

Plenary Session

Sustainable mobility challenges for the transition targets: Zero-emission vehicles

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Energy Economics Group (EEG)

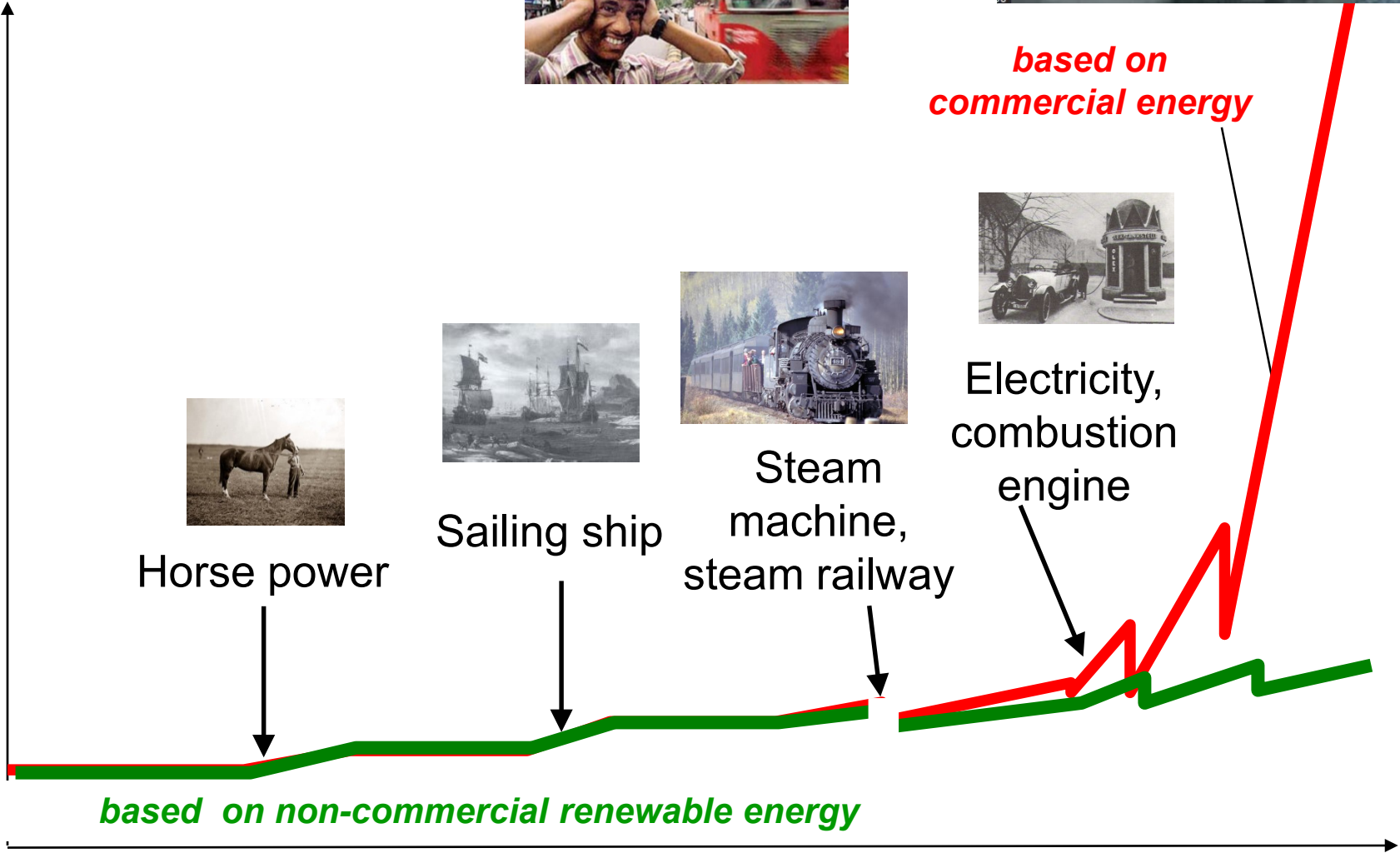
Technische Universität Wien (TU WIEN)

8th AIEE Energy Symposium on Energy Security - Padua 2024

- ✓ Introduction
- ✓ Sustainable mobility
- ✓ Policy framework
- ✓ Zero-emission vehicles
 - Economic, environmental and social issues
- ✓ Conclusions



