Low-emission mobility strategy – projections of the future EU fuel mix

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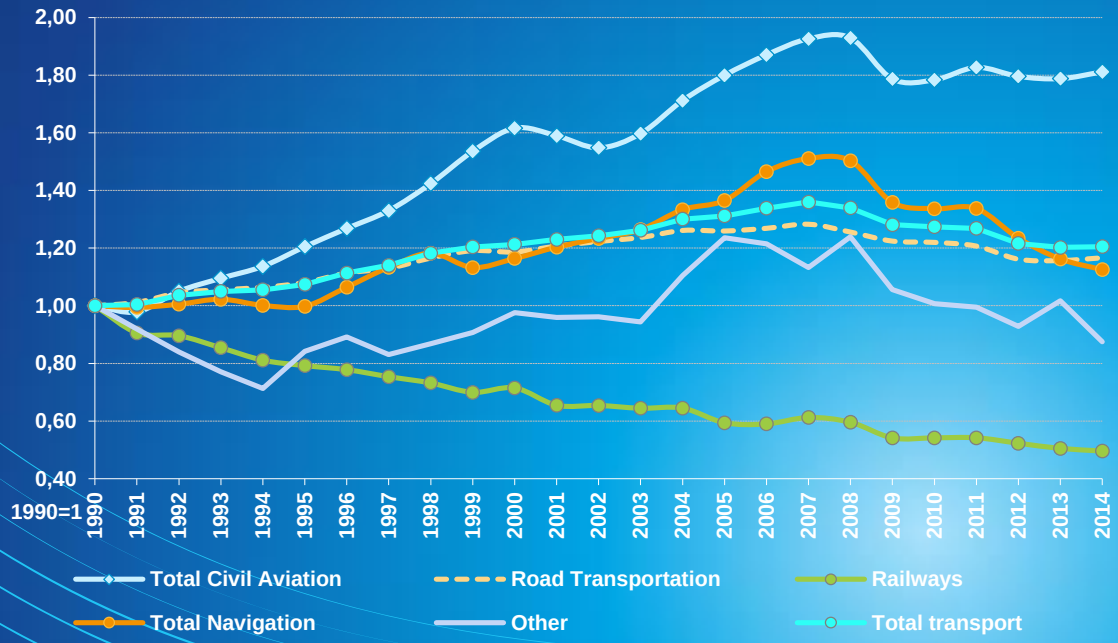
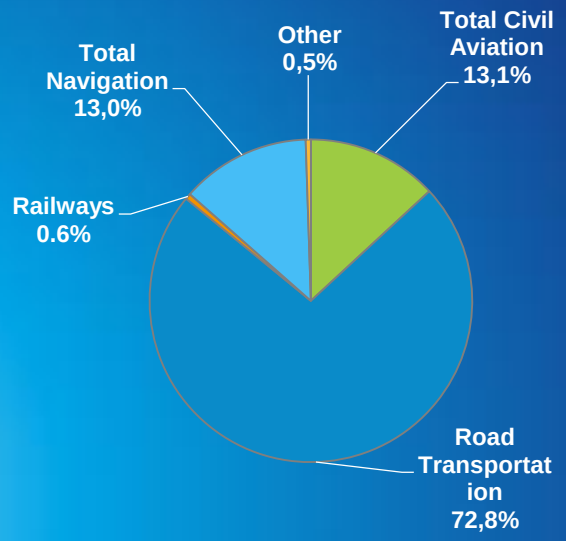
EU strategy for low-emission mobility

- Low-emission mobility: an essential component of the shift to the low-carbon, circular economy
- Level of ambition
  - *GHG emissions from transport at least 60% lower than in 1990 by mid-century, and firmly on the path towards zero.*
  - *Emissions of air pollutants from transport to be drastically reduced without delay*
- Integrated and comprehensive approach, mix of policy instruments, mutually supporting and reinforcing, based on three main dimensions:
  - *Efficiency of the transport system*
  - *Low-emission alternative energy for transport*
  - *Low- and zero-emission vehicles*

+ cross-cutting initiatives for an enabling environment

Greenhouse gas emissions from transport, including international shipping





Pathways/scenarios towards low-emission mobility

Developments under current trends and adopted policies (REF2016 scenario)

