these wider benefits is not estimated.	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	A roadmap has been developed based on the central “optimal” scenario, with interim milestones for heating demand, split by residential and non-residential buildings, although it is acknowledged this does not deliver the highest impact. It represents a 40% reduction in GHG emissions by 2050. This is below the required threshold of 80-95%, hence not compliant with the requirement. Also, progress indicators are not given.	1
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	The LTRS does not explicitly discuss most of these topics under the given headings. However, the impact of the various fiscal and financial measures is likely to reduce risk for investors and leverage private finance. On advisory tools, the network of energy consultation and information centres provides free energy advice to the public, businesses and the public sector to support deployment of energy saving measures and renewable energy sources. To increase uptake rate, the service will be expanded to better respond to the needs of building owners.	2
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	Not provided	0
6	Include implementation details of latest LTRS	Not provided	0

DENMARK²²



SUMMARY

The Danish LTRS is a 400-page tome, comprising a 20-page overview and six annexes providing detailed reports on specific topics like the public consultation and cost-effectiveness calculations. It is published both as a single document, and also as a series of documents splitting out the overview and the individual annexes.

Overall, the strategy presents a positive and determined approach to renovating the building stock, building on decades of effort in this domain. There are areas of particular strength, notably the detailed assessment of the building stock and cost-effective approaches to renovation, as well as a detailed exposition of progress with implementing the 2017 strategy. However, a 2050 roadmap is not presented (it is due to be elaborated as part of the Climate Action Plan), while the submission showed weakness in a few areas, such as the renovation of public buildings and the quantification of wider benefits. Accordingly, this strategy cannot be considered compliant with minimum requirements of EPBD Article 2a.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	An annex contains a very good overview of the building stock, which concludes the following status as of 2020: <ul style="list-style-type: none"> • 20% of building stock has not yet been renovated • 55-60% has had light renovation • 20-25% has had medium renovation • Deep energy renovation has only occurred to a very limited extent. 	4
1b	Cost-effective approaches to renovation considering potential relevant trigger points	There is a very detailed analysis of cost optimality in an annex, which acknowledges the cost-saving benefits of renovating at certain trigger points (see 1c below). To be truly outstanding, the strategy would need to be enhanced with a summary of the analysis in the overview section.	4
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The measures presented are in line with Article 2a requirements. They are grouped around three axes: regulatory requirements (e.g. improving energy performance at certain trigger points), financial instruments (such as high taxes on space heating, tax deductions, grants for scrapping oil boilers, loans for municipalities, energy saving obligations, tax deduction on tradespeople working in the home) and information instruments for consumers, building professionals and tradespeople.	3

²² Available only in Danish at time of publication – please click on the Danish LTRS in the table to open a zip file containing the full strategy as a single document, as well as the individual sections https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies_en#national-long-term-renovation-strategies-2020

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	Under the “pool for energy savings”, grants are awarded according to the greatest improvement in kWh/m ² , thereby benefiting the worst-performing buildings. On split incentives, landlords are permitted to increase rents where there is an improvement in the energy label following retrofit measures. An experimental scheme has been set up for public housing to allow dynamic heating bills determined according to measured indoor climate (indoor temperature, humidity and CO ₂ content). The purpose is to motivate tenants to choose a good indoor climate, which is good for their health and the condition of the dwelling, and can cause a reduction in energy consumption. On alleviation of energy poverty, three financial support schemes are described, but they all go to cover heating costs, so are not focused on making the building more energy efficient.	3
1e	Policies and actions to target all public buildings	All ministries have been under an obligation to reduce energy consumption by 14% in 2020 compared to 2006, and a number of initiatives are in place to deliver the savings. This was revised in January 2020, introducing additional requirements covering acquisition of buildings. However, this only covers state-owned buildings.	2
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	digitalisation and utilisation. A national buildings inventory is in place, while a national datahub collects data on electricity consumption. A knowledge centre for energy saving in buildings provides building professionals and tradespeople with tools and teaching materials to improve skills and awareness.	3
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Forecast energy savings to 2030 against a “frozen policy” baseline are provided: a 4.4% reduction per m ² on 2020 levels. Mention is made of a study into wider benefits, but the results are not presented, nor is the study referenced.	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	The strategy does not include the 2050 roadmap, indicators and milestones but states that these will be elaborated and presented as part of the Climate Action Plan.	0
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	<ul style="list-style-type: none"> a) A national building fund, municipal credit schemes and arrangements with lenders are some of the stated examples of packaged solutions which facilitate easier and/or cheaper finance, while municipal partnerships aggregate projects. b) Risk reduction measures include a strengthened energy label; default savings for energy suppliers in the energy saving obligation scheme; and information from the buildings institute SBI which provides guidance on how to implement energy renovation projects. c) Green bonds enable institutional investors to finance green investments, including building renovation d) Municipalities and regions can procure funding via a commune credit scheme. In Greater Copenhagen, a “Gate 21” partnership between regions, municipalities, companies and knowledge institutions has been established to accelerate the green growth transition. e) The Better Housing Plan helps building owners from start to finish in the renovation process (i.e. as a one-stop-shop), and also in securing finance. The Sparenergi.dk website is an online toolkit dealing with all matters pertaining to energy saving in the home, including best practice in renovation. 	3
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	The Danish Energy Agency (DEA) held a consultation on the draft LTRS from 31 January to 14 February 2020. Individual comments from the 10 respondents are presented, along with DEA’s response. No details are provided on how consultation is to be conducted during strategy implementation.	2
6	Include implementation details of latest LTRS	A progress report on all points of the implementation of the 2017 strategy is provided.	4

ESTONIA²³



SUMMARY

The Estonian LTRS can neither be considered compliant with EPBD, nor is it a strategy in the sense of a clear roadmap and action plan to actually deliver on the aspiration of a highly energy efficient and decarbonised building stock. The document is framed in terms of what is needed, rather than what the government intends to do. It reads more like a discussion paper with recommendations to government, rather than a commitment from government, to put in place an effective policy framework appropriate to the challenge.

The main goal of the Estonian long-term renovation strategy is the complete renovation by 2050 of the building stock built before 2000. In terms of the content, this mostly relates to analyses and quantification of the potential for renovation and the associated costs and benefits in terms of energy saving and GHG emissions reduction.

