Smart Transportation Alliance

2021 Annual Conference
& Innovation Awards

Roundtable 2 – Decarbonising transportation infrastructures: Smart policies and viable funding & financing mechanisms

José Manuel Vassallo
TRANSyT UPM

25 November 2021

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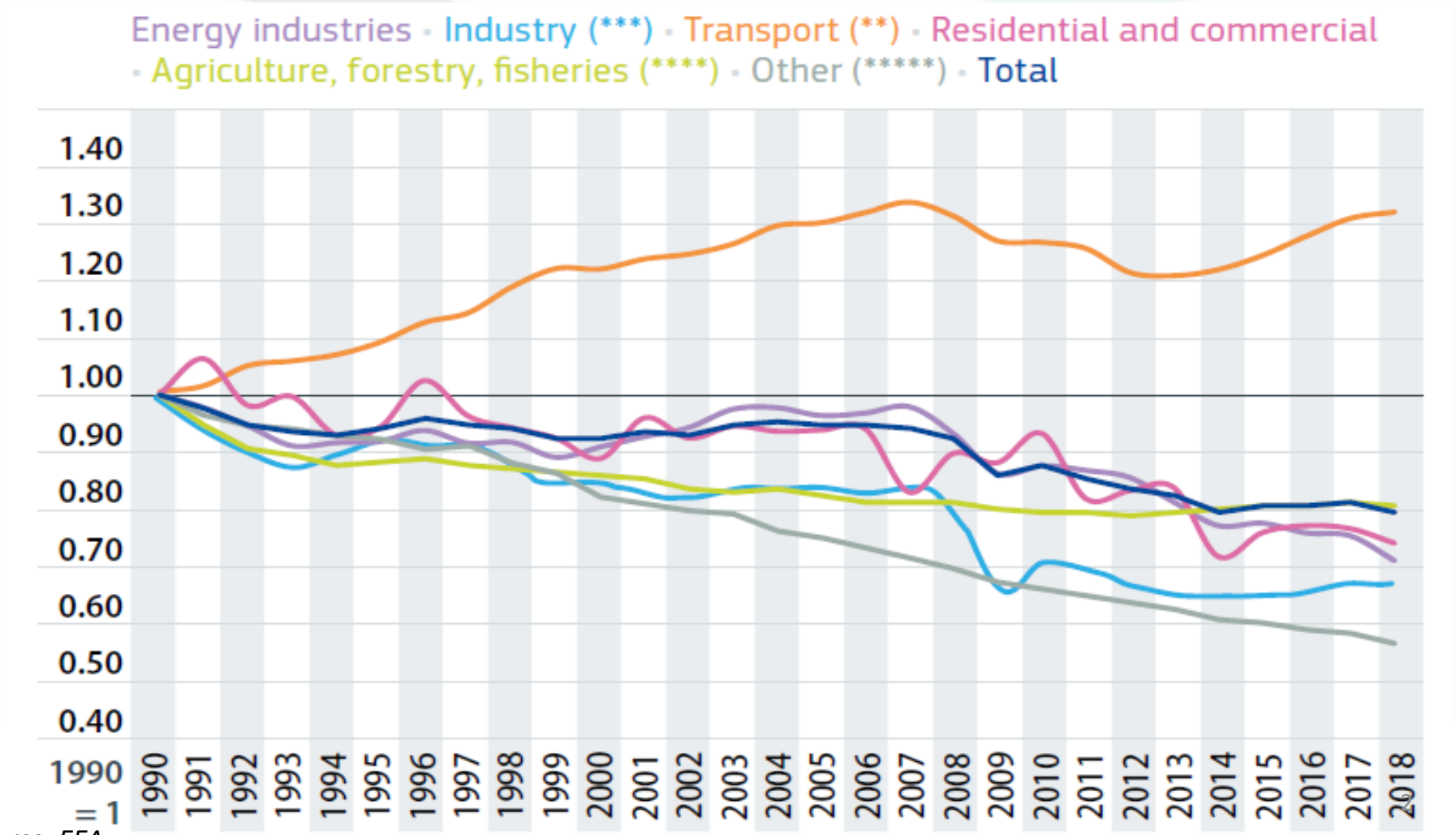
Why is so important to decarbonize Transport?

