FARM EUROPE

DO NECPS FROM THE 28 MEMBER STATES MEET EU TRANSPORT DECARBONISATION TARGETS?

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EXECUTIVE SUMMARY

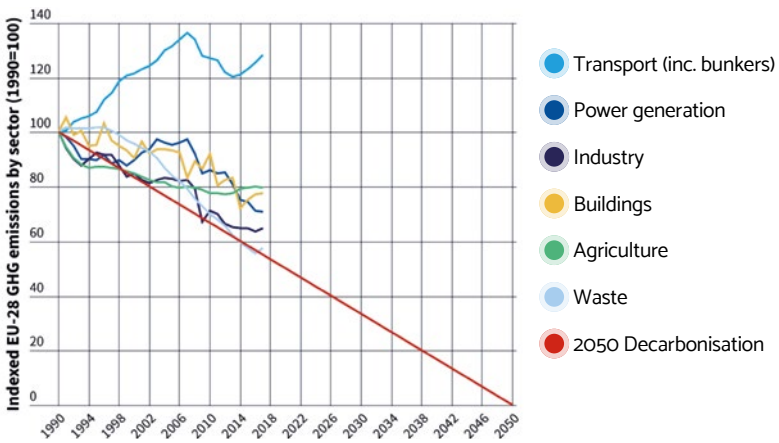
The European Union has both external and internal climate commitments. Externally, the European Union has made a pledge under the **Paris Agreement** to achieve a certain level of decarbonisation across all the Member States. Internally, the European Union has tried to translate these Paris Agreement obligations into targets for *energy decarbonization* (through the **Renewable Energy Directive**), *energy efficiency* (through the **Energy Efficiency Directive**), *industrial/power decarbonization* (through the **EU ETS** system of tradable carbon credits), and *"everything else" decarbonization* (through the **Effort Sharing Regulation** targeting transport, agricultural, waste and other sectors not included in the EU ETS system).

At the heart of this system is the **Energy Governance Regulation**, which is what is supposed to draw these various policies into an integrated whole to allow them to be quantified, measured, costed and stress tested to ensure that the EU's amorphic "ambitions" actually add up to not less than the tons of carbon dioxide abatement of its Paris Agreement obligations.

Accordingly, the Energy Governance Regulation compels all Member States to generate integrated **National Energy and Climate Plans**, laying out what they will do between now and 2030 under the various directives and regulations described above. The Commission is then supposed to crunch the numbers to determine whether these NECPs aggregate to compliance under these directives, regulations and the Paris Agreement. The final NECPs are due to be submitted to the Commission by the end of 2019.

As a result of all this, we know a good amount about where the EU's GHG emissions are coming from today and where they came from 10 years ago. Therefore, we know that most emissions, not surprisingly, come from three **energy sectors** roughly equally divided now among **power generation** (electricity), **heating and cooling** (mostly for industries) and **transport**. However, it is a new phenomenon that there is rough parity among these energy sectors. Whereas transport in 1990 accounted for only 15% of total EU GHG emissions, it now accounts for over 25%[1].

Indexed evolution of EU GHG emissions per sector



Source: Transport & Enviroment from Member States reporting to the UNFCCC (1990-2016 data) and EEA's approximated EU greenhouse gas inventory (2017 data)

[1] https://ec.europa.eu/eurostat/statistics-explained/pdfscache/1180.pdf

Indeed, the transport sector has become the number one issue of EU decarbonisation policy, as its emissions track record has not improved in the last decade but on the contrary is on the rise. In contrast, there is visible progress outside the European Union, for example in the United States and Brazil. Both countries have shown that transport decarbonisation at scale is not only achievable, but need not be expensive or contentious or even be the result of "climate ambition".

Progress in GHG reductions in Europe to date is largely due to EU success with relatively painless "low hanging fruit" in the power sector in the past decade, leading to assertions of climate leadership by the Union. However, this achievement has obscured the lack of meaningful decarbonization in transport. It is probable that large parts of the EU will not meet their 2020 targets. In this eventuality there is a case to be made that meaningful action on transport decarbonization could have ensured 2020 success.

What is absolutely clear is that for a 2030 success meaningful transport sector decarbonisation is required. In the next decade, if the EU ignores again the transport sector it will be left with no plausible path to comply with its Paris Agreement obligations.

Thus there is a large cloud hanging over the EU's current climate policy.

Throughout the Member States and Institutions there is a noticeable trend to propose increased targets and ambitions for 2030, 2050 or even for 2100. This is a tendency that can easily escalate into a state of postponing much needed actions into the distant future that distracts the focus from concentrating on what could, should and needs to be achieved for today's world.

This report aims to highlight this problem more clearly by focusing on transport sector energy. A similar analysis could just as easily apply to every other energy and non-energy sector in the EU, but that would be a far more complicated exercise than just focusing on transport sector energy. It is logical that similar efforts should be made for other sectors. There is a real possibility that the results would be similar, albeit perhaps not as disappointing as for transport sector energy.

Today there is no plausible argument that the NECPs as they were published in draft form earlier this year aggregate to any meaningful level of transport decarbonisation by 2030. Based on observing the draft NECPs or the Commission's public comments attached to them, there is little room to assume that any substantive effort will be undertaken by the Commission to calculate in a systematic way the tons of carbon abated by the EU through 2030 - which is the only metric for compliance with the Paris Agreement - or the costs of such abatement - which is the only way to provide a credible and predictable path for a successful climate policy, which will not be overturned but supported by society as a whole when the challenges and their consequences arise (It is not without a precedent that social unrest and protests have happened before – see France in 2018-2019 – due to policy changes in such climate-related issues as fuel taxes). Openness on cost to citizens, taxpayers and society is important.

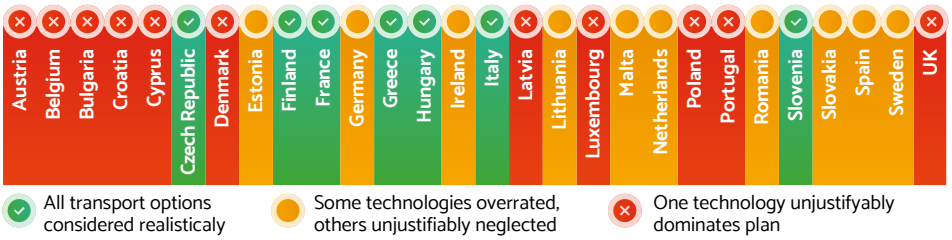
Therefore, it is of utmost importance that society has a clear understanding of what to expect for the future and that citizens support chosen policy tools in order to achieve climate targets. Discussions today focus on "ambitions" rather than on good governance. It is hard to argue against ambitious but vague policies targeting 2100. The real work is gaining public support for and implementing policies that will reduce oil consumption next year, albeit at some level of cost. Hence, the current deficiency in cost and implementation details from all the discussions makes it hard to argue that there is truly forward progress.

Regarding the assessment that we undertook, we examined the plans, targets, policy tools and initiatives for the transport sector in each draft NECP. As the chart below shows, we found that only Finland and Italy submitted a draft NECP with a clear and coherent transport plan where all renewable technologies are considered. A handful of countries (CZ, FR, GR, HU, SI) apply a comprehensive approach to renewable energy technologies in transport, furthermore, Spain's transport decarbonisation pathway could be considered clear.

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented

Technology neutral transport plan

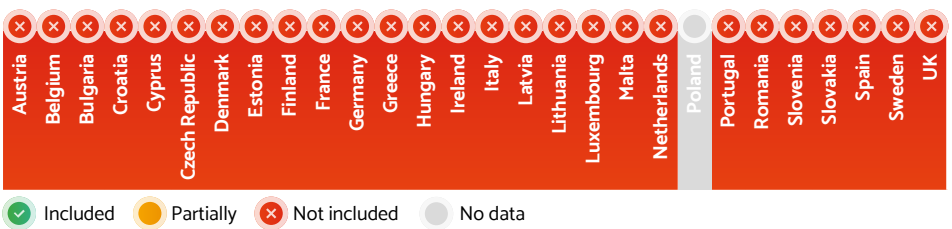


The cost of transport decarbonisation is key, yet it is only discussed in two NECPs in any meaningful way. The carbon abatement cost of transport decarbonisation is the ultimate metric to gauge if a policy is cost effective or not. No draft NECPs contains a carbon abatement cost calculation or a ranking based on costs of the transport decarbonisation options. It is that an ambitious policy whose cost is unknown (or hidden) will lose public support when the costs become known and real. Furthermore, it is unlikely that citizens of one country will continue to support a set of policy measures costing two or three times as much per ton of carbon abated than in a neighbouring country with more cost-effective policies while achieving the same climate outcomes.

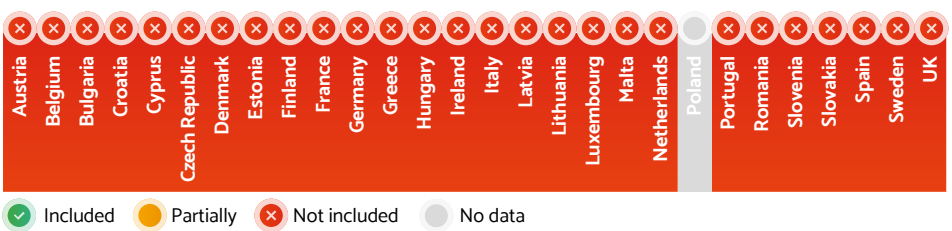
Logic, and history, show that when climate plans are derailed by public protest, the beneficiary is fossil fuel. The most effective way to preserve oil's status quo is to have climate policies that result in a public backlash. Therefore, only robust, ambitious and cost-effective final NECPs stand a chance to reign in fossil fuel dominance.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included



Ranking of transport decarbonisation options based on costs



How much transport decarbonisation will cost until 2030?

Public consultations play a key role in developing well-thought-out plans. Less than half of Member States held a public consultation for the draft NECPs. For the final NECPs EU regulation prescribes that public consultation must be carried out.

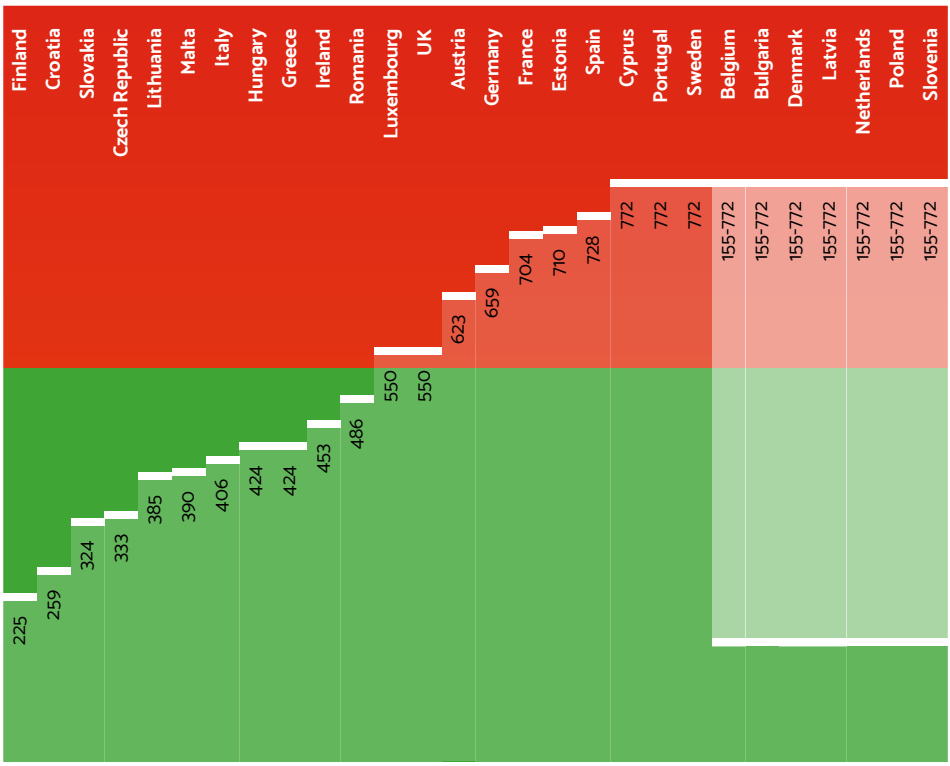
Public consultation caried out

Based on the available literature, we calculated a transport sector carbon abatement cost under each NECP. The aim of the estimation was to indicate the rough magnitude of how much it would cost to abate 1 ton of carbon emission from transport. The figures are not intended to be definitive. It is the task of each Member State and the European Commission to come up with more precise calculations.

Our results show a transport carbon abatement cost of more than €500 on average in the EU under the NECPs, and there is a wide variation across countries. Compared to other sectors, transport decarbonisation is nowhere cheap, it is difficult to find technologies that cost less than a hundred Euros a ton, commonplace in other sectors. The chart below shows that in terms of cost of decarbonisation a lot depends on the choice of transport pathways and technologies.[2] A given Euro will deliver substantially more carbon reduction in countries with well thought through transport policies.

[2] Note that some draft NECPs not been able to provide even basic data on planned shares of renewable energy in transport between 2020 and 2030, so no estimate was made possible (BE, BG, DK, LV, NL, PL).

Carbon abatement cost estimation (€/tCO$_2$)



It is important to note that in its communication[3], the European Commission did not raise any significant objections or recommend any structural changes to any NECP as in general its major comment was a call to increase the ambition. This per se leads to the conclusion that the Commission has in fact approved the part regarding the transport policies of the draft NECPs. Our assessment shows that major revisions are needed if the final NECPs are to stand a decent chance of bringing about cost-effective transport decarbonisation before 2030.

In conclusion, most draft NECPs do not present a robust transport decarbonisation pathway between 2020 and 2030. The draft plans appear to be insufficiently clear and coherent to be aggregated at EU level into a meaningful evaluation of whether the EU will meet its Paris Agreement obligations.

[3] https://ec.europa.eu/energy/sites/ener/files/documents/recommondation_en.pdf

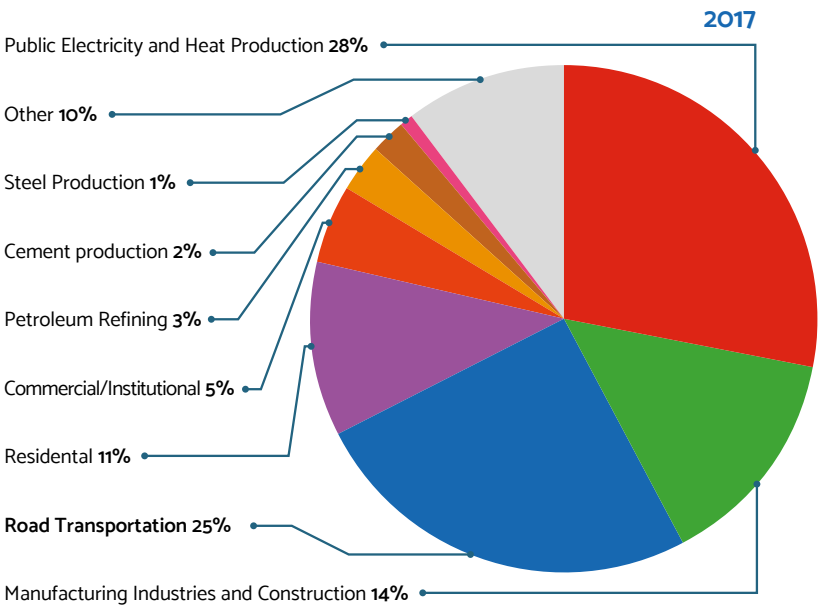
INTRODUCTION

Transport is on its way to becoming the single largest sectoral source of GHG emissions in more EU countries. Decarbonising transport is an urgent priority in which the EU is lagging badly behind. Transport's climate footprint keeps getting worse and there is little sign of real commitment to changing this situation. It is the only sector in Europe where there has been no real progress in recent times, with transport greenhouse gas (GHG) emissions continuing to rise.

Europe cannot afford to continue ignoring the challenge in transport and assume that other sectors such as electricity generation, heating and cooling or agriculture will be able to take up its place or overcompensate. The IPCC[4] makes it clear that the decade to 2030 will be critical if there is to be a realistic chance of achieving the ambition to stay below 1.5 degrees.

Transport's share in CO_2 emissions in the EU has been growing, and road transport today accounts for more than a quarter of total CO_2 emissions in EU (see chart below). It was only 15% in 1990.