The sections on policies, measures and initiatives are less complete and it is not clear what actions will underpin the achievement of the objectives. While many of the required Article 2a clauses are presented in general terms, they are not addressed directly with a clear exposition of how, for example, the worst-performing buildings will be prioritised, the required investment will be mobilised, or the shortfall in suitably qualified buildings professionals and tradespeople will be addressed.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	Graphs and tables show a breakdown of the building stock by age and energy consumption. An ageing population and predicted depopulation of most regions – some by as much as 30% – means there could be significant demolition of older stock by 2050. Buildings constructed since 2000 are considered energy efficient and not a priority for the period of the renovation strategy.	3
1b	Cost-effective approaches to renovation considering potential relevant trigger points	Renovation costs are taken mainly from historical data. These are used to project the costs of the renovation strategy, assuming the target renovation activities are undertaken. However, other than listing measures that are typically cost-effective, the strategy does not present the cost-optimal solutions for the country. It is acknowledged that renovating is more cost-effective when other upgrades such as for fire or structural safety are required, so these could be considered trigger points.	2

²³ LTRS in Estonian - https://ec.europa.eu/energy/sites/ener/files/documents/ee_ltrs_2020.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The strategy discusses possible actions, but these are not presented as policy commitments, so it is not clear what policies will be implemented to stimulate deep renovation.	1
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	While there is a discussion on market failures and the worst-performing buildings, it is not clear what the government intends to do to address these issues. Energy poverty is not considered a significant problem in Estonia. According to the Energy Poverty Observatory, 2.9% of households struggle with heating costs, while 6.3% are in arrears on energy bills.	1
1e	Policies and actions to target all public buildings	Beyond a statement that finance will be available for renovating the public sector, it is not clear what policies will drive this agenda and when these will be implemented.	1
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Despite a discussion on these topics, notably the skills shortage, it is not clear what national initiatives are actually in place to address them.	1
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Energy savings of 60% by 2050 compared to today could be achieved if the target level of renovation activity were delivered. Wider benefits are not quantified.	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	Reconstruction of the building stock by 2050 would reduce GHG emissions by 90% compared to today. Estimates of the building stock that needs to be renovated or reconstructed, broken down by typology, are provided every five years from now to 2050, including investment requirements, though there are no progress indicators. The figures are presented as the outcome of a techno-economic appraisal of renovation potential, rather than a clear roadmap to which the government has committed, hence the score of 2.	2
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	The strategy quantifies the investment required to renovate the building stock as the basis for developing state budgets and allocation of EU funds, though no detail is provided on the mechanisms to be used to mobilise this investment. Advisory tools are discussed but not specified.	1
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	Consultation was undertaken across two workshops – one focusing on the residential sector and one on the non-residential sector. A further consultation with real estate and construction companies identified the barriers and challenges, and sought industry views on possible solutions to increase renovation activity. There is no indication as to how ongoing consultation will be undertaken during strategy implementation.	2
6	Include implementation details of latest LTRS	Not provided.	0

FINLAND^{24,25}



SUMMARY

The Finnish LTRS is an 82-page document which follows the structure of EPBD Article 2a. This helps the authors ensure they address all the clauses in Article 2a while also making it easy for the reader to follow. From a compliance perspective, the strategy largely meets all the requirements, with the exception of the following:

1. The section on policies and actions (clause 1c) gives overall principles for improving energy performance and some examples, while other policies are mentioned throughout the LTRS. However, the full list of policies is not presented, making it difficult to judge the potential overall impact. Also, those policies that are described do not specifically target cost-effective deep renovation.
2. Whilst expected energy savings are described in detail, wider benefits are not, with the exception of potential employment generated by a comprehensive renovation programme (clause 1g).

Highlights of the strategy include the comprehensive description of the national building stock (clause 1a), and the detailed presentation of the 2050 renovation roadmap with measures and progress indicators, which could be considered as an example of best practice.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	A good breakdown of building stock by typology, age, energy class (label), emissions and fuels used is provided. The share of “new and renovated” buildings is 26% – defined as those in energy classes A-C, which includes 99% of buildings constructed since 2010	4
1b	Cost-effective approaches to renovation considering potential relevant trigger points	Three primary means of decarbonising the Finnish building stock and improving energy efficiency are: (1) demolition (in depopulating areas) and improved space utilisation; (2) improved energy efficiency in connection with renovations and maintenance; and (3) abandoning fossil energy sources in energy production. Specific energy efficiency measures and trigger points, as well as barriers, are identified for each building typology. The descriptions are qualitative, without any underlying calculations or cost-effectiveness indicators.	3

²⁴ LTRS in Finnish https://ec.europa.eu/energy/sites/ener/files/documents/fi_2020_ltrs.pdf

