

## Towards low-emission EU mobility

### SUMMARY

While EU transport systems provide the mobility European society needs, they also create severe environmental pressures and are responsible for a quarter of EU greenhouse gas (GHG) emissions. Transport activity is expected to grow still further and become the largest source of EU GHG emissions after 2030.

Meanwhile, the EU has joined global efforts to limit climate change and pledged to reduce its CO<sub>2</sub> emissions significantly. In line with this commitment, it has set out to transform itself into a low-carbon economy. This implies a systemic change towards low-emission mobility, which in turn requires modern and clean transport without compromising European mobility and competitiveness.

The European Commission has put forward a comprehensive strategy for low-emission mobility to accelerate the transformation, focusing on three main areas. Firstly, it seeks to improve transport-system efficiency by employing digital technologies, smart road charging and promoting multimodality. Secondly, it encourages the deployment of low-emission alternative energy for transport, such as electricity and advanced biofuels. And thirdly, it outlines measures for moving towards zero-emission vehicles. In addition, several horizontal initiatives seek to provide coherence between transport and other policy areas and create an environment enabling new digital technologies, research and innovation, energy, investment, and skills.

While reactions to the strategy have mainly been positive, stakeholders also stressed the need for a technology-neutral approach, taking the whole emission cycle and the need for a level playing field between transport modes into account.



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## Background

The European Union (EU) strongly supports international efforts to keep global temperature rises below 2 degrees Celsius compared to pre-industrial levels, confirmed by the adoption of the 2015 [Paris Agreement](#) (COP21). Building on its 2020 climate and energy targets (see box), the EU aims to cut its greenhouse gas (GHG) emissions by 40 % from 1990 levels by 2030, and continue this course to an 80-95 % reduction by 2050. To achieve this, the necessary transition to a low-carbon economy is under way.

The main EU tool for reducing emissions is the emission-trading system ([ETS](#)). By limiting volumes of emission allowances, it seeks to 'cap and trade' emissions from electricity generation, industry and civil aviation.<sup>1</sup> By 2020, the sectors covered by the ETS should cut their emissions by 21 % from 2005 levels.

Other transport, buildings and agriculture are not covered by the ETS. For these, binding annual targets were set for EU Member States, according to their wealth, in the [Effort-Sharing Decision](#), which should deliver a reduction of about [10 %](#) in total EU GHG emissions by 2020. By then, [10 %](#) of the fuels in the EU transport sector should come from renewable sources (mainly biofuels) and fuels used in road transport and the GHG intensity of non-road mobile machinery should fall by [6 %](#).<sup>2</sup>

The European Environment Agency (EEA) [reported](#) that in 2014, EU GHG emissions were at their lowest levels since 1990. Later, it [affirmed](#) that despite a slight increase in 2015, the EU is [well on track](#) to reach its 2020 targets, but more needs to be done to reach the [long-term goals](#). For that, a [post-2020 reform of the ETS](#) and a [new effort sharing regulation](#) are being negotiated, as all sectors of the economy must contribute their fair share to the carbon-cutting effort.

## Greenhouse gas emissions in EU transport

Responsible for about a [quarter](#) of EU GHG emissions,<sup>3</sup> transport is the only sector where emissions have grown over the past 25 years (by about [22 %](#) in 1990-2013), due to a strong dependency on oil. Nevertheless, after a peak around 2007, transport emissions began to fall.<sup>4</sup> However, technological advances in transport have been offset by growing demand, and the European Commission estimates that, by 2050, passenger transport will grow by more than 50 % and freight transport by 80 %, compared to 2013 levels.

The EU defined its action on transport in the [2011 white paper](#), aiming at a 60 % reduction of transport GHG emissions by 2050, while also radically reducing the polluting emissions, harmful to human health. These objectives are, however, [insufficient](#) to contribute effectively to the Paris commitments. In addition, recent [projections](#) suggest that without a change, neither 2030 nor 2050 EU targets will be met and transport will become the largest source of CO<sub>2</sub> emissions after 2030.

