

## RESEARCH FOR TRAN COMMITTEE - THE PARIS AGREEMENT AND THE EU TRANSPORT POLICY

### 1. BACKGROUND: GREENHOUSE GAS EMISSIONS FROM EU TRANSPORT<sup>1</sup>

Transport currently contributes to roughly a **quarter** of the total EU man-made greenhouse gas emissions<sup>2</sup>. This share is growing since **transport is the only EU sector where the GHG emissions have risen since 1990<sup>3</sup>**.

#### EU-28 total GHG emissions, 1990-2013, in million tCO<sub>2</sub>-eq<sup>4</sup>:

1990	2013	Change in volume, 1990-2013
5 870	4 743	- 19.2%

#### EU-28 transport GHG emissions, 1990-2013, in million tCO<sub>2</sub>-eq<sup>4</sup>:

952	1 148	+ 20.6%
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Road emits much more GHGs than other modes, but the share of long distance air and waterborne transport is growing strongly. **In 2013, planes and vessels departing from the Member States accounted for 23.5% of EU transport GHG emissions** and 5.7% of EU total GHG emissions. In 1990, these figures were 18.5% and 2.9% respectively.

#### EU-28 transport GHG emissions per mode, 1990-2013, in million tCO<sub>2</sub>-eq<sup>4</sup>:

	1990	2013	Change in volume 1990-2013	Share in EU-28 transport GHG emissions		Share in EU-28 total GHG emissions	
				1990	2013	1990	2013
Road	723.1	839	+ 16%	76 %	73 %	12.3 %	17.7 %
Waterborne	132	154	+ 16.7%	13.8 %	13.4 %	2.3 %	3.3 %
<i>From which within a Member State</i>	25	16	- 36%	2.6 %	1.4 %	0.4 %	0.3 %
<i>From which departing from a Member State</i>	107	138	+ 29%	11.2 %	12 %	1.8 %	2.9 %
Air	83.3	148.5	+ 78.3%	8.8 %	12.9 %	1.4 %	3.1 %
<i>From which within a Member State</i>	14.3	15.5	+ 8.4%	1.5 %	1.4 %	0.2 %	0.3 %
<i>From which departing from a Member State</i>	69	133	+ 92.8%	7.3 %	11.5 %	1.1 %	2.8 %
Rail	13.1	6.7	- 48.9%	1.4 %	0.6 %	0.2 %	0.1 %
<b>Total EU Transport</b>	<b>952</b>	<b>1148</b>	<b>+ 20.6%</b>	-	-	<b>16.2 %</b>	<b>24.2 %</b>

<sup>1</sup> Source: European Environment Agency; Annual European Union greenhouse gas inventory 1990–2013 and inventory report 2015 (2015). For more details on emissions from transport, please consult the EP analysis of November 2015: [Greenhouse gas and air pollutant emissions from EU transport](#).

<sup>2</sup> GHGs from transport are mainly carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). The global warming potential (GWP) of each gas is currently set as follows by the UN Intergovernmental Panel on Climate Change (IPCC): CO<sub>2</sub> = 1; CH<sub>4</sub> = 21; N<sub>2</sub>O = 310. In other terms, the GWP of nitrous oxide is 310 times that of carbon dioxide.

<sup>3</sup> In 2013, EU transport emitted 1148 million tonnes CO<sub>2</sub> equivalent (tCO<sub>2</sub>-eq), second only to Energy industries (1331 million tCO<sub>2</sub>-eq). However, GHG emissions from Energy industries are decreasing (- 20% by volume from 1990 to 2013).

<sup>4</sup> Including international air and waterborne transport, i.e. planes and vessels departing from the Member States. Excluding emissions and removals from land-use, land-use change and forestry (LULUCF).



## 2. THE U.N. OBJECTIVES ON CLIMATE CHANGE

- Article 2 of the 1992 [United Nations Framework Convention on Climate Change](#) (UNFCCC - 196 contracting parties including the EU) set the objective of "*stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner*".
- The 1997 [Kyoto Protocol](#) (192 contracting parties including the EU<sup>5</sup>) is the primary tool for the implementation of the UNFCCC. During the first commitment period<sup>6</sup> (2008-2012), 37 industrialized countries, including the EU-15, committed to reducing their GHG emissions by at least 5% compared with 1990 levels. Over the second commitment period<sup>7</sup> (2013-2020), the parties have committed to reduce their emissions by at least 18% against 1990 levels.
- The 2015 [Paris Agreement](#) (195 contracting parties including the EU) will succeed the Kyoto Protocol from 2021<sup>8</sup>. The Agreement aims at "*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels*". To achieve this (long term) goal the contracting parties commit to implementing "self-determined" national action plans to reduce emissions (the so-called "Intended Nationally Determined Contributions", or INDCs). These INDCs [are made public by the UNFCCC](#). They shall be upgraded every five years to more ambitious targets.