Two central scenarios: reflect the 2030 targets and main elements of the 2030 climate and energy framework

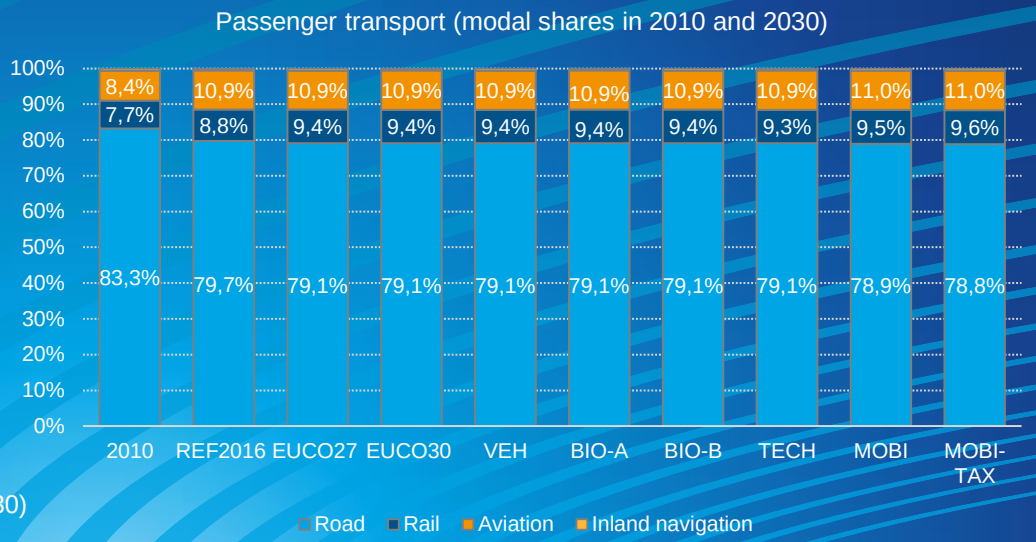
27% primary energy consumption reduction (EUCO27 scenario)	30% primary energy consumption reduction (EUCO30 scenario)

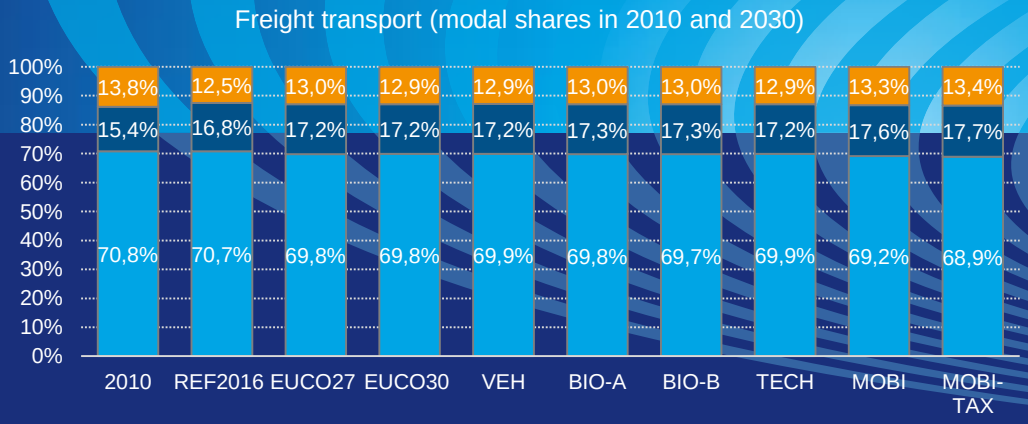
Low- and zero-emission vehicles
Ambitious vehicle efficiency standards (VEH scenario)
Low emission alternative energy for transport
Action on advanced renewable fuels (BIO-A and BIO-B scenarios)
Advanced research and innovation in electro-mobility (TECH scenario)
Efficiency of the transport system
Focus on efficiency of the transport system (MOBI scenario)
Focus on efficiency of the transport system and fuel taxation (MOBI-TAX scenario)

Impacts on transport activity

Rail and inland navigation increase their share with highest impact in scenarios adressing the efficiency of the transport system