²⁵ LTRS in English https://ec.europa.eu/energy/sites/ener/files/documents/fi_2020_ltrs_en.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The key approaches to improving energy performance are described as binding legislation, enabling legislation, voluntary agreements and the dissemination of information. Since 1997, municipalities and companies have been encouraged to improve their energy efficiency through voluntary energy efficiency agreements. However, the policies/actions described are not explicitly geared towards achieving deep renovation.	2
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	Buildings with energy classes F and G, comprising 6-14% of the stock (depending on typology), can benefit preferentially from the energy subsidy scheme operating 2020-2022. There is support for demolition of vacant and poor-quality buildings. Split incentives are not considered a major issue in Finland, since heating costs are usually included in the rent, thereby encouraging the owner to maintain the building and its systems in good condition. Market failures are discussed primarily in the context of information, availability of suitably qualified practitioners, and access to loans, though concrete actions to address them are still under consideration. Energy poverty is not a significant problem in Finland, according to the LTRS.	3
1e	Policies and actions to target all public buildings	Central government agencies are obligated to procure energy-efficient products, services and buildings if it is feasible from the viewpoint of cost-efficiency. A guide on procurement criteria for decarbonised construction includes recommendations on reducing the carbon footprint of construction and renovation projects realised with public funds. The Competence Centre for Sustainable and Innovative Public Procurement (KEINO) supports and assists contracting authorities in the development of sustainable public procurement.	2
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	A number of projects and initiatives are in place or being prepared that support smart, connected buildings, and also to improve skills and education in construction. A government bill will be issued in 2020 requiring installation of automation and control systems in heating and ventilation systems in larger buildings (over 290kW capacity).	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Energy savings are detailed in the roadmap (see below). Wider benefits are mentioned in relation to rectifying indoor air quality (including humidity and mildew) resulting from previous poorly implemented renovations and addressing these issues in future renovations. Wider benefits are not quantified, except for potential employment effects estimated at 12,000 person-years up to 2050.	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	2050 roadmap targets include: <ul style="list-style-type: none"> • 49% reduction in heating energy consumption (c.f. 2020) • 92% reduction in CO2 emissions (c.f. 2020) • Virtually total elimination of fossil fuel use • 82-100% share of nearly zero-energy buildings, depending on typology • 100% share of A, B and C energy class buildings • 0% share of F and G energy class buildings (by 2040) The LTRS includes a detailed presentation of indicators and milestones, each broken down by building typology. Assessed on a cost-optimal basis, implementation of the Finnish renovation strategy would cost €24 billion over the course of 30 years, or €800 million per year. Under its NECP, Finland aims to become carbon neutral by 2035. Some cities and municipalities target this goal by 2030.	5
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ol style="list-style-type: none"> Aggregation of projects and packaged solutions Reduction of perceived risk for investors and the private sector Use of public funding to leverage additional private-sector investment or address specific market failures Guiding investments into an energy efficient public building stock Accessible and transparent advisory tools 	<ol style="list-style-type: none"> The Joint Building Ventures Act encourages joint procurement for households and municipalities to acquire new technology. Energy efficiency service providers and banks have developed leasing-based funding solutions for renovation projects. Banks can support customers with the issue of green bonds, or offering green loans and mortgages. Subsidies to improve a building beyond the required energy performance level are available for the period 2020–2022, with consideration being given for a longer-term arrangement. An interest subsidy is available to non-profit corporations. The Business Finland investment subsidy is available to ESCO projects (requires guaranteed energy savings). 70% of all Finnish municipalities are included in the scope of a voluntary energy efficiency agreement to improve energy performance. They are eligible for a 20% subsidy (25% if the project is realised as an ESCO service). A comprehensive exposition of advisory tools and support services is provided. 	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	Preparation of the strategy was supported by a strategic advisory group consisting of representatives of real estate and construction industry associations and government agencies. The advisory group convened four times in 2019 and 2020. There were also two extensive public hearings, one expert consultation and six workshops. A total of 542 people attended the hearings and the workshops, representing 147 stakeholders and target groups. The Finnish Environment Institute (SYKE) will develop a follow-up system for the strategy. Numerous parties from the advisory group have committed to promotion of the strategy's implementation and the follow-up of the objectives.	4
6	Include implementation details of latest LTRS	Not provided.	5

FRANCE^{26,27}



SUMMARY

The French LTRS sets out what appears to be an ambitious and integrated programme of policies and initiatives to renovate the nation's building stock. At its core is the Plan for Energy Renovation of Buildings (see Figure 7), developed through an extensive consultation exercise. The strategy includes some innovative aspects, such as the requirement on owners of non-residential buildings to achieve energy-saving targets by 2030, 2040 and 2050.

The strategy itself is largely compliant with Article 2a, though the required annexes (summary results of the public consultation and implementation details of latest LTRS) are not included. One other omission is an evidence-based estimate of expected wider benefits.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	A very detailed analysis of the building stock is presented. 190,000 dwellings and 3.7 million square metres of tertiary buildings have been renovated to the low-energy "BBC" standard ²⁸ over 10 years.	4
1b	Cost-effective approaches to renovation considering potential relevant trigger points	Building-stock renovation options, costs and benefits are presented in some detail across eight reference building typologies – six residential, an office and a school. Trigger points were not explicitly modelled in the cost-optimality appraisals, but they are recognised as having a positive impact on the overall cost-effectiveness if maintenance or replacement of equipment is required anyway. The analysis draws two main conclusions: (1) There is no standard cluster of works which would be ideal for all building types. (2) Incentives are key to ensuring maximum cost-effectiveness of renovation works. This conclusion underpins the basis for the various financing mechanisms described in the strategy.	4

²⁶ French LTRS in French https://ec.europa.eu/energy/sites/ener/files/documents/fr_ltrs_2020.pdf

²⁷ French LTRS in English https://ec.europa.eu/energy/sites/ener/files/documents/fr_ltrs_2020_en.pdf

²⁸ BBC – bâtiment basse consommation (low energy building)

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	<p>The strategy discusses numerous initiatives and support schemes to stimulate renovation, though it is not clear that these focus specifically on driving deep renovations. New support measures have been introduced or will be in 2020 and 2021:</p> <ul style="list-style-type: none"> • Dedicated Energy Saving Certificates²⁹ to benefit low-income households, offering basic measures for €1; • New grants for low/very low income households and subsidised energy audits; • Reinforcing information and support mechanisms; • Interest-free eco-loans, including for social housing; • Development of third-party financing companies. <p>Owners of buildings in the tertiary sector are required to achieve energy-saving targets by 2030, 2040 and 2050. A digital logbook (carnet numérique) aims to enable users to gather information relating to housing and to access a range of support services, while the building renovation passport supports anyone working towards a low-energy building in stages. The arrangements for its implementation will be defined in the course of 2020.</p>	3
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	<p>The 2019 Energy and Climate Act includes provisions dealing with worst-performing buildings – the so-called “passoires énergétiques” (thermal sieves). For example, there are plans, yet to be defined through implementing decrees, for an obligation to renovate F and G class homes by 2028. Other policies address split incentives and market failures.</p> <p>The National Observatory of Energy Poverty (ONPE)³⁰ monitors energy poverty through an annual scorecard while also acting as watchdog and think-tank on policies designed to combat the problem.</p>	3
1e	Policies and actions to target all public buildings	<p>A 2018 national roadmap for the energy transition in government buildings prescribes a methodology designed to improve energy efficiency in the state’s property assets.</p> <p>Use of heating oil in government buildings is to be phased out by 2028.</p> <p>A special effort is being made with regard to schools, which are the most energy-intensive type of public building, accounting for 30% of total consumption. A task force will catalogue the energy challenges and develop packaged offers and funding.</p>	3