It is important to note that according to the accounting rules under the Kyoto Protocol, as laid down by the U.N. [Intergovernmental Panel on Climate Change \(IPCC\) Guidelines for National Greenhouse Gas Inventories, emissions from international aviation and from international waterborne transport \(i.e. from planes and vessels departing from the contracting states\) are not covered by the national reduction commitments](#)<sup>9</sup>. These emissions "are to be excluded from national totals and are to be reported separately". (Article 2.2 of the Kyoto Protocol leaves the reduction of these emissions to the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), respectively.)

## 3. EU COMMITMENTS MADE IN PARIS

The [Intended Nationally Determined Contribution of the EU and its Member States](#) set the objective of "*an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990*"<sup>10</sup>. This objective shall be met with no contribution of international market based mechanisms.

### EU successive commitments/objectives on GHG emissions reduction

<i>Commitment/Objective</i>	<i>Time period</i>	<i>Reduction against 1990 level</i>
Kyoto 2	2013-2020	- 20%
<b>Paris</b>	<b>2021-2030</b>	<b>- 40%</b>
Longer term <sup>11</sup>	2031-2050	- 80% to - 95%

<sup>5</sup> The Kyoto Protocol entered into force in February 2005 because of a lengthy ratification process. Its detailed implementing rules were adopted in 2001 (COP7 - the "*Marrakesh Accords*").

<sup>6</sup> First commitment period: EU-15 committed to reduce emissions by 8% compared to 1990. Eight of the Member States that joined the EU in 2004 made the same commitment.

<sup>7</sup> The 2012 "*Doha Amendment*" established the second commitment period. Currently 38 parties, including the EU, have set emission targets for 2013-2020 (note that parties to the second period are (partly) different to parties to the first period). The EU-28 (together with Iceland) have agreed to reduce GHG emissions by 20% against 1990 level, including through offsets.

<sup>8</sup> The Paris Agreement will be open for signature from 22 April 2016 to 21 April 2017. The Agreement will enter into force once ratified by at least 55 countries representing at least an estimated 55% of the total global greenhouse gas emissions.

<sup>9</sup> Note that emissions from commercial fishing are reported as domestic emissions (regardless of where the fishing occurs) under "Agriculture/Forestry/Fishing", not under "Transport". [More details on the UNFCCC website.](#)

<sup>10</sup> GHGs covered by the EU commitment are: Carbon Dioxide (CO<sub>2</sub>); Methane (CH<sub>4</sub>); Nitrous Oxide (N<sub>2</sub>O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); Sulphur hexafluoride (SF<sub>6</sub>), and Nitrogen trifluoride (NF<sub>3</sub>).

<sup>11</sup> Decision made by the European Council of 29-30 October 2009.

## 4. IMPLEMENTATION OF EU COMMITMENTS

The commitments made in Paris by the EU are in line with the "2030 climate and energy policy framework" as approved by the [European Council in October 2014](#). This policy framework (which builds on the "2020 climate and energy package"<sup>12</sup>) set the following key objectives:

- (1) A binding target "of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990".
- (2) A binding target of an at least 27% share for renewable energy in 2030.
- (3) An indicative target of 27 to 30% improvement in energy efficiency in 2030, compared with current criteria.

Pursuant to the "2030 climate and energy policy framework", the reduction in GHG emissions is to be mainly borne by the sectors covered by the EU emissions trading system (ETS)<sup>13</sup>. By 2030, "ETS sectors" will have to reduce emissions by 43% compared to 2005, while "non-ETS" sectors<sup>14</sup> will reduce theirs by 30%. To that end, the European Commission proposed in July 2015 to enhance the ETS<sup>15</sup>. Notably, the annual reduction in the cap (currently set at 1.74%<sup>16</sup>) would increase to 2.2% per year from 2021. As regards "non-ETS" sectors (which include almost all of the transport sector), efforts amongst Member States will be distributed on the basis of relative GDP per capita (in accordance with an amended version of the 2009 "[Effort Sharing Decision for 2020](#)").

The development of renewable energy and the improvement in energy efficiency will be carried out pursuant to the 2015 "Energy Union Package"<sup>17</sup> - which identifies as a priority energy efficiency and decarbonisation in the transport and buildings sectors.

## 5. TRANSPORT CONTRIBUTION TO EU COMMITMENTS

The 2011 White Paper on transport set the following objectives: (1) a reduction of transport (including international aviation, excluding international waterborne transport) GHG emissions by 20% between 2008 and 2030, and by at least 60% between 1990 and 2050; and (2) a reduction of international waterborne transport emissions by 40 % from 2005 levels by 2050.

**These objectives are insufficient to contribute effectively to the commitments made in Paris.** Their achievement would mean that in 2030 emissions from transport (excluding international waterborne transport) would still be 4.5% above 1990 levels<sup>18</sup>. Emissions from international waterborne transport would only be 9.5% below 1990 level in 2050.

The "Energy Union Package" therefore announced new initiatives to lower CO<sub>2</sub> emissions from transportation: new CO<sub>2</sub> emission standards for cars and light commercial vehicles, and measures to reduce CO<sub>2</sub> emissions for heavy duty vehicles and buses should be proposed by the European Commission, as well as measures to increase fuel efficiency and better traffic management.