CO_2 emissions: Share of key source categories and all remaining categories in 2017 for EU-28 and Iceland



Source: EEA

EU actions on energy and climate in Member States (MS) between 2020 and 2030 are set out in the National Energy and Climate Plans (NECPs) of each MS. NECPs are the blueprint for EU climate action between 2020 and 2030.

Transport decarbonisation is a difficult task. There are no silver bullets and all available and sustainable measures are needed. Even with all of those measures combined, it is unlikely that the GHG reductions required by climate science will be achieved before 2030.

Robust policies and actions are needed to reign in transport GHG emissions. NECPs are the key

[4] https://www.ipcc.ch/sr15/

How the European Commission views the draft NECPs, and their transport parts in particular?

Excerpts from its communication[7].

"The Union reached a 17.5 % renewable energy share in 2017, but the pace of increase has slowed since 2014. It is crucial to redouble efforts to reach the 2030 target. The NECPs need to substantiate fully Member States' contributions to the 2030 collective target and underpin them with robust policies and measures."

"The draft NECPs offer a common, solid and comparable platform to engage and discuss across the Union with civil society, business, social partners and local governments the Union's common challenges and long-term priorities in the field of energy and climate. Thanks to their publication at the time of submission, these discussions have already started in a transparent manner. These interactions should help to increase the level of ambition of the final NECPs, as well as providing tangible examples of projects and policies to be implemented in the next ten years. Member States need to ensure that the public has early and effective opportunities to participate in preparing the final plans, which should then include a summary of the public's views."

"Transport is responsible for around a quarter of greenhouse gas emissions in the Union and is the largest sector by emissions under the Member States' non-ETS targets. It therefore needs to be at the centre of the NECPs. Most Member States set out emission reduction measures in the transport sector. Some Member States already combine quantified emission reduction objectives with planned measures. The final NECPs will give Member States the opportunity to develop an even more integrated approach for the transport sector. In their final plans, Member States should be more concrete and a number of them still need to quantify the expected impacts. Electromobility is often among the objectives pursued, but measures are often not described in a very detailed manner."

"The Austrian and Spanish draft NECPs provide good examples of how to combine quantified emission reduction objectives for the transport sector with the underpinning policies and measures to achieve them. For instance, Italy provides considerable detail on the planned measures and goes beyond the mandatory renewable target for transport. While a number of Member States have set indicative electromobility targets, Slovenia underpins this with concrete measures including a quantification of the charging infrastructure required."

mechanism by which both MS and EU will move towards the future. They need to be informative on the actions MSs are planning to implement between 2020 and 2030. Aggregated, they will amount to the real terms of the climate progress in the EU.

Transport decarbonisation is a major element of every NECP. This makes it of high important to assess whether or not each MS will deliver the necessary reductions in carbon emissions from their transport fleets. The NECPs therefore need to include transparent and realistic transport decarbonisation plans. However, most assessments of NECPs carried out by third party stakeholders[5] so far have focused on electricity generation and heating and cooling sectors, with transport largely neglected. This report aims is to fill in the gap and assess transport plans of each MS.

Draft NECPs were submitted to the European Commission (EC) and it provided feedback to MS in June 2019. In its communication[6] the EC did not raise major issues regarding the robustness of the transport parts of the draft NECPs, nor did it recommend structural changes as in general its major comment was a call to increase the ambitions.

The EC positions transport as key, and therefore suggested that it needs "to be at the centre of the NECPs". The EC, furthermore, requested that final NECPs be more concrete. Also, good practice examples, such as policies and measures in the transport sector, were listed. Overall however, no major criticism was voiced, let alone rejection of any of the transport plans.

Since NECPs are the blueprint for climate and energy actions in the EU between 2020 and 2030, we believe a systematic and deep assessment is in order. NECPs will need to be assessed thoroughly. This report finds that the EC has not yet done it so far. The report's assessment of the draft NECPs stands in stark contrast to that of the EC communication. The assessment shows that major revisions are needed if the final NECPs are to have a realistic chance of bringing about cost-effective transport decarbonisation before 2030.

[5] https://europeanclimate.org/wp-content/uploads/2019/05/Planning-for-Net-Zero.-Assessing-the-draft-NECPs.pdf
[6] https://ec.europa.eu/energy/sites/ener/files/documents/recommondation_en.pdf
[7] https://ec.europa.eu/energy/sites/ener/files/documents/recommondation_en.pdf

METHODOLOGY

For the assessment of the draft NECPs submitted to the EC a simple methodology was applied. To answer whether the given NECP is sufficiently robust, three key criteria were applied. In addition, an indicative calculation was used to estimate the carbon abatement cost of the transport part of each NECP. The three main criteria are as follows.

- Efficacy of transport decarbonisation policy
- Transport decarbonisation cost assessment
- Public consultation

In addition, the carbon abatement cost estimates were calculated

For each of the key criteria, a number of indicators and subsidiary questions were used in assessing the effectiveness of NECPs, as follows:

Efficacy of transport decarbonisation policy: Two main indicators are used. Do the transport plan present I.) a clear and coherent pathway, II.) comprehensive technology options. Each plan was assessed under the following headings to establish its performance:

I. Clear and coherent pathway

- Is the pathway to decarbonising transport between 2020 and 2030 clearly presented?
- Is the plan sufficiently ambitious?
- Is there a trajectory of transport decarbonisation between 2020 and 2030 included?
- Are the planned shares of renewable energy sources used in transport between 2020 and 2030 presented?

II. Comprehensive technology options

- Is there a detailed discussion on policy measures?
- Is there a rationale or justification provided for the choice of planned transport measures?
- Are the planned transport measures comprehensive?
- Are all key transport technological options are considered?

For the *Transport decarbonisation cost assessment* criteria three main indicators were selected. Does the transport plan:

- Include a carbon abatement cost assessment?
- Rank transport decarbonisation options based on costs?
- Calculate how much transport decarbonisation will cost until 2030?

None of the draft NECPs were found to provide comprehensive information on any of the indicators above. Therefore, no follow up questions were considered necessary for further detailed analysis of the findings.

The third key criteria was whether a public consultation was carried out? The following questions were used to establish findings under this heading:

- Was there a public consultation carried out at all?
- Was it partial, or comprehensive?
- Was transport given significant attention in the public consultation?
- Was the draft NECP used as a basis for the consultation or was some other document used?

With regard to the carbon abatement cost calculation, the Navigant/Ecofys (2019) report[8] served as a basis for estimates of conventional biofuels and electromobility. This is the latest report as a basis for estimates of conventional biofuels and electromobility. This is the latest report in Europe to study the cost of these transport decarbonisation options in both 2020 and 2030, which is the exact timeframe for the NECPs. Estimates for other technologies were derived from other industry sources.

The costs presented are grounded and useful for the purposes presented, but their limitations should be understood.

Cost estimates are not best founded in scientific literature, but rather in proximity to industrial realities. Accordingly, in the absence of specific and up-to date literature meeting the standards of peer reviewed science, applying common conceptions of peer review to cost calculations would only mean use of obsolescent information. By definition, all the technologies are new and dynamic and so their implementation costs are moving targets.

They are moving targets because of (I) regional differences, (II) changes in costs of basic commodities used in their construction, (III) innovation in design, and (IV) impacts of scale. While most of these criteria are understandable without further elaboration (and are facts at certain points in time rather than capable of reliable prediction), scale deserves special mention. The market for transport energy now met by fossil fuels is immense, and it is reasonable to assume for every technology that the more oil that technology displaces, the higher the per unit incremental cost of that technology. Accordingly, a technology with a low price very likely will become a high price technology if over-deployed, so the prices in this report need to be understood in that context.

As a result, a grounded transport energy policy would not be an all eggs in one basket policy, and the higher the actual ambitions of a policy to displace oil, the more diversification of technologies will be the most cost-effective strategy.

Admittedly, the authors are fully aware of the limitations of the methodology. There is no intention to present the findings as a result of a scientific exercise, but rather as an exercise appropriate to the formulation of effective transport decarbonization policies. It is essential that other stakeholders, especially the European Commission, will follow suit, and that further carbon abatement cost estimates will be forthcoming.

Taking the above into account, these estimates are based on the best available science. To the knowledge of the authors, the Navigant/Ecofys (2019) report is to the best of the most recent relevant literature in this field. Roland Berger (2016)[9] arrived at similar findings.

Since the Navigant report included only the three main technologies to decarbonise transport at scale; corn ethanol, rapeseed biodiesel and electromobility, further calculations were necessary. For advanced biofuels, biogas and renewable hydrogen, a simplified methodology based on Navigant (2019) was applied.

[8] https://www.farm-europe.eu/wp-content/uploads/2019/06/Ecofys2019_Transport-decarbonisation-2030-CEE.pdf
[9] https://www.rolandberger.com/en/Publications/Integrated-Fuels-and-Vehicles-Roadmap-2030.html

For the calculation of carbon abatement costs two types of data are needed:

- Carbon intensity of the technology
- Cost of producing the fuel

Both data will be compared to the fossil fuel pathway (petrol, diesel). A simplified methodology was applied. As for orientation, it is worth noting that the production cost of the given pathway has the largest impact on the magnitude of the carbon abatement cost. The less costly it is to produce the fuel, the lower the carbon abatement cost. On the other hand, the lower the carbon intensity of the pathway compared to fossil fuels, the lower the carbon abatement cost. The difference however in carbon intensity is typically less than in production cost across pathways. Overall, price or cost has the largest impact on the magnitude of carbon abatement cost. Carbon intensity is taken from the RED II default option.

The following are the main simplified assumption behind the additional calculation on production costs:

- Among advanced biofuels, cellulosic ethanol is the most prominent pathway, hence it is taken as basis. This calculation is based on actual industry and market data of a cellulosic ethanol plant in Europe.
- For biogas, our calculation is based on the emerging Italian support scheme, therefore the underlying figures reflect real industry and market data. In Italy a biomethane scheme is up and running so a market value for the cost of technology is available.

The following table shows the carbon abatement cost values applied in the calculations.

Carbon abatement costs, €/tCO_2	2020	2030	Source
Corn ethanol	155	25	Ecofys, 2019
Rapeseed biodiesel	187	6	
Electric driving	772	228	
Advanced biofuels	327		Own calculation
Biogas/biomethane	209		
Hydrogen	772		

Our simplified model allows for the application of any carbon abatement cost value (or any underlying carbon intensity or production cost figure), and the model can be re-run for estimating the cost of transport decarbonisation of the given NECP.

Note that 2030 values are not used in this report. We did not venture as far as attempting to estimate 2030 carbon abatement costs for advanced biofuels, biogas and renewable hydrogen as these technologies are considered immature compared to the three main pathways, therefore availability of data (especially production cost) is seriously limited. Some 2030 data is just included herein for possible further reflections. Hopefully it will stimulate further thinking as carbon abatement costs will change significantly by 2030.

ASSESSMENT OF DRAFT NECPS ACROSS THE EU

EFFICACY OF TRANSPORT PLANS

As the European Commission puts it in its communication[10], "the solidity, credibility and robustness of the final NECPs will determine the extent to which they will be able to support the delivery of the Energy Union goals." Furthermore, the EC recommends that "the NECPs should allow a structured assessment of the impacts of national policies and the interaction between European and national measures on energy and climate".

In our view NECPs should be clear, cost-effective and sufficiently ambitious. Renewable energy sources used in transport should increase at the expense of fossil fuels. In this regard renewables are not competing with one another, but all sustainable pathways will need to displace fossil fuel use.

There is no plausible scenario when a single technology delivers the necessary decarbonisation of transport by 2030. It is unrealistic to assume that conventional ethanol would go beyond E20, and be able to displace much less than 20% of petrol. Conventional biodiesel will see an even lower market share. Biogas is an emerging technology and will be unlikely even to approach that level. As for advanced biofuels, the ambitious target in RED II of 3.5% is at real risk of not being met. Electromobility is the pathway of the future, but even T&E, a green NGO, assumes[11] that it will have a share of much less than 15%. Even in the highly ambitious E-mobility scenario, electric vehicles (PHEV, BEC, FCEV) will represent a moderate 17% of total car fleet in 2030. Renewable hydrogen is negligible today and unlikely to spread meaningfully beyond a few countries in Europe. Therefore, it is of crucial importance that policies consider a wide array of technologies.

Our assessment found that only Finland and Italy submitted a draft NECP with a clear and coherent transport plan where all renewable technologies are considered.

NECPs need to present estimated trajectories for the share of renewable energy in final energy consumption from 2021 to 2030 in the transport sector. A large number of countries failed to provide such a trajectory. Without such a trajectory it is difficult to see how credible or grounded the transport plan is.

In general, there seems to be a low the level of ambition of objectives, targets and contributions in relation to transport decarbonization as presented in the draft NECPs. Some Member States indicated a very low level of ambition, as the measures proposed would not prevent an increase in transport energy consumption until 2030, and transport related GHG emissions are expected to grow between 2020 and 2030.

Policies and measures relating to Member State- and Union-level objectives are described in varying details. The NECP methodology requires the inclusion of additional transport policies and measures that are considered necessary to achieving the targets. The level of detail and clarity varies across the plans.

As regards the clarity and coherence of the transport plans, our assessment found that, in addition to Finland and Italy, Spain's transport decarbonisation pathway could be considered coherent and clear. A robust transport decarbonisation plan is presented, and there is a clear pathway between 2020 and 2030 to decarbonise transport. Both a trajectory and corresponding renewable energy

[10] https://ec.europa.eu/energy/sites/ener/files/documents/recommondation_en.pdf

[11] https://www.transportenvironment.org/sites/te/files/publications/2019_06_Element_Energy_Batteries_on_wheels_Public_report.pdf

shares are provided and backed up by clear rationale in the draft NECP of FI, IT and ES.

Half a dozen MSs (HR, CZ, EE, EL, HU, LT) presented a draft plan, with partially credible transport policies. Often the planned trajectory is not backed up by robust analysis.

The remaining 18 countries (AT, BE, BG, CY, DK, DE, IE, LV, LU, MT, NL, PL, PT, RO, SI, SK, SE, UK) submitted an incoherent, unclear transport plan. Typically, no clear transport decarbonisation trajectory is provided, and the shares of different renewable energy sources planned to be used in transport between 2020 and 2030 are not provided or are unclear. Also, the plans may lack ambition.

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented

Regarding the technology neutrality of the plans, half a dozen countries (CZ, FR, FI, GR, HU,

SI) applied a comprehensive approach to renewable energy technologies in transport. These MSs presented a transport plan where all major transport renewable technologies, including electromobility, conventional biofuels, advanced biofuels, biogas and renewable hydrogen, were considered. The plans contained detailed discussion on these technologies and planned policies appear to consider these key technological options realistically.

Some MSs (EE, DE, IE, LT, MT, NL, RO, SK, ES, SE) presented a draft with some indication of aiming to be technology neutral. In these plans some technologies appear to be overrated, others unjustifiably neglected.

For the remaining eleven countries (AT, BE, BG, HR, CY, DK, LV, LU, PL, PT, UK) there seems to be an absence of a comprehensive technology options approach. These plans presented a largely a one-sided transport plan (e.g. electromobility dominates plan, other technologies neglected), or the level of detail presented is insufficient to see a focused or coherent approach.

Technology neutral transport plan

As a consequence of a general lack of clarity, robustness and detailed information, the draft NECPs appear in our view to be inadequate to be aggregated at EU level and show with clarity

the progress that can be expected in transport decarbonisation between 2020 and 2030. It is unclear how the EU will be able to show expected progress in transport decarbonisation at climate negotiations with a necessary degree of confidence. Our finding indicates that the draft NECPs do not live up to the task to provide for solid ground to draw conclusions at EU level. The Paris Agreement, UNFCCC processes, and international organisations such as the IEA, will all need input on what to expect in Europe. For that purpose, the draft NECPs seem to inadequate to present a clear and coherent picture on transport decarbonisation in Europe between 2020 and 2030.

In general, it may be concluded as follows:

- Draft NECPs do not provide for a clear transport decarbonisation in EU.
- Apart from a very few, most draft NECPs lack to present a robust transport decarbonisation plan between 2020 and 2030.
- It is difficult if not impossible to aggregate MSs transport plans to arrive at a clear EU picture.
- Based on the draft NECPs of each EU MSs, it is unclear how the EU will deliver on transport.
- Given the inadequate transport plans, it is questionable if the EU will be able to show progress in transport at climate negotiations.

Our assessment finds that so far, the draft NECPs fall short on efficacy, including ambition, comprehensiveness, coherence and credibility, and do not describe a robust, Paris Agreement-compliant transport pathway for Europe. MSs should take the opportunity to substantially improve the plans by the end of 2019 when final versions are due.