GHG Emissions by sector in EU 28 (growth from 1990)



Source: EEA

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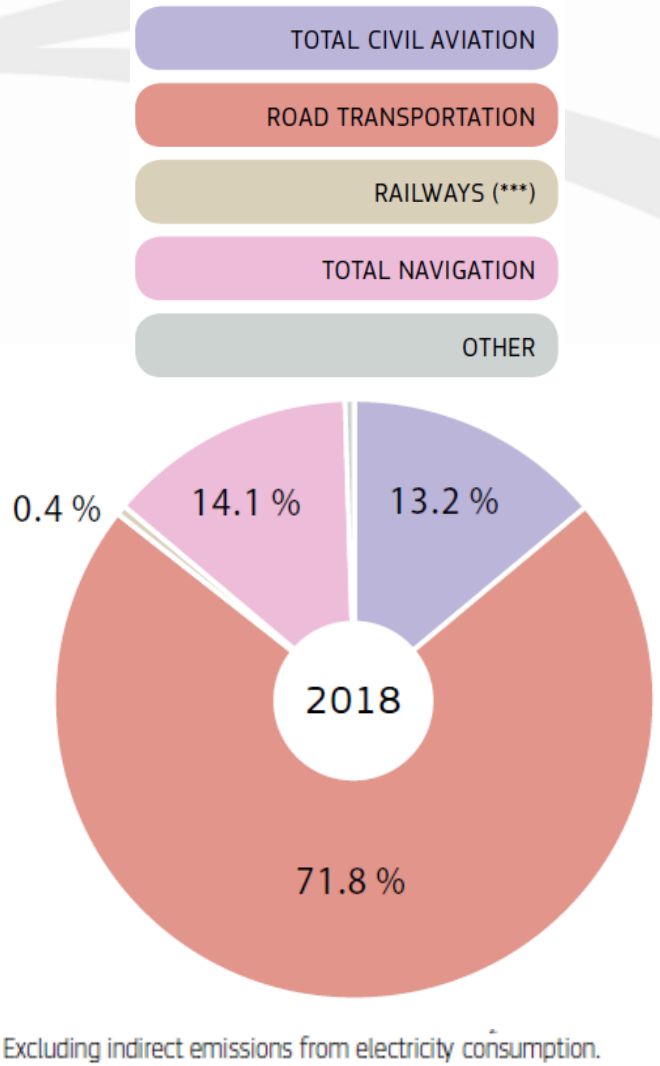
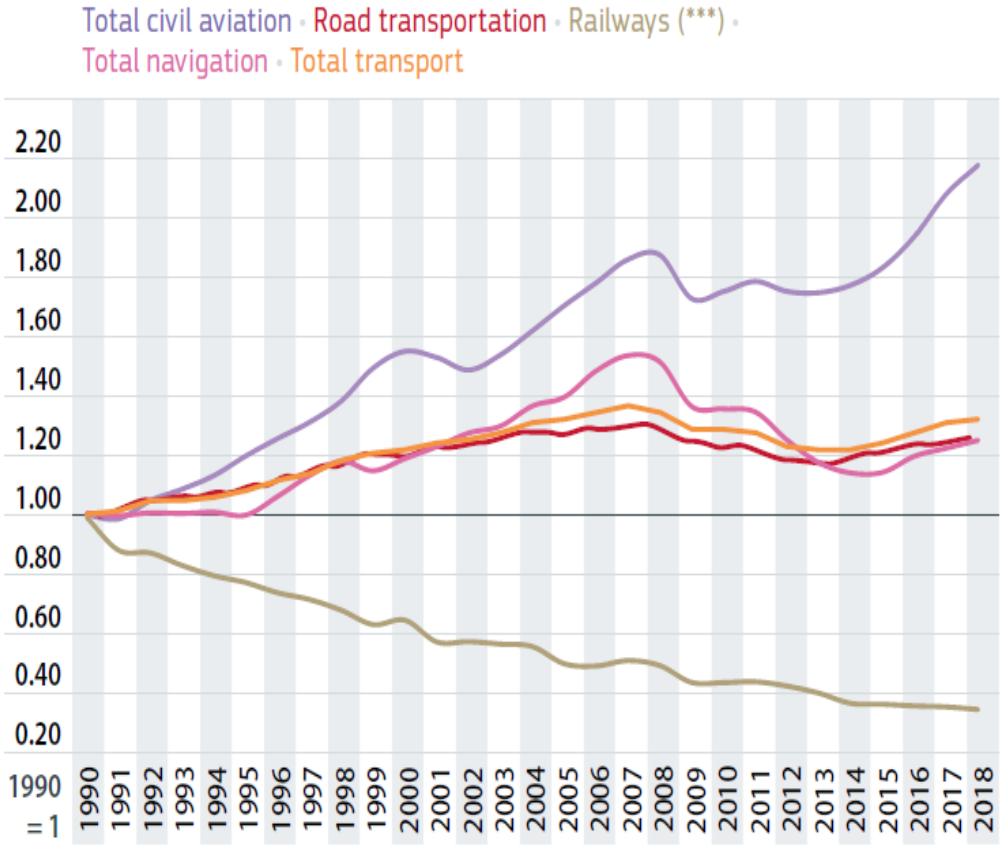
GHG emissions by transport mode