Amount of transport services per capita



based on commercial energy



Horse power



Sailing ship



Steam machine, steam railway

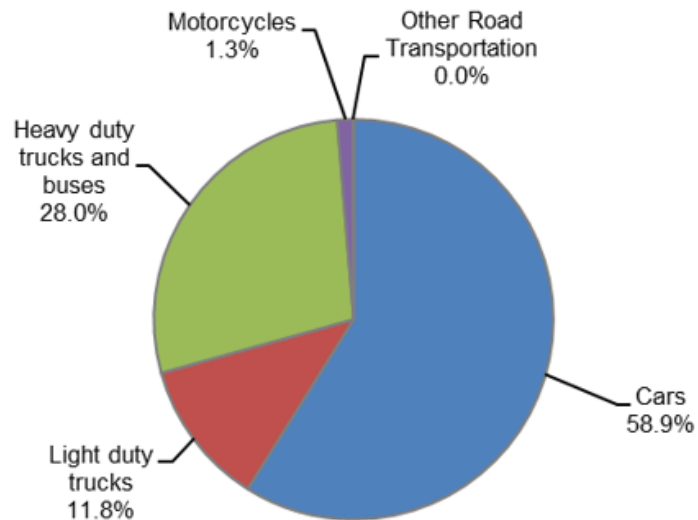
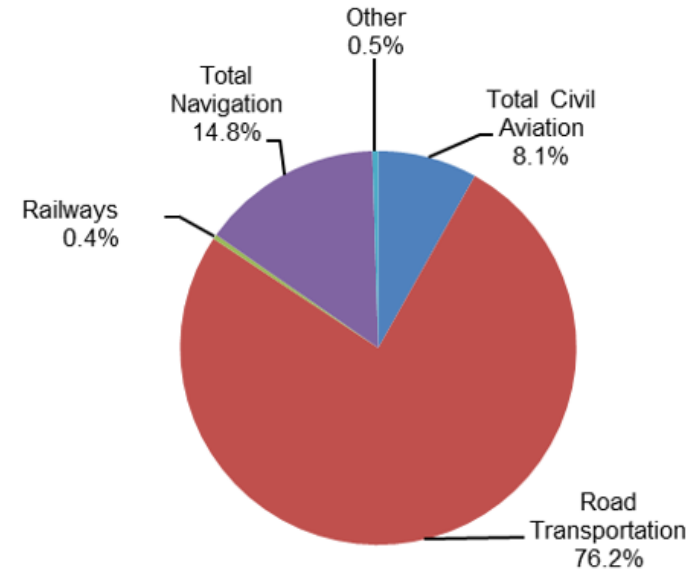
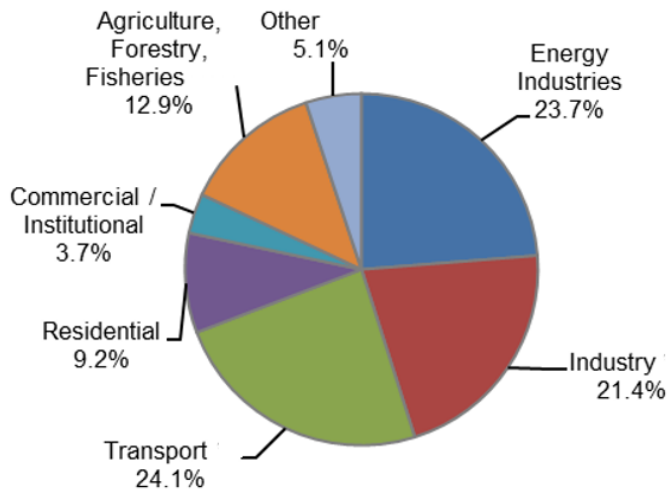


Electricity, combustion engine

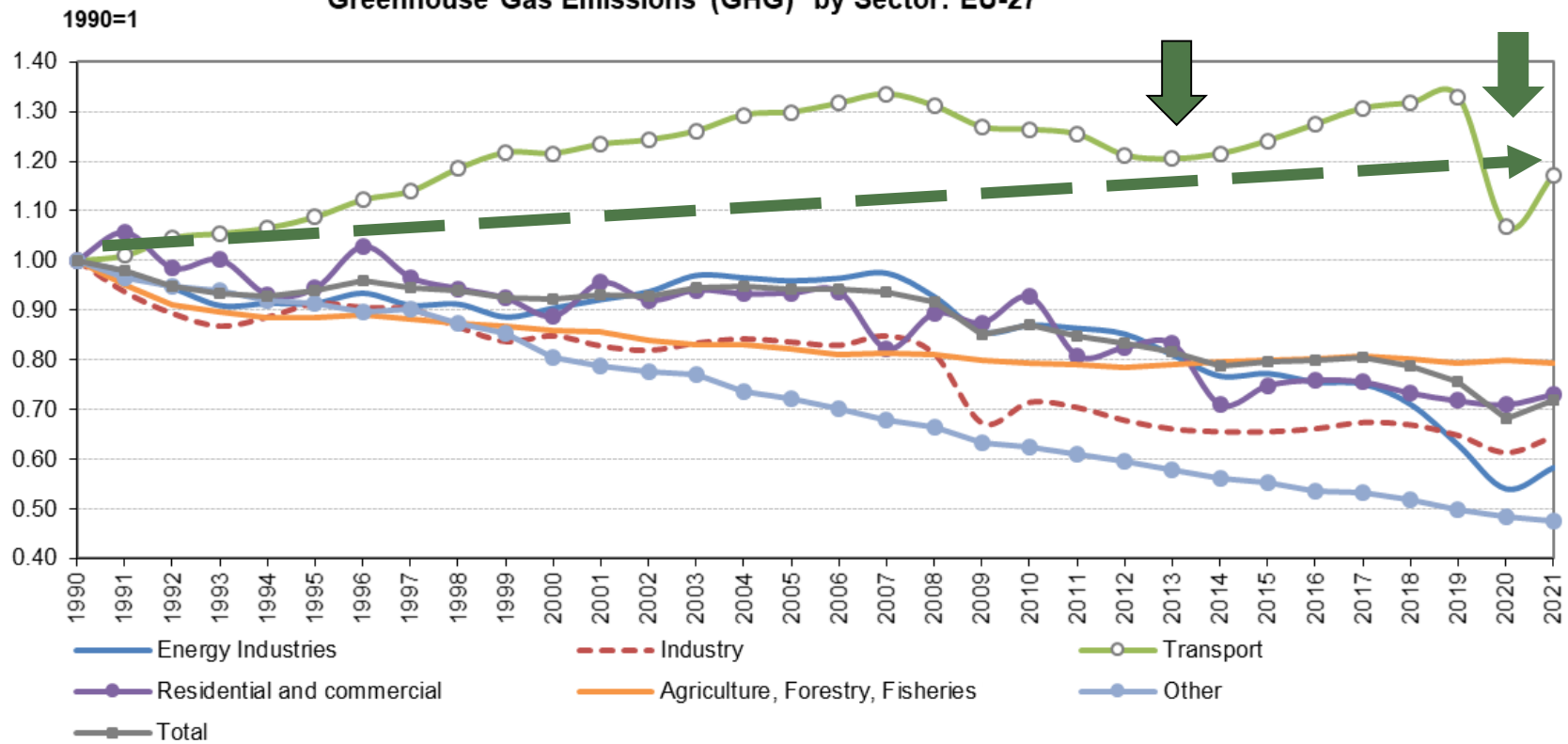
based on non-commercial renewable energy

