

Roadmap for fossil-free transport

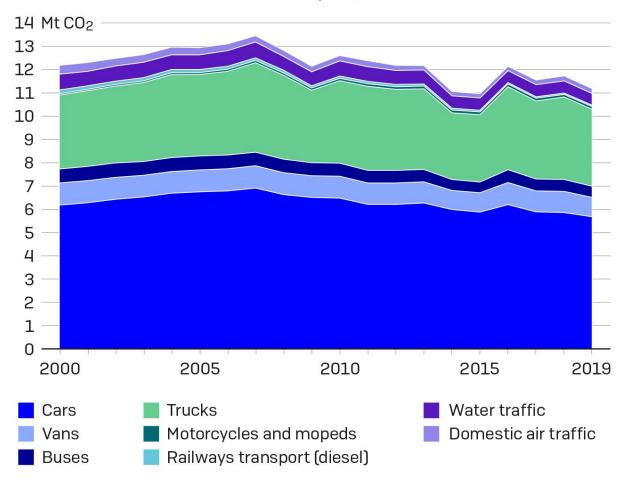
Draft for a Government Resolution 15.1.2021



Greenhouse gas emissions from transport

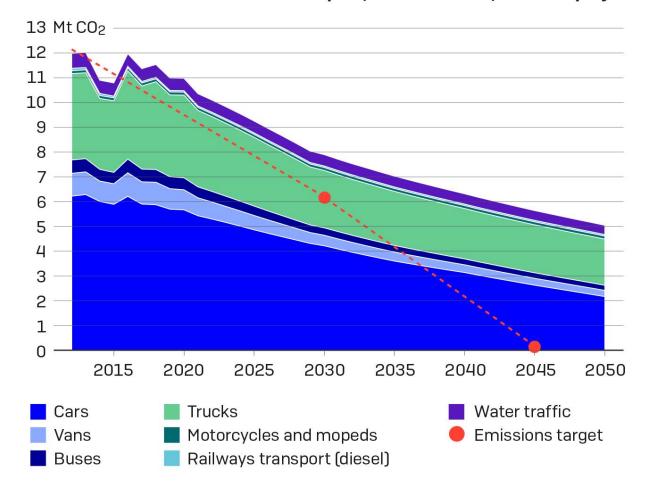
- Emissions from traffic account for about one-fifth of all greenhouse gas emissions in Finland.
- In 2019, greenhouse gas emissions from Finland's domestic transport totalled about 11.1 million tonnes. Road transport accounts for about 94% of emissions from transport.
- Of emissions from road transport, passenger cars account for 54%, vans and trucks for 41% and buses for less than 5%
- On the whole, greenhouse gas emissions from transport have decreased since 2008, but not at a sufficient pace to meet the targets.

CO₂ emissions from domestic transport, million tonnes



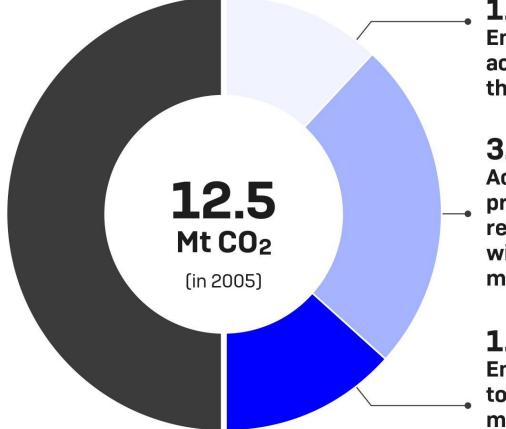
Baseline projection of greenhouse gas emissions from transport

- With the current measures, CO2 emissions from road transport are expected to decrease by about 37% by 2030 compared to 2005.
- The impact assessment of the roadmap has been prepared on the basis of the baseline projection which means that halving emissions from road transport requires a further emissions reduction of 13 percentage points, or about 1.65 million tonnes by 2030.
- The baseline projection, completed in April 2020, does not take into account changes in transport performance or car sales caused by the COVID-19 pandemic. The calculations for the early 2020s may therefore have some inaccuracies.