GHG Emissions by transport mode in EU 28
(share and growth from 1990)



Source: EEA

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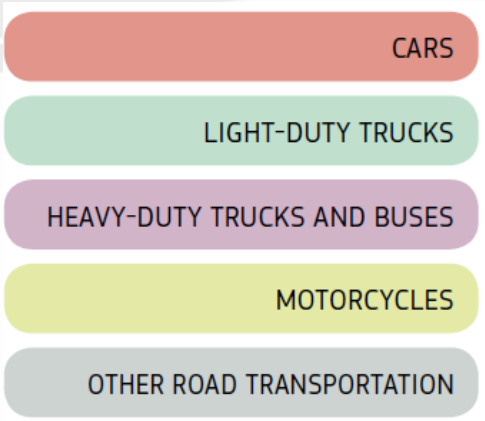
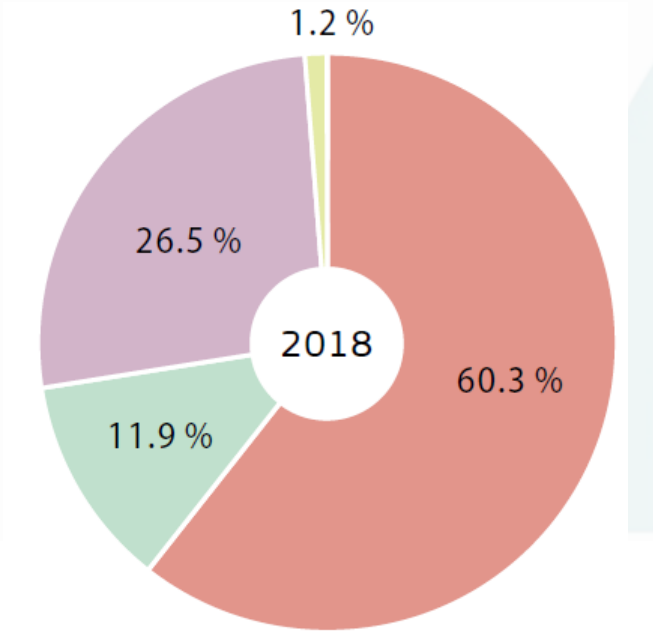
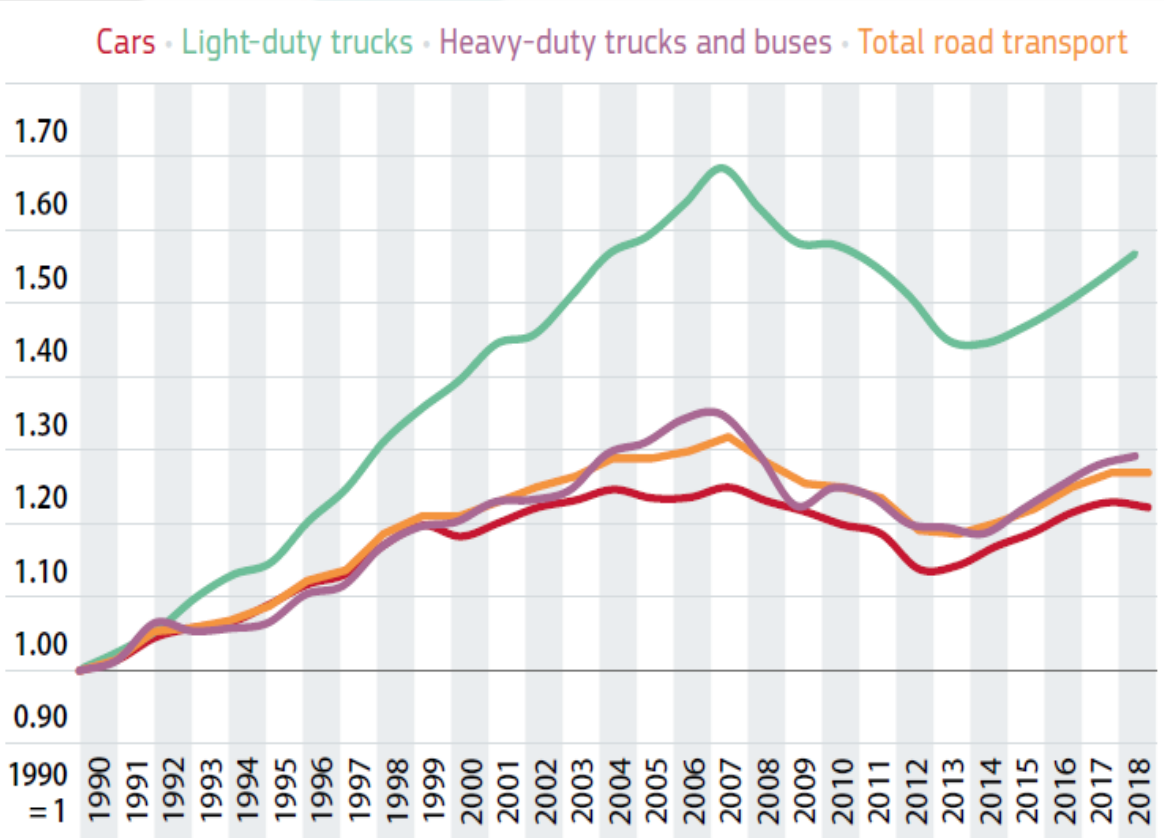
GHG emissions by road transport vehicle