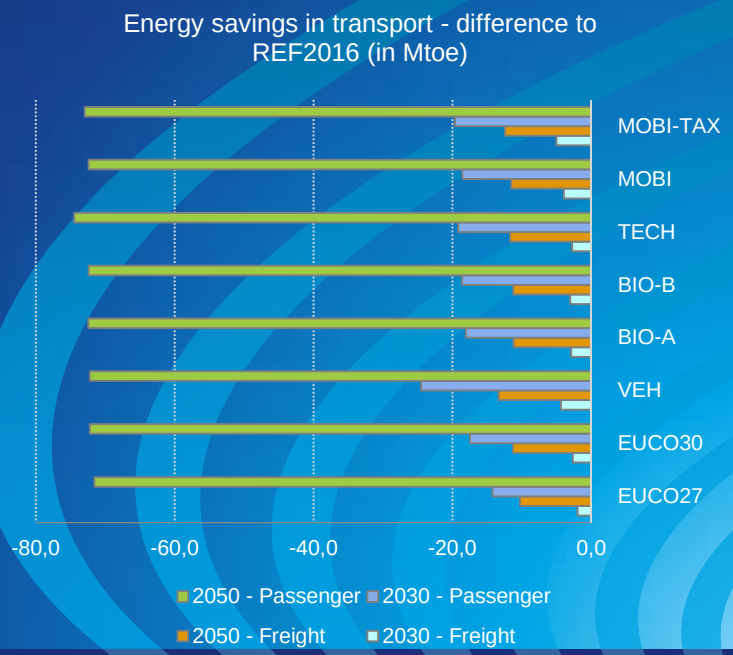
High-speed rail is projected to undertake 108 billion more passenger kilometres in 2030 relative to 2010

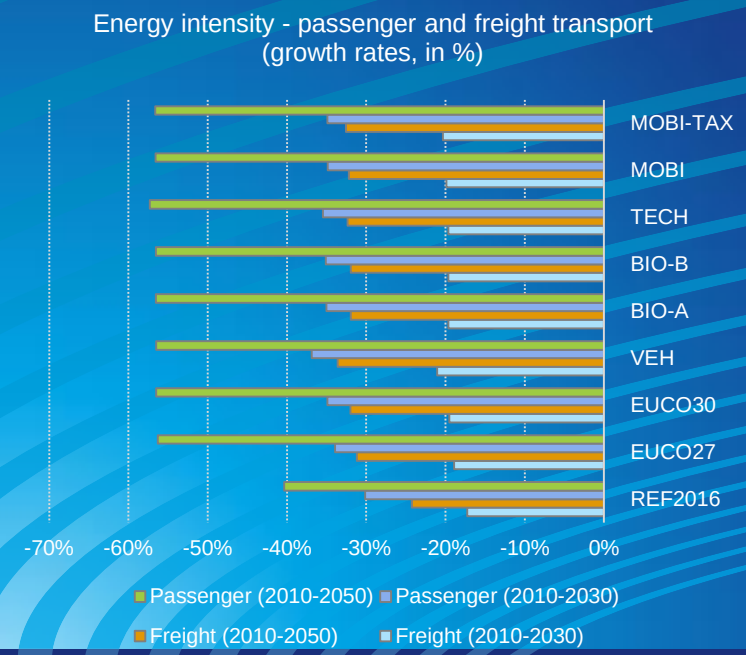




The market shares of passenger and freight road transport decrease in all pathways/scenarios

Increasing energy efficiency





Energy demand in transport declines despite continuous growth in transport activity in all pathways/scenarios: total savings of 16 to 29 Mtoe in 2030 relative to REF2016.