### Binding EU climate and energy targets

- [2020 climate and energy package](#) (adopted in 2008): 20 % cut in GHG emissions from 1990 levels, 20 % of EU energy from renewables and 20 % improvement of energy efficiency.
- [2030 climate and energy framework](#) (adopted in 2014): at least 40 % cut in GHG emissions from 1990 levels, 27 % energy from renewables, 27 % improvement in energy efficiency.

### EU transport targets

- [2011 transport white paper](#): for 2050, a 60 % cut in transport emissions (from 1990 levels), 40 % use of sustainable low carbon fuels in aviation, at least 40 % cut in shipping emissions, no more conventionally-fuelled cars in cities, 50 % shift of medium distance journeys to rail and waterborne transport.

## Strategy for low-emission mobility

In July 2016, as a part of the implementation of its [energy union](#) policy, the European Commission put forward a **strategy for low-emission mobility**, outlining a comprehensive overhaul of the EU regulatory framework for transport, energy, research and other areas. With this [strategy](#), the Commission seeks to accelerate the transition towards a [low-carbon economy](#) by strengthening existing rules and reinforcing their implementation and monitoring. It seeks to create favourable conditions and provide strong incentives, while respecting subsidiarity and without imposing specific national targets for transport. It regards the transformation as a challenge, requiring a long-term sustained effort by all involved, but which also offers opportunities in terms of jobs and business.

The strategy focuses largely on road transport, which accounts for over [70 %](#) of transport GHG emissions. However it also covers rail transport, in particular in combination with other modes and powered from 'clean' energy sources.<sup>5</sup> As for shipping and aviation, which are regulated globally, the EU is to follow the developments in the relevant UN regulatory bodies actively. The strategy is accompanied by an [action plan](#) targeting three areas: higher efficiency of the transport system, low-emission alternative energy for transport, and low- and zero emission vehicles. These are complemented by several horizontal initiatives. The proposed measures should follow the principle of technological neutrality<sup>6</sup> and support jobs, growth and investment.

### Higher transport system efficiency

To make transport safer and more efficient through digital technologies, the European Commission seeks to deploy **intelligent transport systems (ITS)** in all transport modes.<sup>7</sup> In road transport, it [intends](#) to introduce **cooperative intelligent transport systems (C-ITS)**, allowing for communication between vehicles, vehicles and infrastructure, or infrastructure-to-infrastructure. The Commission's [strategy on cooperative intelligent transport systems](#), published in November 2016, addresses the outstanding issues of cyber-security, data protection and interoperability, aiming for a wide deployment of C-ITS enabled vehicles in 2019.

Charging for access to infrastructure is already used at EU level for rail and truck traffic. However, the [diversity](#) of existing **road user charging systems** across the EU, the lack of interoperability between them and different charging principles cause problems for hauliers and administrators alike. To address these incongruities the Commission considers price signals to be the best incentive towards improved energy efficiency, low-emission energy and faster fleet renewal. [Revised](#) rules for Eurovignette and electronic tolling systems ([EETS](#)) should better reflect the polluter-pays and user-pays principles. In addition to distance-based charges, the Commission is considering differentiating truck charges according to their CO<sub>2</sub> emissions and partly extending this principle to buses and coaches.<sup>8</sup>

To encourage the use of lower-emission transport modes (rail, inland waterways, short-sea shipping), the strategy promotes **multi-modal transport**. The Commission wants to adapt [rail freight network](#) regulation, change the rules governing [combined transport](#), and introduce new rules for swifter implementation of projects of common interest on the trans-European transport network ([TEN-T](#)). Adding to the existing internal market rules (such as the [fourth railway package](#) and [Port Services](#) Regulation), which can promote GHG-efficient modes, the Commission plans to review the rules for market access to [coach and bus services](#) and, possibly, the [road haulage](#) market.<sup>9</sup>

### Low-emission alternative energy for transport

To scale up the use of low-emission alternative energy and build on the [mid-term evaluation](#) of the **Renewable Energy Directive**, the Commission put forward a new [proposal](#) on the use of [energy from renewable sources](#) after 2020. The Commission promotes advanced biofuels as a longer-term alternative for aviation, trucks and coaches. Natural gas, for its part, is seen as a transition alternative fuel for trucks, coaches and ships.