GHG Emissions by type of road mean in EU 28
(share and growth from 1990)



Source: EEA

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How to decarbonize TRANSPORT?

MOBILITY	ENERGY	MARKET
REDUCE MOBILITY	SHIFT TO LOW OR ZERO CARBON TECHNOLOGIES	CARBON PRICES / TAXES
SHIFT TO CLEANER MODES	INCREASE ENERGY EFFICIENCY IN THE WHOLE CYCLE	INCENTIVES TO INNOVATION
TAKE BETTER ADVANTAGE OF THE CAPACITY OF THE VEHICLES		

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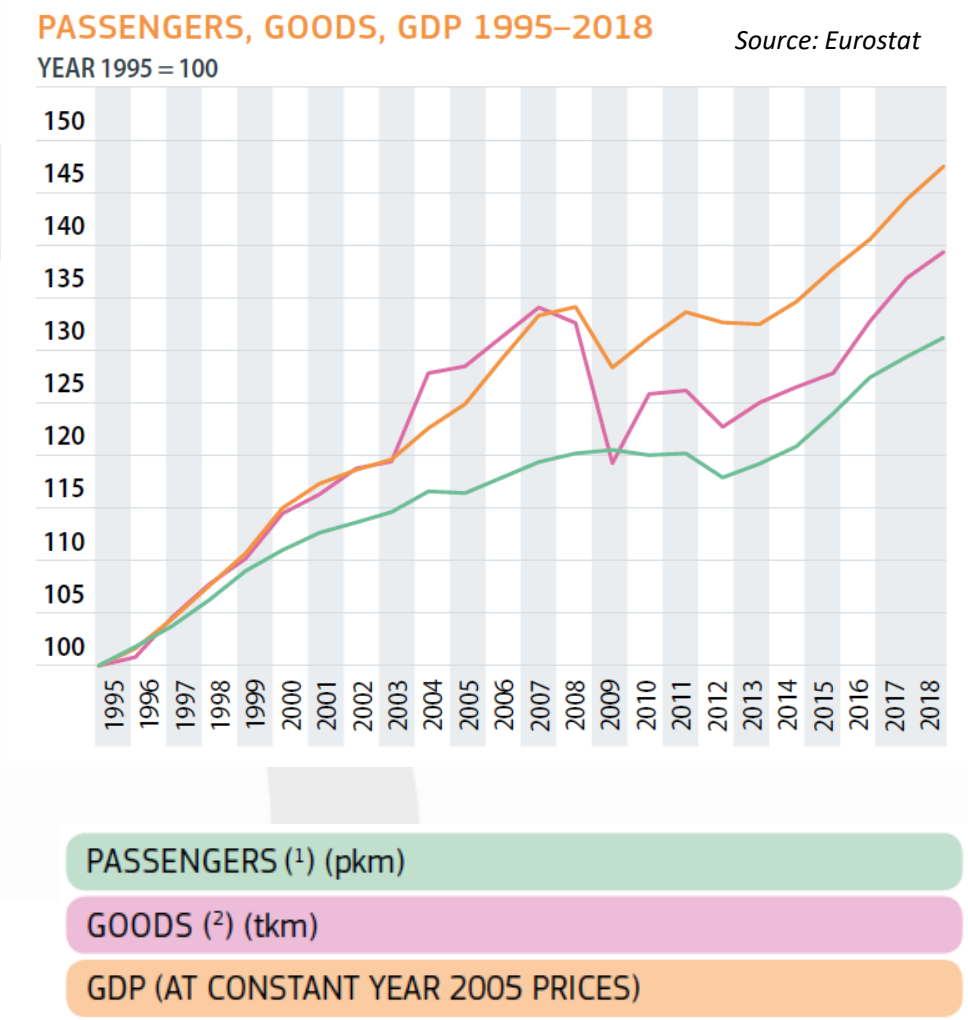
Is it possible to reduce mobility?

- It is **complicated without compromising quality of life**
- There is a slight trend towards **decoupling mobility and GDP**
- **Opposite forces after COVID19**:
  - Tele-working / teleconferences
  - Urban sprawl
  - Greater use of cars
- Some **breakthrough innovations** may have a contribution
  - 3D Printing



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Is shifting to other modes a solution?

- Some modes have **market niches where is difficult to compete**
  - Road transport for last mile
  - Aviation for intercontinental trips
