

International multidisciplinary discussion seminar

Opportunities and Challenges for Energy Transformation in Central Europe

Opportunities for Heading Towards Sustainability in Passenger Car Transport

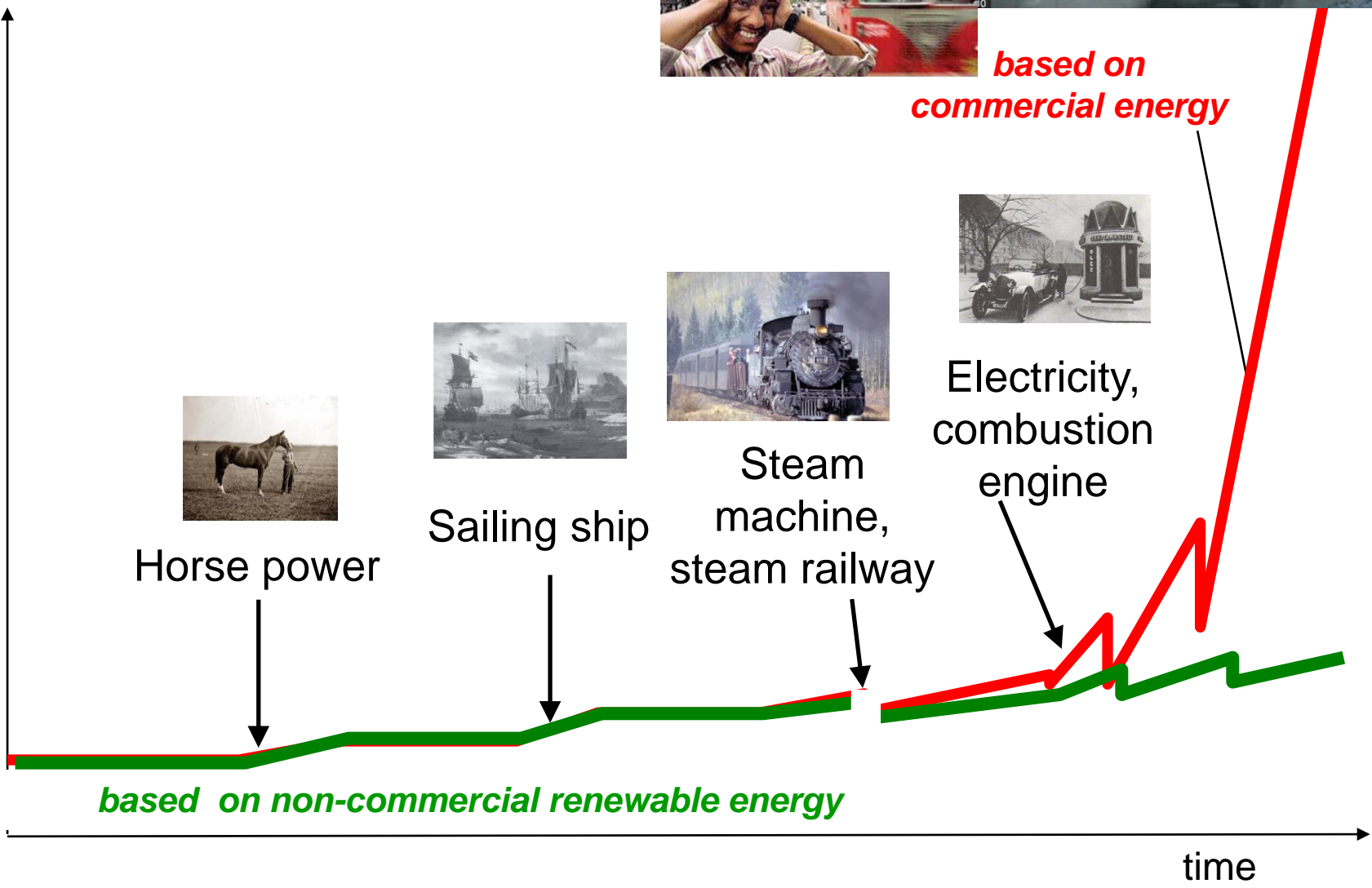
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22.11.2021