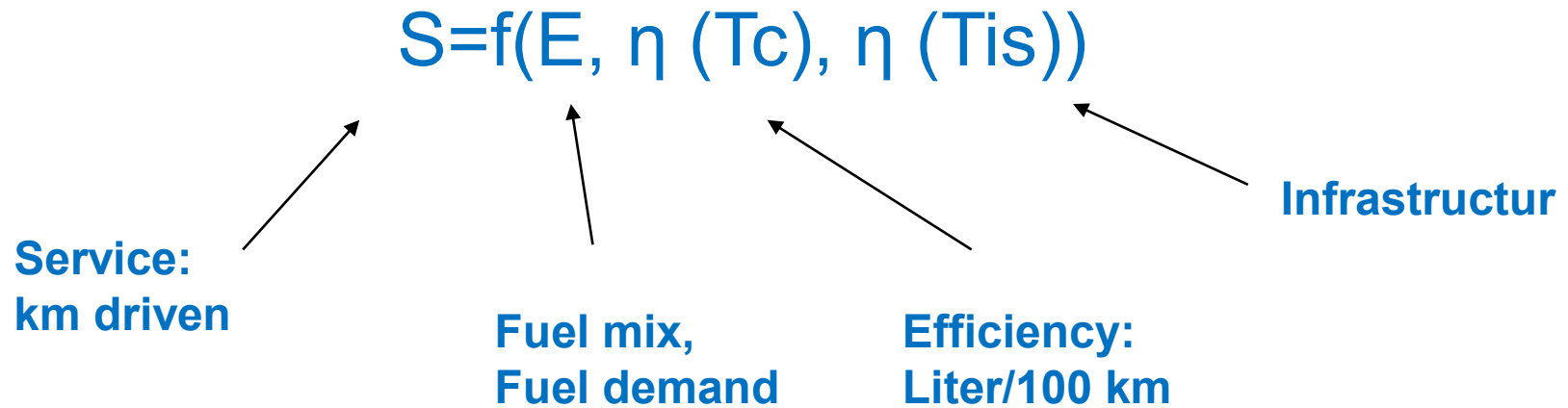
time

GHG by sector: EU-27

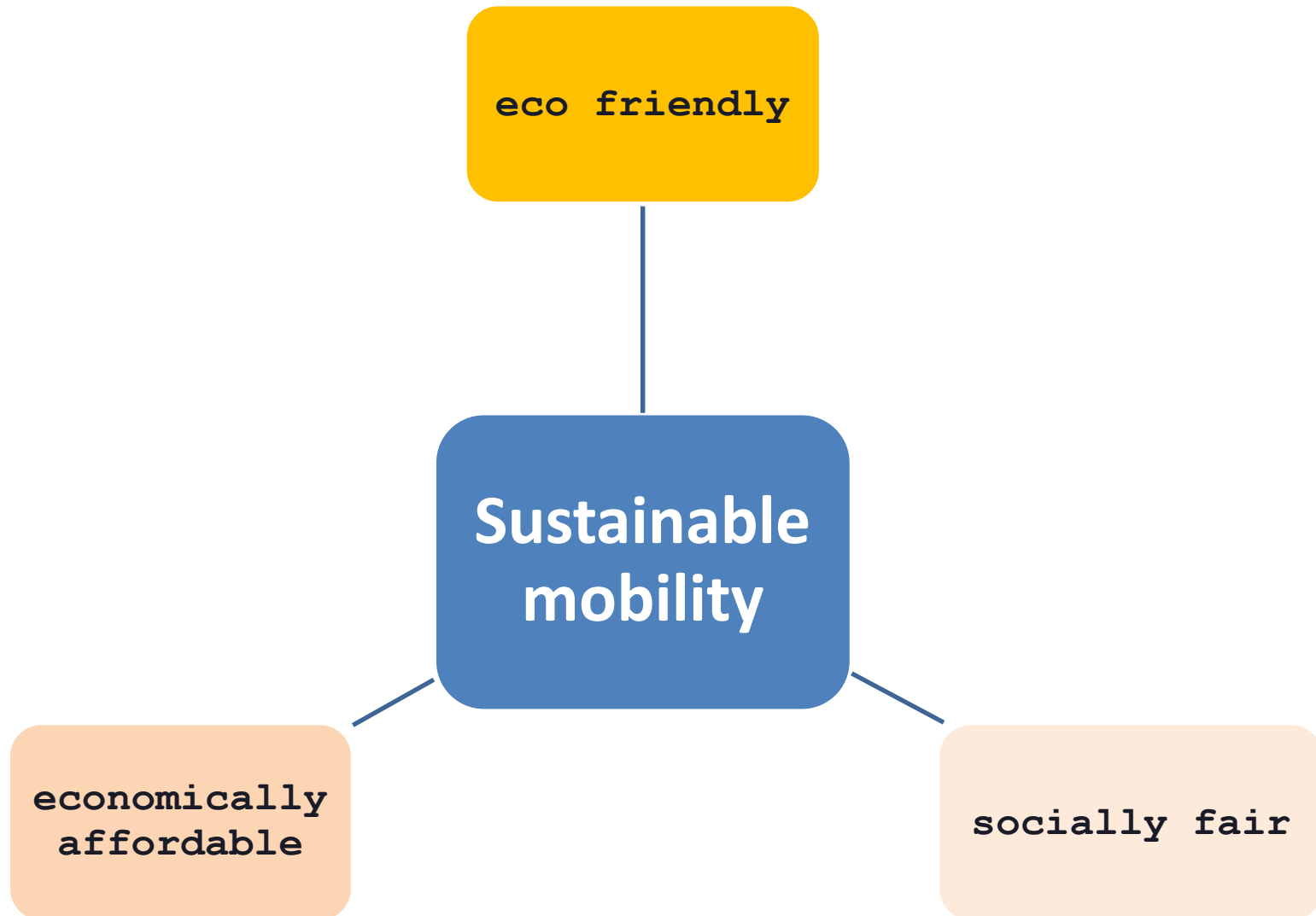


Greenhouse Gas Emissions (GHG) by Sector: EU-27

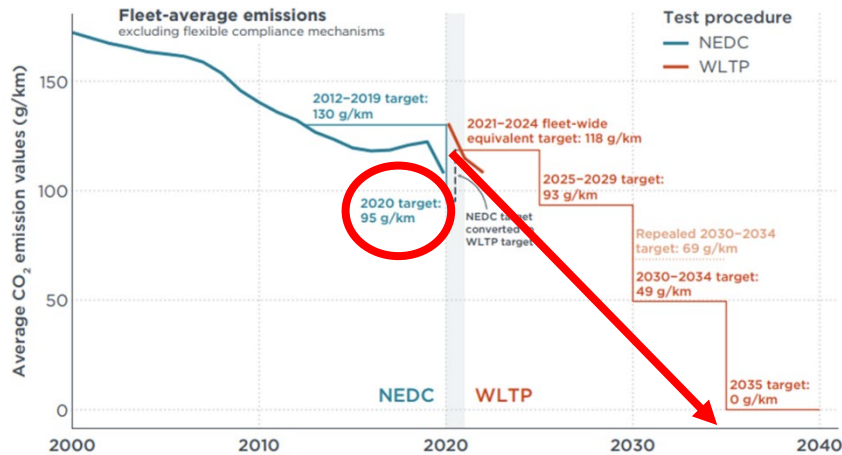




Sustainable mobility



Policy framework



2035

EU - the first climate-neutral continent by 2050
[European Green Deal](#)

