ALICE Decarbonisation Roadmap 2 years on

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ALICE Plenary Meeting

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FREIGHT DEMAND GROWTH IS MANAGED

- Supply chain restructuring
- Localization and nearshoring
- Decentralization of production and stockholding
- 3D printing
- Dematerialization
- Consumer behavior

TRANSPORT MODES ARE SMARTLY USED AND COMBINED

- Increased use of rail
- Increased use of short sea shipping and inland waterways
- Modular road transport
- Cargo bikes
- Multi-modal optimization
- Synchromodality

FLEETS AND ASSETS ARE SHARED AND USED TO THE MAX

- Load optimization
- Load consolidation and asset sharing
- Reduce empty moves
- Modular packaging and boxes
- Open transport networks and warehouses.
- Increase storage density and energy efficiency

FLEETS AND ASSETS ARE ENERGY EFFICIENT

- Cleaner and efficient technologies
- Efficient vehicles and vessels
- High capacity vehicles / duo trailers
- Driving behavior
- Fleet operation
- Fleet maintenance

FLEETS AND ASSETS USE LOWEST EMISSIONS ENERGY SOURCE FEASIBLE

- Electric / hybrids
- Solar / Wind
- Biofuels
- Hydrogen
- CNG/bio-LNG
- Cleaner diesel
- Fuel management

still comprehensive: *covers all possible decarbonisation options*

still very difficult to estimate potential contribution of each of the five levers

Scale and Urgency of the Climate Emergency has increased

CO_2 reductions required to have a **two-thirds** chance of staying within 1.5°C carbon budget

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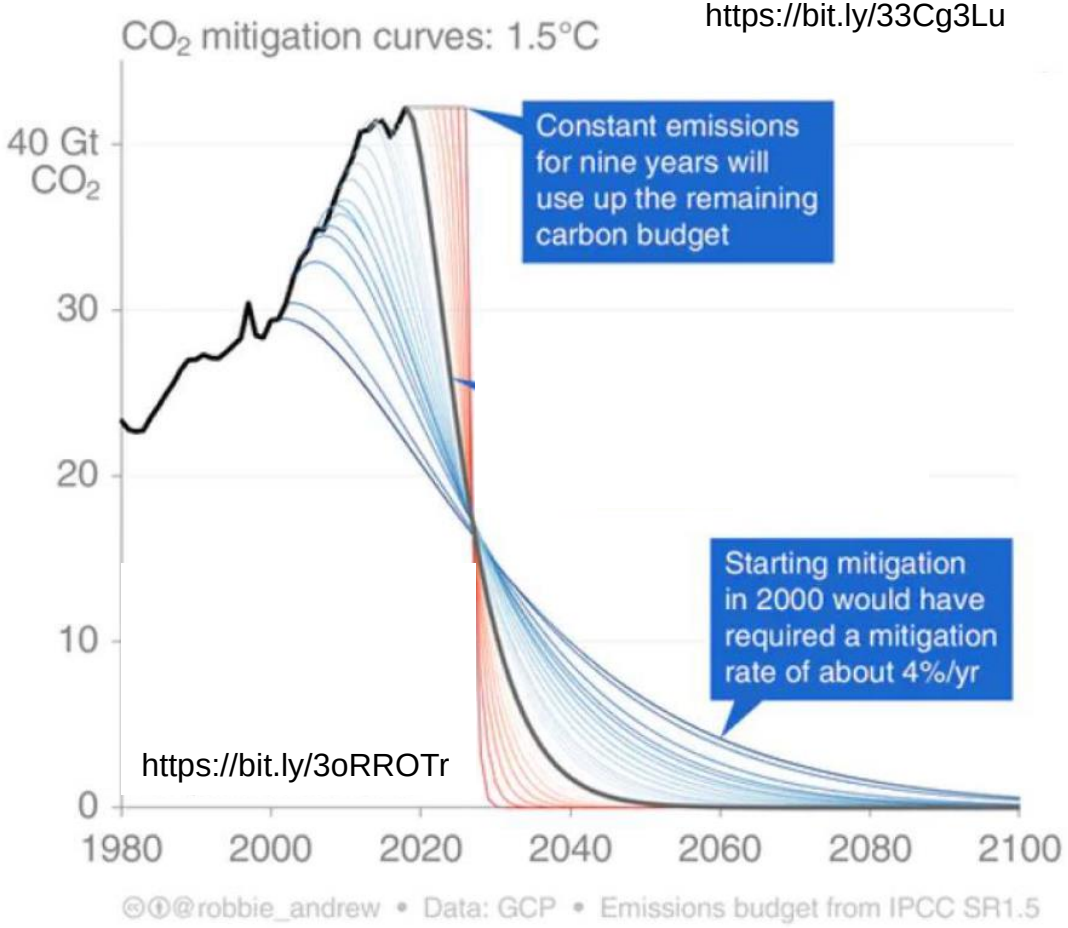