Most **alternative fuels** need specific **infrastructure**. Following [common standards](#), Member States are developing networks of electric charging points and natural gas (as well as some hydrogen) filling stations. For its part, the EU provides help by financing about 100 projects with nearly €600 million, and supports information-sharing platforms such as the [Sustainable Transport Forum](#) and [European Alternative Fuels Observatory](#). The Commission prepares methodology for fuel price comparison. Furthermore, to accelerate the uptake of **electro-mobility**,<sup>10</sup> EU power charging standards are being developed in cooperation with Member States, the industry, and the European Standardisation Organisation. The EU also participates in broader international standardisation efforts ([UNECE](#)).

### Low- and zero emission vehicles

In road transport, vehicle efficiency and innovation are to be enhanced by stricter **new vehicle testing** prior to [market deployment](#). To regain consumer trust after years of growing [divergence](#) between the official test results and real-world emissions, the Volkswagen [emissions case](#) being the most salient example, the EU is replacing the previous test with new 'real driving' emission tests from 2017, and introducing a new type-approval framework.<sup>11</sup> Stricter testing conditions and more realistic values for CO<sub>2</sub> and fuel consumption should encourage the deployment of low-carbon mobility technologies.

Currently, cars have an emission [target](#) of 95g CO<sub>2</sub>/km (by 2021) and vans a target of 147g CO<sub>2</sub>/km (by 2020). The Commission [plans](#) to introduce new **CO<sub>2</sub> standards for cars and light commercial vehicles** for the post-2020 period. To improve **consumer information** on vehicle environmental impact, it wants to review the [Clean Vehicles Directive](#) and [Car Labelling Directive](#), and seek support from local and municipal authorities and through public procurement rules. It is up to the Member States, however, to review any national tax incentives discouraging low-emission mobility, such as the low taxes on [diesel](#) and favourable tax schemes for company cars, which incite greater use of personal vehicles.

The EU has neither fuel efficiency nor CO<sub>2</sub> standards for **trucks, buses and coaches**,<sup>12</sup> which generate about a quarter of road transport CO<sub>2</sub> emissions. The Commission will therefore propose certification of truck, bus and coach fuel consumption and CO<sub>2</sub> emissions, with [monitoring](#) and reporting of the data, and introduction of CO<sub>2</sub> emissions standards later.

### Horizontal initiatives

A number of initiatives should strengthen the impact of the steps outlined above, for instance, advancing electro-mobility uptake by encouraging consumers to charge

#### The EU and conventional biofuels

The EU has a [policy](#) supporting biofuels since 2003. In 2012, reacting to [concerns](#) that crop-based fuels can have a larger net environmental impact than fossil fuels (indirect land-use change), the Commission proposed to [limit](#) the contribution of conventional biofuels towards attainment of EU targets. In 2015, their share in final energy consumption in Member States' transport in 2020 was capped at [7 %](#).

batteries in off-peak times (through new rules for [electricity market design](#)). In addition, [preparations](#) for an EU strategy on **research, innovation and competitiveness**, should bring together energy technologies, transport and industry, facilitate the development of energy storage solutions (such as next generation batteries) and focus more research on advanced bio- and synthetic fuels. Rules for a [digital single market](#) should set standards for using **digital technologies** in transport and ensure free flow of data. The shift to low-emission mobility will impact jobs in the transport sector (currently 15 million, or 7 % of EU jobs) by requiring **new skills**, a challenge taken up in the [new skills agenda for Europe](#).