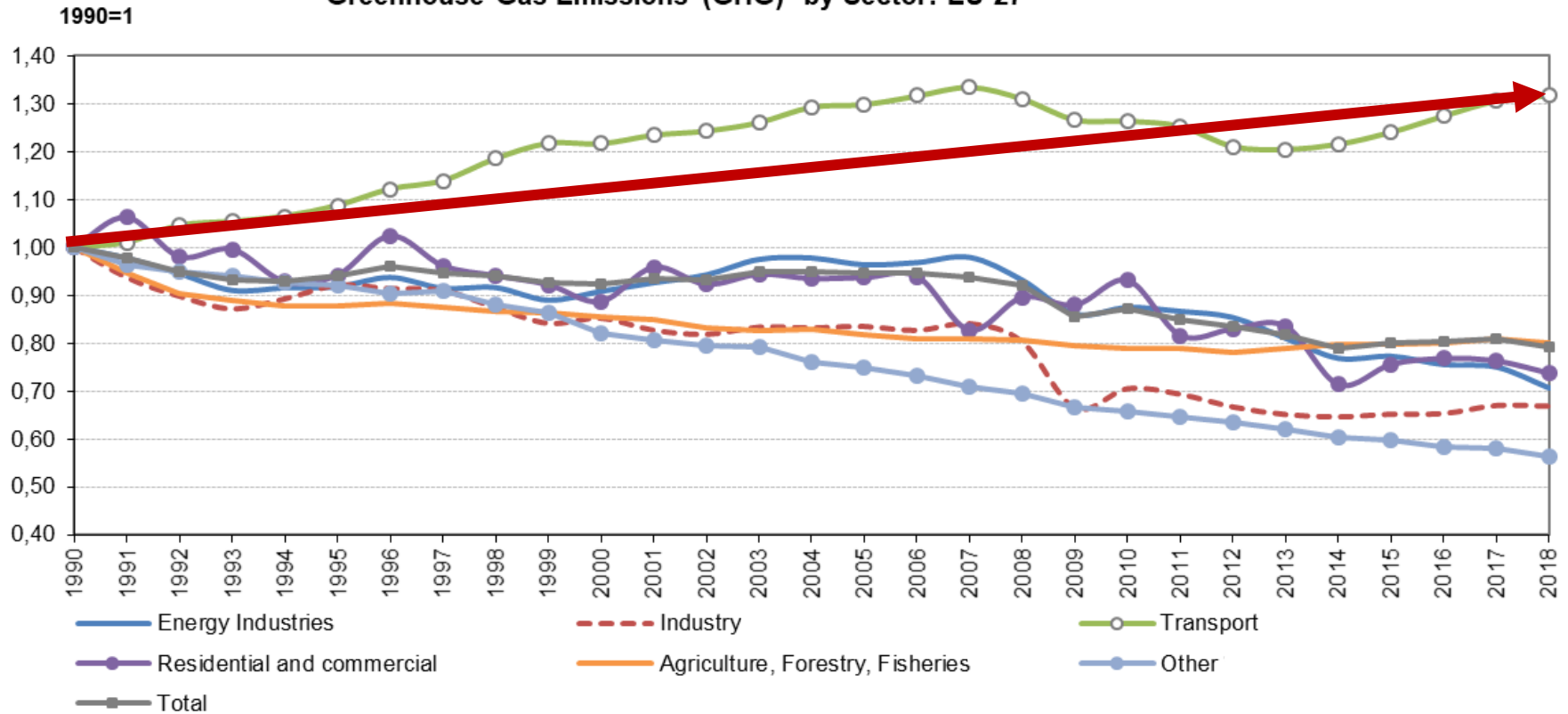
- Introduction
- Biofuels
- Electric vehicles
- Policy framework
- Conclusion