carbon budget exhausted in 8 years at current emission rate

United Nations Climate Change

RACE TO ZERO

120 countries, 3067 businesses and 733 cities committed to have net zero emissions by 2050 or earlier

https://bit.ly/3f6svtD

Race to **NET** Zero

Concept of net zero is a dangerous trap
(Dyke, Watson and Knorr, 2021)
https://bit.ly/3oRROTr

'*Within a few decades, we will need to transform our civilisation from one that currently pumps out 40 billion tons of carbon dioxide into the atmosphere each year, to one that produces a net removal of tens of billions*.'

'*net zero has licensed a recklessly cavalier "burn now, pay later" approach which has seen carbon emissions continue to soar*.'

logistical implications of implementing a *negative emission* strategy at a planetary scale?

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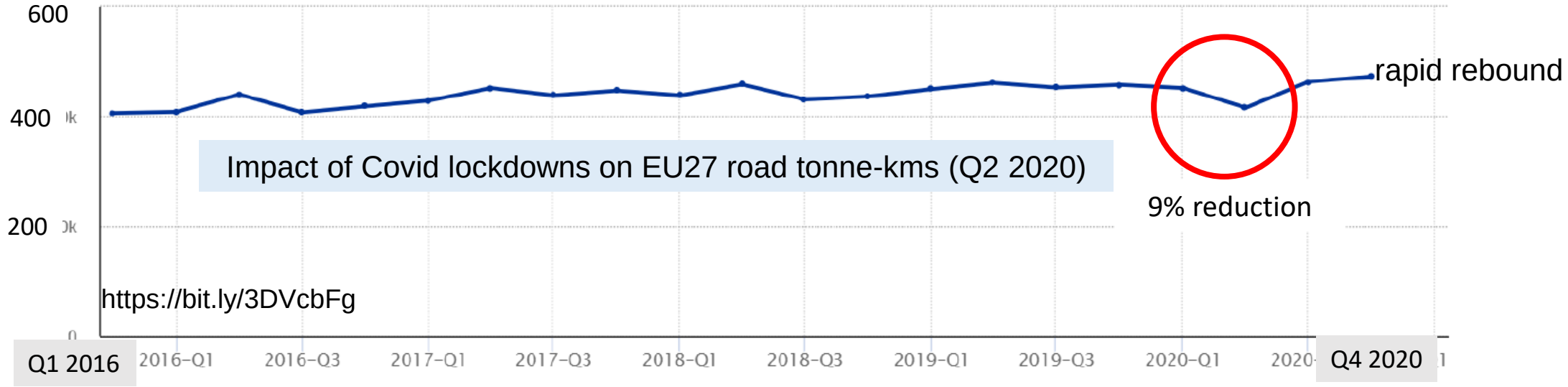
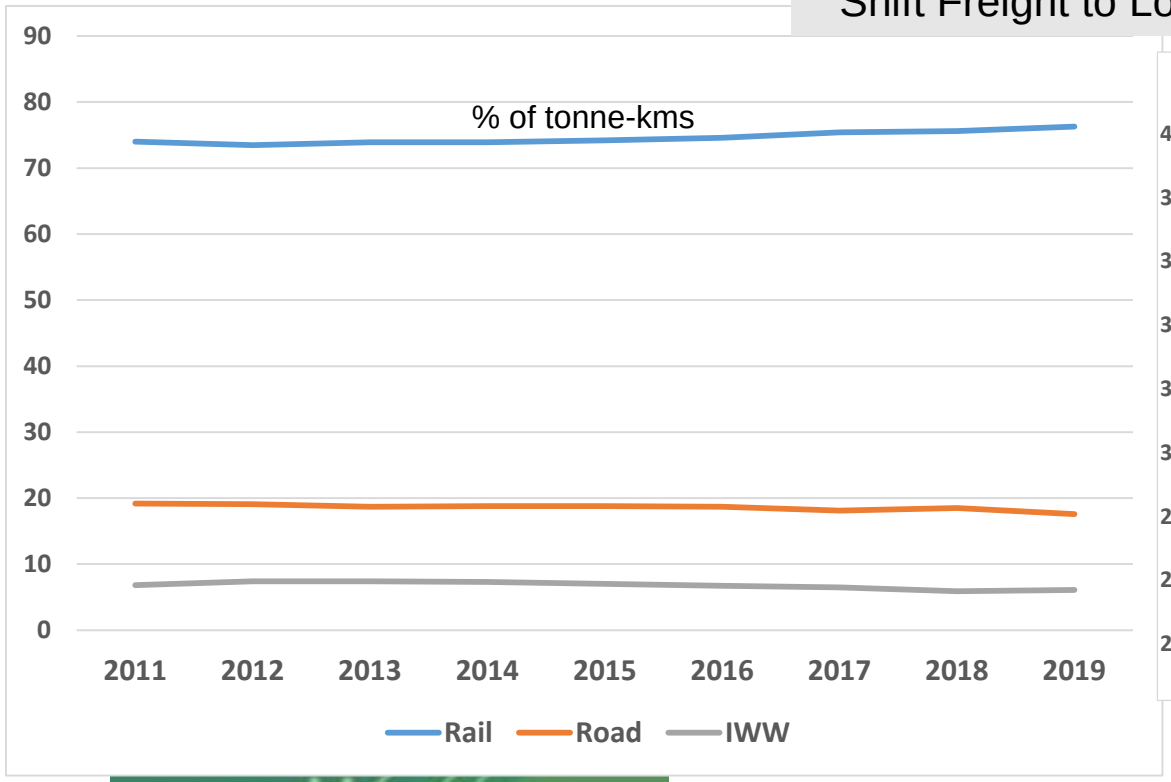
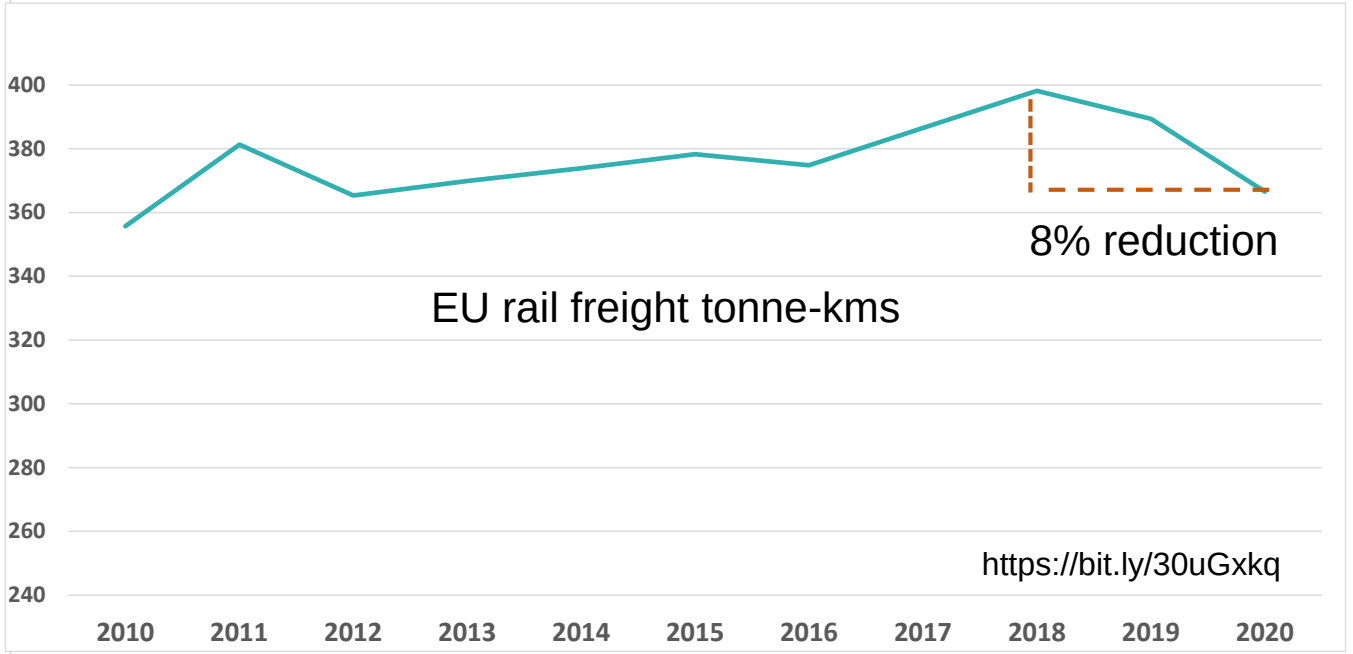
Logistical efforts intensified to capture atmospheric greenhouse gases