Sustainable and Smart Mobility Strategy

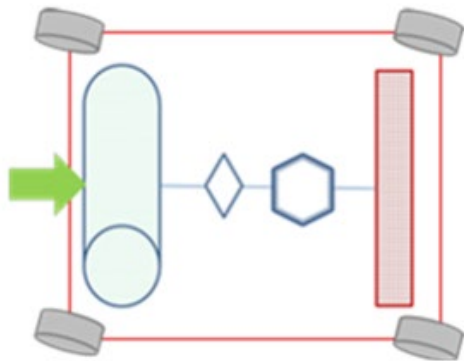
at least 30 million zero-emission cars will be in operation on European roads

nearly all cars, vans, buses as well as new heavy-duty vehicles will be zero-emission.

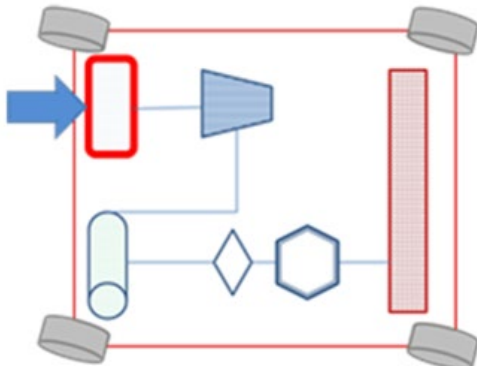
2030

2050

ZEV



BEV: 28 000 000
FCV: 66 000



Advantages

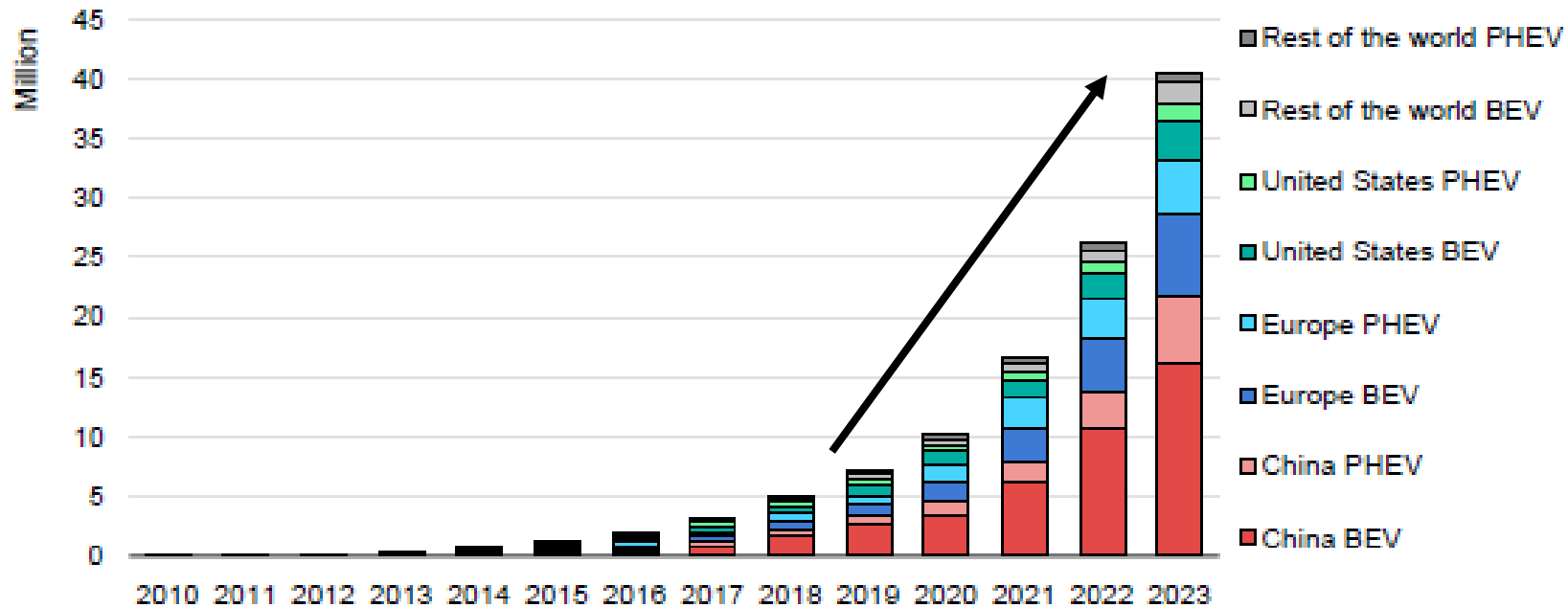
- ✓ Energy efficiency
- ✓ Energy security
- ✓ Air pollution
- ✓ Noise reduction

Disadvantages

- Costs
- Driving range
- Charging time
- Infrastructure

Electric vehicles

BEV: 28 000 000
PHEV: 12 000 000



IEA. CC BY 4.0.