²⁹ White Certificates under the Energy Saving Obligation scheme

³⁰ <http://onpe.org>

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	innovation in the field of energy renovation. PACTE, the Action Programme for Construction Quality and the Energy Transition, funds actions to improve skills in the construction sector. However, there is no mention of well-connected buildings and communities.	2
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Expected reductions in energy consumption from 2015 levels are: 22% by 2030, 29% by 2040 and 41% by 2050. There is some discussion about the benefits of renovations in relation to improved indoor air quality and better health for building occupants, though no quantification of the wider benefits.	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	The objectives for buildings in the National Low-carbon Strategy are: <ul style="list-style-type: none"> • Carbon neutrality by 2050 • A 49% reduction of the 2015 level of GHG emissions from buildings by 2030 The following indicators have been set to monitor progress: <ul style="list-style-type: none"> (i) A 'renovation equivalent' i.e. the energy saving required to take an average dwelling to the performance target of 60 kWh/m² (ii) Total annual consumption of the existing housing stock (iii) EPC rating of the housing stock (iv) Distribution of the housing stock by energy system, to monitor progress towards elimination of heating oil. 	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	<p>There are several examples of packaged solutions in different sectors. The various financing schemes serve to reduce perceived risk and also leverage private investment.</p> <p>The Big Investment Plan provides €3 billion for buildings owned by local or regional authorities over the period 2017 to 2022.</p> <p>A planned nationwide network of over a thousand advisers at 450 contact points is expected to provide households with information and support with the aim of achieving 500,000 energy renovations a year, alongside a dedicated Energy Renovation Support Service.</p> <p>The Energy Saving Certificate scheme, in place since 2005, is a significant source of funding for renovation.</p>	3
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	<p>A public consultation was held in the first half of 2020. The results are not annexed to the LTRS, though a weblink to the results is included as a footnote. The strategy also refers to prior consultations on the National Low-carbon Strategy, the Plan for the Energy Renovation of Buildings and the Multiannual Energy Plan (PPE), the results of which all contributed to the formulation of the LTRS.</p> <p>A new National Energy Renovation Observatory will monitor progress with the LTRS.</p>	3
6	Include implementation details of latest LTRS	Not provided	0

GERMANY³¹



SUMMARY

The German LTRS sets out what appears to be a broad programme of policies and initiatives to renovate the nation's building stock. At its core are focused regulatory instruments, extensive support schemes and innovative information measures. It is lacking some of the financing strategy elements. The milestones beyond 2030 are missing. The German LTRS justifies this omission by referring to the ongoing political negotiation with no indication when a decision will be taken. The strategy includes a thorough analysis of many concepts, such as the potentials, restrictions, data situation and the building stock. At the same time, concepts such as cost-effectiveness or the framework for financing need improving.

The LTRS itself is compliant with most requirements of Article 2a. A quantified 2050 goal is missing. Also, the weak progress in facilitating financing is noticeable.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	An analysis of the building stock is presented. Residential buildings are disaggregated by the decade of construction, type and ownership, insulated envelope parts, renovated envelope parts, window quality, energy mix for heat by type of building. Energy consumption trends are presented for tertiary buildings, disaggregated by 13 types.	3
1b	Cost-effective approaches to renovation considering potential relevant trigger points	The section lists the policy instruments addressing cost-effectiveness of renovation and different renovation ambition levels, including for residential and non-residential buildings and heating system exchange. Incentives are considered a key asset in ensuring maximum cost-effectiveness of renovation works. In relation to renovation at trigger points, such as an ownership change, the LTRS refers to the obligations included in the building code (Energy Conservation Act; EnEV). In the case of ownership change, these obligations are for example to replace combustion units older than 30 years and to insulate ceilings to unheated roofs.	3

³¹ LTRS in German https://ec.europa.eu/energy/sites/ener/files/de_ltrs_2020.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The strategy discusses numerous and comprehensive policy instruments such as support schemes, the building code, and inspections to stimulate deep renovation. For example, a well-known initiative combines minimum requirements aligned with a renovation subsidy from the development bank KfW that increases with the efficiency ambition, supplemented by a subsidy for renewables. ³² New measures have been introduced in recent years such as tax measures for insulation of roofs and walls, advisory services, and a subsidy for innovative heating infrastructure using renewables, low temperatures and waste heat. Since 2017, Germany has also introduced an optional, subsidised individual building roadmap (= building renovation passport) coupled with an 80% subsidy for issuing it. Subsidised, optional individual building roadmaps for non-residential buildings were introduced in 2016.	4
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	The LTRS defines efficiency classes F, G and H as the worst-performing buildings and quantifies their share for the residential sector. Policies that include measures covering them are listed: <ul style="list-style-type: none"> • KfW subsidises for heritage-protected buildings • The Energy Conservation Act³³ requires a minimum energy efficiency if renovation is conducted and an exchange of the combustion unit after 30 years • The German Federal Emission Control Act³⁴ requires that chimney sweepers control heating system emissions • Heating systems need to carry a label with their efficiency class. Several policies, mostly informational, address the split-incentives dilemma and market failures. The LTRS states energy poverty is addressed by the financial support for poor households and by a set of mostly free energy consulting services.	3
1e	Policies and actions to target all public buildings	The climate protection programme 2030 ³⁵ of 2019 sets out that federal buildings have an exemplary role in climate protection. As such, new central government buildings need to fulfil the lowest KfW efficiency standard (EH 40) starting in 2022 and renovations need to achieve the second-lowest KfW standard (EH 55). A KfW programme grants subsidies for the municipal level, ³⁶ and a national climate protection initiative promotes municipal climate protection concepts. A large proportion of public buildings, those owned by the 16 German federal states, are not addressed; this is why the score is 2.	2

³² German: Marktanzreizprogramm (MAP)

³³ German: Energieeinsparverordnung (EnEV)

³⁴ German: Bundesimmissionsschutzgesetz (BimSchG)

³⁵ <https://www.bmu.de/download/klimaschutzprogramm-2030-zur-umsetzung-des-klimaschutzplans-2050/>

³⁶ <https://www.kfw.de/inlandsfoerderung/Privatpersonen/Bestandsimmobilie/Energieeffizient-Saniieren/Das-KfW-Effizienzhaus>