Shift Freight to Lower Carbon Transport Modes



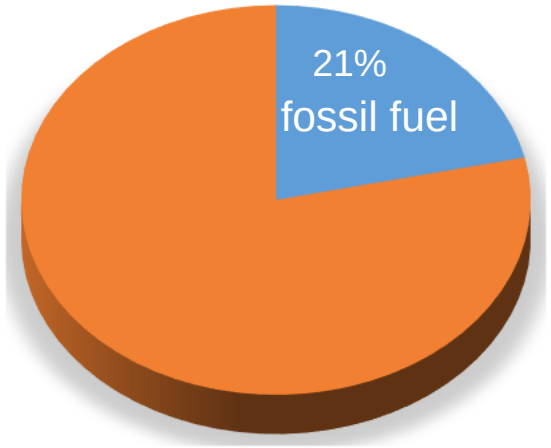


SUSTAINABLE & SMART MOBILITY STRATEGY

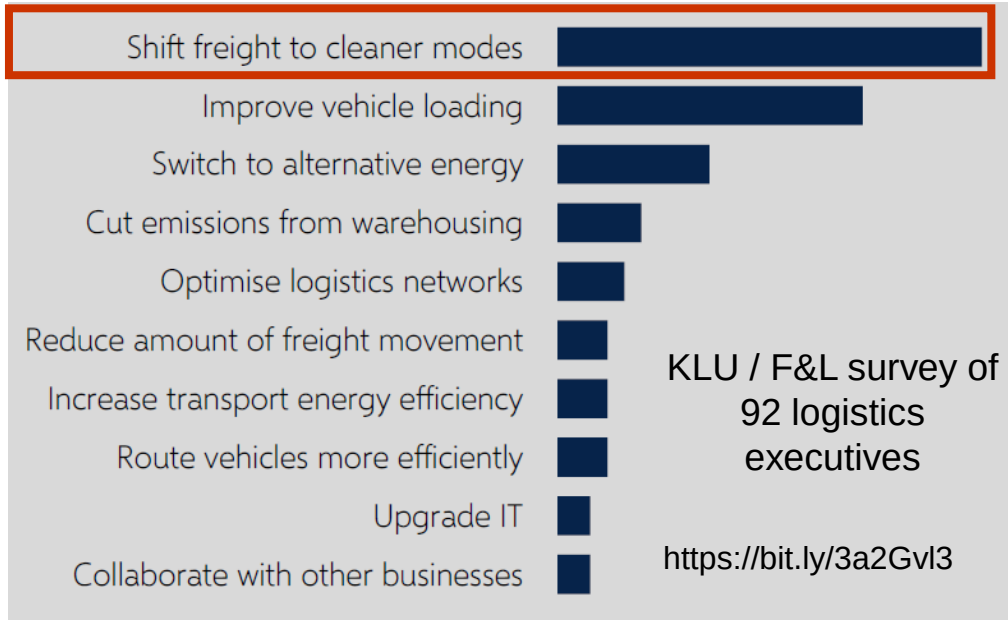
mode-specific targets rather than modal split target

- 50% increase in rail freight tonne-kms by 2030
- 100% increase by 2050

EU rail freight tonnage 2020



most cost-effective methods of decarbonising logistics



KLU / F&L survey

Increasing the Utilisation of Vehicle Capacity

Supply Chain Collaboration

current levels of collaboration (out of 6)