Over 40 million electric cars were on the road in 2023

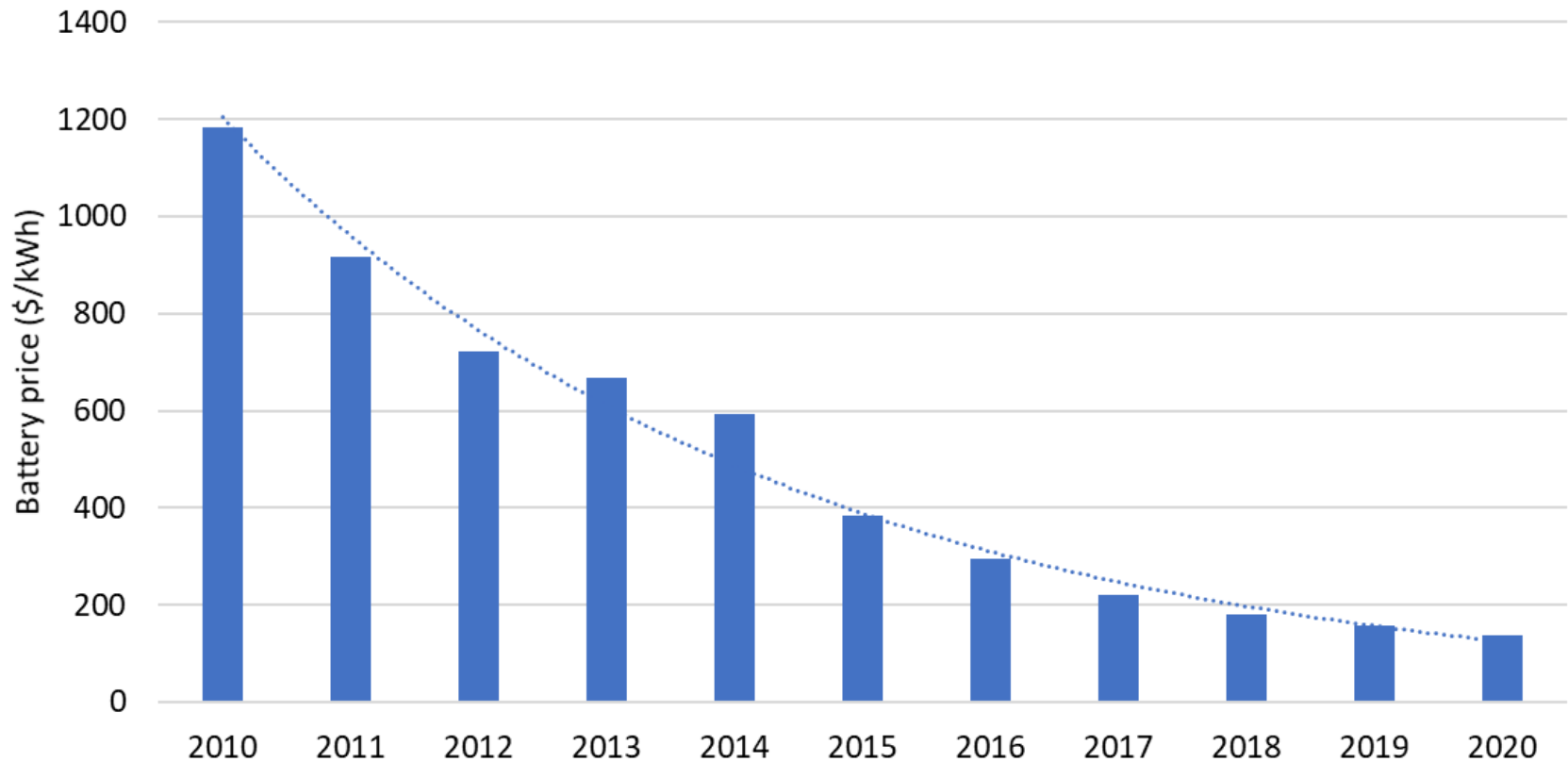
Monetary measures:

- road taxes
- annual circulation tax
- company car tax
- registration tax
- fuel consumption tax
- congestion charges

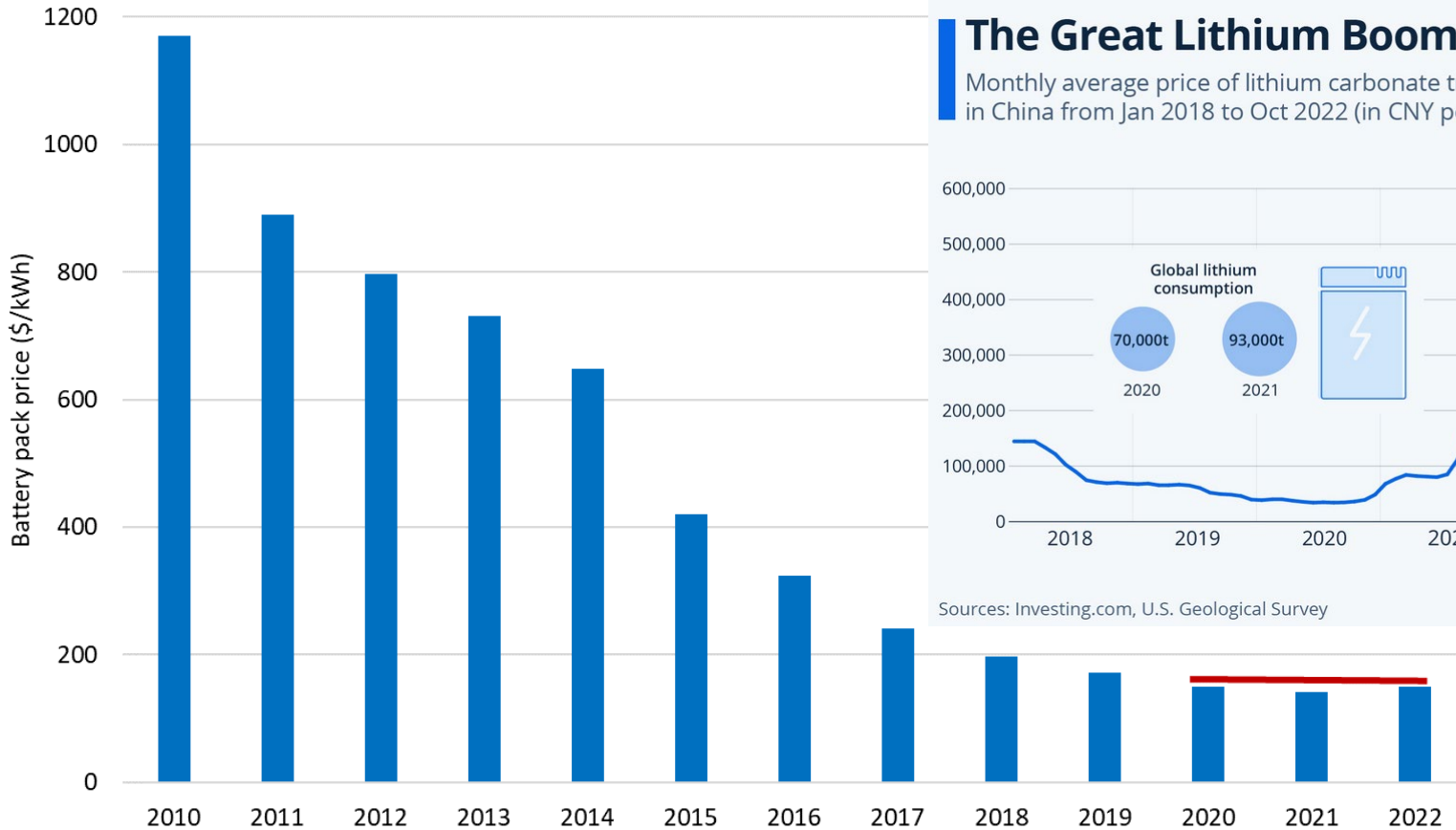
Non-monetary measures:

