

EU Transport GHG: Routes to 2050 – towards the decarbonisation of the transport sector



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In the run-up to Copenhagen...

“**The European Council** calls upon all Parties ... to agree to global emission reductions of at least 50%, and aggregate developed country emission reductions of at least 80-95%... It **supports an EU objective**, in the context of necessary reductions according to the IPCC by developed countries as a group, **to reduce emissions by 80-95% by 2050 compared to 1990 levels.**”

Presidency Conclusions, Brussels European Council, 29/30 October 2009

- **Business-as-usual (BAU) scenarios project increases in EU transport GHG emissions of 60% to 70% between 1990 and 2050**
- **Without further action, in 2050 transport sector GHG emissions could be equivalent to 30% of 1990 economy-wide GHG emissions**
- **Would limit the scope for overall economy-wide emissions reductions to a maximum of 70%**

Current EU approach for tackling transport sector emissions

To date, EU policy on reducing transport's GHG emissions has been targeted at specific areas, e.g.

- Passenger car CO₂ regulation
- Inclusion of aviation in EU Emissions Trading Scheme
- Clean Road Transport Vehicles Directive
- Proposed Regulation on CO₂ from vans
- Biofuels and Renewable Energy Directives
- GHG reduction requirement of amended Fuel Quality Directive

Given scale of the challenge a co-ordinated, strategic approach should help to ensure that the “best” and most cost effective measures are undertaken at most appropriate time