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Several measures aim to build skills in and facilitate market entry for smart technologies, for example: <ul style="list-style-type: none"> • Building information modelling industry standards (German: VDI-Richtlinien) • Energy research programme with an emphasis for buildings on digitalisation, energy system integration, and district/decentralised supply structures. • Innovation programme for the future of construction. Smart technologies for optimal operation are supported by several subsidy programmes. For ensuring the quality of energy consulting through the qualification of consultants, the Energy Conservation Act includes requirements to be included in the national expert list.	3
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Germany selected the main indicator “Overall energy efficiency” ³⁷ and defined an interim milestone of 55% emission reduction for 2030 compared to 2008. Milestones for 2040 and 2050 are only described qualitatively, stating the intention of a continuous increase of the overall energy efficiency. There is a discussion on the wider benefits, including health, work performance and macroeconomic benefits. The only quantified impacts are 544,000 jobs and €20-21 bn worth of efficiency goods produced annually. However most wider benefits are not quantified, hence the score is 2.	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	A long-term 2050 goal for buildings is not specified within the LTRS even if the German government has a GHG-neutrality objective by 2050. The 2015 energy efficiency strategy for buildings already had a goal of achieving a nearly climate-neutral building stock by 2050. Primary energy efficiency is chosen as a progress indicator. A 55% energy reduction goal for 2030 compared to 2008 represents emissions reduction of 67% compared to 1990; i.e. to a level of 70 MtCO ₂ e. The German government has set up a process to develop the indicative milestones for 2040 and 2050 by 30 June 2024.	2

³⁷ German: Gesamtenergieeffizienz

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	<p>The strategy explains that risks and the small sizes of the energy efficiency projects pose a barrier for financing efficiency measures in buildings, but measures addressing these barriers are lacking.</p> <p>For packaged solutions, there was a project between 2017 and 2019 working to standardise and bundle energy efficiency measures. The LTRS states that three products were developed with financing parties.</p> <p>Several public funding measures leverage private-sector investments, such as the KfW subsidies and the MAP subsidy for renewables.</p> <p>10-15 pilot projects for energy savings contracting are being conducted in municipal buildings to build regional skills and establish a German energy saving contracting market</p> <p>A nationwide list of qualified energy consultants and several consulting schemes provide building owners and users with information and support.</p> <p>Because the LTRS does not describe measures addressing perceived risks, and the efforts to aggregate renovation projects are very basic, the score is 2.</p>	2
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	<p>The final LTRS was presented in one of the regular consultations to a range of stakeholders and written statements were obtained, both listed in the annex. In 2020, the government seeks to start a dialogue process called “energy efficiency roadmap 2050” that aims to halve primary energy demand for all sectors compared to 2008.</p> <p>Because modalities for consultation are not explained, the score is 2.</p>	2
6	Include implementation details of latest LTRS	<p>Regular consultations with a wide range of stakeholders have taken place since 2014 within the energy transition platform for buildings (German: “Energiewendeplattform Gebäude”) that contain discussions on elements of the latest LTRS.</p> <p>As implementation details of the latest LTRS are not described the score is 1.</p>	1

LUXEMBOURG³⁸



SUMMARY

Luxembourg has produced a detailed renovation strategy. It includes an open and frank exposition of the current status of the building stock and how prevailing economic and market conditions (e.g. low energy prices) are not conducive to fostering the necessary level of renovation activity to deliver a decarbonised and energy efficient building stock by 2050. This leads to the formulation of a suite of policies, measures and initiatives that aim to significantly increase activity, with a clear focus on achieving more and deeper renovations than has been the case.

From a compliance perspective, it is helpful that each section of the strategy is referenced back to the Article 2a clauses. Most sections are addressed fully, with much analytical detail and discussion, and also with due acknowledgement of shortcomings, such as the inability at present to set out a roadmap for the non-residential sector. This will be rectified within the coming two years.

In conclusion, this is a good quality strategy that largely meets the EPBD requirements, except in regard the two required annexes: a report on the public consultation (which did not take place) and progress with implementing the 2017 renovation strategy.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	A detailed bottom-up analysis according to a classification of 40 building types of different age groups and size is presented. Some 10-14% of residential buildings have been renovated to date. For non-residential buildings, the strategy collates information from a variety of sources and studies to provide a reasonable overview, but concludes that a detailed survey of the sector is required, planned for 2021.	3
1b	Cost-effective approaches to renovation considering potential relevant trigger points	The analysis of cost optimality concludes that the current minimum energy performance requirements are neither cost-optimal nor compatible with the climate protection goals, although they are within the 15% limit permitted under the EPBD. Trigger points were not taken into consideration in the analysis It is noted that Luxembourg has among the lowest energy prices in the EU. To address this, carbon pricing is to be introduced from 2021. Furthermore, any new funding incentives should be limited to renovations that achieve an energy class of A or B.	2