  - Ships for crossing the ocean

MODAL SPLIT

%

	ROAD	RAIL	INLAND WATERWAYS	PIPELINES	SEA	AIR
1995	47.0	15.6	5.1	4.3	28.0	0.1
2000	48.8	14.1	4.9	4.2	28.0	0.1
2005	51.4	12.8	4.5	4.1	27.1	0.1
2010	51.5	12.4	5.1	3.7	27.2	0.1
2011	50.8	13.2	4.7	3.6	27.7	0.1
2012	50.2	13.0	5.1	3.6	28.1	0.1
2013	50.5	12.8	5.1	3.4	28.2	0.1
2014	50.2	12.8	5.0	3.3	28.7	0.1
2015	50.8	12.9	4.8	3.4	28.1	0.1
2016	50.8	12.9	4.6	3.3	28.4	0.1
2017	51.8	12.6	4.5	3.2	27.9	0.1
2018	51.0	12.6	4.0	3.1	29.2	0.1

Source: Eurostat

MODAL SPLIT

%

	PASSEN-GER CARS	P2W	BUS AND COACH	RAILWAY	TRAM AND METRO	AIR	SEA
1995	73.0	2.4	10.4	6.9	1.4	5.3	0.6
2000	73.2	2.0	9.9	6.8	1.4	6.3	0.5
2005	73.1	2.2	9.5	6.5	1.4	6.9	0.5
2006	73.0	2.1	9.4	6.6	1.4	7.1	0.5
2007	72.8	2.0	9.4	6.6	1.4	7.3	0.5
2008	72.6	2.1	9.5	6.8	1.5	7.1	0.5
2009	73.8	2.1	9.0	6.6	1.4	6.7	0.4
2010	73.5	2.1	8.9	6.6	1.5	7.0	0.4
2011	72.8	2.2	9.0	6.7	1.5	7.5	0.4
2012	72.4	2.2	9.1	6.9	1.5	7.6	0.3
2013	72.6	2.2	8.9	6.9	1.5	7.5	0.3
2014	72.6	2.2	8.7	6.9	1.5	7.8	0.3
2015	72.5	2.1	8.7	6.8	1.5	8.1	0.3
2016	72.3	2.1	8.5	6.7	1.5	8.5	0.4
2017	72.1	1.9	8.0	6.9	1.5	9.2	0.4
2018	71.7	1.8	8.0	6.9	1.5	9.6	0.4