- free parking spaces,
- possibility for EVs drivers to use bus lanes,
- permission for EVs to enter city centers and zero emission zones.

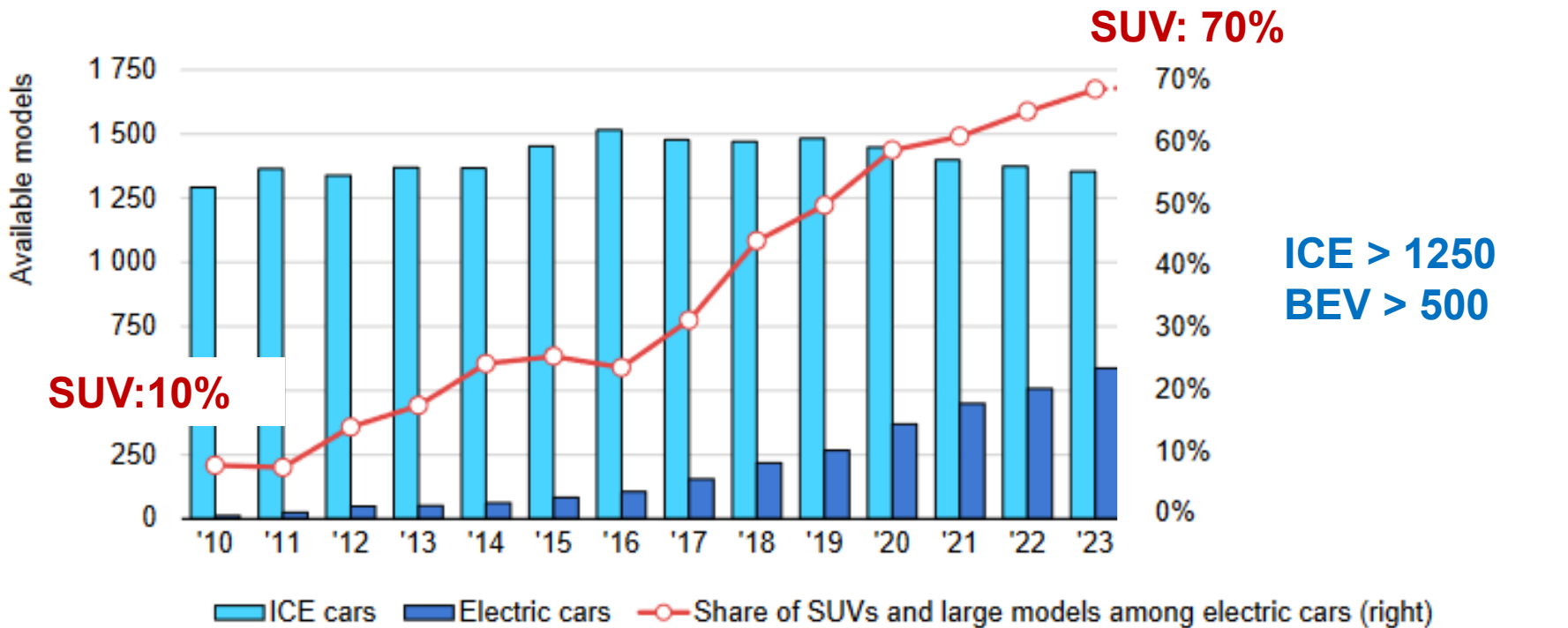