³⁸ LTRS in German - https://ec.europa.eu/energy/sites/ener/files/documents/lu_ltrs_2020.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	As a backdrop to the design of a policy framework intended to achieve the strategy's goals, an analysis of the reasons why progress has been hampered to date is presented, followed by a detailed list of policies under the headings: regulations, taxation, financing/funding, training, communication, and research.	4
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	A detailed appraisal of these issues is presented followed by a comprehensive overview of policies designed to address them, including: <ul style="list-style-type: none"> • Stricter minimum requirements for individual building components from 2023 • Introducing an obligation to build up a renovation fund through a rent levy in the social housing sector (modelled on an Austrian example) • Providing advice, social welfare support and financial support to reduce energy consumption through the My Energy programme 	4
1e	Policies and actions to target all public buildings	Public buildings are subject to the same policies and requirements as other non-residential buildings, though some measures, such as phasing out the use of oil boilers, are accelerated for the public sector. Under the Climate Pact, municipalities are encouraged to develop action plans to improve energy efficiency and achieve GHG emission reductions.	3
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Installation of smart electricity meters is due to be completed by the end of 2020. Since March 2019, the laying of conduits for electricity and data cables is compulsory to ensure that charging stations can be installed later or to facilitate PV systems. Energy communities can benefit from attractive tariffs for small systems. An interactive tool for managing continuing education in the field of sustainable building has been developed. Additional training is available for optimisation of renovations in non-residential buildings and to reduce cooling energy requirements.	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	<p>Predicted energy savings compared to 2018 are:</p> <ul style="list-style-type: none"> • Non-residential – 2030: 44%; 2040: 55% • Residential – 2040: 37-51%; 2050: 55-64% <p>Wider benefits include increased employment in construction and the reduction of health problems related to mould and moisture in buildings. Despite only affecting a minority of buildings, these benefits are seen as valuable, although not quantified. Also, given the higher expected rate of demolition and new construction in Luxembourg compared to the rest of the EU, there is a focus on the resource benefits of adopting a circular economy approach.</p> <p>However, wider benefits are not quantified, hence the score is 2.</p>	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	<p>The strategy sets a target of reducing GHG emissions in the residential building stock by 62% by 2030 and by 96% by 2040 compared to the status quo. No figure is provided for 2050. Milestones to 2030, 2040 and 2050 are given for a number of parameters, along with progress indicators.</p> <p>Given the absence of data on the non-residential stock, comparable figures cannot be provided at present, though plans are in place to undertake the necessary detailed modelling in the next two years.</p>	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	<p>To support mobilisation of investments, facilitate access to appropriate mechanisms for:</p> <p>a) Aggregation of projects and packaged solutions</p> <p>b) Reduction of perceived risk for investors and the private sector</p> <p>c) Use of public funding to leverage additional private-sector investment or address specific market failures</p> <p>d) Guiding investments into an energy efficient public building stock</p> <p>e) Accessible and transparent advisory tools</p>	<p>Alongside fiscal instruments such as the introduction of carbon pricing and reduced VAT on renovations, a “de-risking” instrument in the form of an investment platform is currently being developed to facilitate investments. In this context, the bundling of projects is also to be considered in order to form larger projects that could be attractive to investors and implemented within the framework of an energy performance contract. “myenergy” is the national tool to support energy saving, renewable energy deployment and sustainable building, living and mobility.</p>	3
5	<p>Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation</p>	<p>Reference is made to consultations on the 2017 renovation strategy and the NECP in 2019, though the 2020 LTRS was not exposed to a public consultation. The planned renovation day in May 2020 had to be cancelled due to Covid-19. There are plans to start a further participation process to present the next implementation measures (e.g. the revision of the PRIME House funding programme) in autumn 2020 (if Covid-19 restrictions allow), but no later than in spring 2021.</p>	2
6	<p>Include implementation details of latest LTRS</p>	<p>Not provided</p>	0

THE NETHERLANDS^{39,40}



SUMMARY

The Dutch government has made strong efforts to get buy-in from stakeholders and citizens into its Climate Agreement, which forms the basis of the long-term renovation strategy. The consultative approach has produced a strategy that is comprehensive in terms of policies, actions and initiatives that are geared towards the virtual elimination of GHG emissions from buildings by 2050. Overall, it is a well thought-out strategy, with some interesting and innovative aspects, such as the renovation accelerator, designed to streamline processes and bring down costs.

In terms of compliance, the strategy largely meets the Article 2a requirements, except for the omission of an annex describing progress with implementation of the 2017 strategy, and an incomplete assessment of wider benefits.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	Building stock data is presented as a series of graphs and tables, including (for the residential stock) a progression over time by energy label. The current share of renovated buildings is not provided directly, but can be estimated from energy labels – somewhat over half of residential properties are within energy classes A+ to C. For non-residential buildings, the current situation is 55-80% in classes A+ to C, depending on typology.	3
1b	Cost-effective approaches to renovation considering potential relevant trigger points	The analysis of cost optimality concludes that the current minimum energy performance requirements are neither cost-optimal nor compatible with the climate protection goals, although they are within the 15% limit permitted under the EPBD. Trigger points were not taken into consideration in the analysis It is noted that Luxembourg has among the lowest energy prices in the EU. To address this, carbon pricing is to be introduced from 2021. Furthermore, any new funding incentives should be limited to renovations that achieve an energy class of A or B.	3
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	As a backdrop to the design of a policy framework intended to achieve the strategy's goals, an analysis of the reasons why progress has been hampered to date is presented, followed by a detailed list of policies under five categories: regulations, taxation, financing/funding, training, communication, and research (see Figure 9 for details).	4

³⁹ LTRS in Dutch - https://ec.europa.eu/energy/sites/ener/files/documents/nl_2020_ltrs_new.pdf

⁴⁰ LTRS in English - https://ec.europa.eu/energy/sites/ener/files/documents/nl_2020_ltrs_en.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	A detailed appraisal of these issues is presented followed by a comprehensive overview of policies designed to address them, including: <ul style="list-style-type: none"> • Stricter minimum requirements for individual buildings' components from 2023 • Introducing an obligation to build up a renovation fund through a rent levy in the social housing sector (modelled on an Austrian example) • Providing advice, social welfare support and financial support to reduce energy consumption through the My Energy programme 	3
1e	Policies and actions to target all public buildings	Public buildings are subject to the same policies and requirements as other non-residential buildings, though some measures, such as phasing out the use of oil boilers, are accelerated for the public sector. Under the Climate Pact, municipalities are encouraged to develop action plans to improve energy efficiency and achieve GHG emission reductions.	4
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Installation of smart electricity meters is due to be completed by the end of 2020. Since March 2019, the laying of conduits for electricity and data cables is compulsory to ensure that charging stations can be installed later or to facilitate PV systems. Energy communities can benefit from attractive tariffs for small systems. An interactive tool for managing continuing education in the field of sustainable building has been developed. Additional training is available for optimisation of renovations in non-residential buildings and to reduce cooling energy requirements.	3
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Predicted energy savings compared to 2018 are: <ul style="list-style-type: none"> • Non-residential – 2030: 44%; 2040: 55% • Residential – 2040: 37-51%; 2050: 55-64% Wider benefits include increased employment in construction and the reduction of health problems related to mould and moisture in buildings. Despite only affecting a minority of buildings, these benefits are seen as valuable, although not quantified. Also, given the higher expected rate of demolition and new construction in Luxembourg compared to the rest of the EU, there is a focus on the resource benefits of adopting a circular economy approach. However, wider benefits are not quantified, hence the score is 2.	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	The strategy sets a target of reducing GHG emissions in the residential building stock by 62% by 2030 and by 96% by 2040 compared to the status quo. No figure is provided for 2050. Milestones to 2030, 2040 and 2050 are given for a number of parameters, along with progress indicators. Given the absence of data on the non-residential stock, comparable figures cannot be provided at present, though plans are in place to undertake the necessary detailed modelling in the next two years.	4
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools	Alongside fiscal instruments such as the introduction of carbon pricing and reduced VAT on renovations, a “de-risking” instrument in the form of an investment platform is currently being developed to facilitate investments. In this context, the bundling of projects is also to be considered in order to form larger projects that could be attractive to investors and implemented within the framework of an energy performance contract. “myenergy” is the national tool to support energy saving, renewable energy deployment and sustainable building, living and mobility.	3
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	Reference is made to consultations on the 2017 renovation strategy and the NECP in 2019, though the 2020 LTRS was not exposed to a public consultation. The planned renovation day in May 2020 had to be cancelled due to Covid-19. There are plans to start a further participation process to present the next implementation measures (e.g. the revision of the PRIME House funding programme) in autumn 2020 (if Covid-19 restrictions allow), but no later than in spring 2021.	4
6	Include implementation details of latest LTRS	Not provided	0