CO₂ emissions from domestic transport, million tonnes, baseline projection

Transport emissions must be halved by 2030



1.5 Mt CO₂ Emissions reduction achieved by 2019 with the current measures

3.1 Mt CO₂ According to the baseline projection, emissions reduction to be achieved with the current measures

1.65 Mt CO₂ Emissions reduction to be sought with new measures

Preparations for the Roadmap for fossil-free transport

- In accordance with the Government programme, Finland will be carbon neutral in 2035.
 Transport must also meet this objective.
 - In accordance with the Government programme, Finland will halve the greenhouse gas emissions of domestic transport by 2030 from the level in 2005.
 - Based on the scenario reviews carried out in 2018 and 2019, greenhouse gas emissions from transport should be eliminated completely by 2045.
- The key principles in all of the preparatory work have been social and regional fairness and knowledge-based decision-making.

- Impact assessments of individual measures, commissioned by the Ministry of Transport and Communications from the Finnish Transport and Communications Agency Traficom, VTT Technical Research Centre of Finland and Aalto University, were published on 6 October 2020.
- The term of the Working group for fossil-free transport extended from 1 November 2019 to 30 October 2020. The Working group's final report encompassing all transport modes and including recommendations was issued on 27 October 2020.
- The preparation of the Roadmap, which mainly affects road transport, was continued on the basis of the final report and impact assessments.
- Separate draft Resolutions have been prepared for air traffic and water traffic.

Measures to reduce transport emissions

1.65 Mt CO₂

Source: Road map for fossil-free transport

Supports and incentives at least 0.62 Mt CO2

Replacement of fossil fuels at least 0.39 Mt

- Expanding the scope of the distribution obligation legislation and raising the target level
- Distribution infrastructure support for public charging and refuelling stations
- Charging infrastructure support for housing companies and workplaces
- Service station charging points
- Joint use of charging services and roaming
- Electric road pilots

Renewal of the car fleet at least 0.16 Mt

- Updating manufacturer-specific binding CO₂-limit
- Purchase support for electric cars
- Purchase support for vans
- · Purchase support for heavy-duty vehicles
- Scrapping premium campaigns
- Conversion subsidies for ethanol and gas cars
- · Procurement of clean vehicles in the public sector
- · Research on clean vehicles

Improving the efficiency of the transport system at least 0.07 Mt

- Investment programme on walking and cycling
- Support for public transport
- Support for mobility management
- Promotion of combined transport
- Heavy vehicles in road transport

Other possible measures 📕

EU-level measures, transport emissions trading, transport tax model based on vehicle kilometres and road categories

> Potential means and the realisation of measures to be decided in other connections affect whether additional measures are needed.

Various emission reduction potentials

Teleworking
 Logistics digitalisation
 New transport services
 Distribution obligation
 Electric fuels

Measures to be decided in other connections

Solutions of cities
 Transport system plans
 Transport taxation reform
 Transport network maintenance and development

The Roadmap for fossil-free transport will be implemented in three different phases

Phase 1:

Promote zero-emission transport through various supports and incentives.

Decisions on these will be made in early 2021.

These measures would reduce carbon dioxide emissions by an estimated 0.6 megatonnes.

Phase 2:

Assessment of the ways in which more data on the effects of emissions are needed before decision-making.

Consideration of the potential of logistics digitalisation and route maintenance

Impact assessments to be completed, at the latest, by autumn 2021:

- Increasing the distribution obligation 34% higher
- Conditions for increasing telework
 and impact assessment
- Specification of transport digital solutions and their impact assessment
- · Other means that arise to be verified

Phase 3:

The last phase is conditional.

In the autumn of 2021, the Government will assess whether the decisions made at EU level and the means of the Roadmap's phases 1 and 2 are sufficient to meet the objectives. If it seems that the target will not be achieved, the Government would take decisions on other necessary measures.