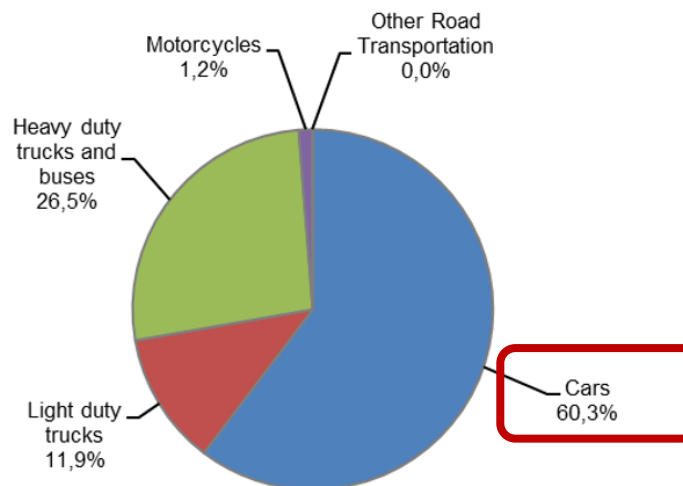
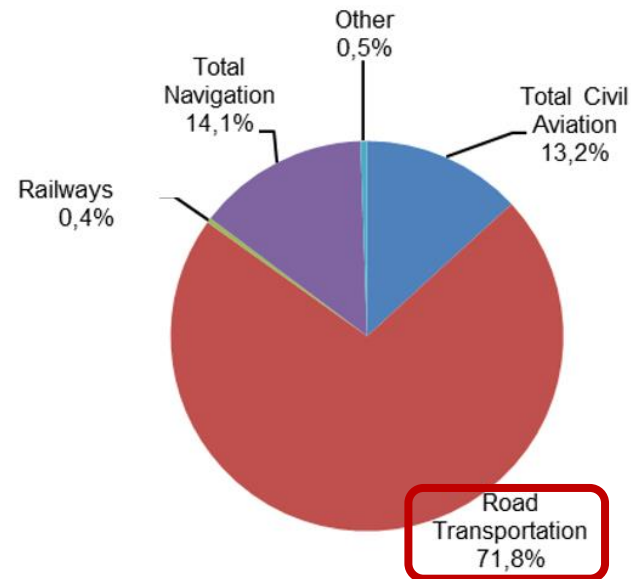
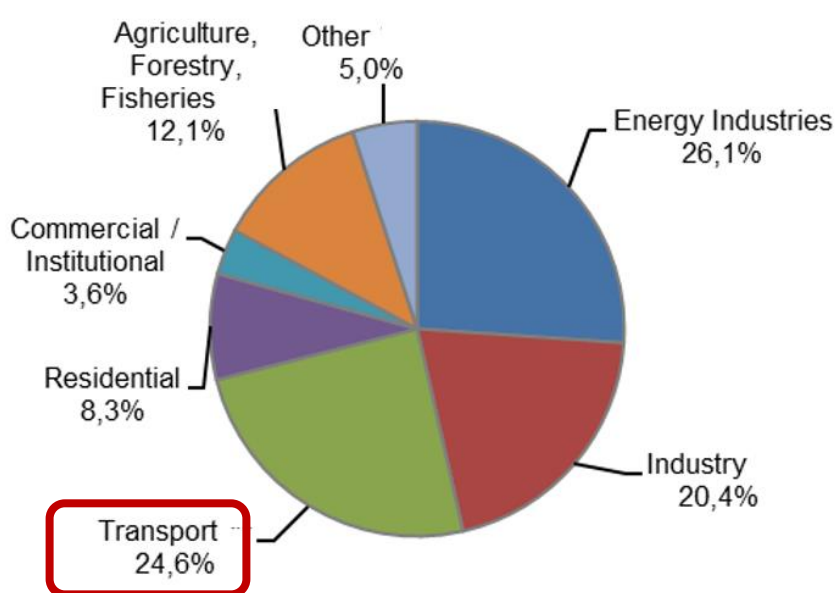