COST OF TRANSPORT DECARBONISATION

Cost of transport decarbonisation is key, yet over the past years in Europe there has been little discussion on it. As the European Commission puts it in its communication[12], "comparability of the NECPs requires as much as possible a common approach of metrics used and an alignment of base year figures to reported data points. While the majority of the draft NECPs document key assumptions and data sources, the completeness of the information can still be improved".

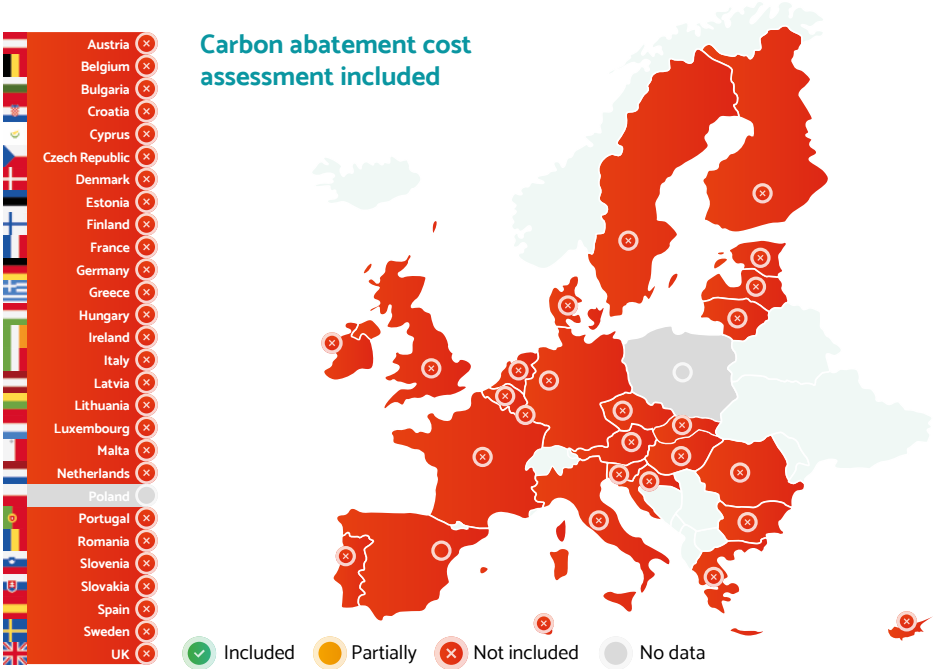
The Energy Governance Regulation[13] mentions costs or cost-effectiveness 49 times, and states that "Cost-effective deployment of renewable energy is one of the key objective criteria for assessing Member States' contributions." It is clear that the objective set for MSs is to contribute to the Union target achievement at the lowest possible cost. Cost-effective renewable energy deployment is a priority.

Furthermore the regulations requires information to be included in the *Integrated reporting on greenhouse gas policies and measures and on projections* to be submitted by MSs by 15 March 2021 and every two years thereafter, on "available estimates of the projected costs and benefits of policies and measures, as well as estimates of the realised costs and benefits of policies and measures".

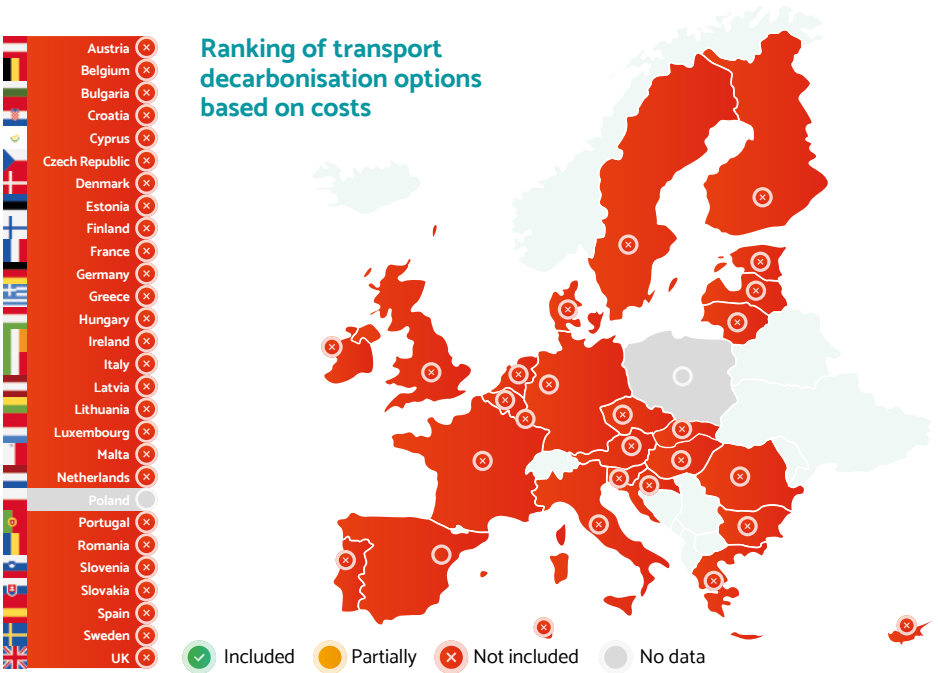
Our assessment found that none of the draft NECPs included an estimation of carbon abatement cost of the chosen transport pathway. Carbon abatement cost is the ultimate metric to gauge if a policy is cost-effective. In the absence of such estimates it is difficult to compare the merits of transport decarbonisation technologies, it remains unknown if the plan is optimal or there is room for improving it from a societal cost perspective.

[12] https://ec.europa.eu/energy/sites/ener/files/documents/recommondation_en.pdf
[13] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1999&from=EN

Transport decarbonisation cost assessment



Needless to say, that without carbon abatement cost estimates being available, no ranking of technological options is possible. In an ideal case, transport technologies are ranked based on cost-effectiveness in delivering climate progress. Regrettably, none of the draft NECPs went so far as considering this step as necessary.



Our policy analysis shows that there is a lack of clarity as to how MSs are planning to decarbonise their transport sector. Also, it is unclear how much the planned transport actions will cost to taxpayers. Unsurprisingly, without a cost-effectiveness assessment and a ranking of technologies, it is not possible to disclose how much transport decarbonisation will cost between 2020 and 2030. No draft NECPs make it clear how much the transport plan therein would cost to society.

Finland, Italy and Spain presented some considerations regarding the cost of their transport policy plans. These may be seen as a first step to elevate the topic to higher levels in the political agenda. Perhaps the final NECPs will contain more detailed and well substantiated information.

How much transport decarbonisation will cost until 2030?

As a general finding it may be concluded:

- The cost to society of transport plans are neglected in all draft NECPs.
- It appears that transport sections of draft NECPs were not informed by underlying cost assessments.
- Transport decarbonisation plans, as presented by draft NECPs, risk being unnecessarily costly.

CARBON ABATEMENT COST

In addition to assessing the efficacy of transport plans, cost of transport decarbonisation, as sketched out in the NECPs, is estimated based on the information provided in the plans. The methodology is kept as simple as possible. Results are not to be interpreted as stemming from a scientific exercise, it is rather an attempt to makes sense of the transport part of the NECPs from a practical point of view. The cost of planned transport policies between 2020 and 2030 is of crucial importance, as the recent gilets jaunes (yellow jacket) protests in France attest; citizens are not indifferent to the cost of climate measures. Crucially, there has been hardly any discussion in Brussels or in national capitals on cost-effectiveness of transport decarbonisation policies. Since to the best of our knowledge the EC has never looked into these issues, we felt the need to contribute.

Our results are best treated as indicative, nevertheless they suggest that some countries will waste money compared to best cases. A given Euro will deliver substantially more carbon reduction in countries with well thought through transport policies.

The lowest cost is estimated for Finland, where the transport plan for the period of 2020-2030 is calculated to cost €225 per ton of CO_2 abated. On average, the carbon abatement cost in the EU was calculated at 521 €/tCO_2. The highest carbon abatement cost is associated with the transport plans of CY, PT and SE, 772 €/tCO_2. Note that some draft NECPs failed to provide even basic data on planned shares of renewable energy in transport between 2020 and 2030, so no estimate was possible (BE, BG, DK, LV, NL, PL).

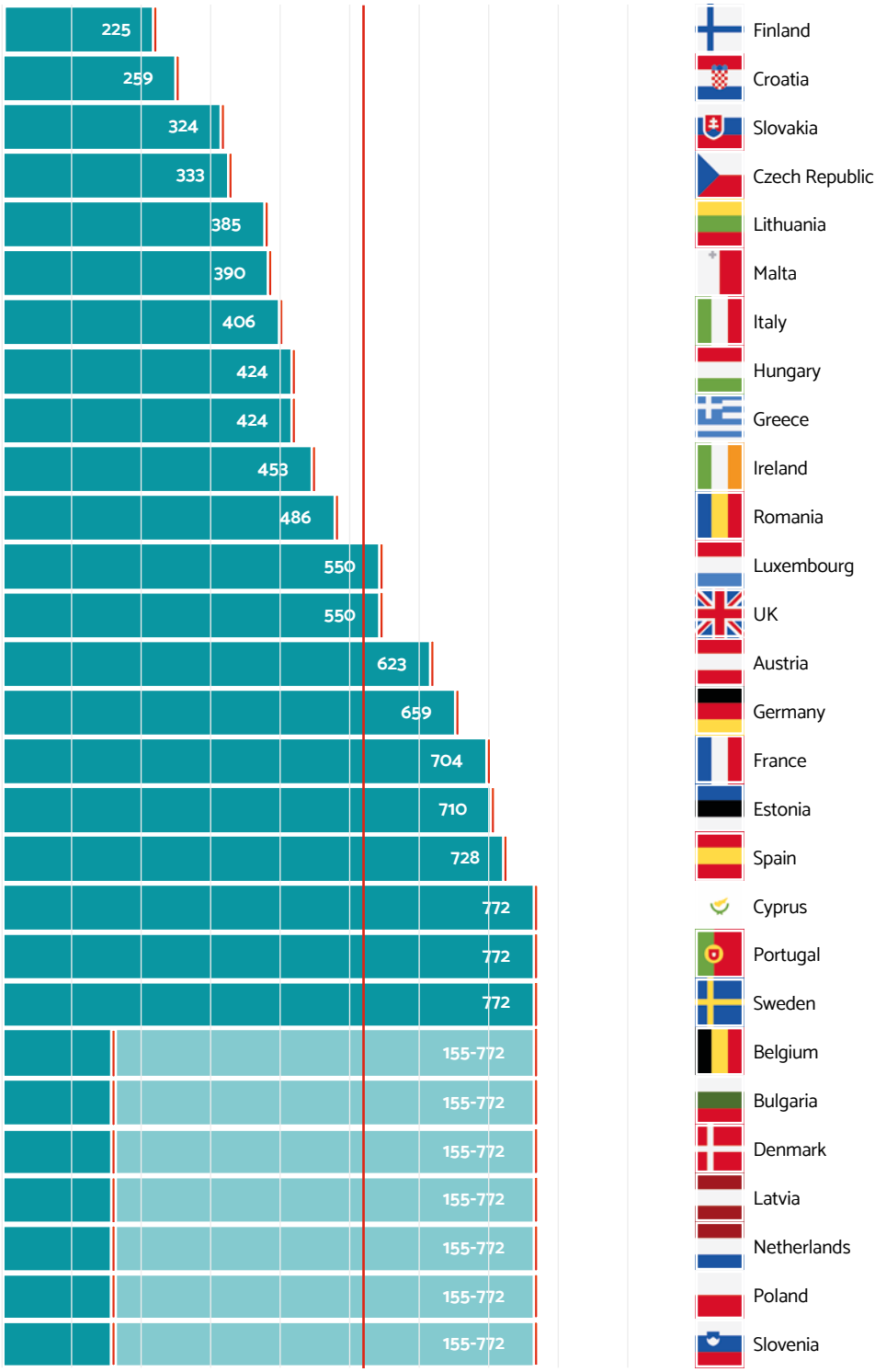
Our carbon abatement cost estimates are not scientific, but it serve as a first attempt to assess the cost of transport decarbonisation put forward by MSs. Our hope is that other stakeholders, such as the European Commission, will improve on our methodology and come up with more precise carbon abatement cost estimates for transport decarbonisation.

In general, it may be concluded:

- The cost to taxpayers and society at large of transport decarbonisation plans, as depicted by the carbon abatement costs, are found to vary widely across MSs.
- Transport decarbonisation plans, as presented by draft NECPs often appear to be unnecessarily costly.

All draft NECPs miss out appropriately consider the cost of transport decarbonisation. As a result of lack of transparency there is risk that transport decarbonisation will cost more than it should. Indeed, there are signs that the cost of abating CO_2 emissions in some MS will cost four times as much as the best performing MSs. It is imperative that both the efficacy and cost aspects of the final NECPs will need to be improved.

Carbon abatement cost estimation (€/tCO$_2$)



PUBLIC CONSULTATION

In general, governments, in the context of public consultation, seek the views of citizens and stakeholders when they develop policies and legislation. Given that NECPs are meant to be the blueprint for energy and climate action in the EU between 2020 and 2030, public consultation is a useful tool to seek out the views of all stakeholders and as a result inform these key documents.

Public consultation is mandatory for the final NECPs to be submitted by the end of 2019. Regulation does not *per se* prescribed it for the drafts, yet some Member States carried out public consultation before the drafts were submitted.

The quality of the consultations varied. It is difficult to see how comprehensive the given public consultation was, as it is self-reported in the draft NECPs. It appears that some consultation was partial at best. Furthermore, it appears that in some cases, it was not the draft NECP rather than other national documents that served as a basis for the consultation. Moreover, the question necessarily arises, was transport given significant attention in the public consultation?

Nine MSs held a seemingly comprehensive public consultation. An additional four consultation can be described as partial, meaning the process was not comprehensive, and as a result quite possibly the consultation did not sufficiently cover transport. The remaining fifteen MSs did not hold a public consultation at all.

It is important that the findings of the public consultation are considered in the final NECPs. Final plans will need to reflect the outcome of the consultation. Therefore, process-wise, consultation will need to take place well before finalising the plan so as to provide room for incorporating the findings into the final document.


Finland
Sweden
Estonia
Latvia
Denmark
Lithuania
Netherlands
Poland
Ireland
UK
Germany
Czech Republic
Belgium
Luxembourg
Austria
Slovakia
France
Hungary
Romania
Slovenia
Croatia
Portugal
Spain
Italy
Bulgaria
Greece
Malta
Cyprus
Carried out
Partially, or transport lacked appropriate attention.
None

AUSTRIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Despite the admission that "Transport is currently the most polluting sector, accounting for 45 % of overall (non-ETS) emissions", no meaningful transport decarbonisation plan is presented. Some transport policy measures are listed, but there is no clear pathway, nor it is clear how much each of the vaguely described transport policy measures will contribute to transport decarbonisation. No transport decarbonisation trajectory is presented ("no estimated target trajectories can be provided at this stage"). It is hinted that the final plan will contain trajectories.

Comprehensive technology options?

The focus is on electromobility, yet the draft NECP admits that "even in the most ambitious of scenarios, this will be far from enough to achieve a CO_2 emissions reduction of 15.7 million tonnes CO_2e in the transport sector by 2030". No meaningful conclusion follows from this admission. As the draft does not specify it, it is unclear what role available transport decarbonisation options are expected to play between 2020 and 2030.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Compresenhive public consultation took place, and will take place for the final NECP.

623 €

EU average 521€/tCO_2E

Carbon abatement cost estimation

BELGIUM

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Notably weakly described transport decarbonisation plan. A limited number of planned transport measures are listed, they are detailed very insufficiently. No pathway is presented. Hardly any data is included on transport decarbonisation. A trajectory is presented for transport renewable energy use, but no underlying calculation or methodology is included. There is no share of renewable energy sources used in transport between 2020 and 2030 presented.

Comprehensive technology options?

There is no clear focus. No meaningful discussion of technological options. Planned measures are far from being comprehensive, they rather look like a compiled text. The draft acknowledges that "the trend for RES-T shows that existing policies for the development of biofuels and the use of electricity for transport (numerator) are insufficient to meet the 10 % target for 2020 and to stimulate the development of renewable energy sources beyond 2020."