SPAIN⁴¹



SUMMARY

This is an excellent, detailed and ambitious strategy. It provides comprehensive information and analysis across all aspects of the building stock and the market for renovation, before coming up with a comprehensive list of policies and actions designed to drive the sector towards energy efficiency and decarbonisation. The strategy targets a 99% reduction in GHG emissions by 2050 compared to today from the residential sector, though the equivalent figure is not provided for the non-residential sector.

From a compliance perspective, all Article 2a topics are covered well, with many exemplary responses, as denoted by the number of sections scoring 4 or 5. These include the overview of the building stock, cost-effective approaches to renovation, policies, mobilisation of investment, expected savings and wider benefits, and the review of progress in implementing the 2017 strategy. The only evident shortcoming is the absence of details on the modalities for inclusive consultation during implementation of the strategy.

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	An outstanding analysis of the Spanish stock is presented, disaggregated according to typology, age, distribution by municipality, tenure, climatic zones, energy consumption end use and energy label.	5
1b	Cost-effective approaches to renovation considering potential relevant trigger points	A very detailed analysis of renovation options under a range of scenarios is presented, segmented by building type, location and other parameters. Trigger points are considered, including timely replacement of boilers and undertaking renovation at the time of improving a building's fire/earthquake safety	4

⁴¹ LTRS in Spanish https://ec.europa.eu/energy/sites/ener/files/documents/es_ltrs_2020.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1c	<p>Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports</p>	<p>As a precursor to setting out the policies and actions that make up the building renovation roadmap, the strategy presents a detailed analysis of the physical, legislative, economic and cultural situation regarding the building stock and its occupants. It then goes on to describe a comprehensive portfolio of policies and actions, structured around 11 themes:</p> <ol style="list-style-type: none"> 1. Political leadership and co-ordination across different levels of government 2. Development of the regulatory framework 3. Rehabilitation of public buildings 4. Public financing measures 5. Promotion and mobilisation of private financing 6. The fight against energy poverty 7. Deployment of a new energy model in the building sector 8. Aggregation of demand 9. Professionalisation of construction trades 10. Promotion of a cultural change and awakening greater social awareness towards energy saving 11. Development of statistics, indicators and monitoring. 	5
1d	<p>Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures, and an outline of actions that contribute to alleviation of energy poverty</p>	<p>Following a detailed segmentation and clustering exercise, the strategy identifies 1.2 million homes (out of 18.7 million primary residence homes) that form the priority market for renovation in the coming decade and on which the policies are focused. Several regulatory measures are envisaged to address barriers and market failures. On energy poverty, the strategy has a four-pronged approach: improve knowledge; improve the response to the current situation; structural changes to reduce energy poverty; and measures to protect consumers and raise social awareness</p>	4
1e	<p>Policies and actions to target all public buildings</p>	<p>The government proposes to extend the 3% p.a. renovation requirement in EED Article 5 to all public bodies, including autonomous communities and local entities, and require each administrative body to develop an energy saving action plan, alongside a range of other initiatives.</p>	4

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	Under the theme “new energy model”, energy communities and district networks are supported, while research and development activities seek to bring new technologies to market. Under the “professionalisation” theme, a number of initiatives seek to improve the sector’s skills and education levels.	3
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	The presentation of energy savings and the quantification of wider benefits is exemplary. Figures are provided for energy savings, investment, cost savings, GDP impact, job creation, distributive benefits (the strategy helps lower-income households more than higher-income households) and health benefits. For example, energy renovation of 1.2 million homes would reduce the number of people being diagnosed with cardiovascular problems by 96,000. The total accumulated energy savings would reach 6,949 ktoe.	5
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	Objectives for 2050 are: <ul style="list-style-type: none"> • Residential: 37% reduction in energy use and 99% reduction in CO2 emissions compared to 2020 • Non-residential: 36% reduction in energy use compared to 2020. These are underpinned by interim milestones and a comprehensive range of progress indicators.	4

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: <ul style="list-style-type: none"> a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools 	The financing measures identified within the list of policies above cover a wide range of actions that seek to aggregate demand; reduce risk (e.g. through the provision of a guarantee fund and debt insurance); create a more conducive environment for investment for both the public and private sectors; and simplify decision-making through improved tools such as a grants database and a network of one-stop-shops. There is also fiscal reform to incentivise energy efficiency such as changes in real estate tax, transmission property tax and income tax.	4
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	Consultation on the strategy took place between September and December 2019 across six sessions, using the approach developed under the Horizon 2020 BUILD UPON project. Over 200 participants were involved. The implementation of the strategy will be discussed with relevant stakeholders through working groups.	3
6	Include implementation details of latest LTRS	An extensive and detailed point-by-point summary of progress with implementing the 2017 renovation strategy is provided.	5

SWEDEN^{42,43}



SUMMARY

The Swedish renovation strategy presents a well thought-out range of initiatives designed to accelerate the transformation of the building stock towards carbon neutrality. The economy-wide target of a 50% reduction in energy intensity by 2030 compared with 2005 provides the overall medium-term objective for improving energy efficiency; while a specific building-related objective is absent, specific progress indicators for the building sector are clearly defined. However, a number of the individual clauses are not fully or adequately addressed, receiving a score of 2. Consequently, the Swedish LTRS cannot be considered compliant with EPBD Article 2a