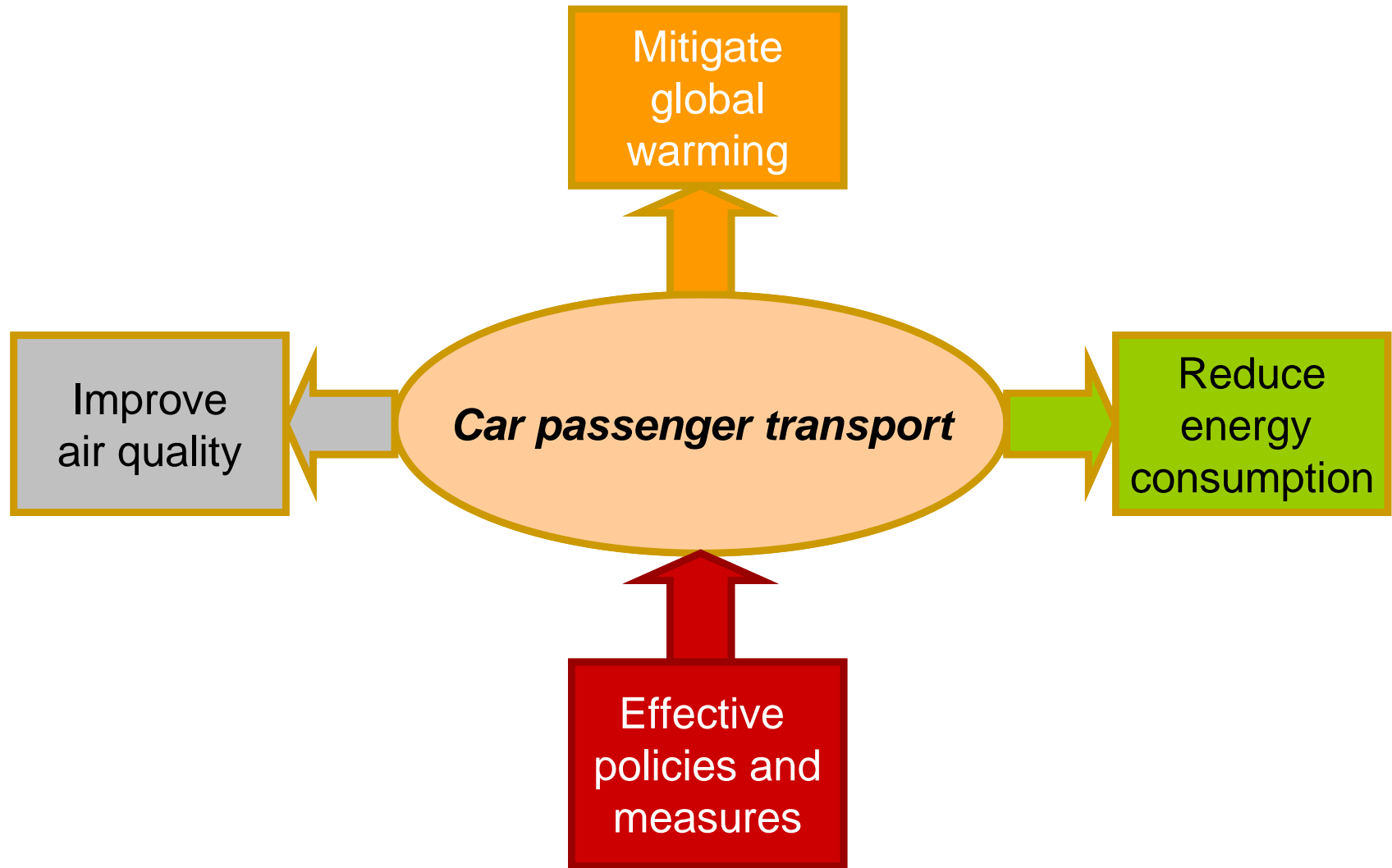
Amount of transport services per capita



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







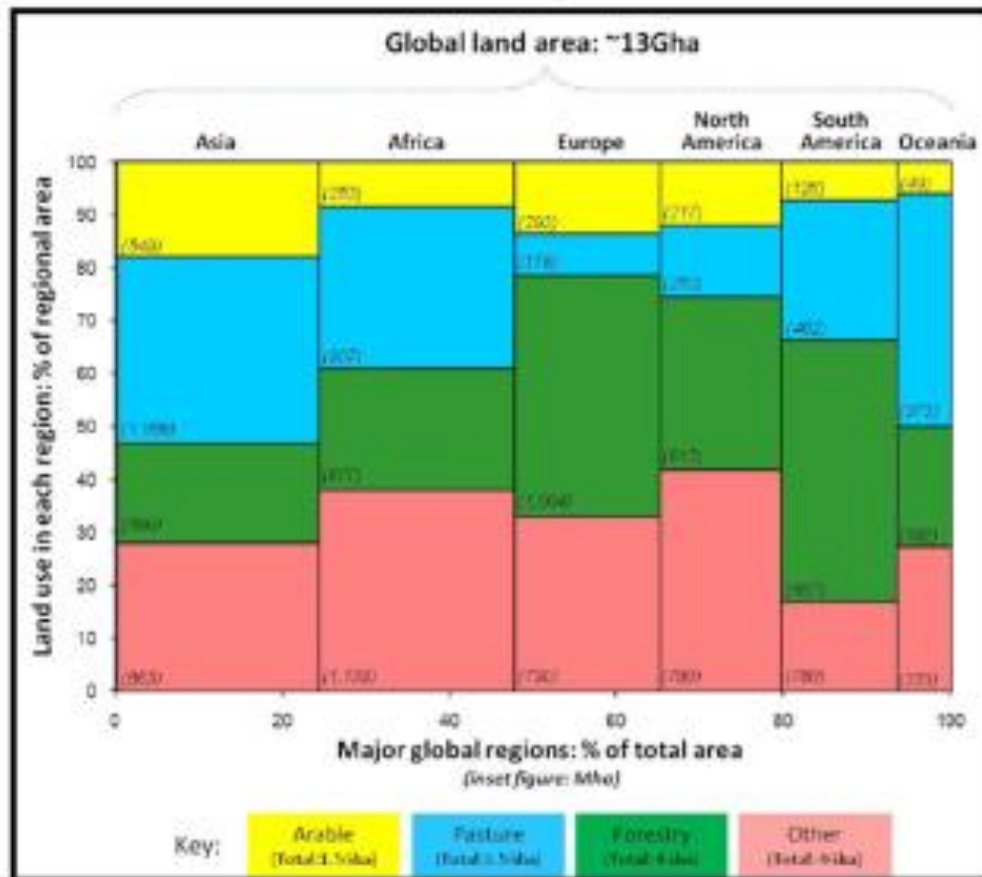
Mature biofuels
1st generation biofuels

Immature biofuels
2nd generation biofuels
(from lignocellulose)

Biofuels in labour stage
3rd generation biofuels
(from algae)

Long term possibility
4th generation biofuels
*(from genetically manipulated
feedstocks)*