The preparation of various measures, such as national emissions trading for fossil fuels and a transport tax model based on vehicle kilometres and road categories will continue.

Phase 1 Measures to support a fair transition



MEASURES 1–6

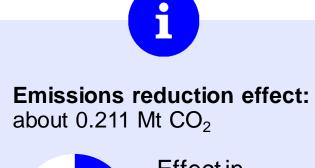
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Replace fossil fuels with alternative transport fuels



1. Inclusion of biogas and electrofuels in the distribution obligation and raising the distribution obligation of biofuels to 34%

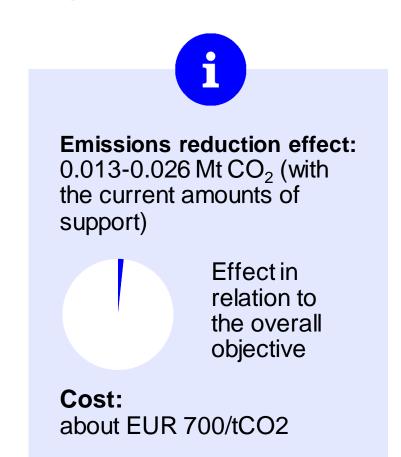
- Under current legislation, the share of transport biofuels in liquid road transport fuels will be increased to 30% by 2030.
- Distribution obligation legislation currently includes liquid fuels used in road transport (petrol and diesel) and their substitute biofuels (ethanol, biodiesel and renewable diesel).
- → Inclusion of sustainably produced biogas and electric fuels in the distribution obligation. Raise the distribution obligation to 34% in 2030 (estimated at 2.5 TWh).
- In this case, the increasing use of biogas would not reduce the emissions reductions achieved with liquid biofuels.
- No direct costs to the central government; may raise fuel prices.



Effect in relation to the overall objective

2. Continue and increase support to public distribution infrastructure for transport electricity and gas

- Increasing the use of alternative transport fuels requires a nationwide public electric car charging network and gas refuelling infrastructure.
- Support is needed until the mid-2020s.
- → EUR 8.5 million per year in support for car charging infrastructure will be reserved during 2022–2025, in total EUR 34 million.
- \rightarrow EUR 5 million per year in support for refuelling stations for gas vehicles will be reserved in 2022–2025, in total EUR 20 million.
- The distribution of support will take into account the regional coverage of the distribution infrastructure.
- Cost to the central government: EUR 54 million in 2022–2025

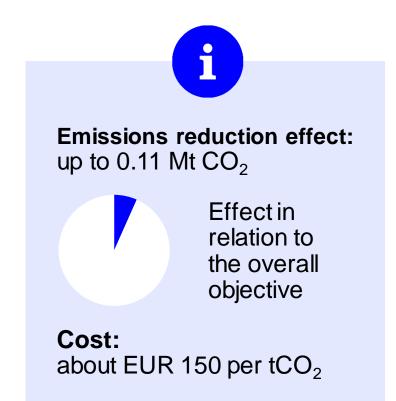


3. Continue and increase support for private charging infrastructure

• Electric cars are mainly charged at home and at work. In particular, the lack of home charging has been identified as a bottleneck.

→ At least EUR 8.5 million per year will be reserved in 2021–2023, in total EUR 34.5. The amount now reserved for 2020–2021 is EUR 12.5 million, so the additional need is EUR 21.5 million.

- → EUR 1.5 million per year will be reserved for the construction of charging infrastructure at work in 2021–2030. Support may be granted if the number of charging opportunities to be built exceeds the minimum obligations under energy efficiency legislation.
- Cost to the central government: about EUR 30 million in 2021–2023 and at least EUR 70 million in 2024–2030



4. Assess possible ways of implementing the obligation concerning charging points in service station chains

 \rightarrow Assess possible ways of implementing the obligation to be prescribed for service station chains to provide a certain number of charging points for electric cars at service stations.

• The obligation would give users of electric vehicles added certainty about the development of the public charging network and the accessibility of charging opportunities in different parts of Finland.