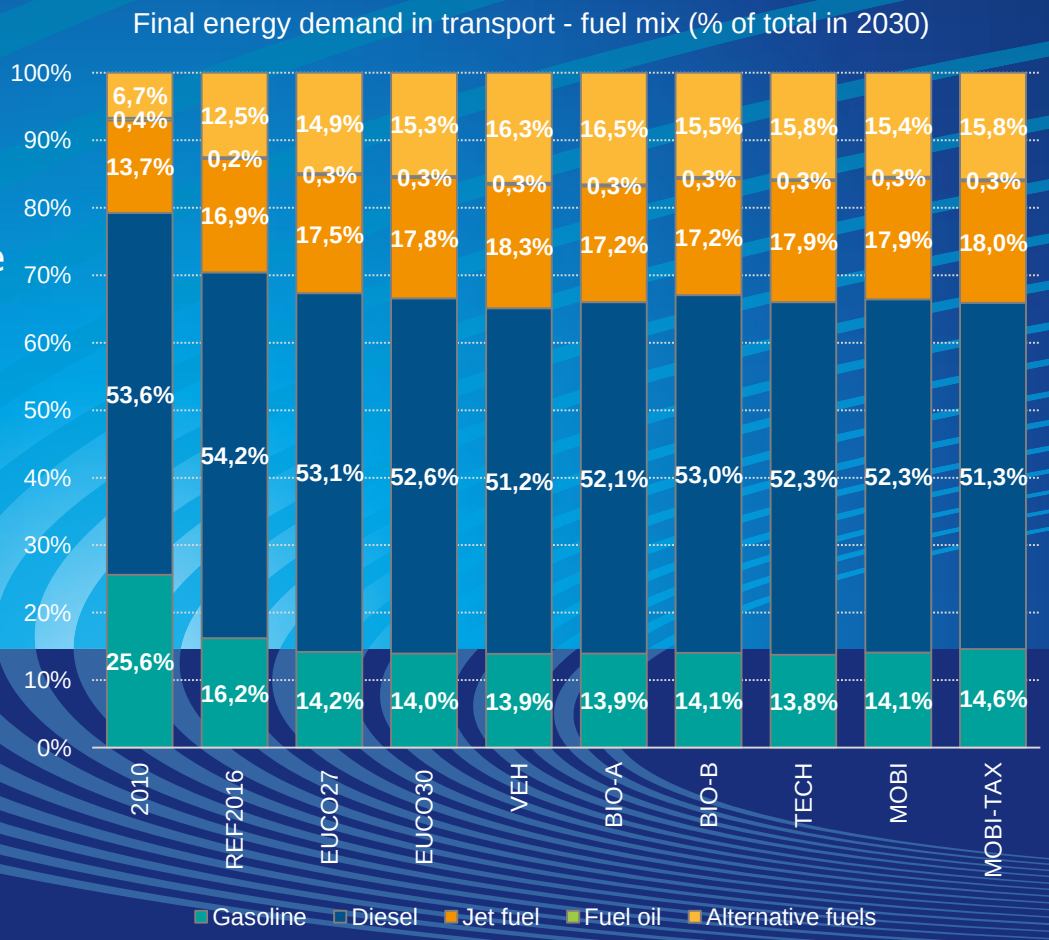
Significant improvements in energy intensity achieved by 2030 in the central scenarios, relative to 2010: 34-35% for passenger transport, 19-20% for freight transport. Highest improvements in VEH scenario (37% for passenger and 21% for freight transport).

Impact on the fuel mix

The share of low-emission energy in transport would increase, providing about 15-17% of transport energy demand in 2030.

Oil dependency is expected to decrease by 8-9 percentage points compared to 2010 levels. Oil products would still represent 86-87% of the EU transport sector needs by 2030 compared to 94% today.

Highest reduction in oil dependency would be achieved in VEH, MOBI-TAX (where energy savings and electro-mobility play a significant role) and BIO-A (where the uptake of advanced renewable fuels is also an important contributing factor) by 2030.