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1a	Overview of the national building stock and expected share of renovated buildings in 2020	The building stock is described in some detail, including a breakdown by typology and energy label. Around 10-20% (depending on age/type) of buildings are identified as having been renovated to date.	3
1b	Cost-effective approaches to renovation considering potential relevant trigger points	An analysis shows the cost-effectiveness of different measures across 60 multi-family houses and made available to other property owners to help them reduce consumption. However, single-family houses and non-residential buildings are not addressed. The main trigger points seen as driving renovation are transfers of ownership and/or occupancy, together with the periodic upgrades for larger buildings.	2
1c	Policies and actions to stimulate cost-effective deep renovation, including for example introducing an optional scheme for building renovation passports	The strategy lists a number of ways in which improving building energy performance is encouraged. The philosophy of support is described as addressing market failures and accelerating the trend towards energy efficiency, so that the climate goals are achieved at the lowest cost to society. Key policies are described in the following sections.	3

⁴² LTRS in Swedish - https://ec.europa.eu/energy/sites/ener/files/documents/se_2020_ltrs.pdf

⁴³ LTRS in English - https://ec.europa.eu/energy/sites/ener/files/documents/se_2020_ltrs_official_translation.pdf

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1d	Overview of policies and actions to target worst-performing segments of the building stock, split-incentive dilemmas and market failures , and an outline of actions that contribute to alleviation of energy poverty	<p>A new requirement to install individual metering and charging for heating and hot water comes into force on 1 July 2021. It is envisaged this will particularly encourage owners of the worst-performing buildings to improve their performance.</p> <p>Following a study into split incentives, it was concluded that they constitute a relatively minor obstacle to energy efficiency improvements compared with profitability issues and knowledge-related obstacles, but are considered to be a bigger problem in non-residential premises because leases here do not include heating. Various state-funded project initiatives promoting the use of green leases may help overcome this barrier.</p> <p>The strategy lists the existing range of initiatives and the market failures they seek to ameliorate.</p> <p>Sweden does not distinguish energy poverty from general poverty; consequently, there are no specific policies dealing with it.</p>	3
1e	Policies and actions to target all public buildings	<p>Since 2009, there has been a requirement for state agencies to maintain environmental management systems and to undertake an annual audit and submit this to the Swedish Environmental Protection Agency. However, not all public authorities are obligated.</p> <p>Public procurement rules encourage energy efficiency. Other measures include municipal energy planning, a cooperation agreement between public authorities and a collaboration fund.</p>	2
1f	Overview of national initiatives to promote smart technologies and well-connected buildings and communities , as well as skills and education in the construction and energy efficiency sectors	<p>The government has developed a broadband strategy for a fully connected Sweden in 2025. Viable Cities is a 12-year strategic innovation programme for smart and sustainable cities with a budget of SEK 1 billion. It brings together 50 stakeholders from a wide range of research fields, industry, public services and civil society. Smart City Sweden is the national demonstration platform for smart solutions in sustainable cities. In addition to energy and environmental aspects, the platform will address issues such as planning and construction, digitalisation, social sustainability, mobility and other issues of relevance to sustainable urban development.</p> <p>The Information Centre for Sustainable Construction and the National Renovation Centre exist to improve knowledge and disseminate information on sustainable construction.</p>	3

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
1g	Evidence-based estimate of expected energy savings and wider benefits , such as those related to health, safety and air quality	Expected energy savings in 2030, 2040 and 2050 are presented for apartment buildings, schools and offices – three sectors which have been modelled in detail. Wider benefits are discussed but not quantified.	2
2	Roadmap with measures and progress indicators , with a view to the long-term 2050 goal of reducing EU GHG emissions by 80-95% compared to 1990. The roadmap shall include indicative milestones for 2030, 2040 and 2050	Sweden aims to be climate neutral by 2045, defined as fossil-free and with zero GHG emissions. There are also interim targets for 100% renewable energy production by 2040 and 50% lower energy intensity by 2030 compared with 2005. However, there is no roadmap detailing the path of the building sector to 2050. Progress indicators include: <ul style="list-style-type: none"> • Specific energy consumption for the building sector • Proportion of building stock in each energy class • Proportion of building stock with direct resistive electric heating • Energy consumption (absolute and temperature-corrected) for heating and hot water • Distribution of energy carriers for heating and hot water • Proportion of building stock using fossil-based gas or oil directly for heating and hot water • GHG emissions from own combustion of fuels for heating and hot water. 	2

CLAUSE	REQUIREMENT	ASSESSMENT	SCORE
3	To support mobilisation of investments , facilitate access to appropriate mechanisms for: a) Aggregation of projects and packaged solutions b) Reduction of perceived risk for investors and the private sector c) Use of public funding to leverage additional private-sector investment or address specific market failures d) Guiding investments into an energy efficient public building stock e) Accessible and transparent advisory tools	a) Sweden has a long-established policy of technology procurement, designed to initiate a market transition and disseminate new, more efficient technologies and methods, such as new products, systems and processes. Network-based procurement encompasses the entire decision-making process, from preliminary study and the buyers' group, to the specification of requirements. b) Credit guarantees are available to finance both the construction and conversion of residential properties. c) Green bonds for sustainability projects and tax deductions for building repairs are among measures identified as leveraging private investment. d) A credit institution owned by Swedish municipalities and regions offers financing solutions, loans and advice. e) A free, impartial advice service is available for households, businesses, housing associations and organisations. Additional support has been provided to focus on locally prioritised target group, together with the ability to provide financial support.	3
5	Include summary results of the public consultation into the LTRS and establish modalities for consultation in an inclusive way during its implementation	Consultations with stakeholders took place through meetings with an external reference group and through an open public hearing with the industry, carried out by the Swedish National Board of Housing, Building and Planning and the Swedish Energy Agency. Going forward, the Swedish Energy Agency is tasked with developing sectoral strategies for energy efficiency improvements and to establish a dialogue between the various industries and relevant authorities concerning appropriate indicative targets and measures in each sector	3
6	Include implementation details of latest LTRS	The annex includes a brief status update on the key policy instruments that have been introduced, concluded and/or revised since the 2017 renovation strategy.	3



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