• The objective has already been partially achieved by a law prepared by the Ministry of the Environment on charging points and charging point capacities for electric vehicles in buildings.

• The assessment takes into account the relation to other legislation, the appropriateness of regulation, the climatic and economic effects of the obligation, and the effects of the obligation on business freedom and the protection of property.

Emissions reduction effect:

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to be assessed later, when the way of implementing the obligation is clear.

Cost:

to be assessed later, when the way of implementing the obligation is clear.

5. Promote the fair and non-discriminatory sharing of charging services and roaming

- The EU Directive on the deployment of alternative fuels infrastructure regulates the technical requirements for charging points for electric cars and the information to be provided to consumers.
- An amendment to the Directive will be proposed in summer 2021.
- In connection with the reform, the functionality of the charging service market must be promoted:
 - An easy-to-use public charging network for consumers in Finland and the EU
 - Easy and non-discriminatory one-time charging and payment

 \rightarrow Exert influence during preparation of the Directive on the cross-border availability of services and ease of use

Emissions reduction effect:

1

to be assessed later, when a proposal on reform of the Directive is presented.

Cost impact:

to be assessed later, when a proposal on reform of the Directive is presented.

6. Launch the first pilot projects to study the suitability of electric roads in Finland

- On an electrified road, vehicles receive the electricity required for mobility from the road network and can charge their batteries as they go.
- Electric roads can be used to promote the transition of heavy equipment, in particular.

→ Pilot projects will be launched in 2021 to study the suitability of electric roads in Finland

Emissions reduction effect:

to be assessed later, when the project plan is completed.

1

Cost impact: Electrification of an existing road costs about EUR 1 million per km. In order to gain the necessary amount of experience and results from the project, the test road must be long enough, at least about 20 km. The costs of a pilot described in the example rise to at least EUR 20–25 million.

MEASURES 7–14

Renewal of the car fleet





7. Influence the preparation of CO₂ limit values for EU passenger cars and vans

- Under the Regulation setting the binding CO₂ limit for passenger car and van manufacturers, the average CO₂ emissions of new passenger cars registered in the EU must be 37.5% lower in 2030 than in 2021. A new proposal on limit values is expected in summer 2021.
- The current measurement method under the EU Regulation on passenger car and van manufacturer-specific binding CO₂ limit does not take into account the fossil nature or renewable nature of the fuel used by the vehicle.

\rightarrow Influence the preparation of CO₂ limit values for EU passenger cars and vans so that:

- By 2030, CO₂ limits for cars would be clearly tightened from the current 37.5%
- the limit values would take gas-fuelled cars and vans into account as their own entity

Emissions reduction effect: 0.106 Mt CO_2 (if CO_2 emissions from new cars would be 40% lower in 2030 than in 2021)

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Effect in relation to the overall objective

Cost impact:

No direct costs to the central government

8. Continue the current purchase support for all-electric cars and increase the support amount

- The purchase prices of electric cars are expected to fall and reach the purchase price level of internal combustion cars in the mid-2020s.
- Until then, support measures are needed to increase the fleet of electric cars and, in particular, to make all-electric cars more common.
- \rightarrow Reserve EUR 6 million per year for purchase support to all-electric cars in 2022-2025.
- The support amount also includes the continuation of supports for ethanol and gas conversion.

Emissions reduction effect: about 0.0004-0.004 Mt CO ₂
Effect in relation to the overall objective
Cost: EUR 2700–10,000 per tCO2_depending_on the

 $\leq,$ upper luing amount of support per car

9. Continue the present conversion supports to convert an old petrol car to ethanol or gas

- In the conversion, an old gasoline or diesel fuelled car is converted to an ethanol or gas fuelled car.
- Promote the social fairness of the transition.
- The gas conversion support is EUR 1000 and the ethanol conversion support EUR 200.
- \rightarrow Continue supports with the existing support amounts and the same criteria until 2030.

\rightarrow Enable application of the gas conversion support also to vans.