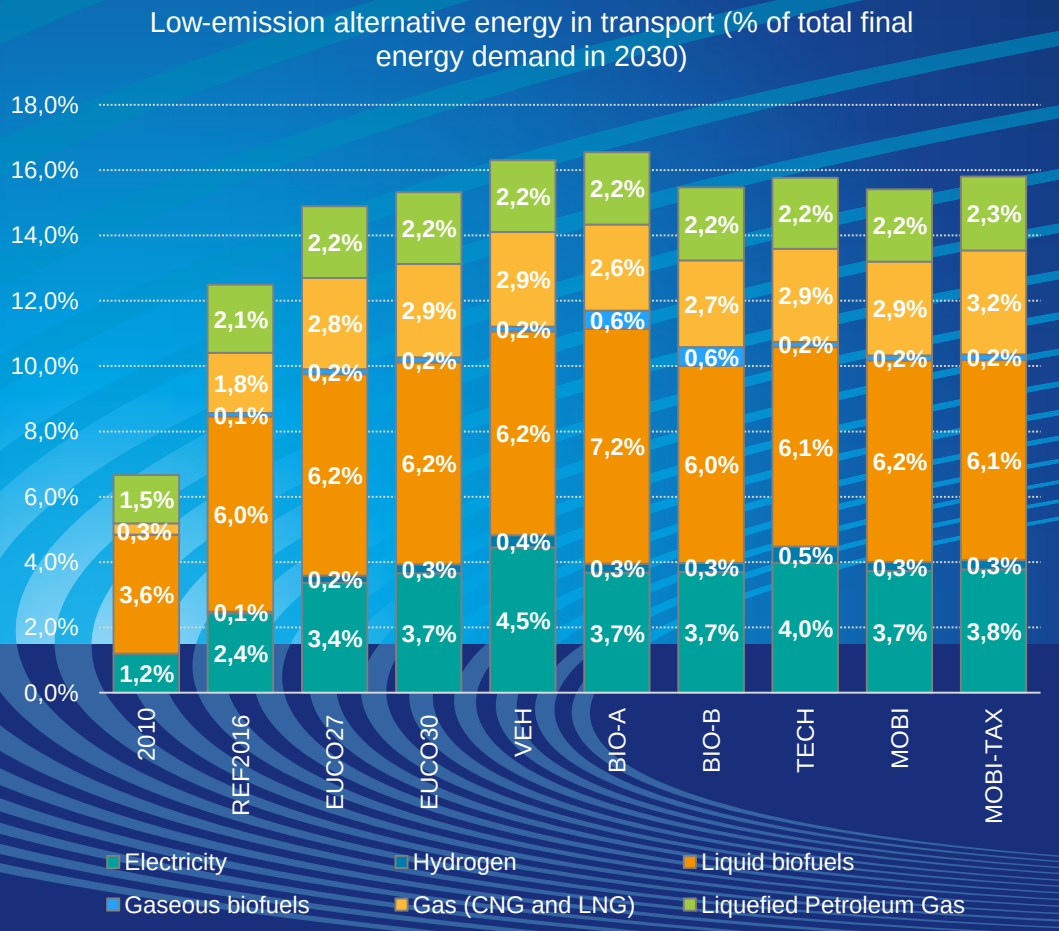
Low-emission alternative energy in transport

Electricity demand is projected to show the highest increase in 2030 relative to REF2016, gaining 0.9-2 percentage points in terms of energy use in transport. Hydrogen also shows an increasing share (0.2-0.5 percentage points).

Natural gas, in particular LNG, would gain 0.8-1.3 additional percentage points by 2030, relative to REF2016 (being used for heavy goods vehicles and in inland navigation).

Liquefied petroleum gas is projected to maintain a rather stable share.

Liquid and gaseous biofuels would represent around 6.3 to 7.7% of transport energy demand by 2030.