The European Commission seeks to provide certainty for investors by affirming the **EU financial support** for the targeted areas. The European Fund for Strategic Investment (EFSI) has already [helped](#) to mobilise investment for various transport projects. An extension is [proposed](#) and is under [negotiation](#). EFSI complements other EU funds available for the 2014-2020 period, namely the European Structural and Investment Funds (with €39 billion for low-emission mobility out of the €70 billion for transport), the Connecting Europe Facility (CEF, [€24 billion](#) for transport) and [Horizon 2020](#), which supports research and innovation into green transport and clean energy with about €6 billion.

The transition will largely depend on local administrations. **Cities**, home to over 70 % of the EU population, already implement a range of measures supporting low-emission urban transport, which is currently responsible for 23 % of EU GHG emissions. Having set their own targets, cities are improving public transport, encouraging active mobility (walking and cycling), introducing congestion and pollution charges, promoting shared mobility (car- and bike- sharing, car-pooling), and installing electric charging points. The Commission supports this action via the urban agenda for the EU, sustainable urban planning, exchange of best practice, and the deployment of new technologies at the local level, through initiatives like the [Covenant of Mayors for Climate & Energy](#).

### International aviation and shipping

Both sectors were omitted from the Paris agreement, which makes the achievement of global emissions goals all the more challenging. Indeed, despite efficiency improvements, aviation and shipping emissions could jointly reach almost [40 %](#) of global CO<sub>2</sub> emissions by 2050, due to growing transport demand. Technological and operational improvements alone are unlikely to help achieve targets compatible with the 2°C global objective.<sup>13</sup> The strategy affirms that EU action will be aligned with the action of the respective international regulatory bodies, the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), where until recently, progress on emission issues has been [slow](#).

In **aviation**, emissions from flights within the European Economic Area (EEA) are counted in the EU-ETS since 2012. However, in [2014](#), requirements for flights to and from non-European countries were suspended to support the development of a global solution. In [2016](#), the ICAO adopted a market-based measure ([CORSIA](#)) to offset emissions as of 2021. While the EU ETS is a 'cap and trade' system, emissions can grow under CORSIA, as long as airlines compensate for this with offsets in other sectors, such as renewable energy. In light of this development, the Commission [proposes](#) to [maintain](#) its approach to emissions from non-EEA flights beyond 2016. However, the low-emission strategy leaves aside the thorny issues of exemptions from fuel tax and VAT on [tickets](#).

**Shipping** was the first sector to adopt global binding [energy efficiency measures](#) in 2011, which, however, only limit increases in emissions, but do not reduce their volume. In

addition, the main measure applies to new ships only and experts consider the limits are [low](#).<sup>14</sup> In [October 2016](#), facing proposals to make the efficiency measures more stringent, the IMO postponed the decision to 2018, while adopting a mandatory global CO<sub>2</sub> emission data-collection system for large ships. The EU already has [legislation](#) on CO<sub>2</sub> emissions, which will require large ships to monitor and report their emissions as of 2018, and can be aligned with developments at the IMO.

### Reactions to the strategy

The European Economic and Social Committee (EESC) appreciated the effort to provide coherence between transport and other policy areas in its [opinion](#),<sup>15</sup> noting however that the links between the strategy and the communication on upgrading the internal market could have been better developed. The EESC drew attention to the need to find co-financing solutions for small projects and to the potential effects of the new developments on transport patterns and their social implications. The Committee of Regions is also preparing an opinion.

In a joint letter,<sup>16</sup> sent before the publication of the strategy, several organisations representing rail, public transport and environmental interests demanded a **level playing field between transport modes** as regards infrastructure charging and to abolish practices that distort competition, such as tax-free kerosene for aviation.