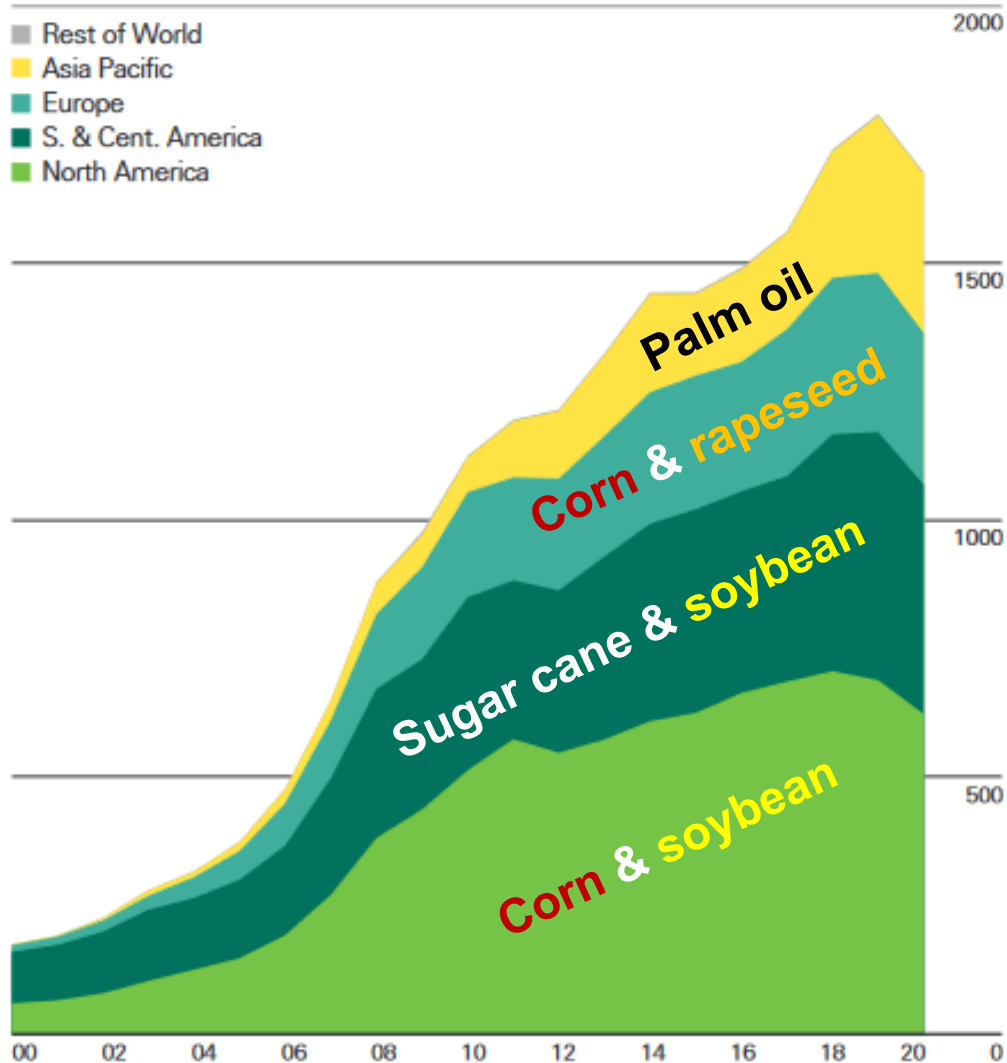
World land use

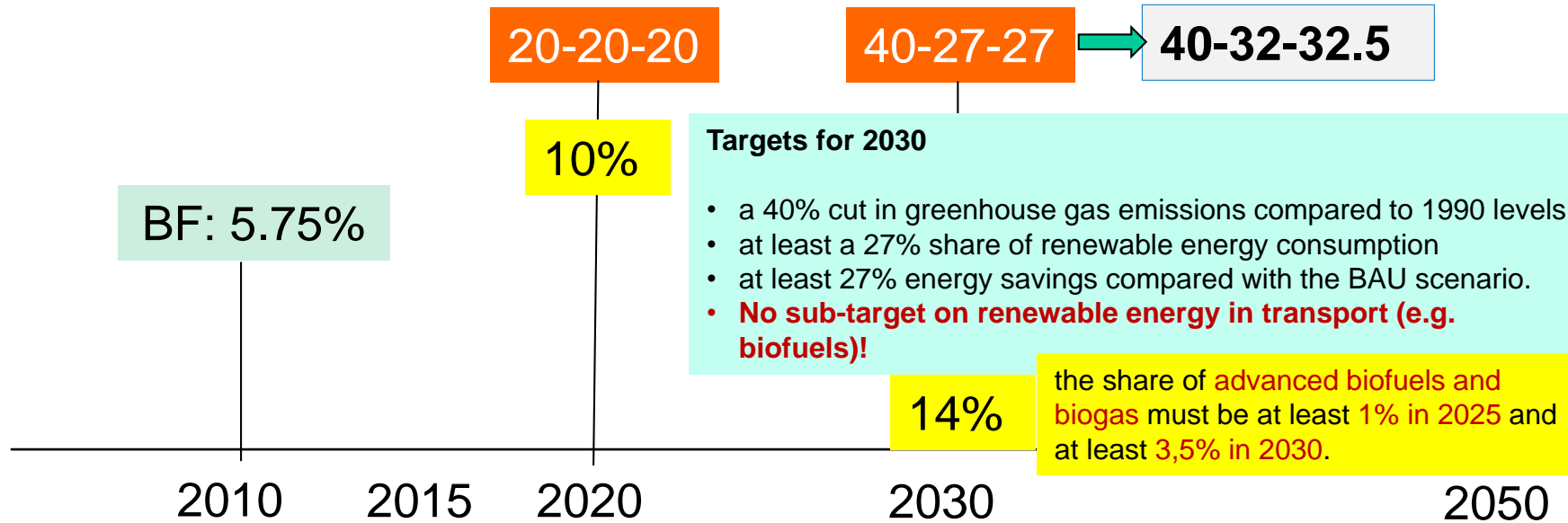


Source: (Slade et al., 2011; based on FAO database).

World biofuels production

Thousand barrels of oil equivalent per day





New legislation approved by European Parliament on 28 April 2015

- Cap of 7% on the contribution (to 2020 targets) of biofuels produced from 'food crops' to mitigate ILUC emissions
- No public support for food crop based biofuels post 2020

ICE -50% in city

20% GHG
(2008)

No ICE in city

60% GHG
(1990)

Transport White Paper

Announced 100% ZEV sales targets and bans on ICE vehicle sales



	2025	2030	2035	2040	2045	2050
Costa Rica						●
Denmark		●				
France				●		
Iceland		●				
Ireland		●				
Israel*		●		●		
Netherlands		●			●	
Norway	●					
Portugal				●		
Slovenia		●				
Spain				●		●
Sri Lanka				●		
United Kingdom				●		