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

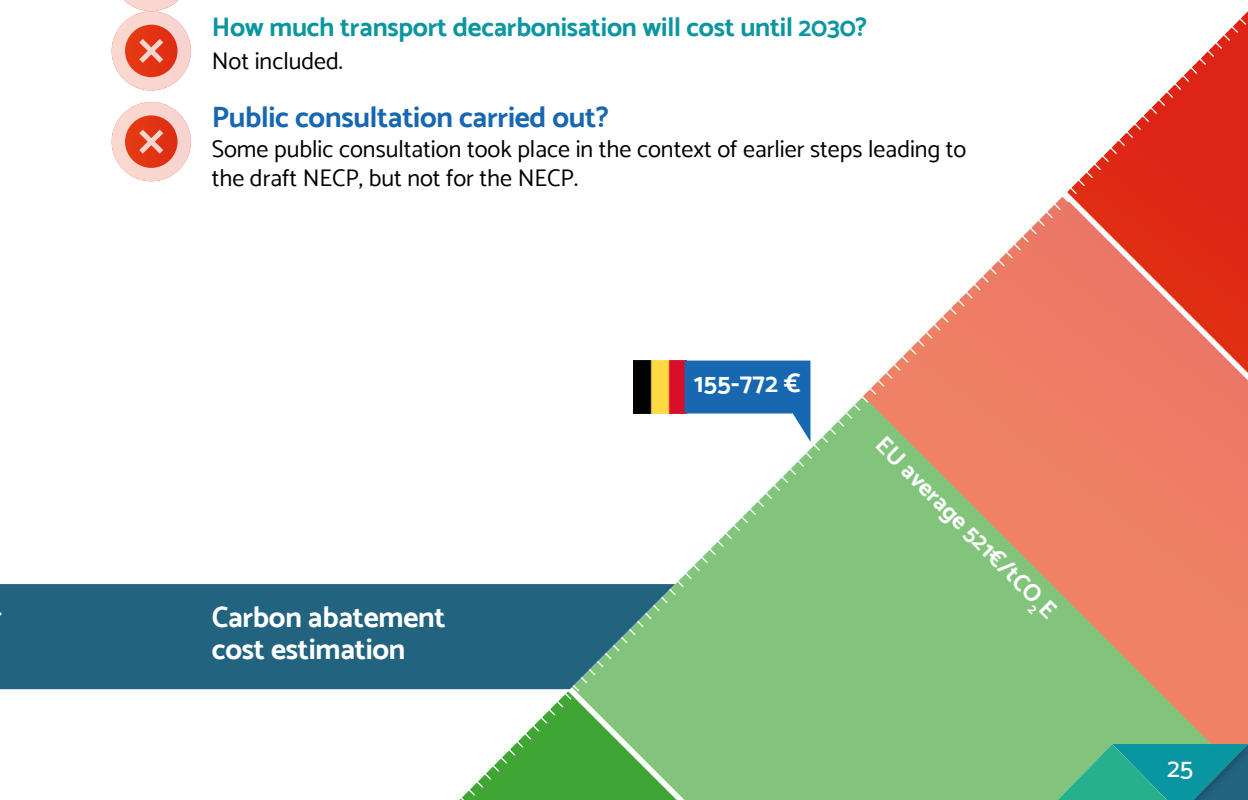
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Some public consultation took place in the context of earlier steps leading to the draft NECP, but not for the NECP.



Carbon abatement cost estimation

BULGARIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

No discussion on the transport renewable energy trajectory, yet annual overall percentages leading to 14% by 2030 are presented. The trajectory is not backed up by a robust analysis. There is a lack of clarity of the contribution or share of planned measures to decarbonise transport. There is no clear pathway presented. Unclear how much each available transport decarbonisation options are expected to contribute between 2020 and 2030.

Comprehensive technology options?

Some measures are listed, but these do not amount to comprehensive technology options. No meaningful discussion on technological options are included. The plan appears to rely mostly on transport demand side management. The level of details provided on the planned measures is incomplete.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

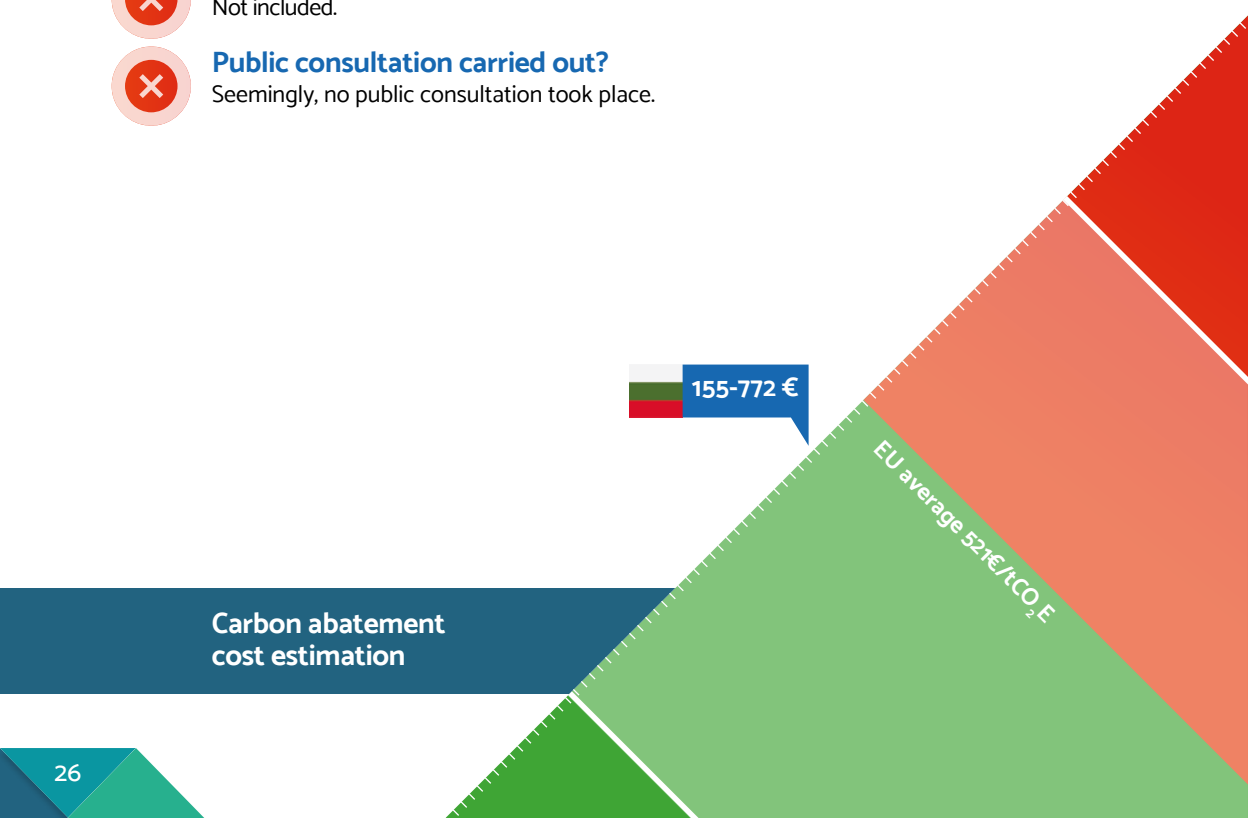
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Seemingly, no public consultation took place.



CROATIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

No credible transport decarbonisation pathway is presented. A trajectory is included for renewable energy use in transport between 2020 and 2030, with precise shares of renewable energy sources. Yet no meaningful discussion is offered as to the contribution of each transport decarbonisation measures. Some scenarios are presented, yet they are unclear based on methodology and assumptions. It appears that some modeling run is presented without interpretation, conclusions are not drawn.

Comprehensive technology options?

The discussion on transport decarbonisation option between 2020 and 2030 is highly inadequate. Technological options are not described. The trajectory presented in tables is not backed up by rationale. No distinction is made between advanced and conventional biofuels. Electromobility only gets a mention.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

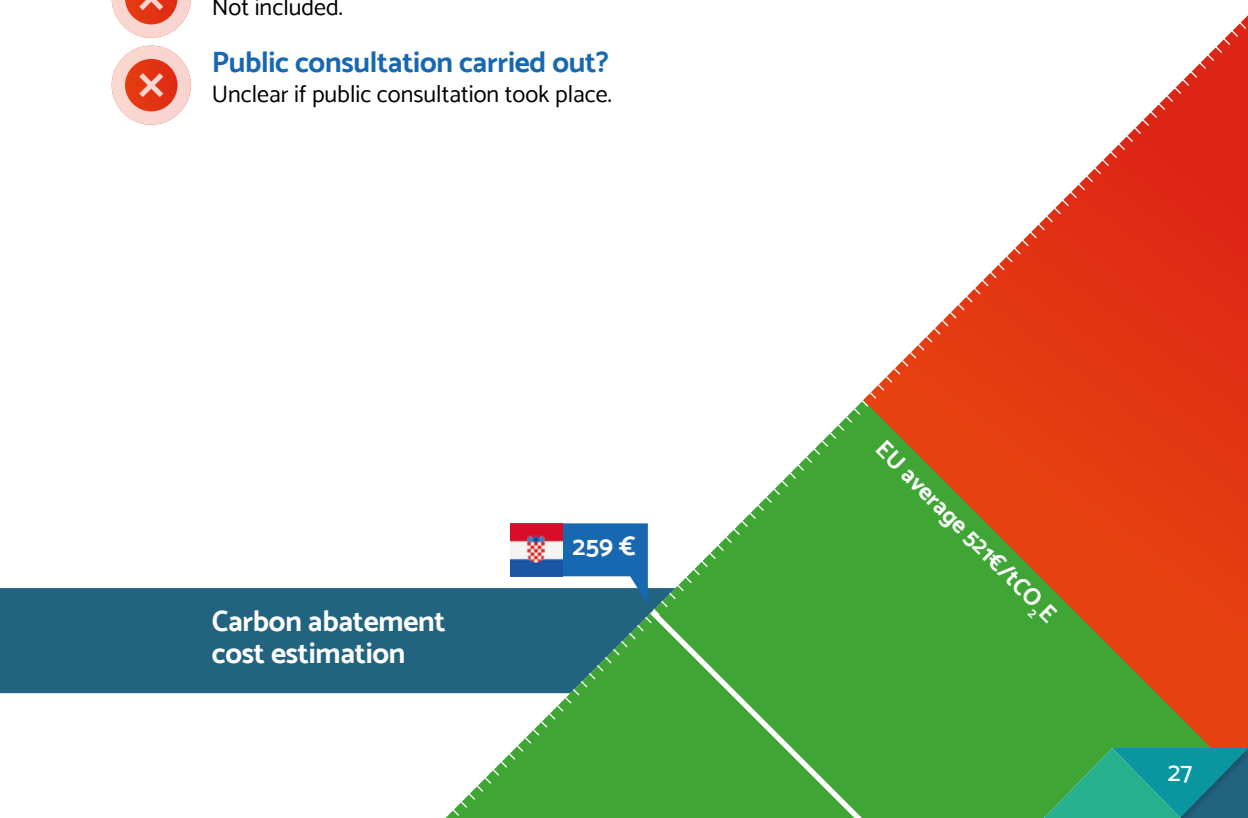
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Unclear if public consultation took place.



Carbon abatement cost estimation

CYPRUS

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

A highly inadequate presented transport decarbonisation plan. There is a long discussion of policies and measures taking place in the recent past, but the period between 2020 and 2030 is neglected. There is no transport decarbonisation pathway presented. No credible trajectory for 2020 and 2030. Overall ambition on transport decarbonisation is unclear and appears to be low based on the planned increase in road transport GHG emissions between 2020 and 2030 (Table 4.5).

Comprehensive technology options?

There is no coherent presentation of transport decarbonisation options. There is a lack of clarity in the planned shares of technologies. As regards technologies; there is a marginal discussion on advanced and conventional biofuels, and a not sufficient presentation of the role of electromobility. LPG is extensively discussed in the context of a modelled scenario, yet conclusions are unclear.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

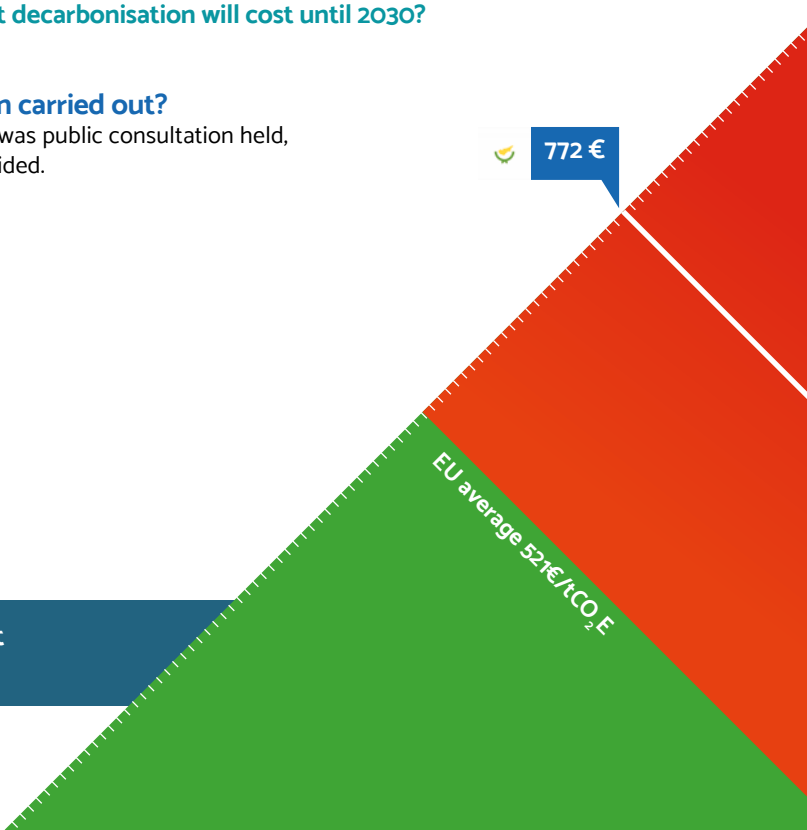
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Text claims that there was public consultation held, but no details are provided.



Carbon abatement cost estimation

CZECH REPUBLIC

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

A trajectory of reaching the 14% transport target is presented and shares of different renewable energy sources between 2020 and 2030 are also included. However there is no meaningful discussion on pathways. There is extensive discussion on a number of measures being implemented, but no meaningful discussion on transport policy measures between 2020 and 2030.

Comprehensive technology options?

The plan is not overreliant on any technology options and it appears to aiming for a comprehensive approach. Extensive discussion are presented on electromobility, natural gas for mobility, including biomethane, hydrogen mobility and LPG. Discussion on conventional biofuels are missing. Apart from conventional biofuels, a comprehensive set of technology options are considered.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

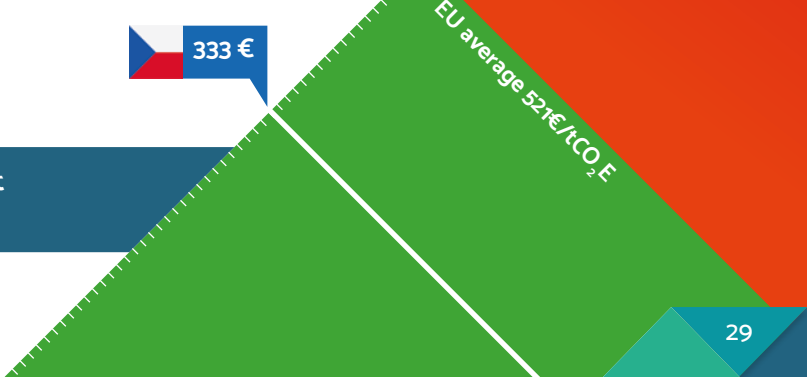
How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

A brief public consultation took place, but its results were not incorporated.

Carbon abatement cost estimation



DENMARK

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

No clear pathway on how to decarboniste the transport sector is presented, in fact, no pathway is presented at all. Only a general trajectory of reaching 13% renewable energy share in 2030 is presented, but it is not backed up by rationale, nor data, nor any meaningful discussion. Unclear what role each tranport decarbonisation option is expected to play between 2020 and 2030. The draft does not show a credible transport decarbonisation plan.

Comprehensive technology options?