Reacting to the strategy, the [Covenant of Mayors for Climate & Energy](#) and [POLIS](#), the network of European cities and regions cooperating for innovative transport solutions, underscored the **role of cities** in its implementation. POLIS also pointed out the [incoherence](#) between the EU-promoted planning of sustainable urban mobility and energy, and called for a common approach to **measuring the carbon intensity of urban mobility**. In their view, cities should get EU financial support for the renewal of their public fleet and deployment of charging and refuelling infrastructure, and both cities and operators should be able to resell energy. The NGO [Transport & Environment](#) highlighted that the **existing diesel tax breaks** slow transition, and called for **CO<sub>2</sub> emissions standards for trucks**.

[FuelsEurope](#), representing refinery companies, noted that, to safeguard the internal market, the adopted policy should be cost-effective, technology neutral, and predictable. They suggest incentives for alternative fuels and electricity based on their total energy balance (including fuel production), limiting them in time and cost. Storage battery manufacturers ([EUROBAT](#)), called for better integration of the transport and energy sectors and stressed the need to keep the EU industry competitive to maintain jobs and growth. [COPA-COGECA](#), speaking on behalf of farmers and agri-cooperatives, rejected the phasing out of EU targets for conventional biofuels after 2020. According to them, advanced biofuels need to be developed on a commercial scale in parallel with conventional biofuels, as both types are vital to ensuring a sustainable, low-carbon economy.<sup>17</sup> [EDSO](#), representing distribution system operators, welcomed the attention paid to electricity grids, necessary to accelerate the roll-out of electric vehicles, and recommended focusing efforts on **smart charging solutions**.

For automotive suppliers ([CLEPA](#)), technological neutrality should be the key principle, not only to save the environment but also safeguard employment opportunities. Automobile manufacturers ([ACEA](#)) called for a more balanced approach to transport modes, including air, maritime and rail. Noting that most of the binding measures concern new vehicle technology, they propose more focus on **fuels, faster fleet renewal,**

**improving infrastructure and changing driver behaviour.** They also [cautioned](#) against applying the same approach to heavy-duty vehicles as to passenger cars. The Freight Transport Association ([FTA](#)) pointed out that the strategy does not sufficiently emphasise the **take up of new technologies** and **changes to vehicle weights and dimensions**. As for commercial vehicle carbon performance, they recommended that any new measure takes how much the vehicle can carry into account. [Road pavement sector](#) representatives ([EUPAVE](#), [EAPA](#) and [FEHRL](#)) called for increased investment in roads and greater alignment of policies on CO<sub>2</sub> with policies for **upgrading and maintenance of roads**, as smoother roads can reduce CO<sub>2</sub> emissions from vehicles by about 5 %. Rail infrastructure managers ([EIM](#)) stressed the role of [electrified rail](#) services in closing the carbon-gap. The European Community Shipowners' Association ([ECSA](#)) supported the strategy and the progress towards a global agreement, proposing aligning EU rules for monitoring emissions with the IMO.

### European Parliament

The European Parliament position on the strategy is [being prepared](#) by the Committee on Transport and Tourism (TRAN; rapporteur Bas Eickhout, Greens/EFA, the Netherlands).

As regards transport GHG emissions, the Parliament has long promoted modal shift to less GHG-intensive modes, co-modality and sustainable urban transport, for instance in the [resolution](#) of 9 September 2015 on the implementation of the 2011 white paper on transport. In its 2 December 2015 [resolution](#) on sustainable urban mobility, the Parliament underlined the importance of a bottom-up approach, recalled the 'polluter-pays' principle, and insisted that revenues from road charging should be used to improve sustainable urban mobility.