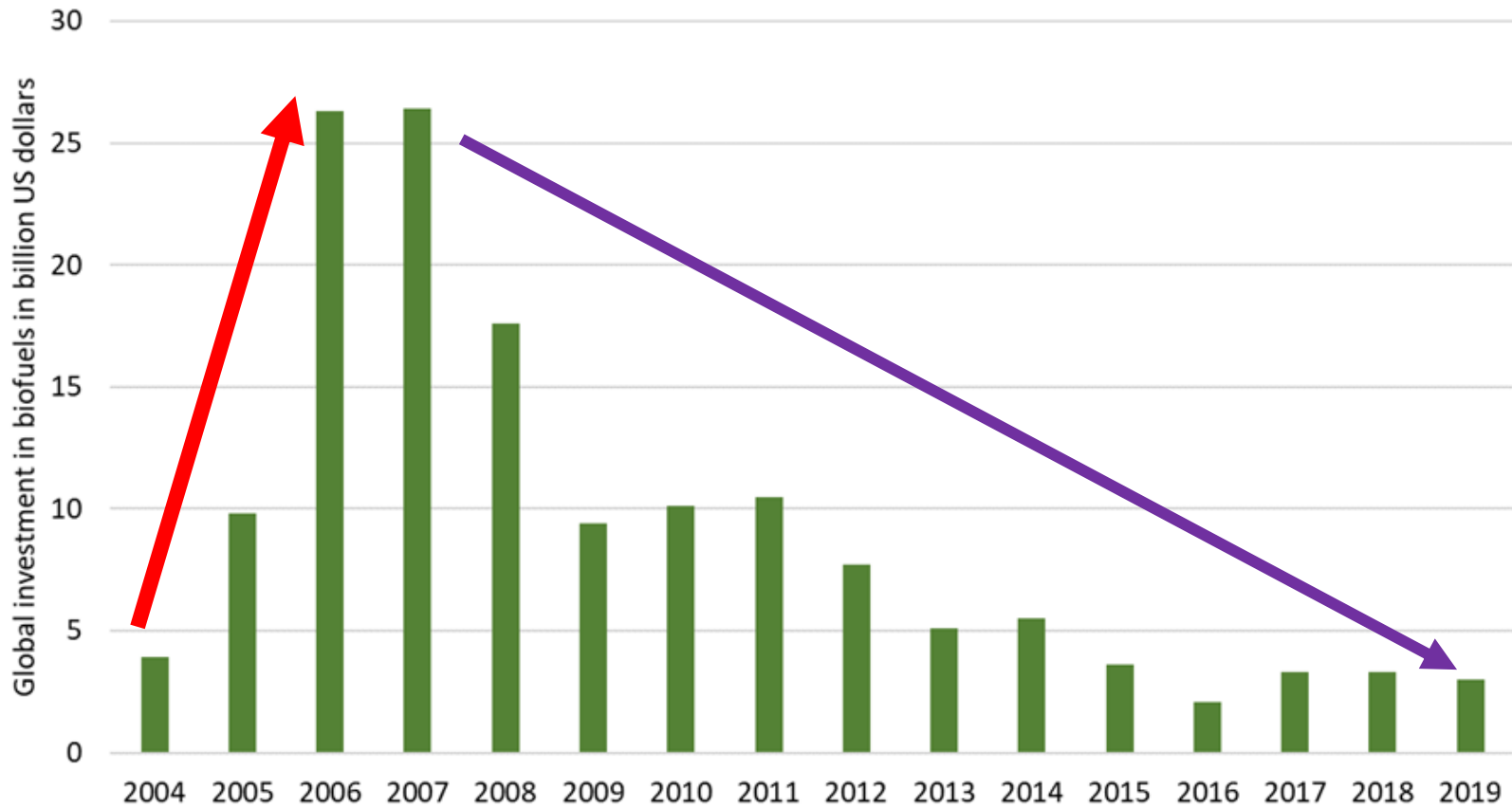


ICE sales ban or 100% ZEV sales target



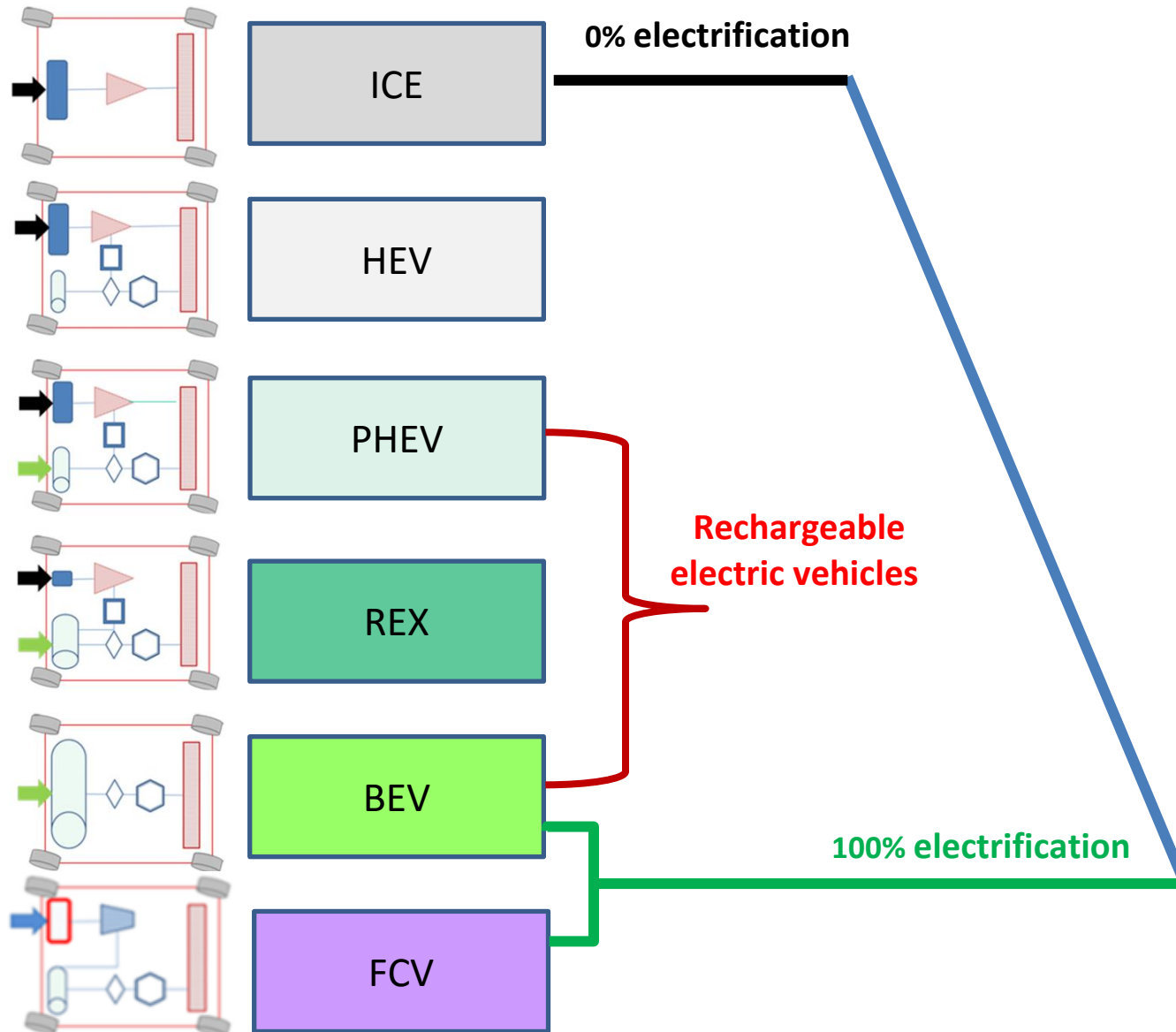
Fleet without ICEs

Global investment in biofuels

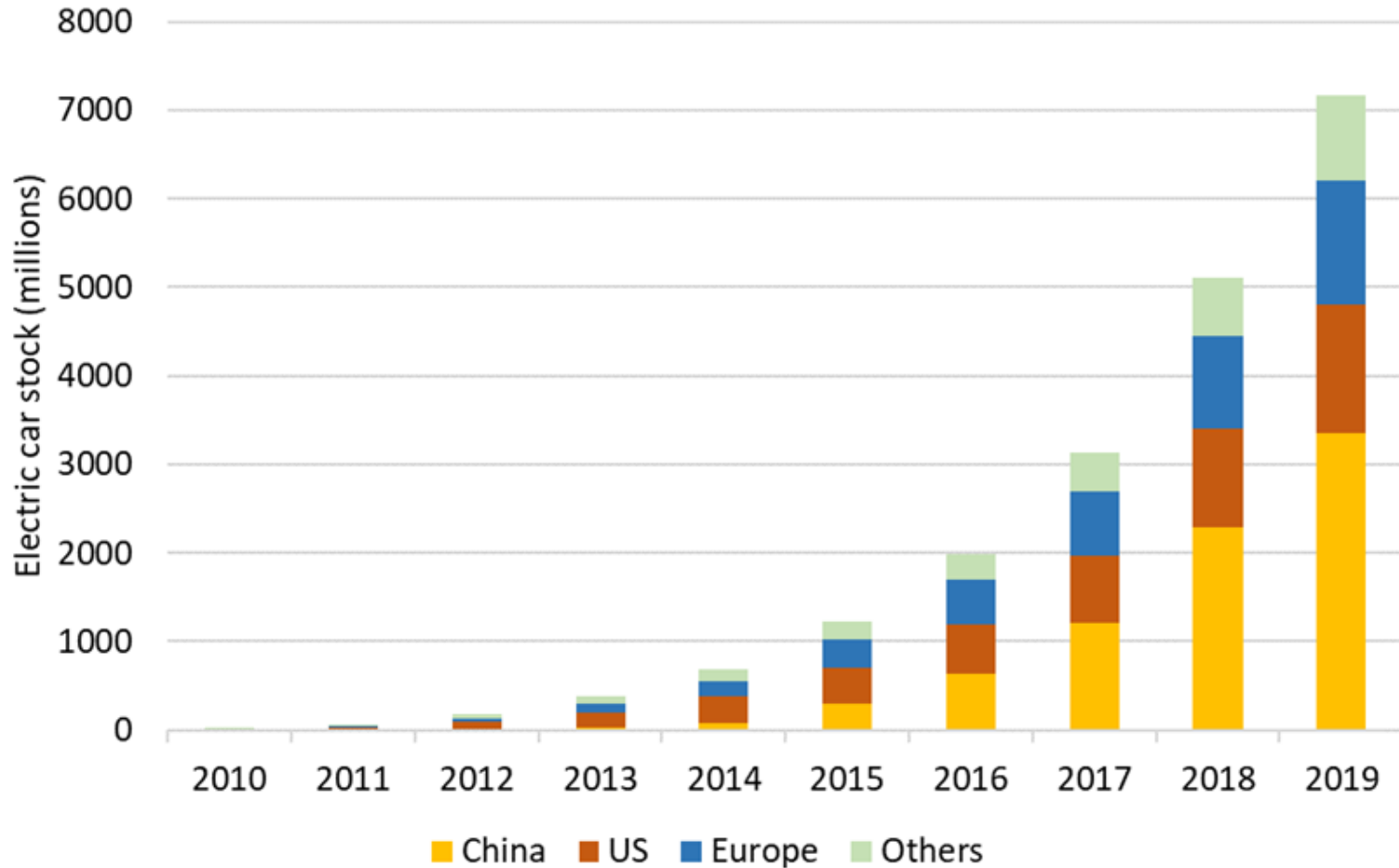