Battery pack prices



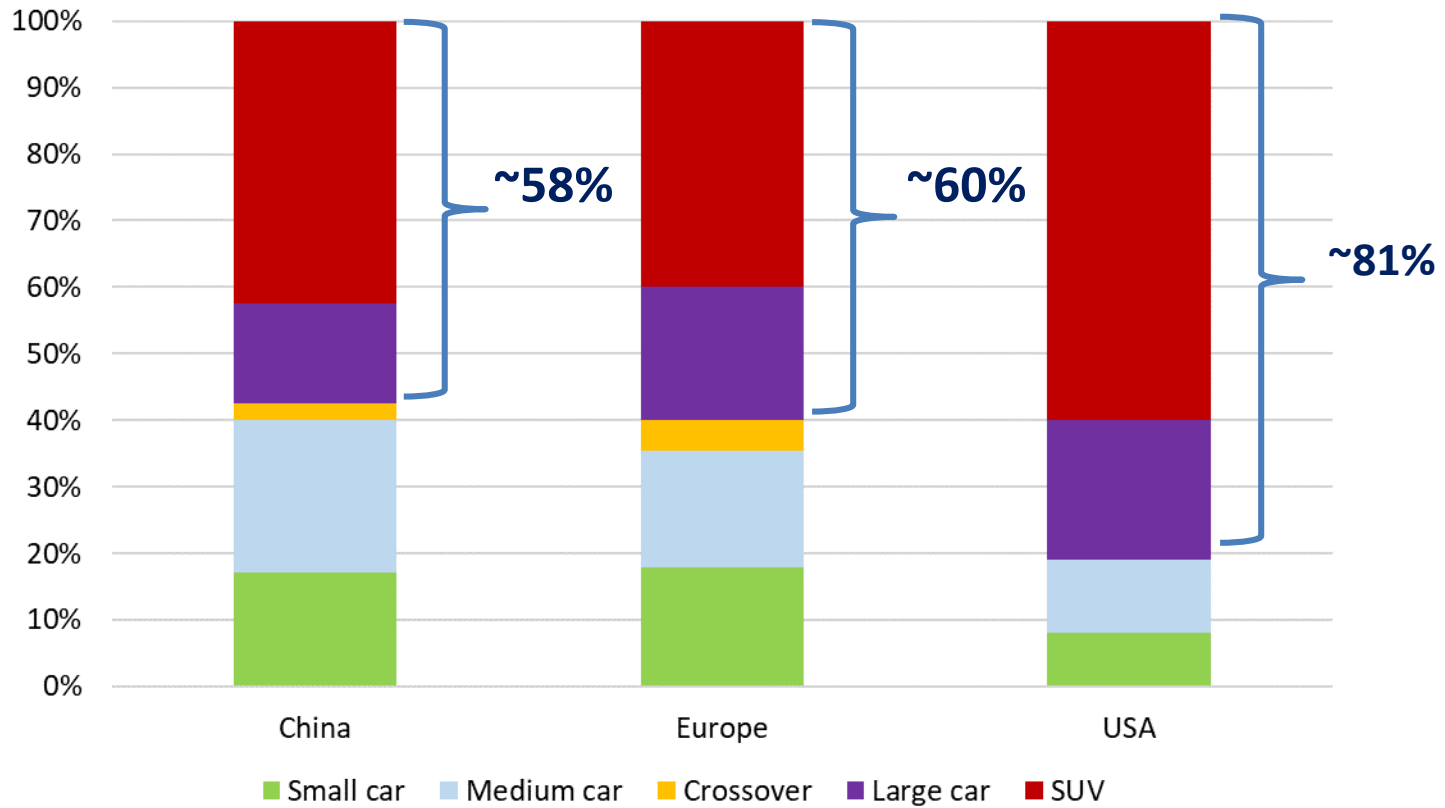
Battery pack prices



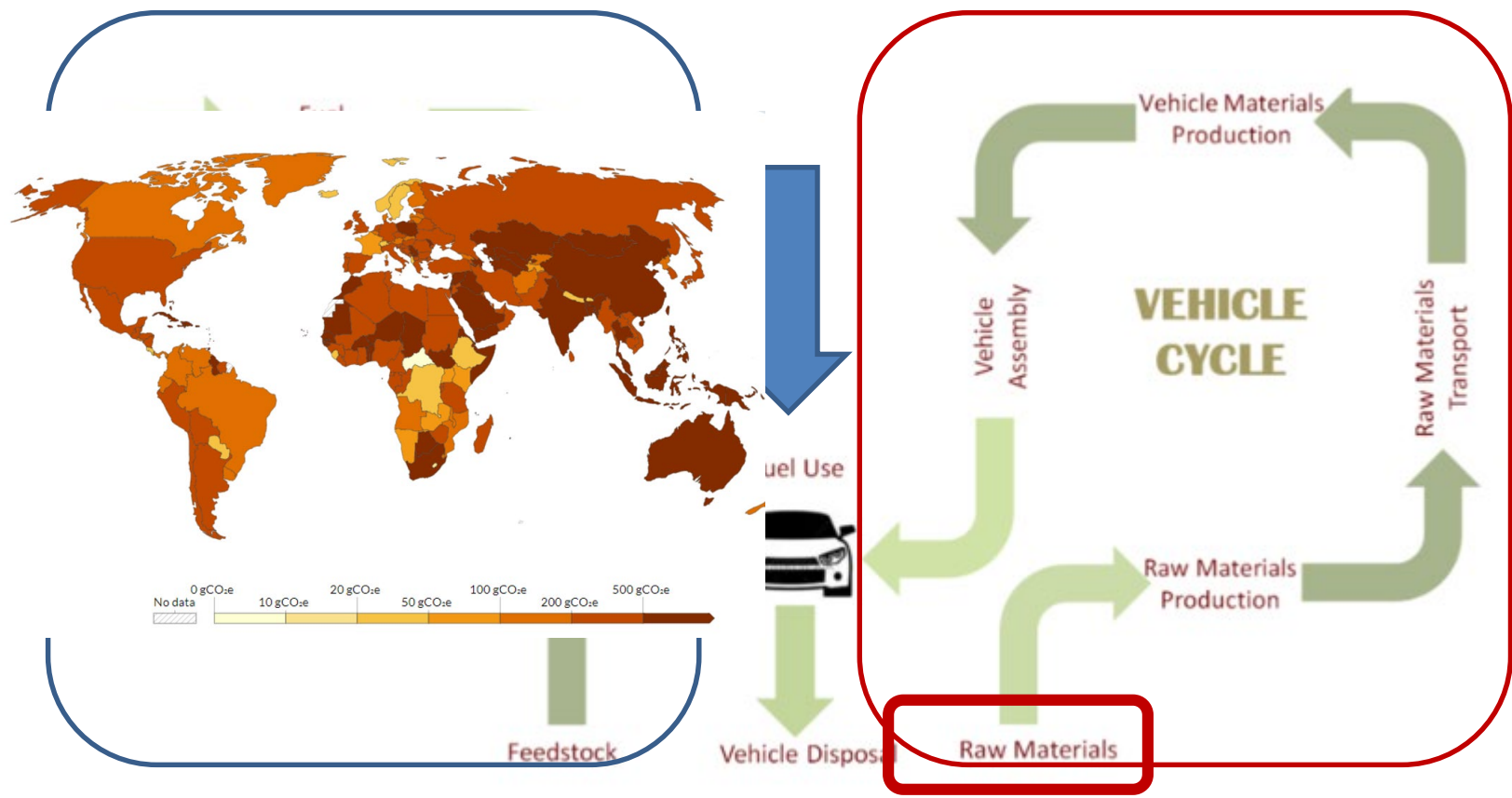
Car model availability



EV models (2022)