• Funding as part of a package of purchase and conversion supports EUR 6 million per year (measure 8). The estimated share of conversion supports is less than EUR 1 million per year.

Emissions reduction effect:

1

modest, but supports promote a fair transition towards lower-emission transport

Cost impact:

a total of EUR 24 million in 2022–2025

10. Carry out a scrapping premium campaign or campaigns

• In a scrapping premium campaign, the scrapper of an old car receives a scrapping premium toward the purchase a new car.

\rightarrow Repeat scrapping premium campaigns from time to time.

- According to the Act on scrapping fees, which entered into force at the end of 2020, a scrapping fee is granted to a physical person for replacing an old car to be scrapped with a new car, an electric bicycle, a season ticket for public transport or integrated mobility services including the right to travel on public transport.
- Ensure that the criteria for supported cars correspond as closely as possible to the changing situation on the car market.
- Cost to the central government: about EUR 8 million per campaign

Emissions reduction effect: about $0.005 \text{ Mt CO}_2 \text{ per}$ campaign

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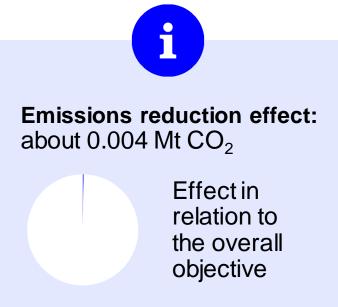
Cost: about EUR 1900 per tCO₂

11. Introduce new purchase support for electric and gas fuelled vans

• Most vans used in transport are diesel fuelled, and the share of alternative transport fuels is small.

 \rightarrow Introduce purchase support for vans, for the purchase or long-term rental of electric and gas fuelled vans.

- The support would be granted to private persons.
- A total of EUR 6 million will be reserved for support in 2021–2024.



Cost: about EUR 1500 per tCO₂

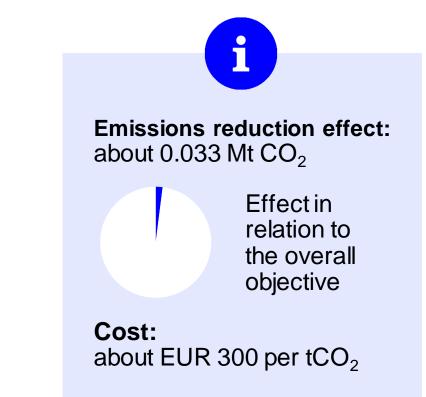
12. New purchase support for electric trucks, extension of purchase support for gas fuelled trucks

• Purchase support is used to encourage the transition of heavy-duty vehicles towards alternative transport fuels. The share of alternative transport fuels out of the number of heavy-duty vehicles is small.

 \rightarrow Introduce purchase support for electric trucks in 2021–2030.

 \rightarrow Continue purchase support for gas fuelled trucks until 2030.

• An appropriation of EUR 10 million per year will be reserved for support, or a total of EUR 100 million in 2021–2030.



13. Pursue implementation of the Clean Vehicles Directive in Finland with determination

- The Revised Clean Vehicles Directive, adopted in 2019, advances the share of clean and energy-efficient vehicles in the vehicles and transport services procured in the public sector.
- Finland's objective for the cleanness of procurement in 2025 (2030):
 - Purchases of passenger cars and vans: 38.5% clean (38.5%)
 - Bus purchases: 41% clean (59%)
 - Truck purchases: 9% clean (15%)
- National implementation of the Directive will begin at the start of 2021.
- National implementation will take into account regional specificities, the economic situation of local governments and differences in the length of transports.

 \rightarrow Ensure that information reaches all contracting units and that, if necessary, guidance on procurement is also available.