EU Transport GHG: Routes to 2050: Project aims and objectives



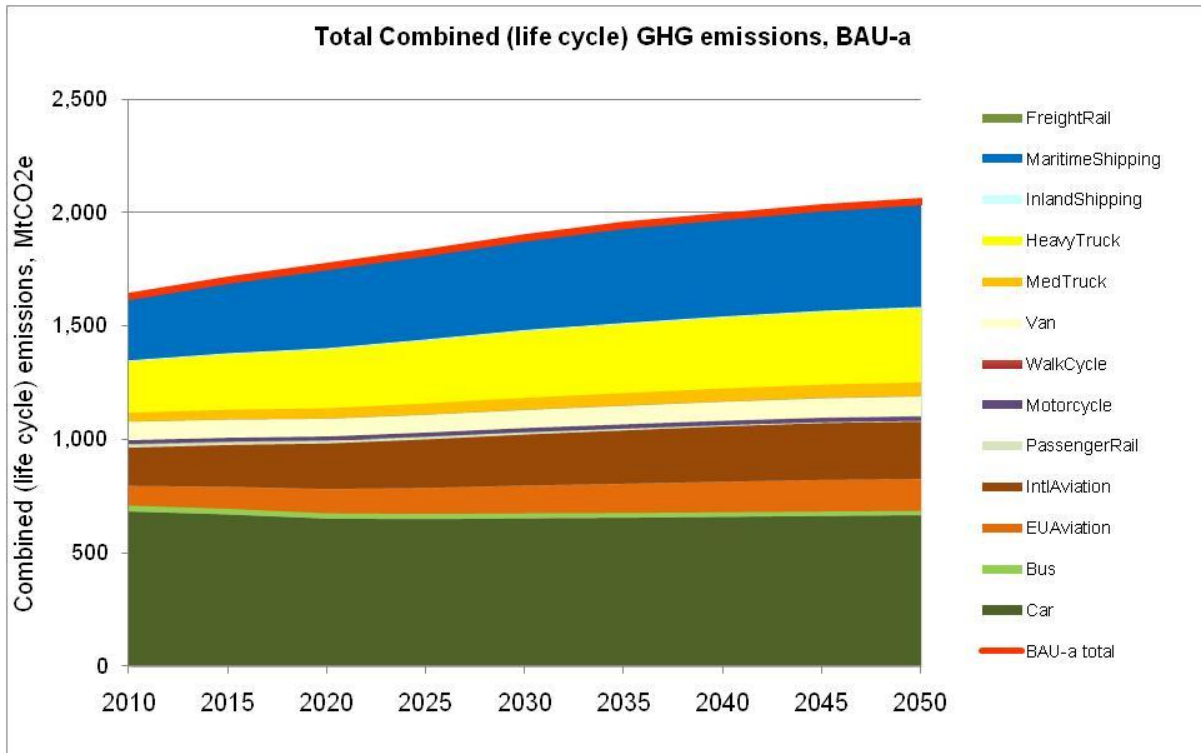
CE Delft



- Begin to consider long-term policy framework for transport in context of the need to reduce economy-wide GHG emissions
- Focus on medium- to long-term (post 2020 out to 2050), i.e. moving beyond recent focus on short-term policy measures
- Gather evidence on what we know about reducing transport's GHG emissions
Identify timescales for taking action and what these actions should be
- Quantify the impacts of taking action on GHG emissions and, where possible, on costs
- Investigate co-benefits of GHG reduction measures
- Engage with full range of stakeholders from the transport sector

www.eutransportghg2050.eu

Baseline business as usual scenario



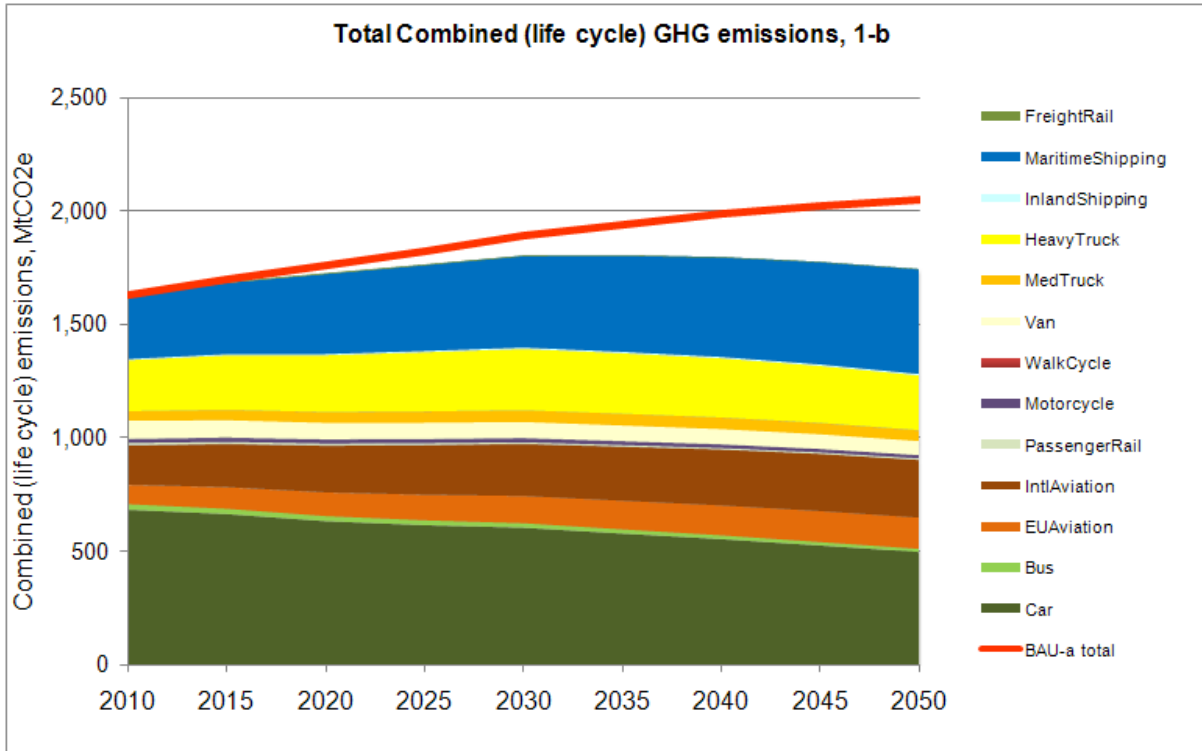
- In 2010, road transport emissions account for 66% of total transport CO₂ emissions