No brakedown of individual shares of renewable energy sources contributing to transport decarbonisation is presented. Not enough detailed discussion on transport policy measures. It appears that the draft NECP lacks focus on tranport decarbonisation. Tranport decarbonisation technological options are not discussed at an appropriate level.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

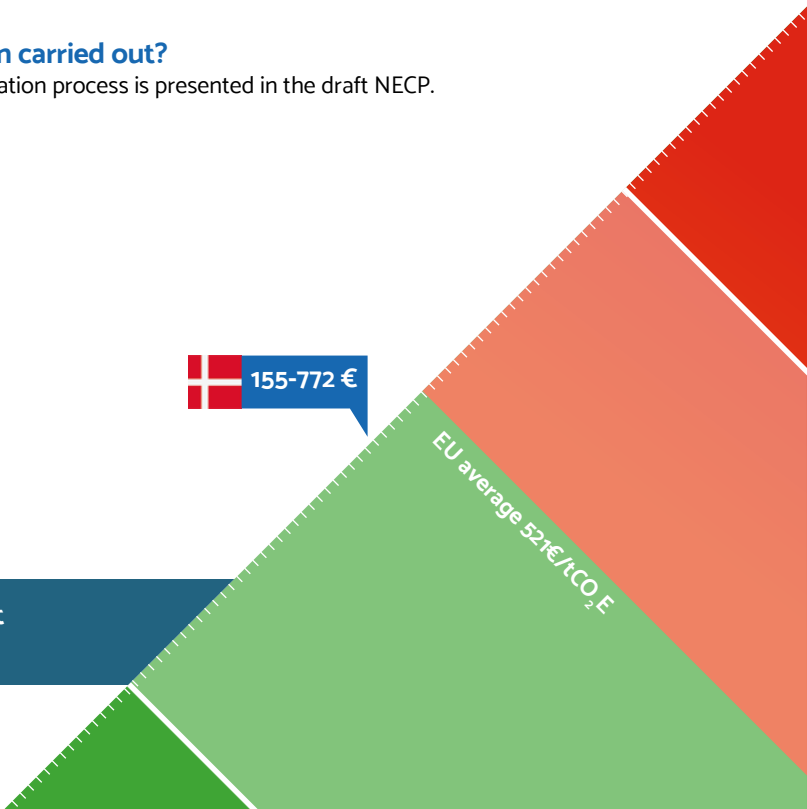
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

No clear public consultation process is presented in the draft NECP.



Carbon abatement cost estimation

ESTONIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

There is no clear pathway presented to decarbonise transport. Some transport polices and measures are described briefly. A trajectory between 2020 and 2030 of achieving the renewable energy target in the transport sector is presented, broken down by renewable energy shares such as electromobilty, advanced biofuels and conventional biofuels, but there is no real discussion behind these figures. It is difficult to assess the credibility of the plan without clear discussion. Note that Fig 2 shows that most of the growth in RES come from electrification between 2020 and 2030, but it does not appear to feature in the text.

Comprehensive technology options?

Several technological options are considered, including electromobility, advanced biofuels and conventional biofuels. The plan does not overly rely on any single technology, but this may be because the plan is crudely presented. Yet a figure (Fig 2) assumes all the growth in renewable energy sources used in transport between 2020 and 2030 comes from electrification. There appears to be no priorities assigned to any technological options. The shares of renewable energy sources in transport between 2020 and 2030 is presented.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

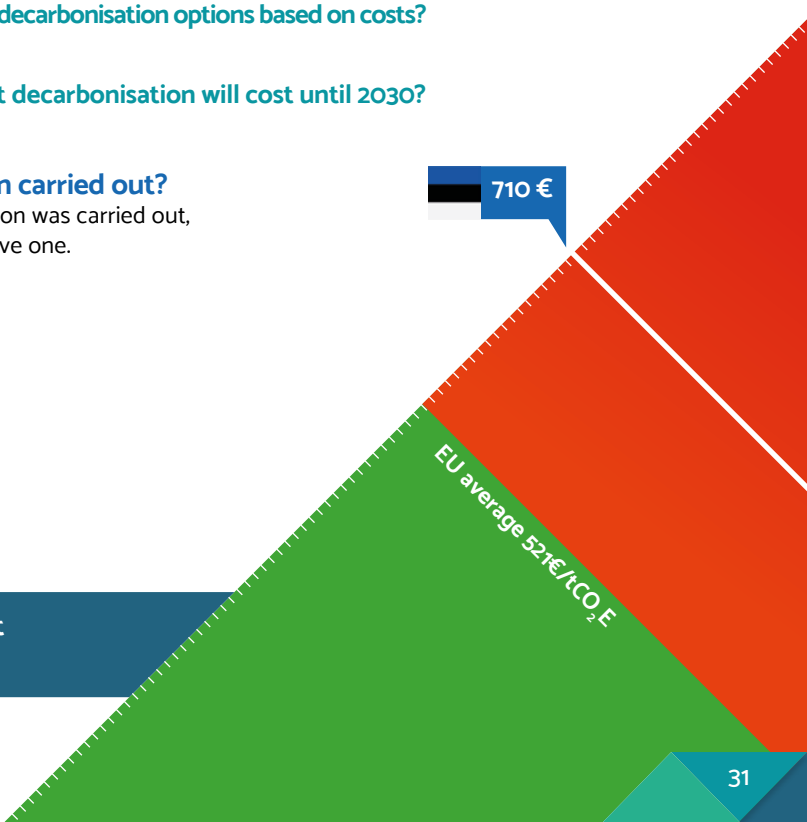
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Some public consultation was carried out, but not a comprehensive one.



Carbon abatement cost estimation

FINLAND

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The plan includes a breakdown of renewable energy shares in transport between 2020 and 2030, and lists existing and planned additional measures to achieve the target set for transport decarbonisation. There is a clear pathway presented for a variety of transport decarbonisation options such as liquid biofuels, biogas and renewable electricity used in transport until 2030. Furthemore, the plan is ambitious, 30% RES is expected to be achieved in road transport by 2030, with the "goal to reduce transport emissions by a half by 2030 compared to 2005 levels".

Comprehensive technology options?

All technology options are considered and prioritised. There appears to be a balanced approach towards each transport decarbonisation options. The roles of each option (including liquid biofuels, biogas and renewable electricity) is sufficiently clear and detailed.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

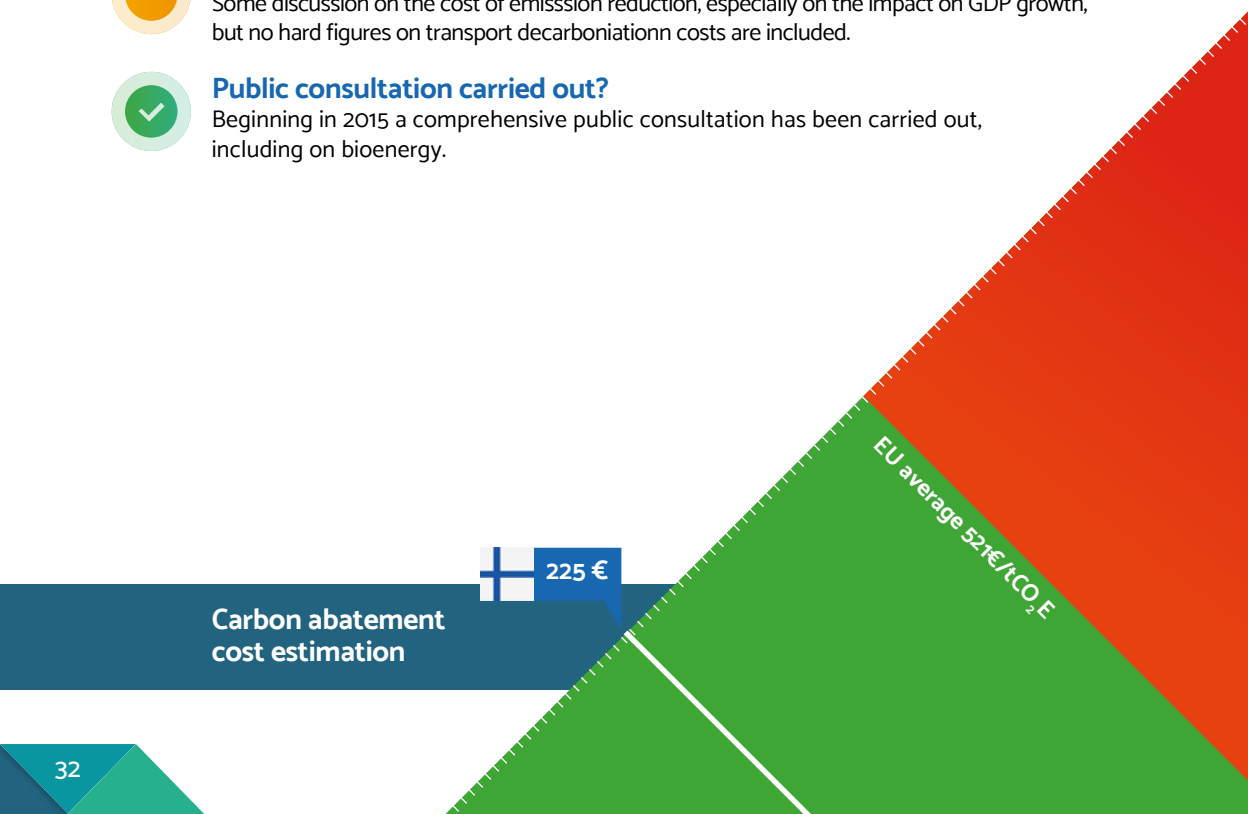
How much transport decarbonisation will cost until 2030?

Some discussion on the cost of emisssion reduction, especially on the impact on GDP growth, but no hard figures on transport decarboniationn costs are included.

Public consultation carried out?

Beginning in 2015 a comprehensive public consultation has been carried out, including on bioenergy.

Carbon abatement cost estimation



FRANCE

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

There is no clear pathway presented on how to decarbonise transport between 2020 and 2030. Fragmented elements are scattered in the report. The draft includes a transport GHG trajectory until 2030, and provides planned shares for fossil fuels, conventional biofuels and 2G biofuels in road transport energy use for 2023 and 2028 (Table 36). Furthermore, some shares of renewable energy use in transport planned for 2023 and 2028 are also provided. However, the actual shares between 2020 and 2030 of each of the renewable energy sources are not included. The plan is more ambitious than the minimal EU requirement, as renewable energy must account for 15% of final transport fuel consumption by 2030.

Comprehensive technology options?

The draft includes a detailed discussion on the policy measures envisaged to decarbonise the transport sector, and it provides some supporting evidence for the choice of measures. The draft includes a wide range of solutions to decarbonise transport, and the planned transport measures may be considered comprehensive. The draft identifies the main technological options, namely electricity, 1st and 2nd generation biofuels and hydrogen (and to some degree biogas), and all of these are considered.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

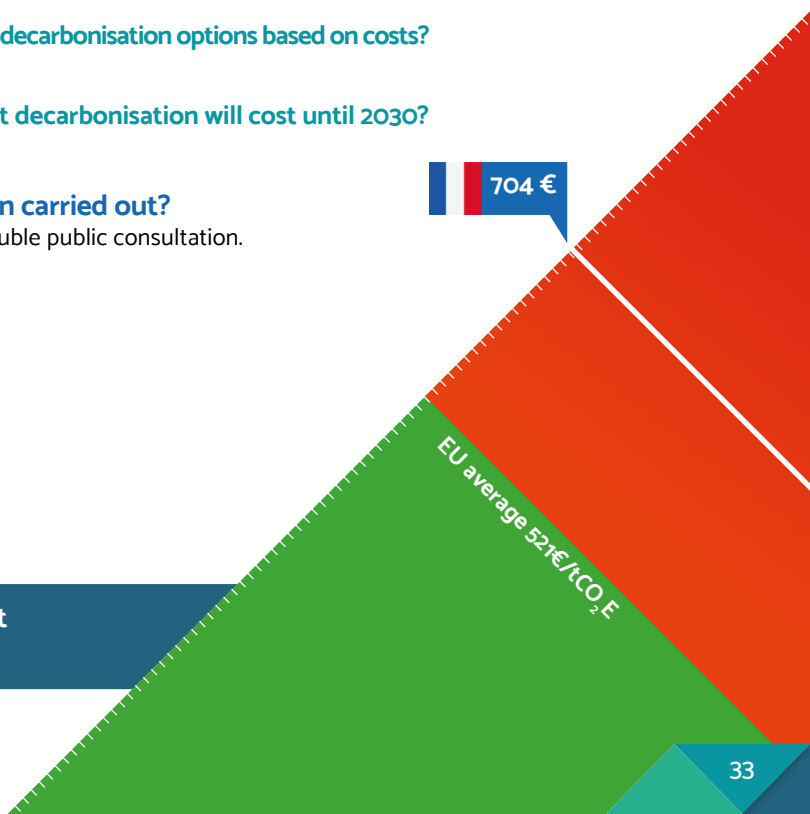
How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

France organized a double public consultation.

Carbon abatement cost estimation



GERMANY

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

No clear pathway to decarbonise tranpsort is presented. It is not discussed how the proposed measures will decarbonise transport, nor are their individual contribution presented. A trajectory for the use of renewable energy sources in transport is presented, but it appears to contradict stated plans discussed in the case of advanced biofuels (not included in the relevant table but planned to grow as stated in the text). Furthermore, there is a lack of ambition expressed by stating that 'Even when combined, the EU's minimum requirements for conventional biofuels and new renewable technologies will not, however, be enough to meet the Federal Government's energy and climate goals in the transport sector'.

Comprehensive technology options?

Although several technologies are briefly discussed, the technology options considered appear to be skewed towards a single solution. The vast majority of planned measures center on electromobility. Advanced biofuels are suggested to supplement existing biofuels, yet the role of advanced biofuels is unclear. The draft appears to be a one-sided transport decarbonisation plan.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

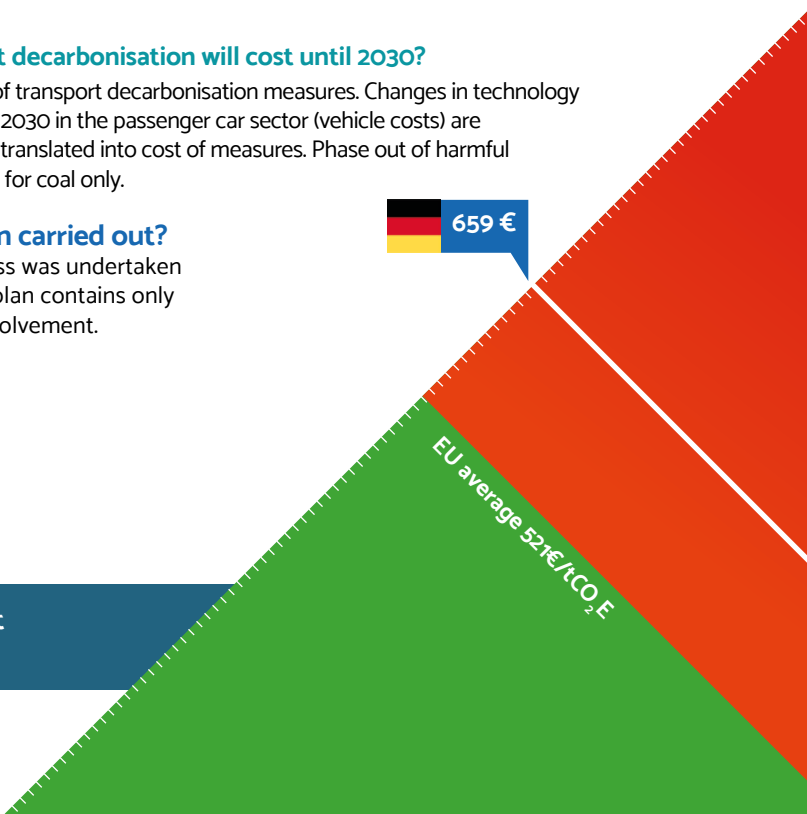
How much transport decarbonisation will cost until 2030?

No discussion on costs of transport decarbonisation measures. Changes in technology costs between 2021 and 2030 in the passenger car sector (vehicle costs) are presented, but it are not translated into cost of measures. Phase out of harmful subsidies are mentioned for coal only.

Public consultation carried out?

No consultation process was undertaken for the draft plan; the plan contains only a promise of future involvement.

Carbon abatement cost estimation



GREECE

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The draft plan contains long discussions on existing transport policy measures and also on planned measures between 2020 and 2030. Listed measures are assigned an estimated impact. A trajectory of reaching the transport target is provided, and shares of renewable energy sources are somewhat specified. The plan is insufficiently detailed, for instance there is no distinction made between advanced and conventional biofuels in the trajectory. The plan appears to be unclear (see Table 24 and Graph 114 and 18 on share of RES). There seems to be an overall lack of ambition on how to decarbonise transport (see Table 49 with differences between existing and additional measures).

Comprehensive technology options?

Several transport decarbonisation options are considered. Some priority is sketched out. The draft does not appear to overly rely on any single one of them, roughly equal weight is added to each options discussed.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included. Carbon abatement cost is not included in criteria on RES and energy efficiency.