Emissions reduction effect: calculated as part of the

1

baseline projection

Cost: not assessed

14 Launch an extensive research programme on vehicles and alternative transport fuels

- A research programme on alternative transport fuels will be launched. It will investigate, among others, the following:
 - Issues related to charging electric cars, increasing kerbside charging and payment practices for charging
 - Issues related to charging systems for buses and trucks
 - Issues related to the production, development and use of biofuels and electric fuels
- Funding of EUR 1 million per year will be reserved for the research programme, or a total of EUR 5 million in 2021–2025.



MEASURES 15–19

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15.4.2021

Improve the efficiency of the transport system



15. Continue the investment programme on walking and cycling and improve walking and cycling conditions

- High-quality walking and cycling infrastructure is one of the most important ways to influence the choice of the transport mode and increase the volume of walking and cycling traffic.
- Through the investment programme on walking and cycling, investments are made in municipal walking and cycling projects. The precondition for funding is that local governments use a corresponding sum to finance the projects.

→ EUR 30 million of funding will be directed to projects annually in 2021–2030. EUR 10 million per year will be reserved for improving the cycling infrastructure of highways and transport hubs in 2021–2030. **Emissions reduction effect:** 0.004-0.015 million t CO_2 in 2030

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Cost:

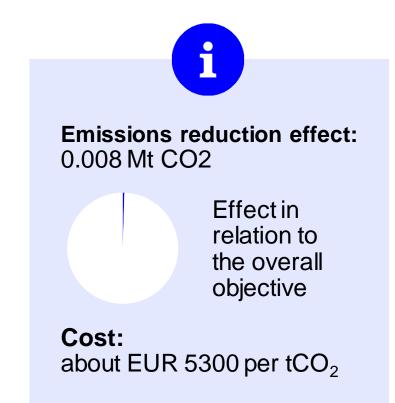
about EUR 2000 per t CO₂ (the public health benefits, however, should also be noted)

16. Increase the level of the government grants for public transport in large and medium-sized urban areas

- Increasing the amount of public transport supports make it possible to prepare for increased numbers of passengers.
- Public transport supports assist a fair transition towards lower-emission transport.

\rightarrow Public transport support for large and medium-sized urban areas will be doubled in 2021–2024.

- In 2020, public transport support in large urban areas came to EUR 13.25 million, and public transport support for medium-sized cities in 2020 was EUR 8.125 million.
- Additional funds of EUR 21.375 million per year will be reserved for the support in 2021–2024, or a total of EUR 85.5 million in additional funds.
- Support levels after 2024 will be decided as part of the Transport 12 work.



17. Increase the level of the government grant for mobility guidance

- The transition of people towards sustainable transport can be made easier through, among others, advice, marketing, mobility planning, and the coordination and development of services.
- The support is aimed at local governments and non-profit organisations.
- EUR 0.6–0.9 million per year is currently spent on government grants reserved for mobility guidance.

 \rightarrow Increase the appropriation for mobility guidance to EUR 2.5 million per year in 2021–2030.

1 **Emissions reduction effect:** 0.0005 Mt CO₂ Effectin relation to the overall objective Cost: about EUR 5000 per tCO₂

18. Determine measures for restarting combined transport in Finland

- Combined transport means transport consisting of the trunk haul by rail, ship or aircraft and the clearly shorter collection or distribution of goods by road.
- Combined transport is an effective way to reduce CO₂ emissions from goods transport.

\rightarrow A project will be launched to identify the reasons why demand for combined transport is weak and the measures needed to relaunch combined transport.

• The project will examine implementation methods and transport units that would be suitable for the needs of Finnish businesses.

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Emissions reduction effect:

to be assessed later, when the study is completed

Cost:

to be assessed later, when the study is completed

19. Full use of the large lengths and masses for road transports permitted by law in Finland

- The energy efficiency and, at the same time, the cost efficiency of heavy-duty equipment can be enhanced by increasing the size of transports. Driving with large combinations and full loads yields the best result in terms of energy efficiency.
- In 2019, a Government Decree entered into force, based on which the maximum permissible length of vehicle combinations in road traffic increased from 25.25 to 34.50 metres. The maximum permissible mass of 76 tonnes remained unchanged. In addition, new types of vehicle combinations that differ from those previously permitted may be used on the road.