- 10% increase in road transport emissions (25% increase for all transport) likely between 2010 and 2050

- Clear that actions to control road transport emissions will be key in decarbonising the whole transport sector



Reducing the GHG intensity of transport fuels: abatement potential from biofuels



•30% reduction in life-cycle emissions associated with road transport fuels by 2050

•Gives 18% reduction in road transport emissions in 2050 compared to 2010

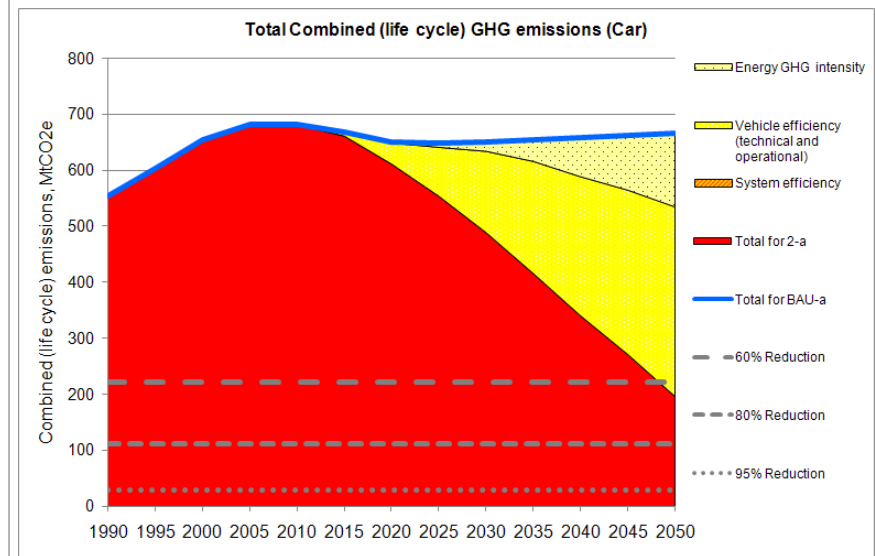
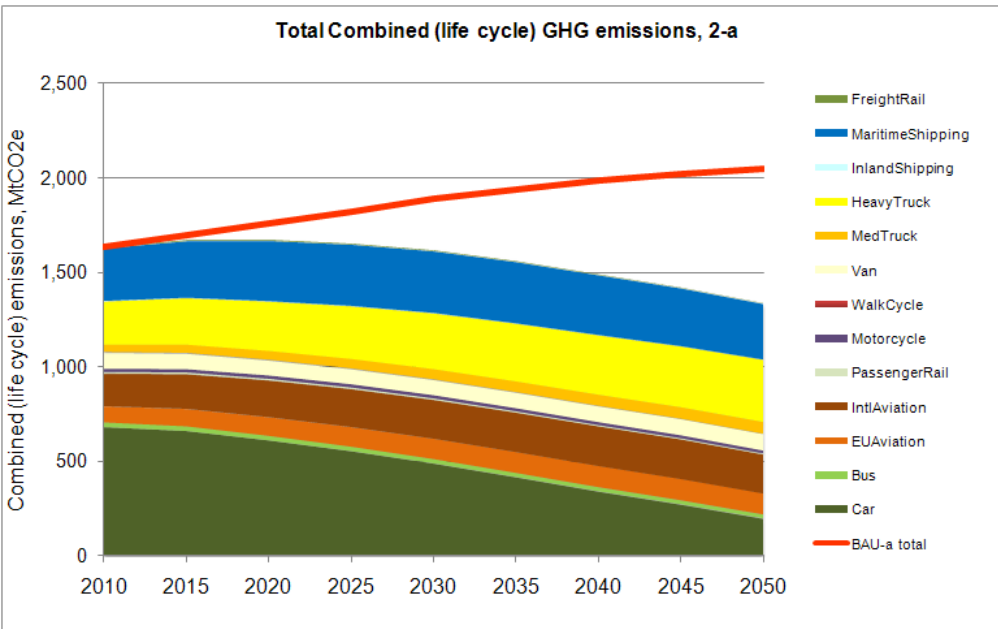