suppliers / customers / LSPs	*3.8*
competitors	*2.0*

relative benefit of logistical collaboration

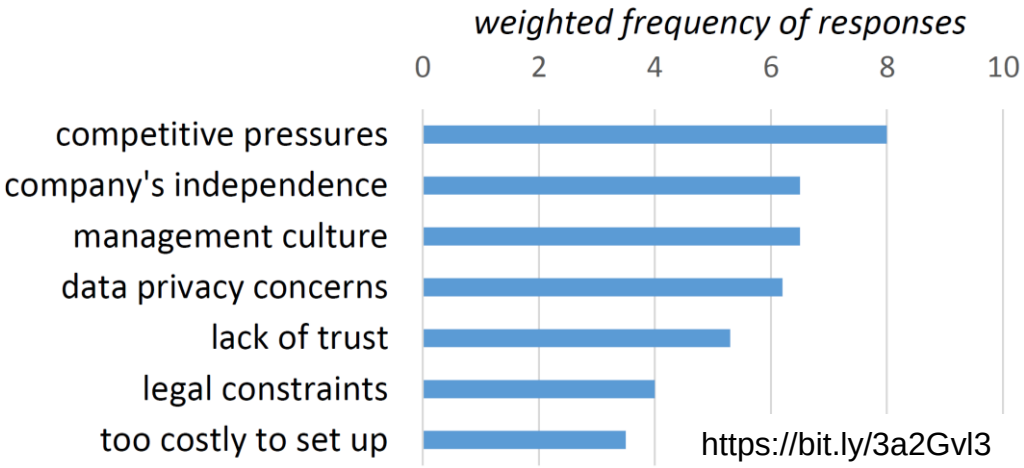
1 = no benefit 6 = large benefit

environmental improvement 3.7

increased economic efficiency 3.8

little variation by type or size of business

main barriers to inter-company collaboration



https://bit.ly/3a2Gvl3

Digitalisation

% European logistics executives rating the impact of digitalisation as '*high or transformational*'

	in past 5 years	in next 5 years
total sample (n=92)	22%	**74%**
Logistics providers	38%	**86%**
Shippers	9%	**64%**

truck empty running % stable

% of truck-kms run empty in EU

2010: 22%

2018: 20%

2019: 19.9%

2020: 20.2%

Impact of EU Mobility Package on truck empty running and CO_2

Ricardo study: 0.8–4.6% increases in vehicle-kms and CO_2 emissions

https://bit.ly/3s2Fsvv

KPMG study: based on Bulgarian data 2% increase in CO_2 emissions

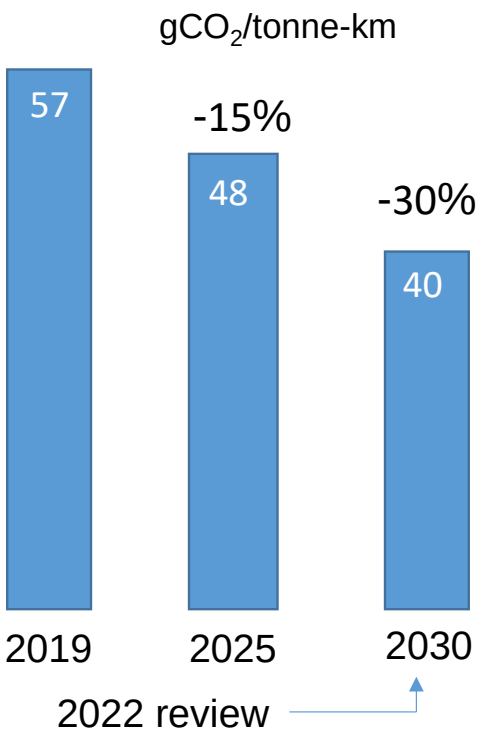
https://politi.co/3oX9hLO

Improving the energy efficiency in logistics

Little macro-level data on energy efficiency of EU freight transport

Increasing fuel efficiency of new ICE trucks

EU fuel / CO_2 standards for new trucks



54m tonnes of CO_2 saved by 2030

main sources of future truck fuel efficiency improvements to 2030

(ING / TNO, 2021)