The "Energy Union Package" also places emphasis on the development and deployment of alternative fuels and the electrification of road and rail transport. While around 94% of the energy consumed by the sector is oil derived, the package intends to boost the share of electricity (which is currently stable and insignificant) and that of biofuels (about 5.4% in 2013, when considering only biofuels meeting the sustainability criteria of Directive 2009/30/EC).

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<sup>12</sup> The "2020 climate and energy package" set the following targets for 2020: 20% cut in GHG emissions from 1990 level (in line with EU commitments under Kyoto 2); 20% share for renewable energy; 20% improvement in energy efficiency compared to 2007 forecasts.

<sup>13</sup> The EU system for trading greenhouse gas emission allowances (EU ETS) currently covers about 45% of the Union's GHG emissions. The transport sector is largely outside the scope of the ETS - with the notable exception of flights within the European Economic Area. See: [European Commission, EU ETS Handbook \(2014\)](#).

<sup>14</sup> Non-ETS sectors in the EU include: transport (with the exception of air transport within the EEA), households, agriculture, forestry and waste sectors.

<sup>15</sup> COM(2015) 337 final (awaiting ENVI decision).

<sup>16</sup> Unlike fixed installations, the cap for aviation remains stable throughout the 2013-2020 trading period.

<sup>17</sup> COM(2015) 80 final.

<sup>18</sup> Based on 2014 data from the European Environment Agency, emissions from transport excluding international waterborne transport were about 850 mtCO<sub>2</sub>-eq in 1990 and 1110 mtCO<sub>2</sub>-eq in 2008 (+30%). They would be 888 mtCO<sub>2</sub>-eq in 2030 on the basis of the White Paper objectives (i.e. +4.5% compared with 1990 level). Emissions from international waterborne transport were about 110 mtCO<sub>2</sub>-eq in 1990 and 166 mtCO<sub>2</sub>-eq in 2005 (+51%). They would be around 100 mtCO<sub>2</sub>-eq in 2050 on the basis of the White Paper objectives (i.e. -9.5 compared with 1990 level).

## 6. SOME CHALLENGING POINTS

When considering the capacity of the transport system to meet EU environmental commitments/objectives, the following should be kept in mind:

### (1) Road transport emissions are unclear:

Road transport GHG emissions are much greater than those from all other modes. However, this "lion's share" is notoriously underestimated because the laboratory tests used to measure official fuel consumption/emissions underestimate consumption/emissions in real life<sup>19</sup>. This was true even without the frauds recently denounced by the United States Environmental Protection Agency. In the absence of an in-depth reform of the EU type-approval system for cars and light commercial vehicles, the virtues of new emissions standards would be largely illusory.

### (2) There is no EU emission standard for aircraft and ships:

In 2013, air and waterborne transportation accounted for 26% of EU transport GHG emissions, or 6.5% of EU total GHG emissions. Yet, emission standards for aircraft and ships are not set by the EU. They are set by, respectively, the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) - where progress is slow and modest<sup>20</sup>. (In addition, because of the lifetime of ships and aircraft it takes decades before new standards spread.)

### (3) Electricity and biofuels are not always "cleaner":

The impact of electric vehicles on the environment is not always lower than that of internal combustion vehicles when power generation and the manufacture of vehicles/batteries are taken into account. Electric vehicles "have the edge" only if they travel a large number of kilometres (which is currently rarely the case since they are mostly small urban vehicles) and depending on the energy mix. In most cases, small urban electric vehicles do not solve the problem, they simply shift it<sup>21</sup>. To change this, the share of electricity from renewable sources should continue to sharply increase<sup>22</sup>.

Identically, the impact of biofuels on GHG emissions is not always positive. When emissions due to indirect land-use change (ILUC) are estimated properly and taken into consideration there may be little or no saving, if not an increase in emissions<sup>23</sup>. Improving the environmental performance of biofuels would imply a radical shift towards second (and third) generation biofuels.

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<sup>19</sup> Roughly speaking, GHG emissions from road transport are estimated on the basis of fuels sales and their use by different vehicle categories and their emission standards. Detailed methodologies in: [EMEP/EEA air pollutant emission inventory guidebook \(Part B\) \(2013\)](#).

<sup>20</sup> For instance, ICAO Governing Council should adopt this year the first standard on aircraft CO<sub>2</sub> emissions. This standard would apply to all new commercial and business aircraft delivered after 1 January 2028. It would lead to an average 4% reduction in the cruise fuel consumption of new aircraft (with reductions ranging from 0 to 11% depending on the size of the aircraft).

<sup>21</sup> See: [ADEME \(2013\)](#).

<sup>22</sup> In 2013, electricity from renewable energy sources accounted for about one quarter (25.4 %) of the EU-28 gross electricity consumption.

<sup>23</sup> See: [The impact of biofuels on transport and the environment, and their connection with agricultural development in Europe](#), European Parliament (2015).