\rightarrow Use of these lengths and masses in road transport as effectively as possible.

Emissions reduction effect: about 0.06 Mt.

1

Cost impact:

to be assessed as part of the Transport 12 plan

Phase 2 Additional means to achieve transport emissions reduction targets



20. Increase the distribution obligation

Under existing legislation, the share of biofuels for transport out of liquid fuels for road transport will be increased to 30% by 2030 (distribution obligation legislation).

The distribution obligation legislation is currently being amended to include biogas and electric fuels.

In Phase 1, it is proposed that the obligation for 2030 be raised to 34%, i.e. the obligation would increase by the same amount as biogas is thought to be available to transport in that same year.

→ By autumn 2021, it will be assessed whether raising the distribution obligation higher than the proposed 34% is possible if the availability of biodiesel and biogas in domestic sustainable production is strengthened and if investments in industrial-scale production of electric fuels make this possible.

21. Enable the digitalisation of transport and the development of new services and trip chains

- Access to information and the interoperability of information systems, as well as the widespread utilisation of digitalisation, are pivotal to sustainable trip chains and customer-oriented services.
- Shared resources, such as car sharing and new transport services (Mobility as a Service, MaaS) significantly increase the range of options for sustainable mobility and have considerable emissions reduction potential.
- The climate impacts depend on adoption of the solutions and the ways they are implemented.
- The measures will be specified as part of the preparation and implementation of the Transport 12 plan. The sustainable growth programme in the transport sector promotes the growth of investments in the sector.

→ Assess the realistic emissions reduction effects of new transport services, and identify and implement measures through which the central government can promote the servicification of transport.

22. Promote teleworking

- Teleworking can have significant emissions reduction potential if it reduces the number of car trips.
- After the onset of the COVID-19 pandemic in spring 2020, the number of people teleworking in Finland increased significantly and transport performances decreased.
- However, not all of the reduction in transport was the result of an increase in teleworking; it was also accompanied by restrictions on movement in exceptional circumstances, a reduction in hobbies and travel, layoffs and a rise in unemployment.
- According to an estimate prepared by Traficom in autumn 2020, commuter traffic decreased by about 7% in 2020 as a result of teleworking, which means that the emissions reduction from teleworking could be estimated at about 0.95 Mt CO₂.

→ The impact of teleworking on transport emissions will be investigated in more detail by autumn 2021. Identify and implement measures that the central government can use to promote teleworking even after the exceptional circumstances.

23. Digitalisation of logistics

- Digitalisation creates new opportunities for a change in the operating models of goods logistics. Digitalisation also increases operational efficiency and the smoothness of transports, and facilitates the optimisation of transports at the level of both an individual supply chain and the entire transport system.
- By intensifying logistics through digitalisation, rising costs in the transport sector can be curbed.
- A Government resolution on a logistics digitalisation strategy will be prepared in 2021.
- Estimated emissions reduction potential (Ramboll 2020) 0.09–0.24 million t in 2030. The climate impacts depend on the adoption of solutions and the ways they are implemented.

→ Adopt the logistics digitalisation strategy and the Government Resolution to be prepared on the basis of the strategy.

24. Improve route maintenance

- Emissions can be reduced to some extent by reducing the unevenness of pavements and the roughness of the road surface. This requires that additional funding is directed to basic maintenance of the transport infrastructure.
- At the same time, however, care must be taken to ensure that the improvement in road quality does not lead to higher traffic speeds or traffic volumes.
- If, in accordance with the Transport 12 proposal, funding for basic route maintenance increases by EUR 100 million, of which EUR 40 million is used to resurface low-traffic roads, the result would be an estimated emissions reduction of about 0.04%.

→ Improve route maintenance in accordance with the measures of the Transport 12 project.