Ranking of transport decarbonisation options based on costs?

Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

The draft was published for public consultation.

Carbon abatement cost estimation

HUNGARY

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Partially credible transport decarbonisation plan. A number of charts and projections are included on transport. It is not discussed in sufficient detail how the proposed measures will decarbonise transport, nor are their individual contributions presented. A trajectory of RES share in transport between 2015 (not 2020) and 2030 is presented. Transport related GHG emissions are projected to grow, overtaking all other sectors by 2030 - both in the existing and the new policy measures scenarios.

Comprehensive technology options?

Several technological options to decarbonise transport are considered. EVs and biofuels included realistically. Electromobility is the priority in transport decarbonisation. Conventional biofuels are considered, projected to grow much until 2023 and increase little thereafter. The new policy measures – facilitating the increased use of biofuels and the spread of vehicles with electric propulsion – support increasing the use of renewable energy by 7 percentage points in the transport sector.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

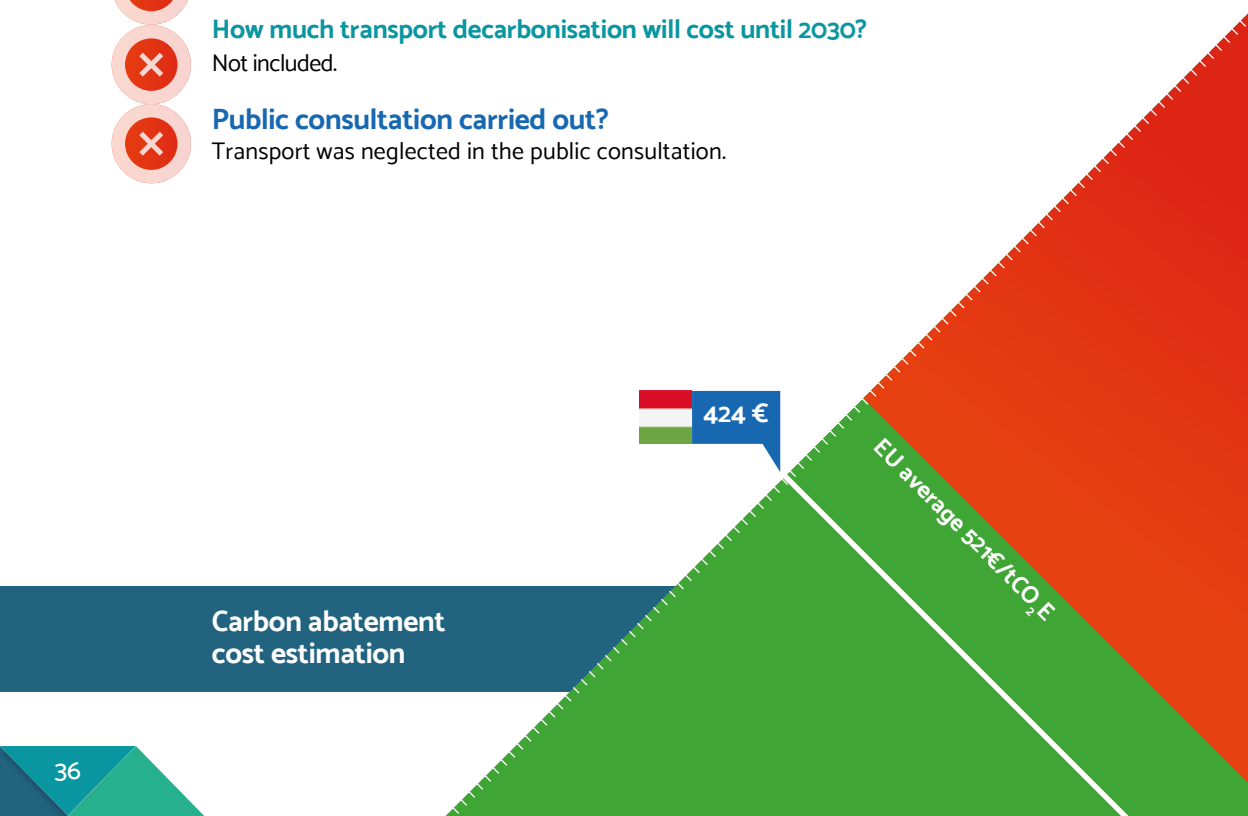
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Transport was neglected in the public consultation.



Carbon abatement cost estimation

IRELAND

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The draft lacks ambition on transport decarbonisation. Despite the fact that four scenarios are included, there is no clear and ambitious transport decarbonisation plan presented. In all four scenarios RES-T will stay below 10% (4% share in two of them). On the plus side, a trajectory of renewable energy use in transport is presented, again in four scenarios. Furthermore, shares of renewables broken down by sources, are provided in sufficient detail. Curiously, impacts of WAM scenarios (policies with additional measures) on GHG emissions are not included. WEM (Policies with existing measures) scenarios will result in increase of transport GHG emissions by 2030 from 2020. Transport energy consumption will grow until 2030 in all scenarios.

Comprehensive technology options?

It appears that the plan gives utmost priority to electromobility. Other transport decarbonisation options, such as biofuels, are also considered, but they do not seem to be given much weight. The plan admits that "A mix of further measures, developments and initiatives will be needed", yet their scope appears to be rather limited in the scenarios. The actual figures presented in Fig 32 on shares of RES-T appear to contradict language in the text (the figures assume large advanced biofuels growth, while the text relies on electromobility).

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

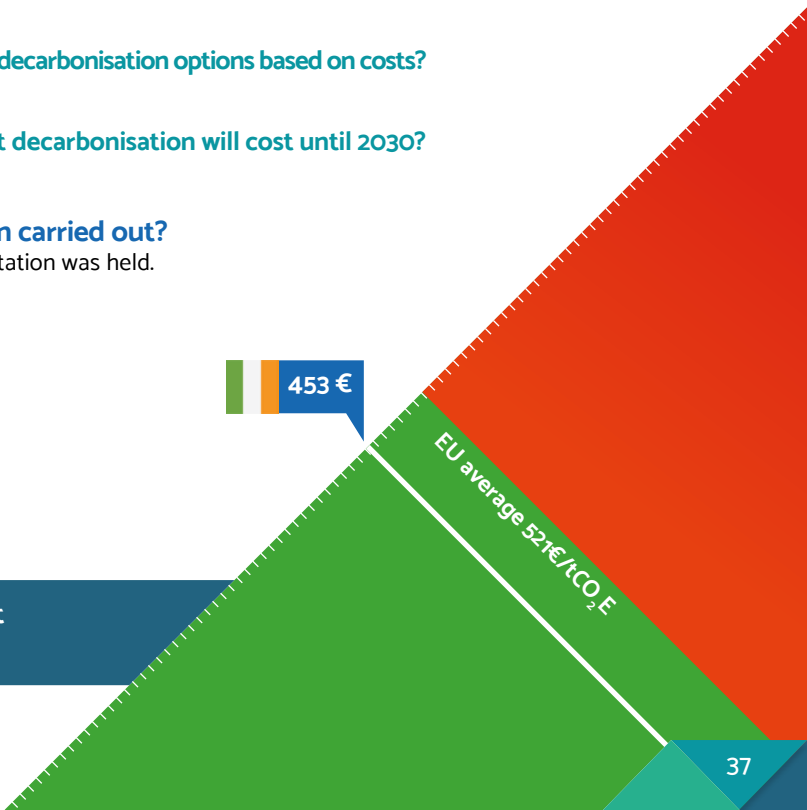
How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

An initial public consultation was held.

Carbon abatement cost estimation



ITALY

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The draft NECP includes a breakdown by RES pathways of the transport target taking into account the applicable multipliers for each technology. There is a clear trajectory provided for renewable energy sources used in transport between 2020 and 2030. Some discussion on major technologies are included, focusing on the optimum mix for attaining the renewable fuels target. The objective for the share of renewable energy in transport by 2030 may be considered ambitious; 21.6% compared with 14% for EU as in REDII.

Comprehensive technology options?

A list of transport decarbonisation technological options are considered. No single technology seems to be overly relied on, and there appears to be a balanced approach towards each transport decarbonisation options. Overall, it appears that a good range of available technologies are considered, including advanced biofuels, biomethane, non-advanced single counted biofuels, conventional biofuels, renewable electricity in road and rail transport.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

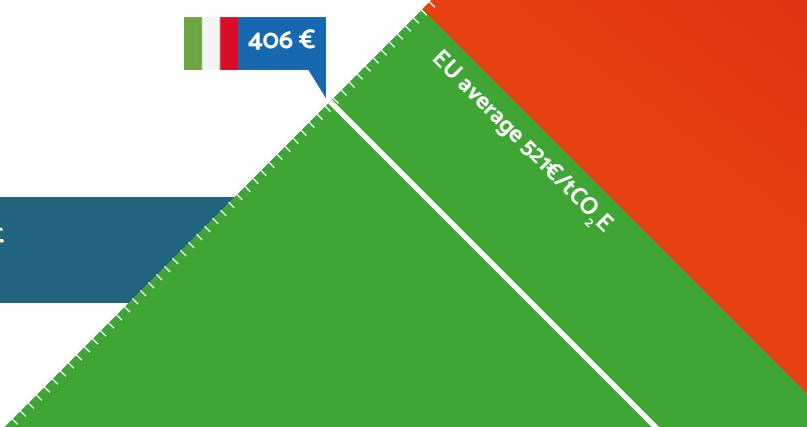
How much transport decarbonisation will cost until 2030?

The impact of additional investments on value added, taxation and jobs are estimated, but this does not amount to a comprehensive assessment of the social cost of transport decarbonisation .

Public consultation carried out?

Not carried out.

Carbon abatement cost estimation



LATVIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Highly inadequate presented transport plan. No trajectory included, let alone shares of RES in transport between 2020 and 2030. Yet transport related GHG emissions are projected to decrease between 2020 and 2030. There is no clear pathway to decarbonise transport presented. There is no meaningful discussion on transport decarbonisation policy between 2020 and 2030. The planned shares of renewable energy sources used in transport between 2020 and 2030 is not included in the draft. Policies and measures to achieve low emission mobility is "To be updated in the final version of the Plan".

Comprehensive technology options?

The draft recites EU regulation laid out in RED II and does not appear to provide much more details on its plans for 2020-2030. Current situation of RES in transport is extensively discussed but no meaningful discussion on plan between 2020 and 2030. Unclear how technologies are considered.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

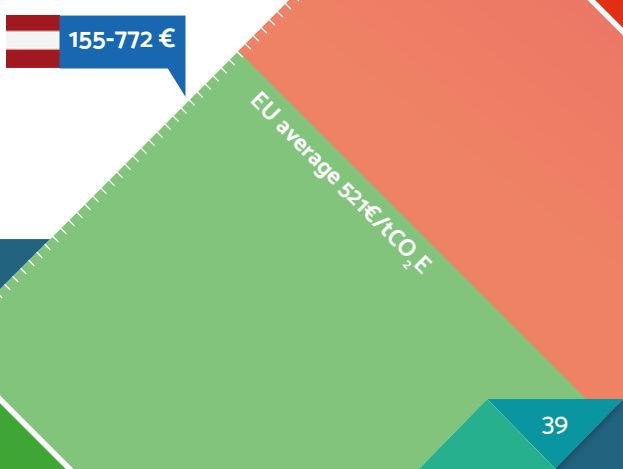
How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

It appears there was some public consultation, but unclear if its outcome was considered.

Carbon abatement cost estimation



LITHUANIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The draft NECP includes a trajectory of how to reach 15% renewable energy use in transport by 2030. The shares between 2020 and 2030 of renewable energy sources are presented in a table, with values for interim years. Policies and measures adopted and under implementation as well as planned provisional measures in the transport sector are also listed in the plan. Yet there is little discussion on the choice of measures and how each measure will contribute to the targets. Most transport related charts and tables are just included and not interpreted. On the plus side the GHG reduction impact of planned transport measures are quatified. However there seems to be a low ambition, as transport GHG emissions are planned to grow in all scenarios between 2020 and 2030 (Fig 3.1.1.1).

Comprehensive technology options?

There seems to be a technology neutral approach to transport decarbonisation policy options. Several technological options, including electromobility and biofuels, are considered. A lack of comprehensive discussion on options, makes it difficult to have a clear view of the government's priorities.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

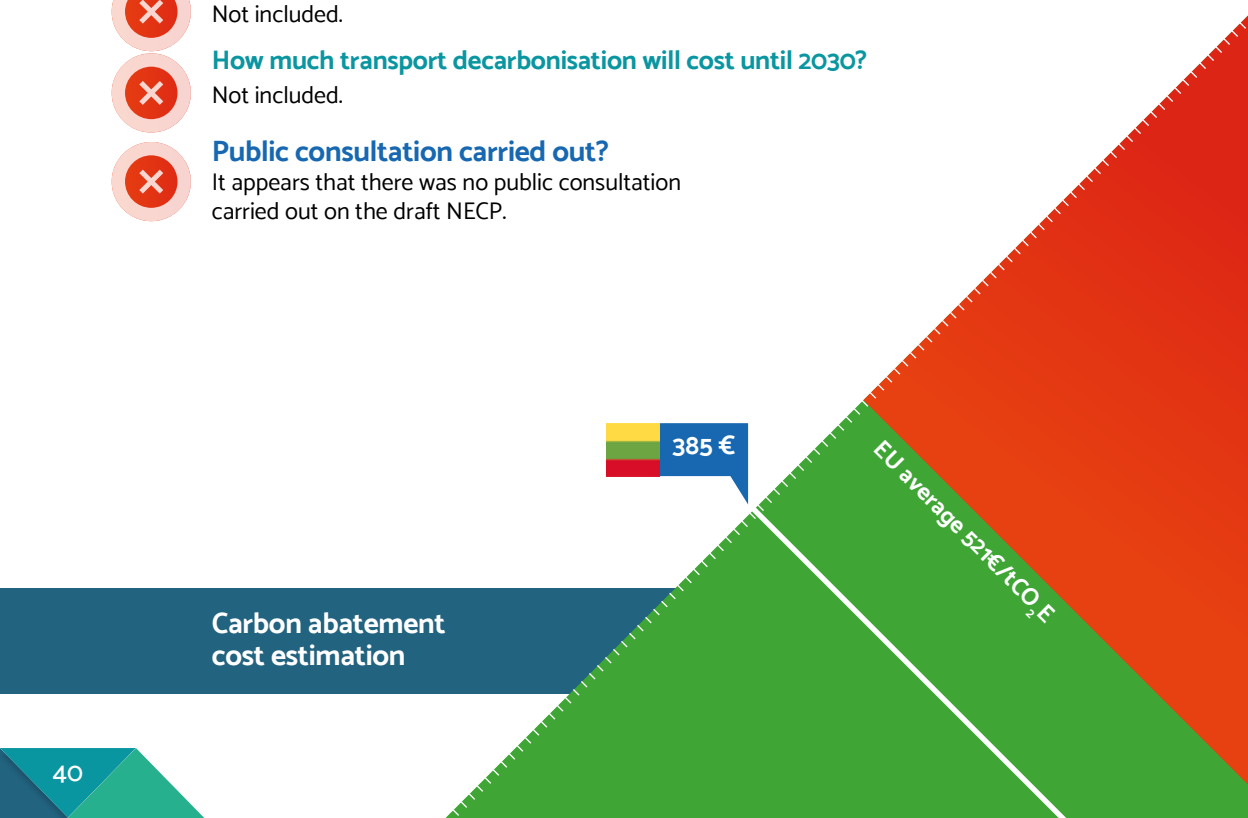
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

It appears that there was no public consultation carried out on the draft NECP.



LUXEMBOURG

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

An insufficient transport decarbonisation plan. In the summary of the draft NECP there is no word on transport decarbonisation. It is unclear what each technological option is expected to play. The planned shares of renewable energy sources used between 2020 and 2030 is not presented. Given the fact that "Around 60 % of the final energy used in Luxembourg will be consumed in the transport sector", there appears to be inadequate attention paid to decarbonise the sector. Ambition seems to be low, transport related GHG emissions are not foreseen to decline between 2020 and 2030 (in fact, increase somewhat). There is no clear pathway presented to decarbonise transport. The draft admits that " The final energy demand in the transport sector, which will see strong growth by 2040, ... is covered almost exclusively by the conventional fossil energy sources".

Comprehensive technology options?