Average GHG emissions factor by energy carrier (Sum All), 1-b

Combined (life cycle) emissions, kgCO₂e/GJ

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Gasoline	86	82	78	76	75	71	68	64	60
Diesel	87	84	80	78	76	73	69	65	62

Tightened passenger car emissions standards



Split of new vehicle sales by powertrain

% of total new vehicle sales

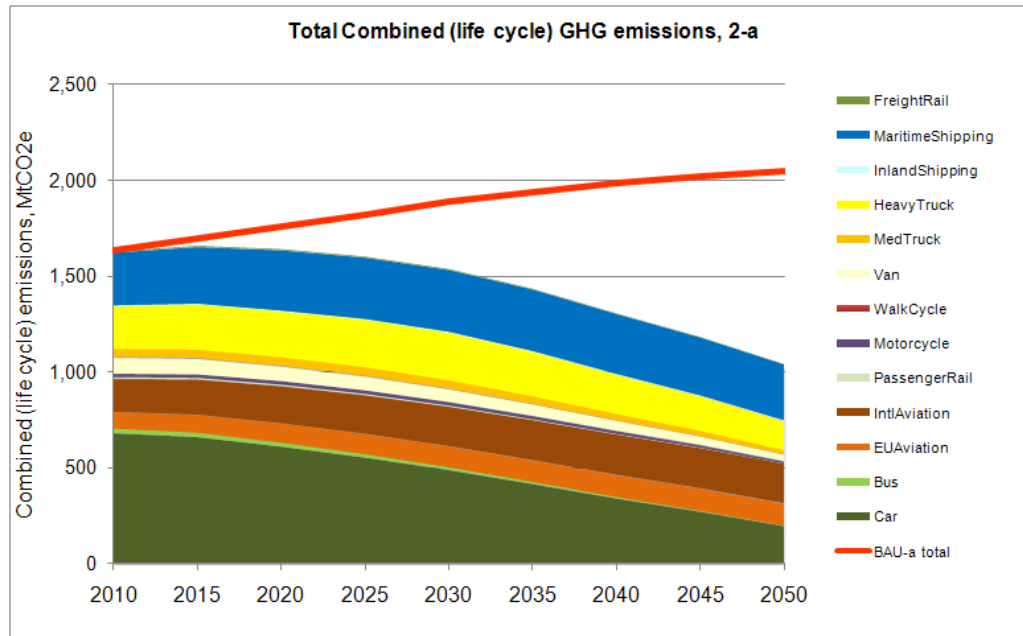
	2010	2015	2020	2030	2040	2050
Gasoline	47.4%	45.4%	28.2%	13.8%	7.0%	1.0%
Diesel	51.7%	47.0%	18.0%	14.0%	7.0%	1.0%
HEV gasoline	0.0%	4.0%	20.0%	17.0%	12.0%	4.0%
HEV diesel	0.0%	2.0%	16.0%	16.0%	10.0%	4.0%
PHEV gasoline	0.0%	1.0%	7.0%	11.0%	18.0%	12.0%
PHEV diesel	0.0%	0.0%	6.0%	12.0%	17.0%	12.0%
EV	0.0%	0.0%	3.0%	10.0%	18.0%	35.0%
FCEV	0.0%	0.0%	0.0%	5.0%	10.0%	30.0%
LPG	0.8%	0.6%	0.8%	0.3%	0.0%	0.0%
CNG	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

• Shift to EVs, PHEVs and Fuel Cell vehicles by 2050

• Gives 34% reduction in road transport emissions (71% reduction in car emissions) in 2050 compared to 2010