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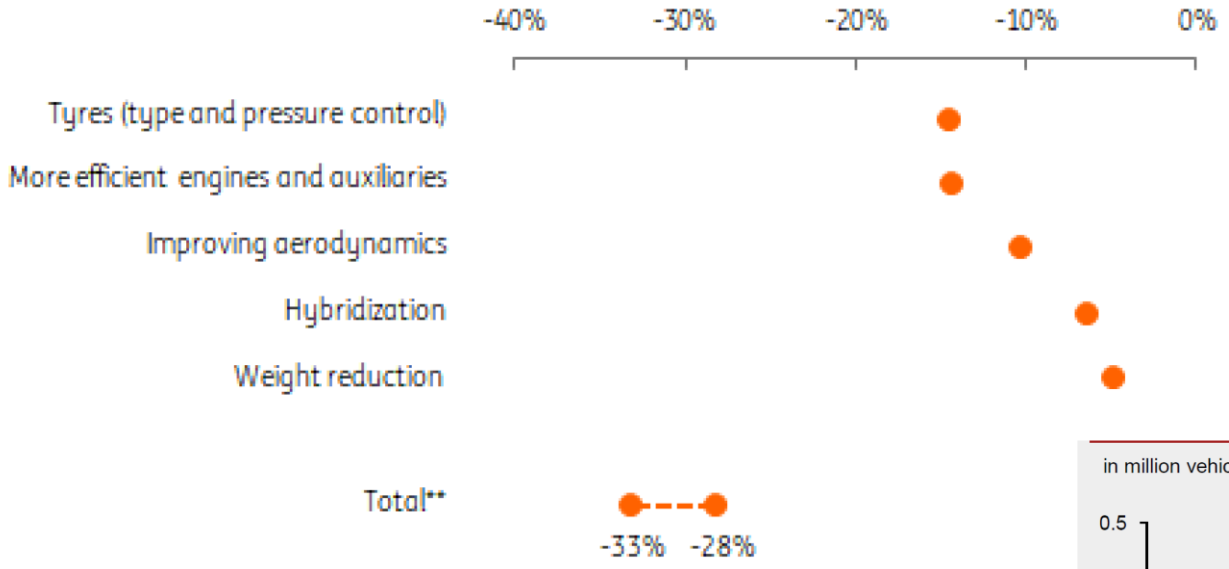


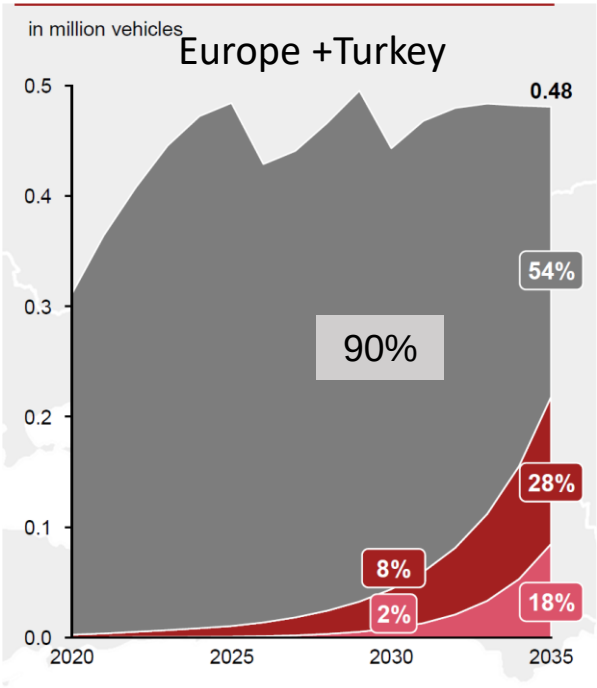
time to replace EU28 truck fleet (at 2017 rate)

12.7 years (unweighted)

13.9 years weighted by national road tonne-kms

Heavy dependence on ICE trucks for next 15-20 years

https://pwc.to/3adTHDB



Cutting the Carbon Content of Freight Transport Energy

low carbon energy options

short haul road	long haul road	rail	shipping	airfreight
battery	battery	catenary	e-methanol	biofuel
hydrogen	hydrogen	battery	green ammonia	e-kerosene
	catenary	hydrogen	hydrogen	hydrogen
	HVO		battery	battery
	biomethane		wind	

uncertainty disagreement lobbying

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

https://bit.ly/3uuW12j

Up to 500km range (70% of European trucking)
currently an 11% payload weight penalty
With chassis lightweighting and increased battery energy density this can be eliminated

H2A

The H2Accelerate collaboration (Daimler Truck, IVECO, and Volvo Group, OMV, Shell, and TotalEnergies. Central objective to enable a commercially viable, pan-European hydrogen trucking system in the post-2030 period.

SIEMENS

technology landscape with stationary charging points …and overhead contact lines ..constitutes most economically and environmentally attractive option for the future of road-based heavy duty freight transport within Europe.