In a 2016 [resolution](#) on the implementation of the Paris Agreement, the Parliament urged the Agreement's early entry into force, calling on developed countries, especially EU Member States, to reduce their emissions further. On 15 February 2017, the Parliament [adopted](#) amendments to the [post-2020 EU ETS](#) reform, opening the way for interinstitutional negotiations. Parliament [agreed](#) to tighten the cap on aviation emissions under the ETS from 2021, and to include shipping in the ETS from 2023, if the IMO does not adopt a global measure [beforehand](#).<sup>18</sup>

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## Endnotes

- <sup>1</sup> For now, only [flights](#) to and from EU Member States, Iceland, Liechtenstein and Norway are covered.
- <sup>2</sup> The required reduction applies to road vehicles, [non-road mobile machinery](#), agricultural and forestry tractors and recreational craft when not at sea. It can be achieved, for instance, by blending fossil fuels with biofuels.
- <sup>3</sup> GHGs from transport are [mainly](#) carbon dioxide (CO<sub>2</sub>), in lower measure methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).
- <sup>4</sup> In [1990-2014](#), road transport emissions grew by 124 million tonnes (Mt), while emissions from international aviation and shipping (not included in national totals reported to UNFCCC) increased by 93 Mt. The recent decline in GHG emissions is at least [partly due](#) to the poor economic situation.
- <sup>5</sup> For instance in 2017, the Netherlands announced that all their electric trains are powered by [wind energy](#).
- <sup>6</sup> Technologies should be judged on their (emission) results over the entire life-cycle.
- <sup>7</sup> The TEN-T includes the deployment of the European Railway Traffic Management System ([ERTMS](#)), Single European Sky [Air Traffic Management](#), vessel traffic monitoring and information system [SafeSeaNet](#) and the River Information Services ([RIS](#)).
- <sup>8</sup> The strategy does not envisage EU taxation beyond infrastructure charges. In fact, the [2015](#) Commission attempt to review [energy taxation rules](#) and [passenger car taxation](#) showed that no agreement was attainable with Member States in the Council and both proposals were withdrawn.
- <sup>9</sup> The issue of 'social dumping' in road haulage creates tensions between Western, Central and Eastern Europe. Many Member States are against further liberalisation of road transport ([Transport Council](#) of 1 December 2016).
- <sup>10</sup> A road transport [system](#) based on vehicles propelled by electricity: some vehicles are equipped with technologies that make them capable of producing their own electricity (e.g. hybrid electric vehicles); others use energy supplied by a source of electricity outside the vehicle – usually the electric grid.
- <sup>11</sup> 'The World Harmonised Light Vehicle Test Procedure' ([WLTP](#)), developed by UNECE, is mandatory in the EU for new types of vehicles from September 2017 and all new vehicles from September 2018.
- <sup>12</sup> The United States' [1975](#) fuel economy standards were first motivated by energy security concerns and only lately by climate change. Their current fuel efficiency standards (phase II, since 2016) cover [cars and light trucks](#) and heavy duty [trucks](#). In 2016, EU fleet average targets for CO<sub>2</sub> emissions were [more ambitious](#) than US emissions targets.
- <sup>13</sup> International regulation [does not address](#) non-CO<sub>2</sub> emissions from aviation, despite their climate-warming effects.
- <sup>14</sup> A 2015 [study](#) commissioned by environmental NGOs showed that in 2014, many new ships already exceeded the 2020 limit values set by the IMO, which raised suggestions that the limits could be [tightened](#).
- <sup>15</sup> [Decarbonisation of transport](#), adopted on 23 February 2017, rapporteur Stefan Back (Employers, Group I, Sweden).
- <sup>16</sup> Decarbonising transport – joint letter signed by CER, EIM, ERFA, Transport & Environment, UITP and Unife, 1 July 2016, available at [EIM website](#).
- <sup>17</sup> Copa-Cogeca, [press release](#) of 20 July 2016.
- <sup>18</sup> In a [letter](#) to senior EU officials and welcomed by [shipping groups](#), the IMO Secretary-General warned that including shipping in the EU ETS could undermine efforts to reduce GHG emissions globally. The global international environmental organisation [Clean Shipping Coalition](#) was [concerned](#) that the IMO might not adopt the promised global GHG measure in 2023, which environmental NGOs consider [inacceptable](#).

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