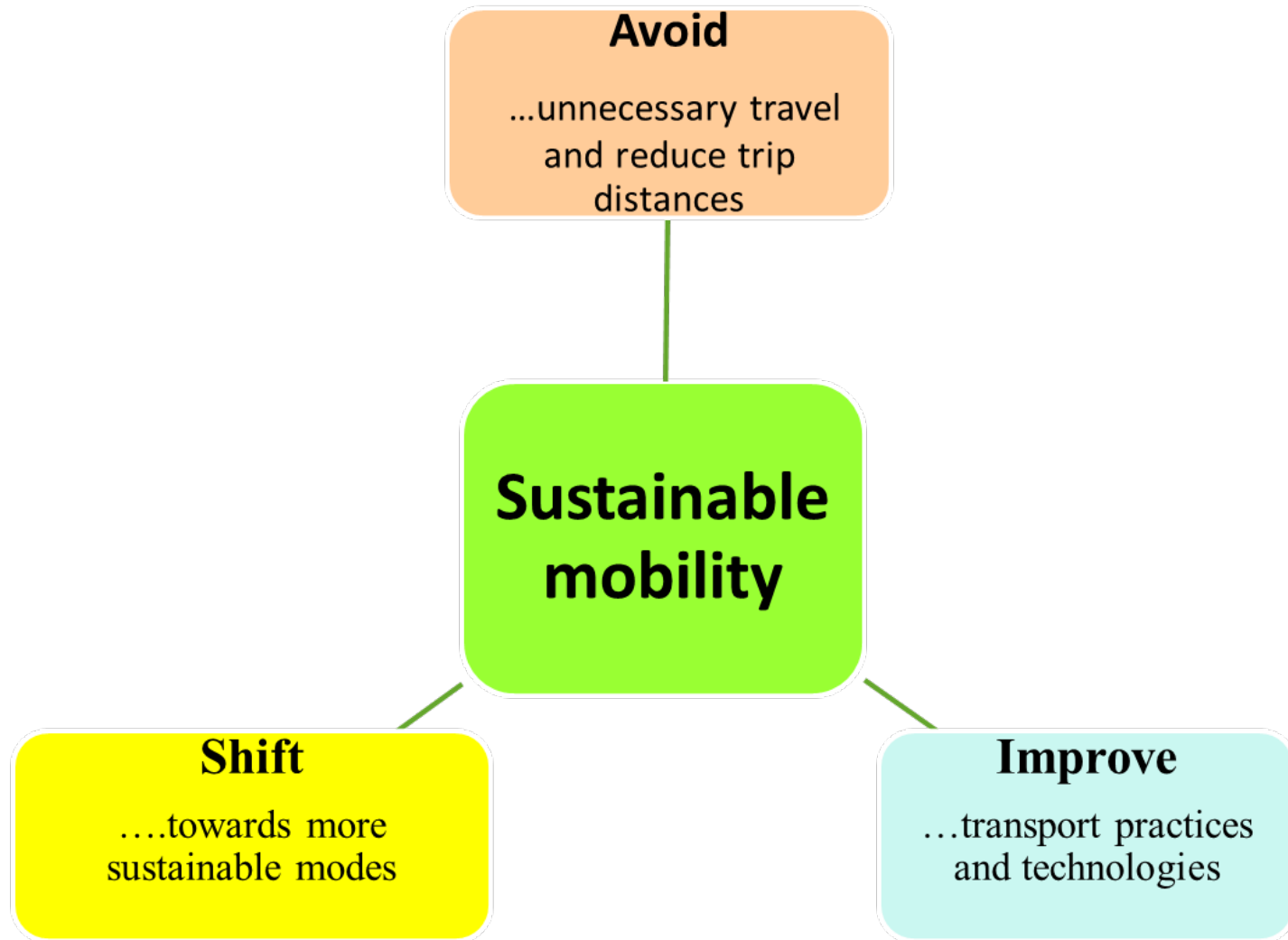


Typical life cycle of a vehicle technology



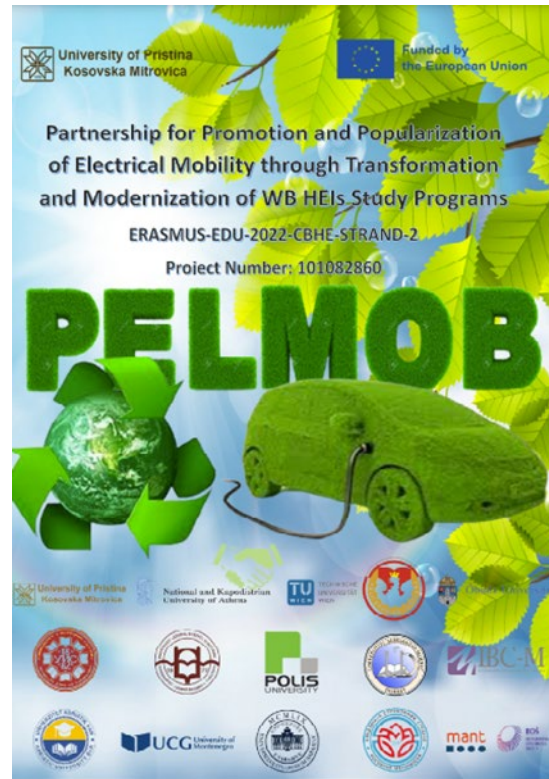
Environmental and social challenges





- Sustainable mobility... three pillars
- The greatest challenge...balance resource consumption with the preservation of natural ecosystems
- EVs...environmentally-friendly technology...most of the policies implemented will be abolished with the increasing number of EVs
- Future policy design should ensure environmental benefits of EVs through the whole supply chain
- New mobility behavior

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Ajanovic A., Haas R. (2018). **Economic prospects and policy framework for hydrogen as fuel in the transport sector**. *Energy Policy* 123 (2018) 280–288. <https://doi.org/10.1016/j.enpol.2018.08.063>

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