COP26

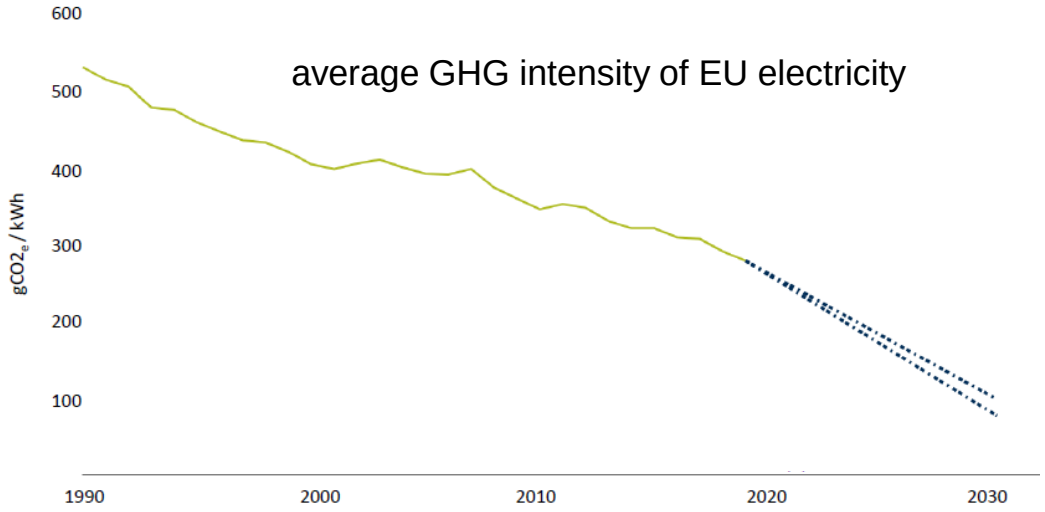
Memorandum of Understanding on
Zero-Emission Medium- and Heavy-Duty Vehicles

https://bit.ly/3IPGdOn

15 countries + sub-national governments and companies

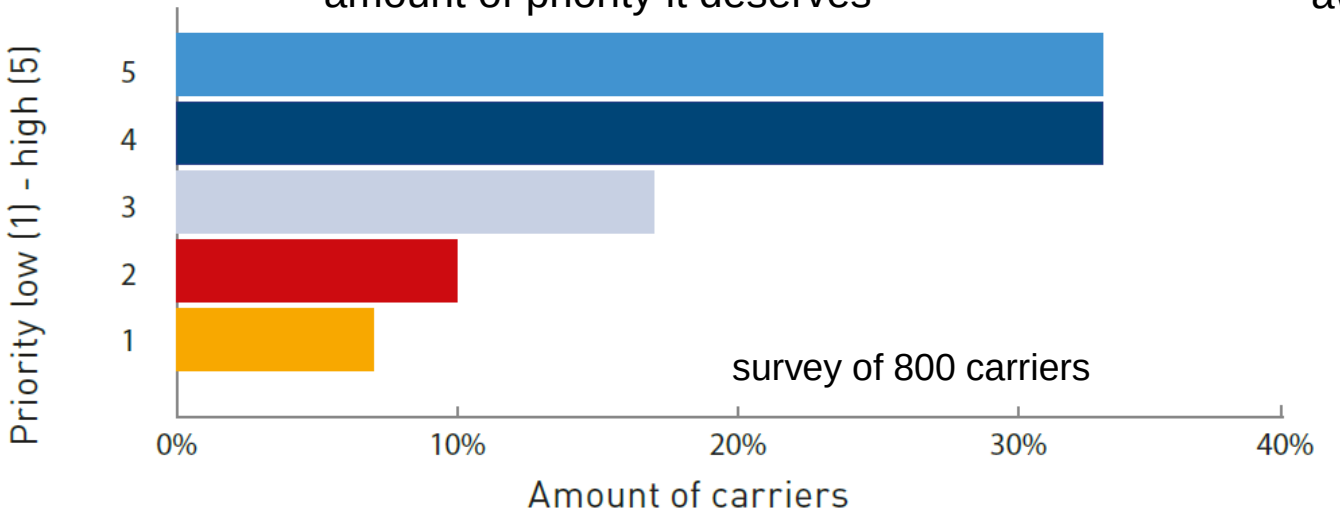
100% zero emission vehicle sales
< 26 tonnes by 2035
> 26 tonnes by 2040