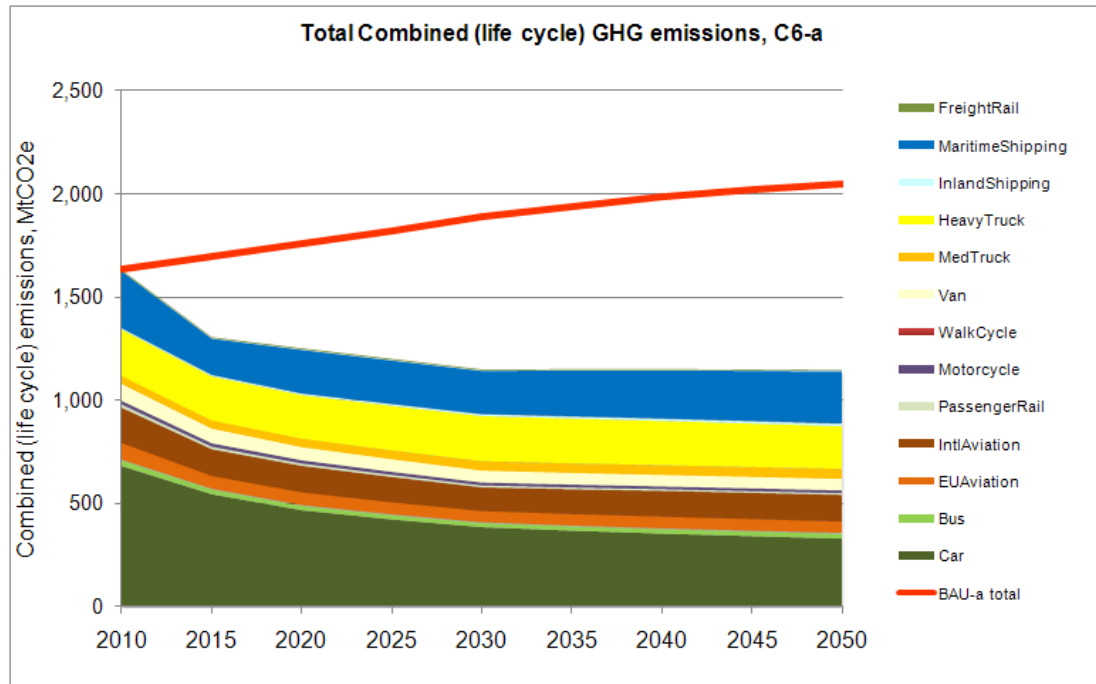
• Average new vehicle tailpipe emissions drop from ~146 gCO₂/km to 14 gCO₂/km

CO₂ emissions standards for all road transport modes



- Passenger cars – as in previous example
- Shift to hybrids, EVs, PHEVs and Fuel Cell vehicles for medium-duty trucks
- No electric heavy duty trucks – majority assumed to be fuel cell powered by 2050, with remainder diesel-hybrids
- New bus and van fleet assumed to comprise mixture of hybrid, PHEV, EV and fuel cell vehicles
- Gives 61% reduction in road transport emissions in 2050 compared to 2010

System efficiency (non-technical) measures



- Total demand for transport services assumed to remain the same as in the baseline