NB: **Air and sea:** only domestic and intra-EU-27 transport; estimates for air and for sea based on Eurostat data. The time series for maritime activity from 1995 to 2004 and for aviation activity from 1995 to 2007 have been recalibrated by DG Mobility and Transport in line with the new EU-27 figures to avoid break in series.
P2W: powered two-wheelers.

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Taking a better advantage of the capacity of the vehicles

Passenger mobility

- Trend to share (car-sharing, car pooling, etc.)
- Better integration and connection across modes through MaaS
- Larger vehicles (air, train and buses)

Freight mobility

- Optimization of empty returns through ICT and syncromodality
- Larger freight vehicles
- Crowshipping

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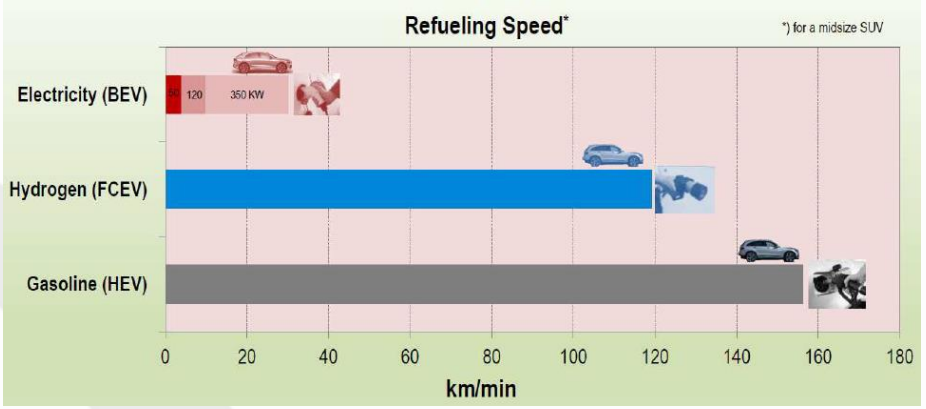
Shift to low carbon technologies

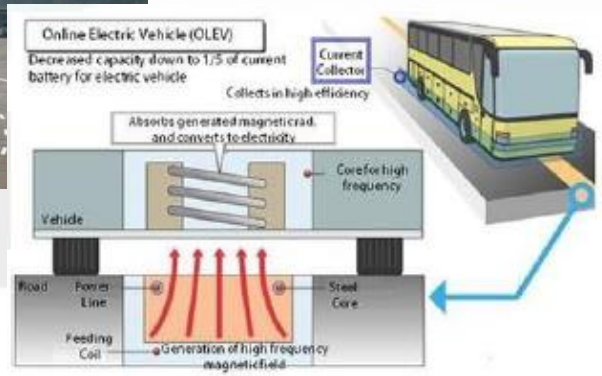
- **Electricity**
  - Need of good infrastructure for re-charging to enhance the shift
  - Possibility of promoting dynamic charging in the road (ERS) for trucks

    New infrastructure design



Source: HyEnergy GmbH

- **Green Hydrogen may play a key role**
  - It is crucial to reduce the cost of electrolysis



- **Biofuels and synthetic fuels**
  - It is important to produce them with clean technologies