dependence on the decarbonisation of electricity



Attitudes of small and medium sized road carrier to decarbonisation

amount of priority it deserves

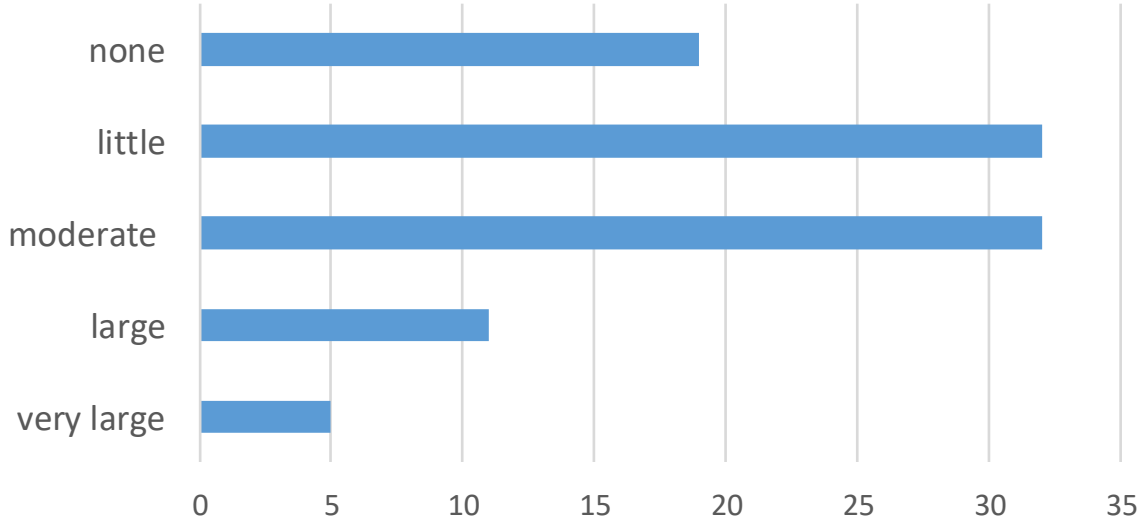


awareness and implementation of decarbonisation measures

Measure	% Awareness	% Implementation
Eco-Driver training	76	69
Fleet manager training	44	40
Transport route optimization	64	57
Fuel consumption monitoring	78	78
Driver performance tracking	64	60
Shorter vehicle-renewal cycles	37	30
Vehicle aerodynamics	33	24
Low rolling resistance tires	37	28
Light weighting	28	19
Anti-idling devices	23	17

Operational | Technical

amount of business opportunity it offers



role of shippers and large logistics services providers in incentivising and advising small carriers

Sustainable Freight Buyers Alliance

- net zero procurement principles
- collaborative platform
- impact tracking

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KLU / Smart Freight Centre / Transporeon survey https://bit.ly/35p4d8A

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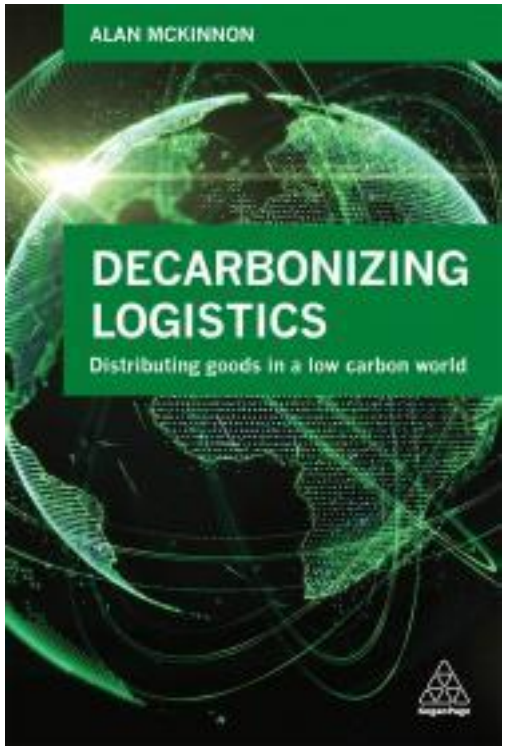

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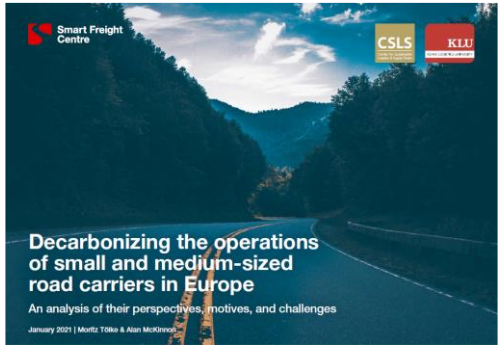

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