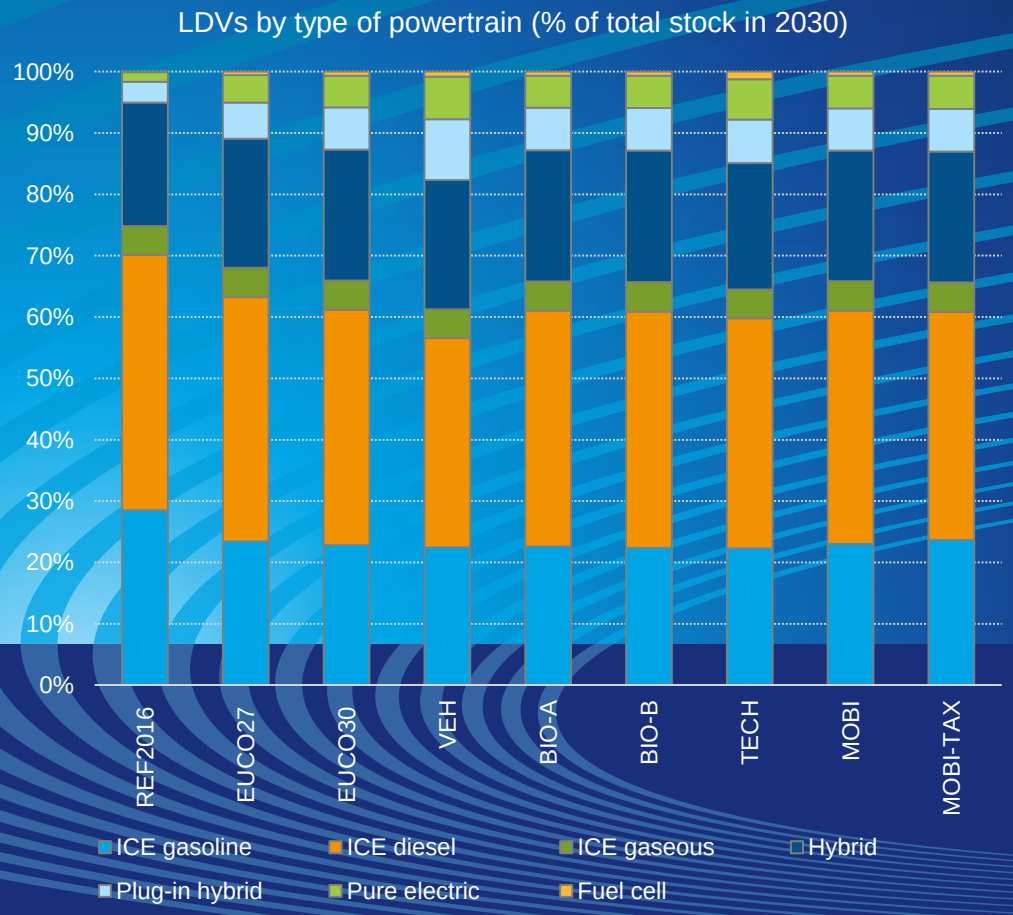


European Commission

Research, innovation and competitiveness

By 2030, electrically chargeable vehicles would represent 11-13% of the light duty vehicle stock in the central scenarios and 18% in the VEH scenario. By 2050, they are projected to reach about 68-72% of the light duty vehicle stock.

Transport activity of ICE diesel and gasoline cars in urban transport activity is projected to go down significantly, from about 76% in 2005 to 33-40% by 2030 and around 6-7% by 2050.



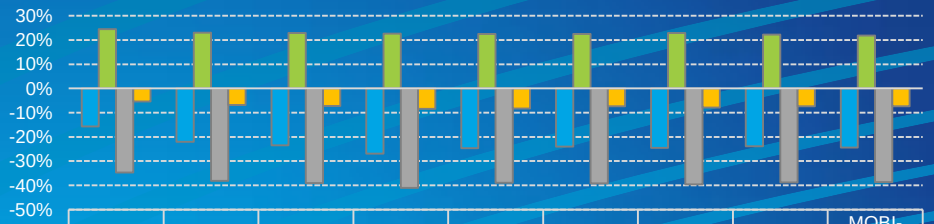
CO_2 emissions (tank to wheel)

By 2030, CO_2 emissions from transport excluding international shipping would go down by 18-22% relative to 2005 (18-19% in the central scenarios).

CO_2 emissions from passenger transport decrease by 22-27%; the contribution of freight transport is more limited (decrease by 5-8% by 2030).

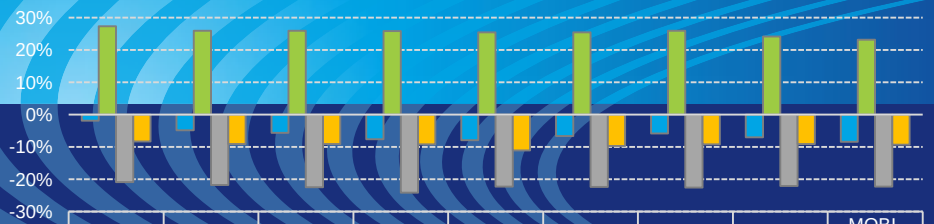
For both passenger and freight transport, the CO_2 emissions reductions are to a large extent due to improvements in energy intensity while carbon intensity plays a more limited role by 2030. Transport activity works in opposite direction, i.e. towards increasing emissions.