The draft is rather vague on technological options, it is difficult to decipher what role each transport decarbonisation option is planned to play. Electromobility and advanced biofuels appear to be relied on, but their share, let alone other options, are not specified. The plan does not offer comprehensive technology options.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

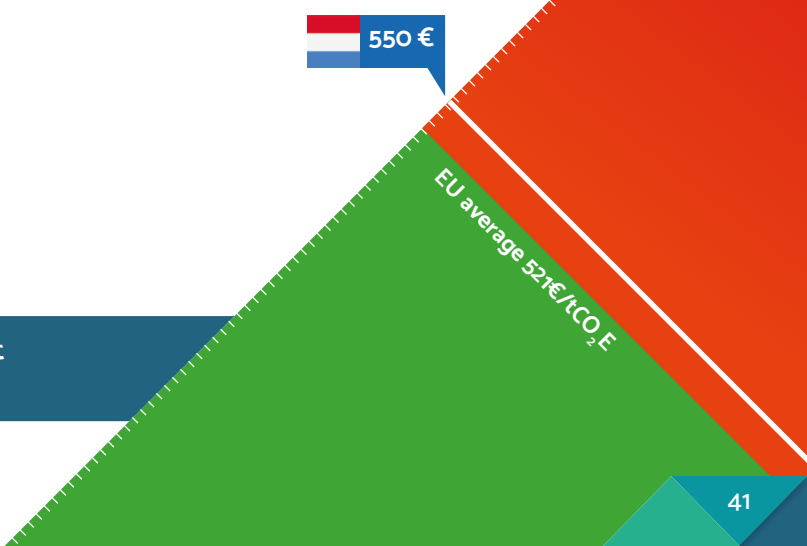
How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

No public consultation for the draft NECP was carried out.

Carbon abatement cost estimation



MALTA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Some trajectory for renewable energy in transport is provided, but the discussion on the pathway is inadequate. The summary of the draft NECP does not even mention tranport despite the fact that "the transport sector is responsible for over half of the energy consumption". No robust plan is presented as to how to decarbonise tranport. It is difficult to decipher what roles each transport decarbonisation options are assigned to play between 2020 and 2030. There appears to be a low level of overall ambition on transport. In short, no clear transport decarbonisation pathway is presented.

Comprehensive technology options?

Several technological options are considered including biofuels, electromobility and CNG/LNP, but the plan does not amount to a coherent transport decarbonisation strategy. Biofuels and electromobility appear to be the main technologies considered, with no real differentiation between advanced and conventional biofuels.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

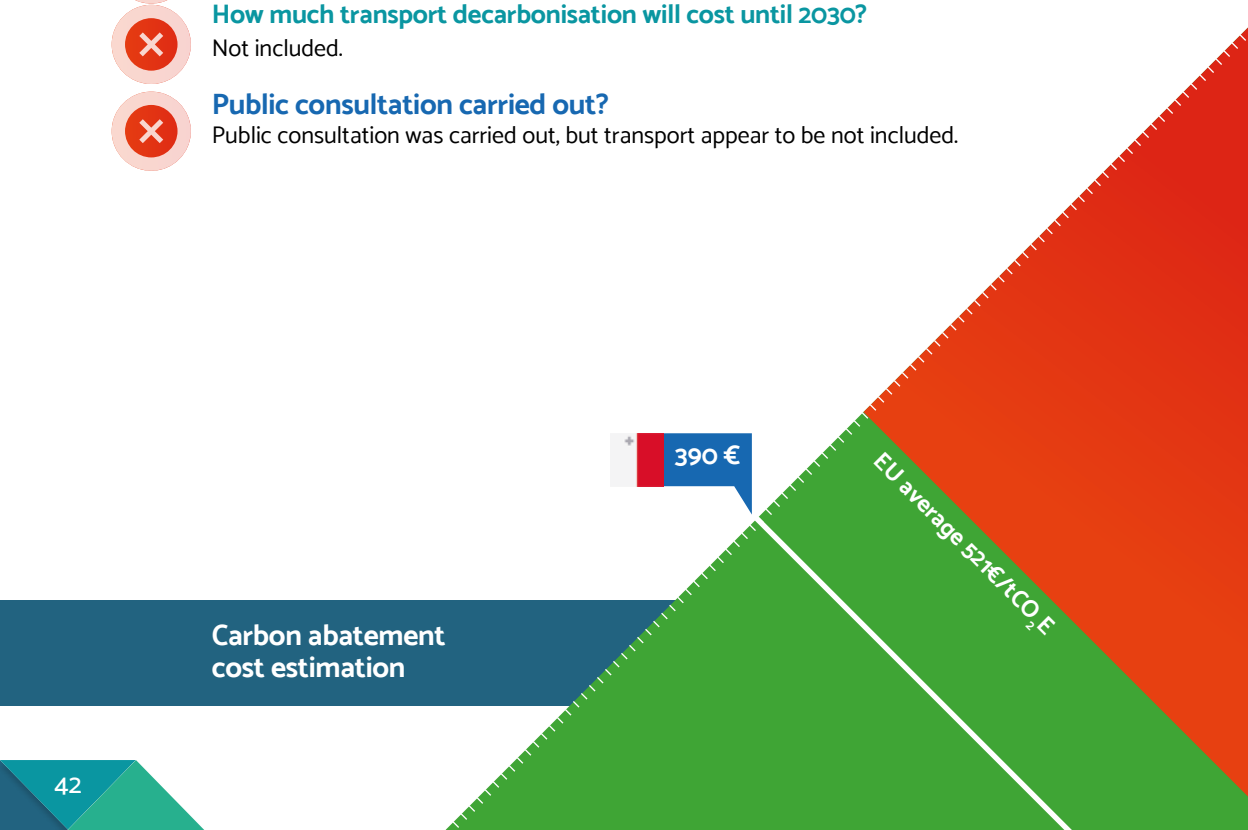
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Public consultation was carried out, but transport appear to be not included.



NETHERLANDS

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Highly inadequate transport plan. No real discussion on transport. The draft admits that "No data are available on the expected share of renewable energy in transport." Lack of details on policies and measures. There is no trajectory for transport decarbonisation until 2030, nor planned shares of renewable energy sources presented. Based on the draft NECP it is unclear how the Netherlands intends to decarbonise its transport sector between 2020 and 2030.

Comprehensive technology options?

There is no comprehensive discussion on available transport decarbonisation technology options, so difficult to assess its quality. Transport policy measures are neglected, including for discussion on electromobility. Electric cars are set as the number one policy and measure to achieve low-emission mobility. Out of 15 mention of the word biofuel, most refer to advanced biofuels. Yet some discussion takes place on a number of technologies, despite the fact that plan seems to be undecided at this stage.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

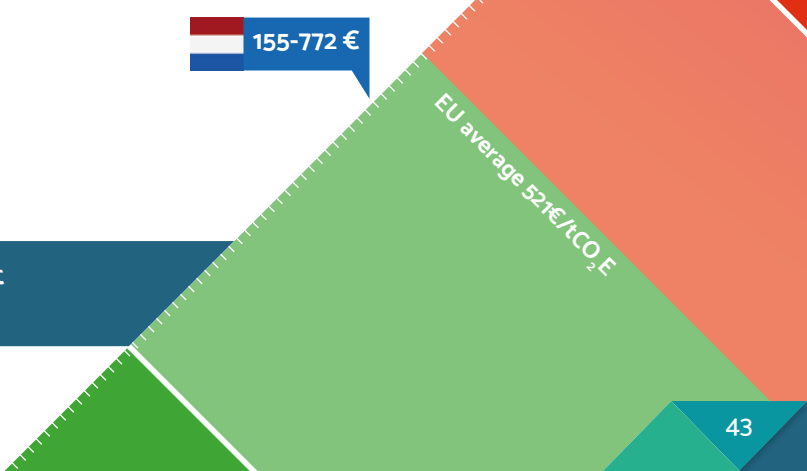
Not included.

How much transport decarbonisation will cost until 2030?

Not included. Some discussion on the costs of fossil fuels are included, but hardly any data.

Public consultation carried out?

The draft NECP states that consultations were undertaken with stakeholders participating in the development and drafting of the Climate Agreement in the sector platforms, including on mobility.



Carbon abatement cost estimation

POLAND

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

There is no clear transport decarbonisation pathway presented. Unclear how Poland aims to decarbonise its transport sector. Transport sector GHG emissions are expected to keep rising in the period of 2020-2030. There seems to be a low ambition. There is no trajectory for transport decarbonisation until 2030, nor are planned shares of renewable energy sources presented.

Comprehensive technology options?

Transport measures are poorly described. Electromobility seems to be in the center of transport measures, CNG and LNG is also mentioned. Hardly any hard figures are presented. The draft does not show a comprehesive approach.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

N/A. Relevant parts of NECP not available in English.

Ranking of transport decarbonisation options based on costs?

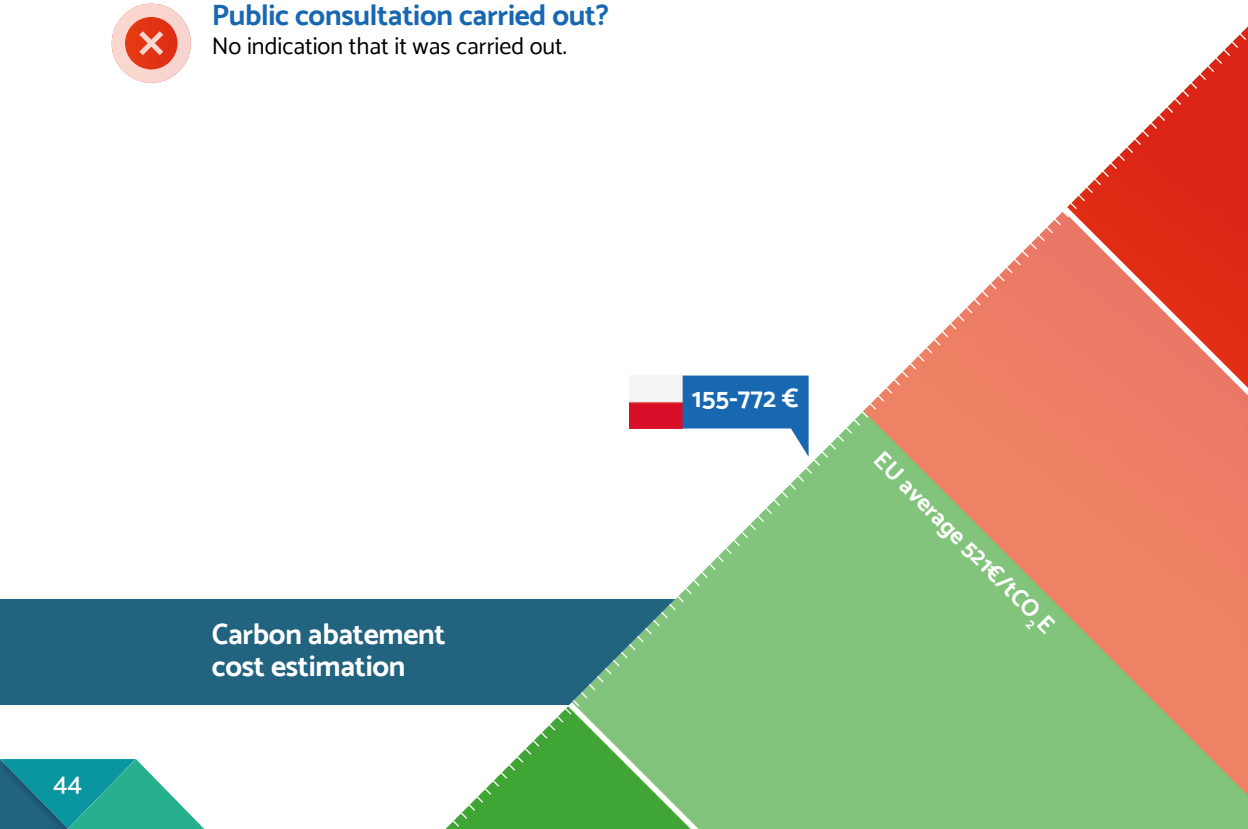
N/A. Relevant parts of NECP not available in English.

How much transport decarbonisation will cost until 2030?

N/A. Relevant parts of NECP not available in English.

Public consultation carried out?

No indication that it was carried out.



Carbon abatement cost estimation

PORTUGAL

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Transport related GHG emissions are planned to halve between 2020 and 2030. All this is supposed to be achieved by electromobility. That is a highly ambitious plan, and the draft does not seem to be sufficiently robust to back it up. No clear pathway is presented. It is not discussed how the proposed measures will decarbonise transport, nor are their individual contribution sufficiently specified. Shares of renewables in transport will be lowest (20%) in 2030 among all sectors, making other sectors such as electricity and heating and cooling having to compensate.

Comprehensive technology options?

The draft appears to be a one-sided transport plan. The increase in demand for mobility will largely be met by more electric transport. The share is planned to grow ten times between 2020 and 2030. Advanced biofuels are planned to be used more. No mention of conventional biofuels. Growth in bioenergy is planned to be used not in transport but in electricity generation. Shares of RES in transport presented in Tables do not include advanced biofuels thereby contradicting statements in the text. Unclear what role each technology is expected to play between 2020 and 2030.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included. The plan aims to "promote energy transition in the transport sector on a cost-effective basis, focussing on electrification, advanced biofuels and hydrogen", but there is no detail presented.

Ranking of transport decarbonisation options based on costs?

Not included.
Cost-effectiveness is dicussed in other sectors, but not in transport.

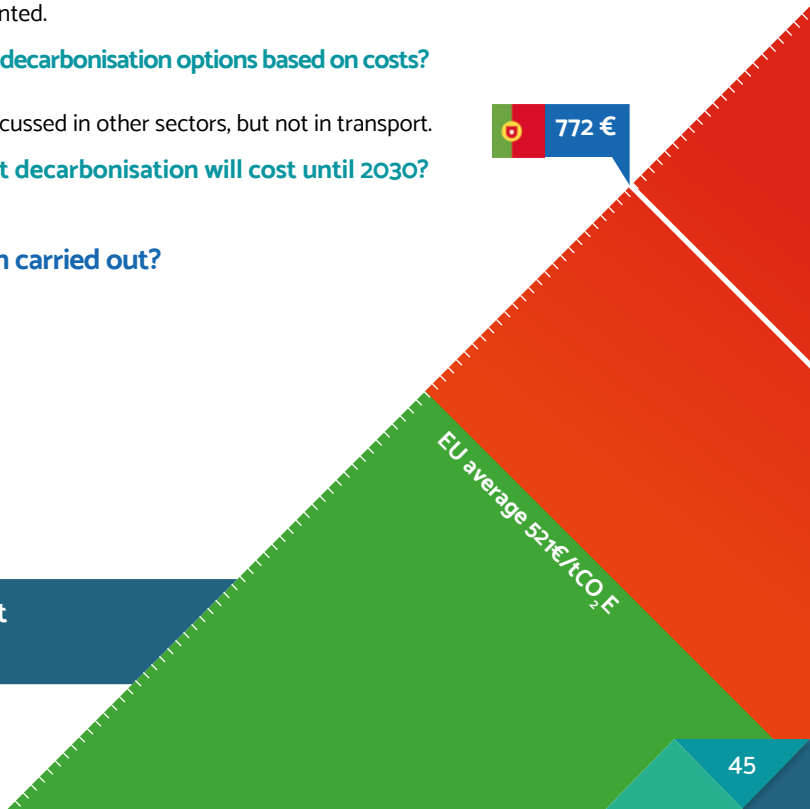
How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Carried out.

Carbon abatement cost estimation



ROMANIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The plan has an ambitious RES-T target, 17.6% by 2030, which is beyond what RED II requires (14%). There is no clear pathway however to decarbonise transport presented. Apparently all the current measures are listed in the draft, in a table of nearly 30 pages of length, yet it offers no discussion, let alone specifics on what the given measure would contribute to transport decarbonisation. It appears to be a collection of current measures repackaged. There is no meaningful discussion on transport measures planned or deemed necessary between 2020 and 2030. No trajectory is included, and a table is presented showing the sources of renewable energy used in Transport between 2020 and 2030, but no discussion is included. Presented values appear to be no more than a result of modelling, not an integral part of the plan.

Comprehensive technology options?