Phase 3 is conditional: other emissions reduction means



Other possible and conditional measures

- In summer 2021, the EU Commission is expected to present a proposal on the connection of transport to emissions trading and other measures to reduce transport emissions.
- Once the progress of EU-level measures and that of both Phases 1 and 2 are known in autumn 2021, the Government will assess and decide on the possible need for additional national measures to halve transport emissions by 2030.
- To this end, the Government will continue to prepare various alternative measures for carbon pricing, including **national fossil fuel emissions trading and a transport tax model based on vehicle kilometres and road categories**, in case other measures together are insufficient.
- The assessment of additional measures will also take into account the progress of Finland's carbon neutrality objective in other sectors and, with regard to other measures, the cost-effectiveness of emissions reductions, the impact on competitiveness as well as regional and social fairness and the impact assessments carried out to support this work.

Emissions reduction effect: to be assessed in autumn 2021

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Cost: to be assessed in autumn 2021.

Compensation: to be assessed in autumn 2021.

Measures to be decided in other contexts

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15.4.2021

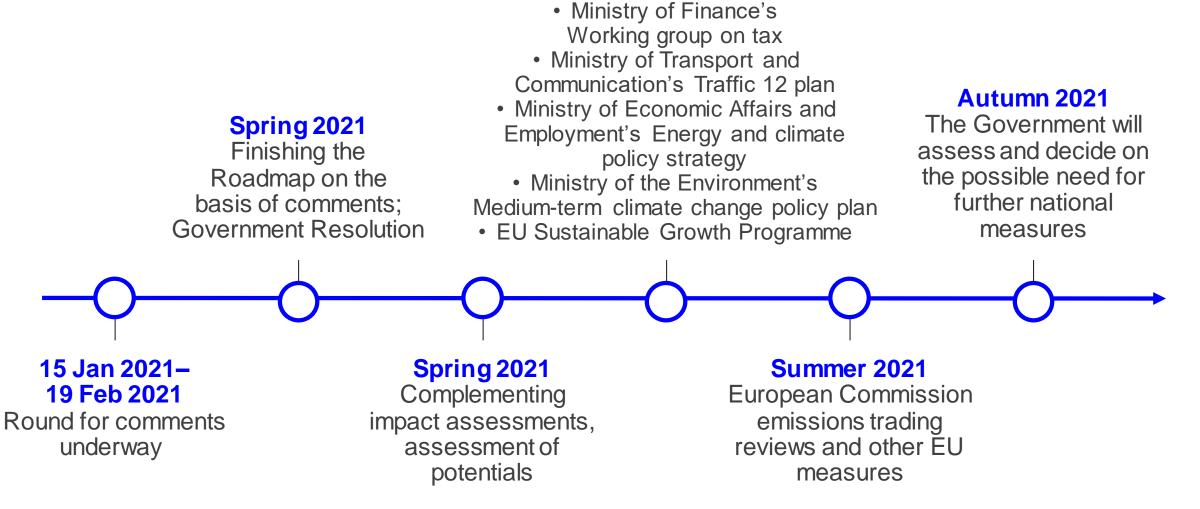


Measures to be decided in other contexts

- Support the start-up of biogas production through energy grants and nutrient cycling compensation. (Energy and climate strategy)
- Support the start-up of electric fuel production with R&D&I funding and energy supports. (Energy and climate strategy)
- Change the car taxation on zero and low emission cars (Working group on the reform of transport taxation)
- Modification of vehicle taxation (Working group on the reform of transport taxation)
- Modification of the fuel tax on electric and gas fuelled passenger cars (Working group on the reform of transport taxation)

- Promotion of sustainable transport in large and medium-sized urban areas through land use, housing and transport (LHT) agreements and transport system plans (Transport 12)
- Increase existing public transport support amounts for large and medium-sized urban areas beyond 2025. (Transport 12)
- Implementation of the Digirail project, i.e. renewal of the train control system. (Transport 12)
- Direct central government's transport infrastructure investments to sustainable mobility and transport. (Transport 12)
- A law will be enacted to enable the introduction of congestion charges for traffic management in urban areas.

Next steps



Spring 2021



Thank you!

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