Decomposition analysis for passenger transport for 2005-2030 (% change)



	REF2016	EUCO27	EUCO30	VEH	BIO-A	BIO-B	TECH	MOBI	MOBI-TAX
Change in emissions	-15,7%	-22,0%	-23,5%	-26,9%	-24,7%	-24,1%	-24,6%	-23,9%	-24,4%
Transport activity	24,5%	23,0%	22,9%	22,6%	22,5%	22,5%	22,9%	22,3%	21,8%
Energy intensity	-34,7%	-38,1%	-39,1%	-41,0%	-39,0%	-39,3%	-39,6%	-38,8%	-38,7%
CO2 intensity	-5,4%	-6,9%	-7,3%	-8,5%	-8,3%	-7,3%	-7,9%	-7,3%	-7,4%

Decomposition analysis for freight transport for 2005-2030 (% change)



	REF2016	EUCO27	EUCO30	VEH	BIO-A	BIO-B	TECH	MOBI	MOBI-TAX
Change in emissions	-1,9%	-4,9%	-5,7%	-7,6%	-7,9%	-6,6%	-5,9%	-7,1%	-8,4%
Transport activity	27,3%	26,0%	26,0%	25,8%	25,4%	25,5%	26,0%	24,2%	23,2%
Energy intensity	-20,9%	-21,8%	-22,5%	-24,2%	-22,3%	-22,4%	-22,6%	-22,1%	-22,3%
CO2 intensity	-8,4%	-9,1%	-9,2%	-9,3%	-11,1%	-9,7%	-9,2%	-9,1%	-9,3%

Transport system costs

The average annual net costs for the transport system associated with this change are projected to be €4 to 16 billion (0.03 to 0.10 percentage points of EU's GDP) for 2021-2030, on top of REF2016.

Capital costs for transport equipment are estimated at €15 to 35 billion for 2021-2030 and costs for recharging and refuelling infrastructure at €2 to 3 billion annually in addition to REF2016.

Fuel costs savings would represent about €11 to 33 billion annually. "Co-benefits" in terms of air pollution, noise, congestion and safety are quantified at €6 to 15 billion annually for 2021-2030 compared to REF2016.

Annual averages for 2021-2030 compared to REF2016 (p.p. of GDP)	EUCO27	EUCO30	VEH	BIO-A	BIO-B	TECH	MOBI	MOBI-TAX
Total costs	0.03	0.03	0.05	0.03	0.04	0.03	0.07	0.10
Capital costs	0.12	0.15	0.23	0.14	0.14	0.14	0.11	0.10
Fuel costs (incl. taxation)	-0.12	-0.15	-0.21	-0.13	-0.12	-0.16	-0.17	-0.07
Fixed operation costs	0.01	0.02	0.05	0.02	0.02	0.03	0.00	-0.01
Variable non-fuel operation costs	0.04	0.04	0.03	0.03	0.03	0.04	0.18	0.16
External costs	-0.04	-0.04	-0.05	-0.04	-0.04	-0.04	-0.08	-0.09
Recharging/refuelling infrastructure	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01

More information

DG MOVE website: http://ec.europa.eu/transport/index_en.htm

Infographics: http://ec.europa.eu/transport/facts-fundings/infographics/index_en.htm

"Scoreboard": http://ec.europa.eu/transport/facts-fundings/scoreboard/index_en.htm

White Paper: http://ec.europa.eu/transport/themes/strategies/2011_white_paper_en.htm

Low-emission mobility: http://ec.europa.eu/transport/themes/strategies/news/2016-07-20-decarbonisation_en.htm

Modelling:
https://ec.europa.eu/transport/sites/transport/files/themes/strategies/news/doc/2016-07-20-decarbonisation/swd%282016%29244.pdf

https://ec.europa.eu/energy/en/data-analysis/energy-modelling

COM work programme2017: http://ec.europa.eu/atwork/pdf/cwp_2017_de.pdf