- Split between modes assumed to shift significantly

- Cars

- BAU: 47% increase in pkm
- With measures: 6% reduction in pkm

- Medium trucks

- BAU: 85% increase in tkm
- With measures: 50% increase in tkm

- Heavy trucks

- BAU: 78% increase in tkm
- With measures: 23% increase in tkm

Modal shift to more efficient modes

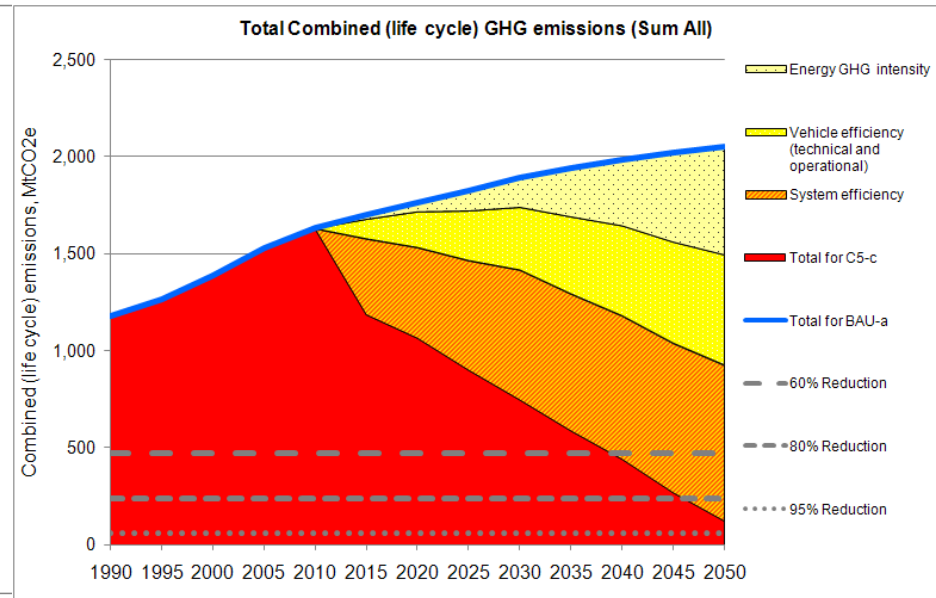
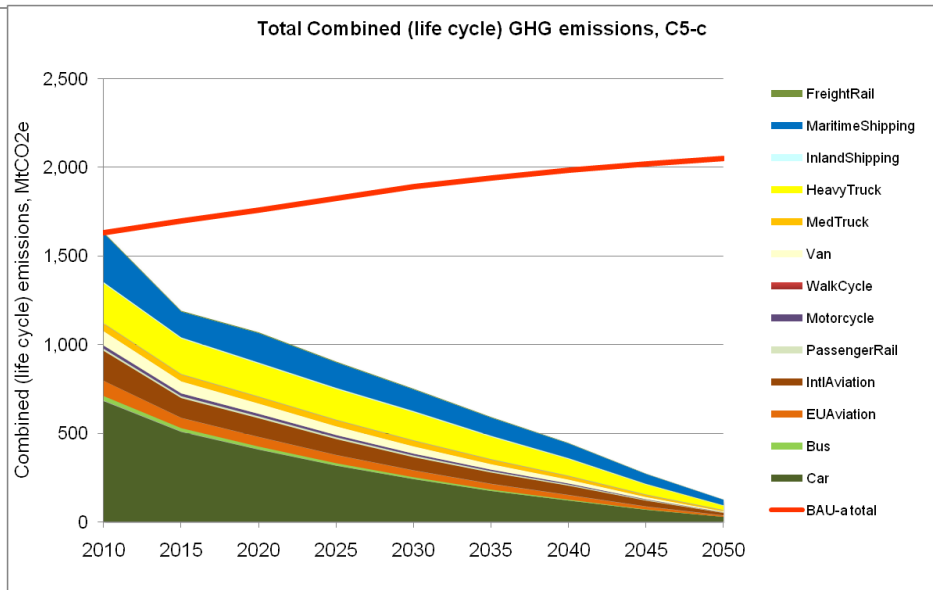
Improved spatial planning

Speed reduction measures

Driver training in fuel efficiency

30% reduction in total transport emissions by 2050 compared to 2010

What does this mean for the transport sector as a whole?



No silver bullet – results indicate that both technological and demand reduction measures will be required

Conclusions

- **To meet 80% reduction in EU economy-wide emissions, reductions in emissions of between 50% and 80% (against 1990 levels) are required from the transport sector**
- **No silver bullet – results of this study strongly indicate that both technological and system efficiency measures will be required (up to 89% reduction in transport emissions possible by 2050)**
- **Urgent action needed now as many policies have long lead times before full effects are felt**
- **Need to account for the co-benefits of policy measures (e.g. air quality and energy security benefits) and trade-offs with other sectors**
- **Action required by all levels of Government in concert with industry stakeholders**

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