The draft NECP is largely quiet on transport decarbonisation options, so it is difficult to see if it is technological neutral. Based on the only table presented (Table 9), several renewable energy sources are considered, therefore the approach may be comprehensive, only difficult to know.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

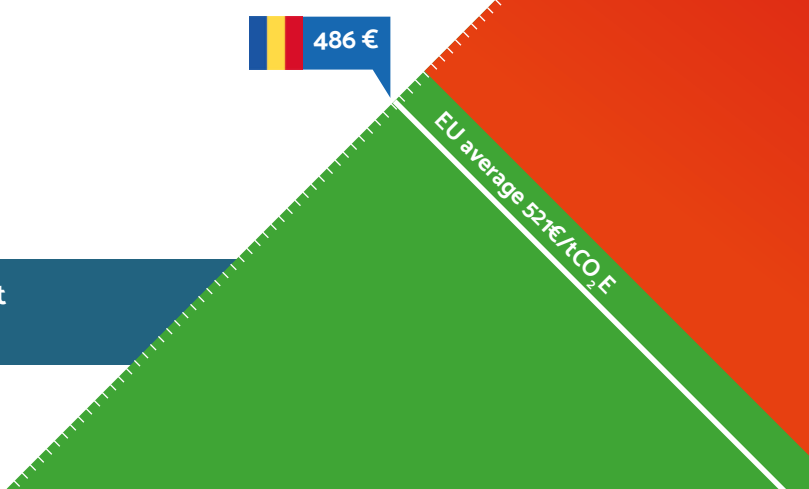
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Although it is difficult to assess based on the limited information provided, apparently, some public consultation took place, and comments are included in the draft NECP.



Carbon abatement cost estimation

SLOVAKIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Unsatisfyingly described plan. Actions and policy measures are poorly listed, discussed. No clear pathway to reach the targets. Existing measures are somewhat presented, hardly any additional measures are described. It is not discussed how the measures will decarbonise transport, nor are their individual contributions presented. A trajectory is presented and shares of renewable energy sources in transport between 2020 and 2030 are presented in a chart, but no discussion or any detail added. There seems to be a lack of ambition in transport.

Comprehensive technology options?

No technology is seemingly prioritised. Electromobility is often mentioned in transport decarbonisation. Conventional biofuels are considered to the degree EU regulation prescribes. Some discussion are offered on several technologies.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

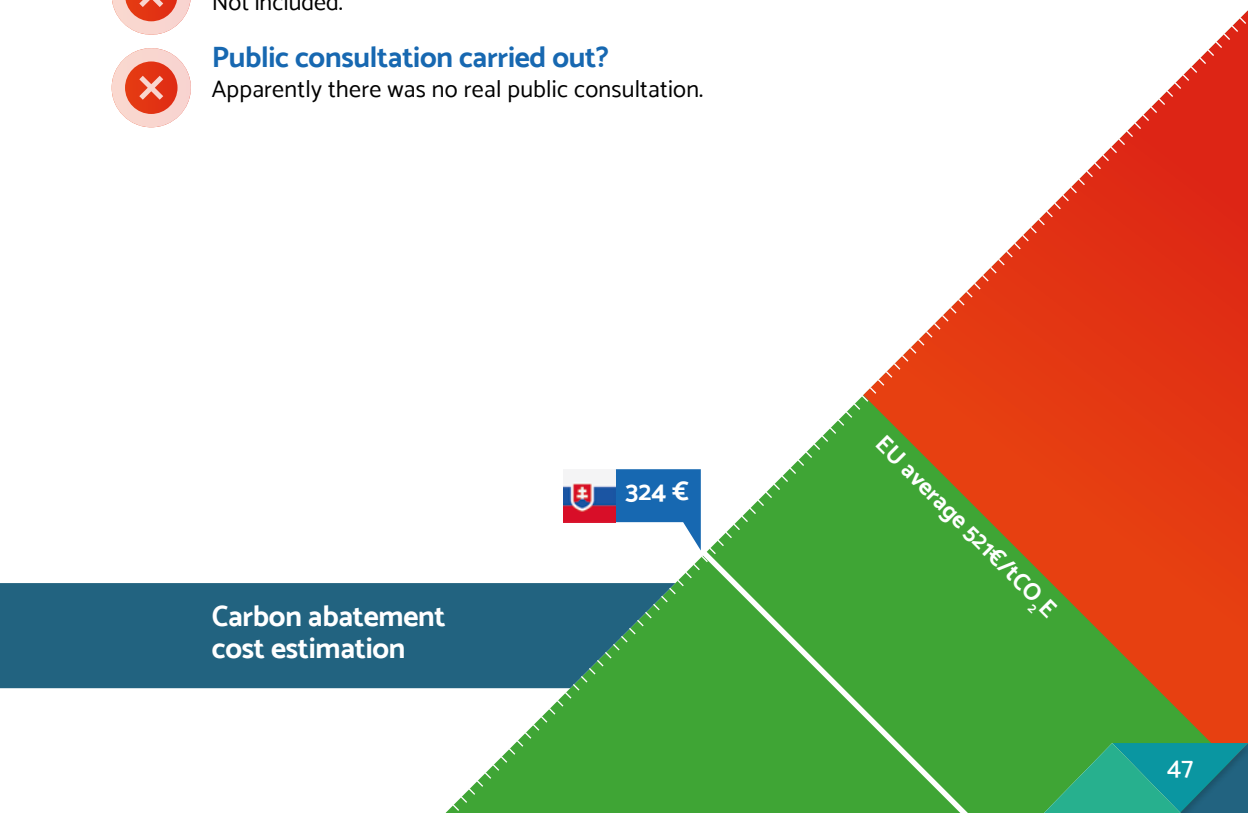
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Apparently there was no real public consultation.



Carbon abatement cost estimation

SLOVENIA

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

There is no clear transport decarbonisation pathway presented. The draft does not say anything about transport decarbonisation in the summary. It appears that the share of renewable energy sources used in transport is expected to remain constant between 2020 and 2030 (10.1%), showing a low level of ambition. A number of existing transport measures are discussed extensively over a good number of pages but extremely low level of detail is provided on plans for the period of 2020-2030. There is no trajectory presented, nor any shares of renewable energy sources planned to be used between 2020 and 2030.

Comprehensive technology options?

The draft follows a comprehensive approach towards transport technology options. It foresees progress between 2020 and 2030 in a variety of technologies including LPG, CNG, hybrid, PHEV, BEV and hydrogen, both for passenger cars and light duty vehicles, as well as buses and heavy duty vehicles. Biodiesel is also considered as low-carbon energy source. A balanced and technological neutral approach is presented.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

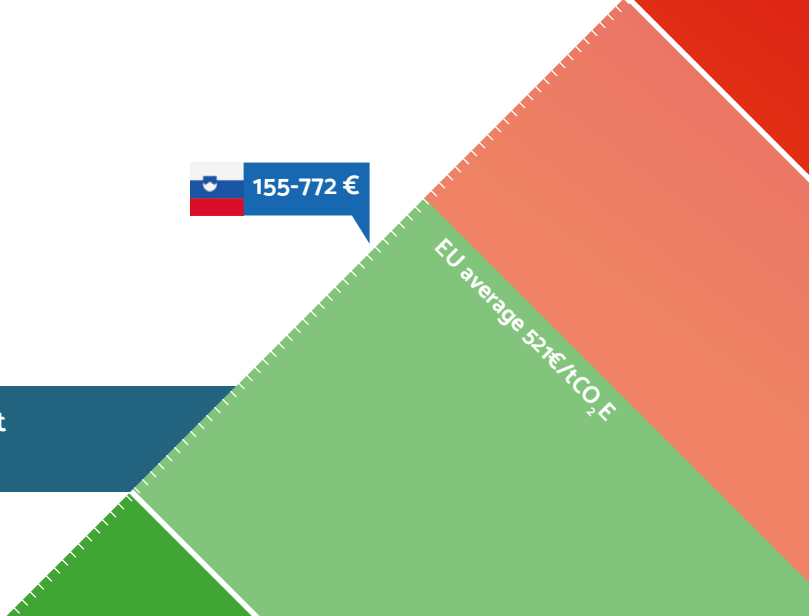
Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

No public consultation took place



Carbon abatement cost estimation

SPAIN

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

The draft seems to be relatively ambitious as by 2030 22 % of renewable energy use is planned to be achieved in transport via electrification and biofuels, above the 14 % required by the EU regulation. The draft states that the electricity generation and transport sectors are responsible for the greatest reduction in greenhouse gas emissions until 2030. The pathway to achieve the planned reduction of 28 Mt CO_2-eq in transport by 2030 centers around modal shift from the conventional combustion vehicle to public transport and electrification of transport (number of electric vehicles planned by 2030: 5 million units, including cars, vans, motorcycles and buses). There is a trajectory provided between 2020 and 2030, and a brake down of contribution to transport decarbonisation of each transport measures planned, for both the baseline and the target scenarios. Furthermore there are long discussions on certain measures, such as advanced biofuels, electromobility or modal shift, however these often go little beyond general ideas, little detail is provided. Energy saving by transport efficiency measures between 2020 and 2030 is estimated and presented. Overall it seems, provided all planned actions will take place and they actually result in GHG reduction as planned, the transport part of the draft NECP may deliver transport decarbonisation by 2030.

Comprehensive technology options?

Several technological options are considered, with electrification of transport and advanced biofuels being in the center. Soft measures, such as modal shift and demand side management are envisaged to play a key role. There is no meaningful discussion however on other key measures, such as conventional biofuels, biogas or CNG, LPG. It seems priority is given to certain technologies, but the prioritisation is not justified, no underlying rationale is provided.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

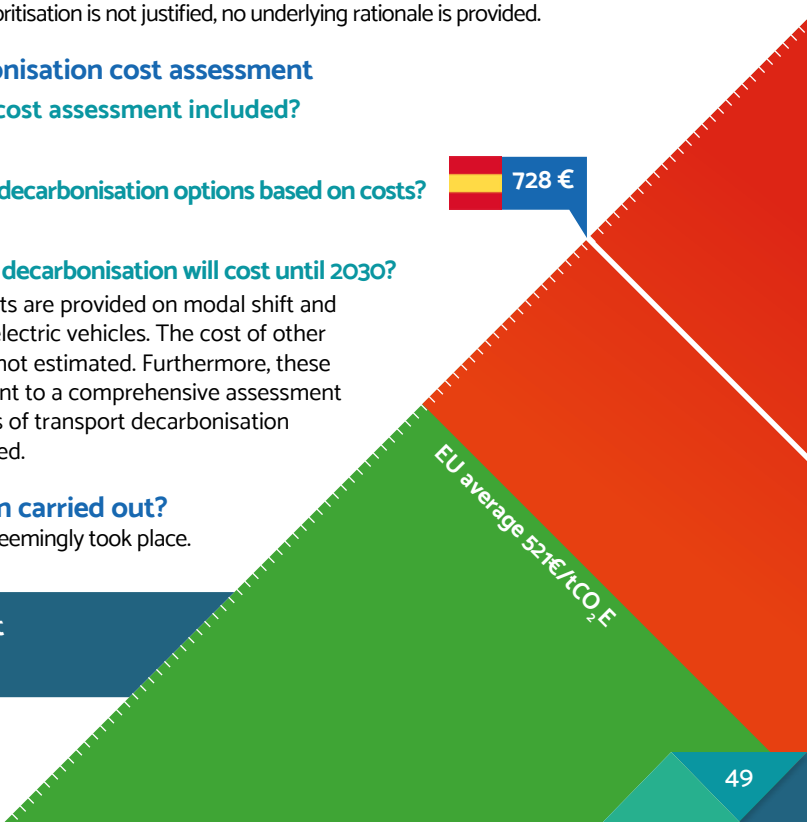
How much transport decarbonisation will cost until 2030?

Some estimates on costs are provided on modal shift and measures to promote electric vehicles. The cost of other measures planned are not estimated. Furthermore, these estimates do not amount to a comprehensive assessment of the cost to taxpayers of transport decarbonisation per CO_2 emission avoided.

Public consultation carried out?

No public consultation seemingly took place.

Carbon abatement cost estimation



SWEDEN

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Compared to other sectors, transport occupies a significant part of the draft NECP. Ambitious objective to decarbonise transport: Reduction of - 70 percent of emissions from domestic transport by 2030 (base year 2010). Also, there is an ambitious 50% share target of renewable energy in gross final energy consumption in 2020. A comprehensive set of transport decarbonisation measures discussed. Yet no analysis offered how each of the elements will deliver. Beyond an overall picture, no clear pathway offered. Apart from a seemigly inconsistent chart (ambition presented in Figure 16 does not match transport targets discussed) no credible trajectory on transport decarbonisation between 2020 and 2030 is presented, nor are shares of renewable energy sources are sufficiently detailed. RES in transport is projected to grow significantly before 2020, and the period between 2020 and 2030 lacks ambition.

Comprehensive technology options?

Several technological options are discussed, mostly in a technology neutral manner. It is increased use of HVO that contributes most to the increased share of renewables in transport by 2030. Ethanol is projected to decline, FAME and biogas stagnate. The plan seems to project realistic growth in elecromobility. Seemingly not much growth in transport RES between 2020 and 2030 is planned to take place, all the growth appears to come from electromobility.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

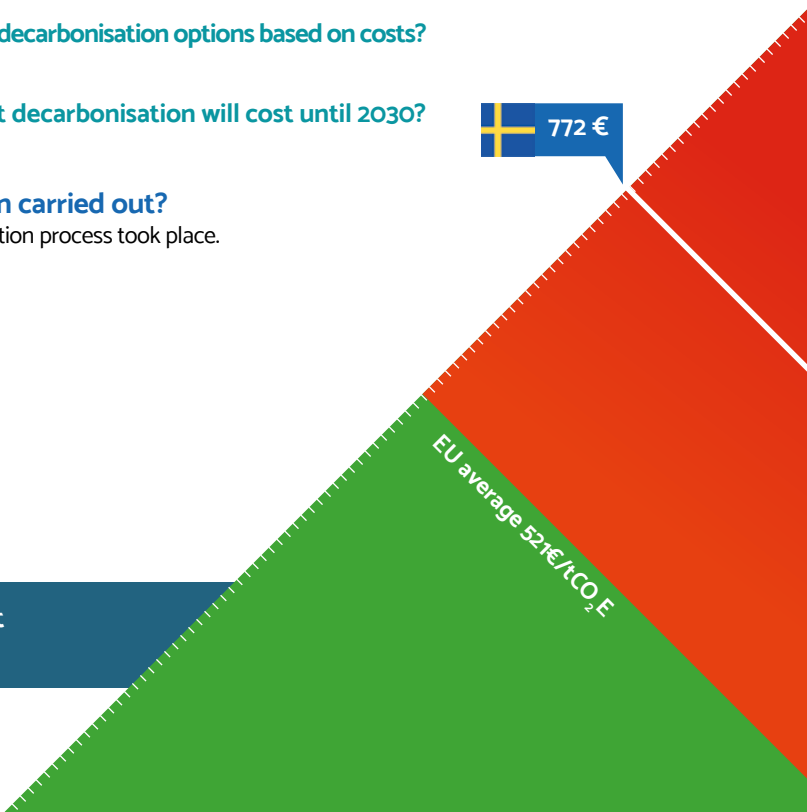
Not included.

How much transport decarbonisation will cost until 2030?

Not included in draft.

Public consultation carried out?

A robust public consultation process took place.



Carbon abatement cost estimation

UNITED KINGDOM

Efficacy of transport decarbonisation policy

Clear and coherent transport pathway presented?

Despite the fact that "The UK Government recognises that transport is one of the key areas where we must step up the pace of progress in reducing emissions", little detail is presented on how to decarbonise UK transport sector between 2020 and 2030. Existing and implemented transport policies are presented and detailed, some of them (i.e. RTFO) with a time horizon until 2032, but no meaningful transport plan is sketched out for the period between 2020 and 2030. No projection for transport decarbonisation beyond 2020 is presented. No data or discussion on the shares of renewable energy use in transport between 2020 and 2030 is included. Transport related emissions are projected to decrease somewhat between 2020 and 2030 (by 7.3 $MtCO_2e$). Overall, the draft does not present a credible and clear transport decardonisation pathway.

Comprehensive technology options?

The draft appears to rely on a few transport technologies, such as electromobility and advanced biofuels, while others, such as conventional biofuels, biogas or others, are neglected or ruled out. Little underlying justification is offered, and no analysis is provided to back up the priorities. Some discussion are offered on prioritised technologies, especially on electromobility, but these do not reflect a comprehensive approach.

Transport decarbonisation cost assessment

Carbon abatement cost assessment included?

Not included.

Ranking of transport decarbonisation options based on costs?

Not included.

How much transport decarbonisation will cost until 2030?

Not included.

Public consultation carried out?

Despite the fact that the draft claims that "The UK Government has conducted a number of public consultations", no evidence is provided that public consultation took place on the draft NECP, let alone on its transport part.

Carbon abatement cost estimation