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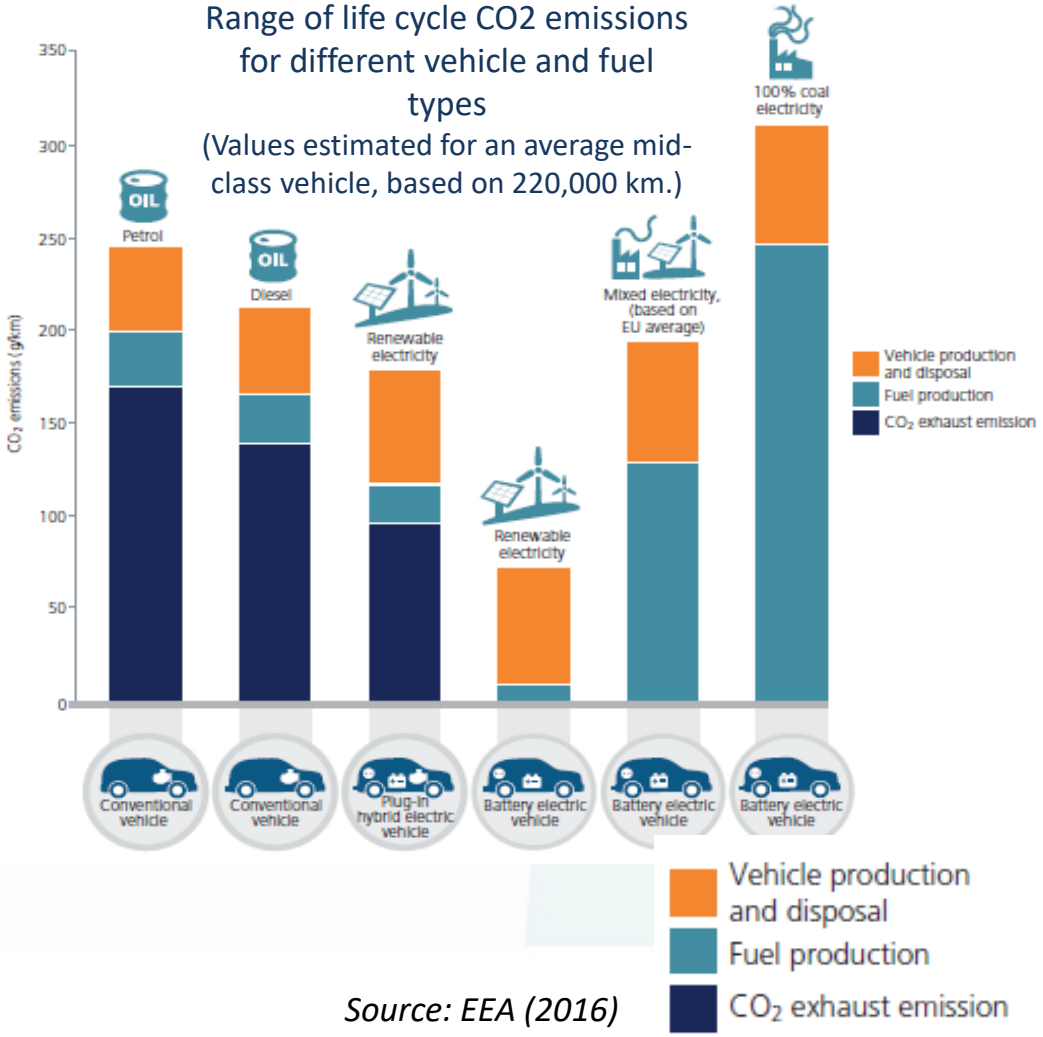
Increase efficiency in the whole cycle



Source: EEA (2016)

To make renewable energy effective, the development of **energy storage technologies** becomes crucial

- Green Hydrogen
- Batteries

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Economic incentives: pricing GHG emissions

- **The current mechanism (Cap and Trade) is not the most efficient one**
  - It does not reflect the marginal damage produced by GHG emissions
  - It is not applicable to many sectors (such as road transport)
- **GHG pricing should be**
  - Harmonized across transport modes
  - Proportional to carbon emissions
  - Applicable to all countries and sectors
  - Equal to the marginal damage

Source: World Bank

- **Part of the revenues should be devoted to research an innovation in decarbonization**

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Incentives to innovation

- **Implementation of zero carbon technologies**
  - Batteries production, capacity and recycling
  - Reducing the cost of producing Green Hydrogen
  - Alternative fuels for aviation and the truck industry
  - Electric Road Systems
- **Other aspects**
  - 3D printing
  - Automation
  - Syncromodality
  - Carbon capture

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THANK YOU FOR YOUR ATTENTION

Tribes European Quarter
Avenue Marnix 17
1000 Brussels (Belgium)
Tel: + 32 2 808 60 50

Email: info@smart-transportation.org

www.smart-transportation.org