- + Reduction of GHG emissions
- + Energy security
- + Rural development

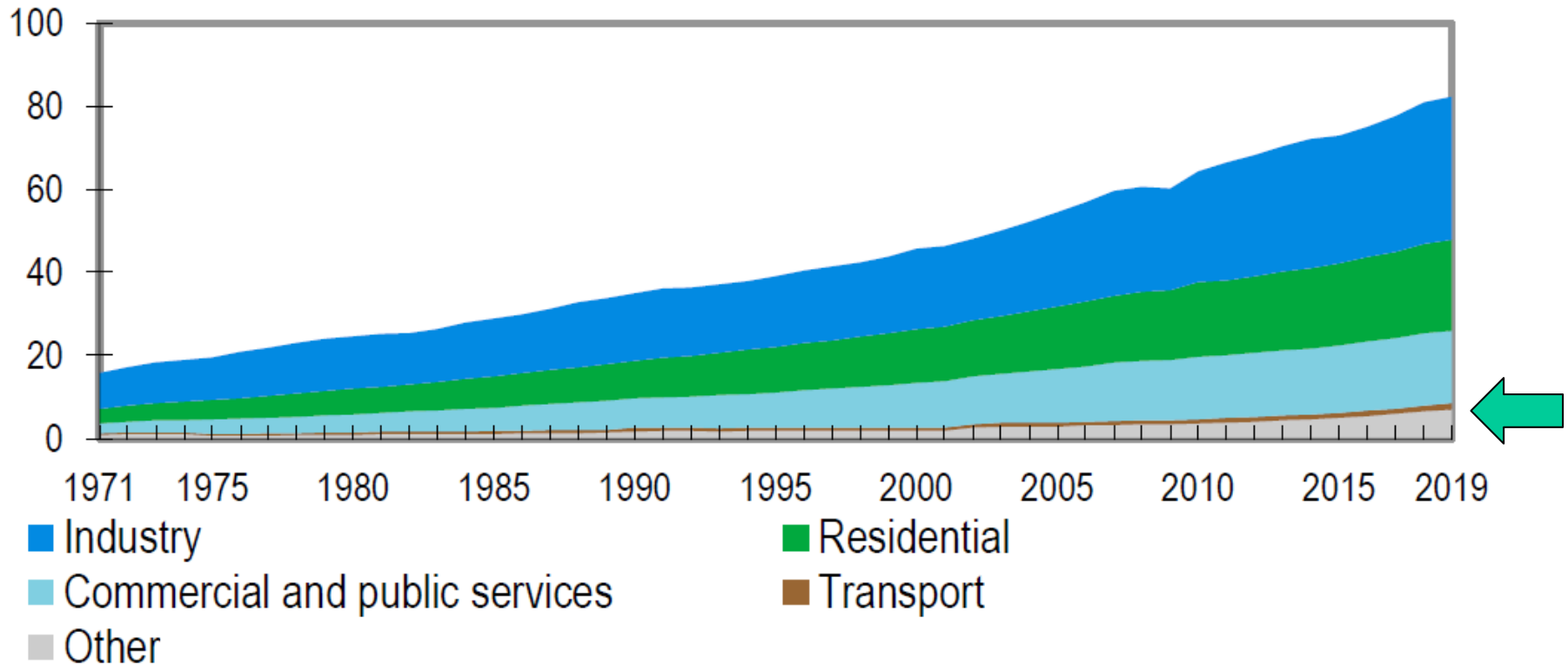
- Food and fuel competition
- Sustainability....risk of increase in GHG emissions – LUC
- Risks of degradation of land, forests, water resources and ecosystems - associated with use of freshwater, fertilizers and pesticides
- Economic viability...2. gen biofuels



Electric vehicles



Total final consumption by sector: electricity (EJ)

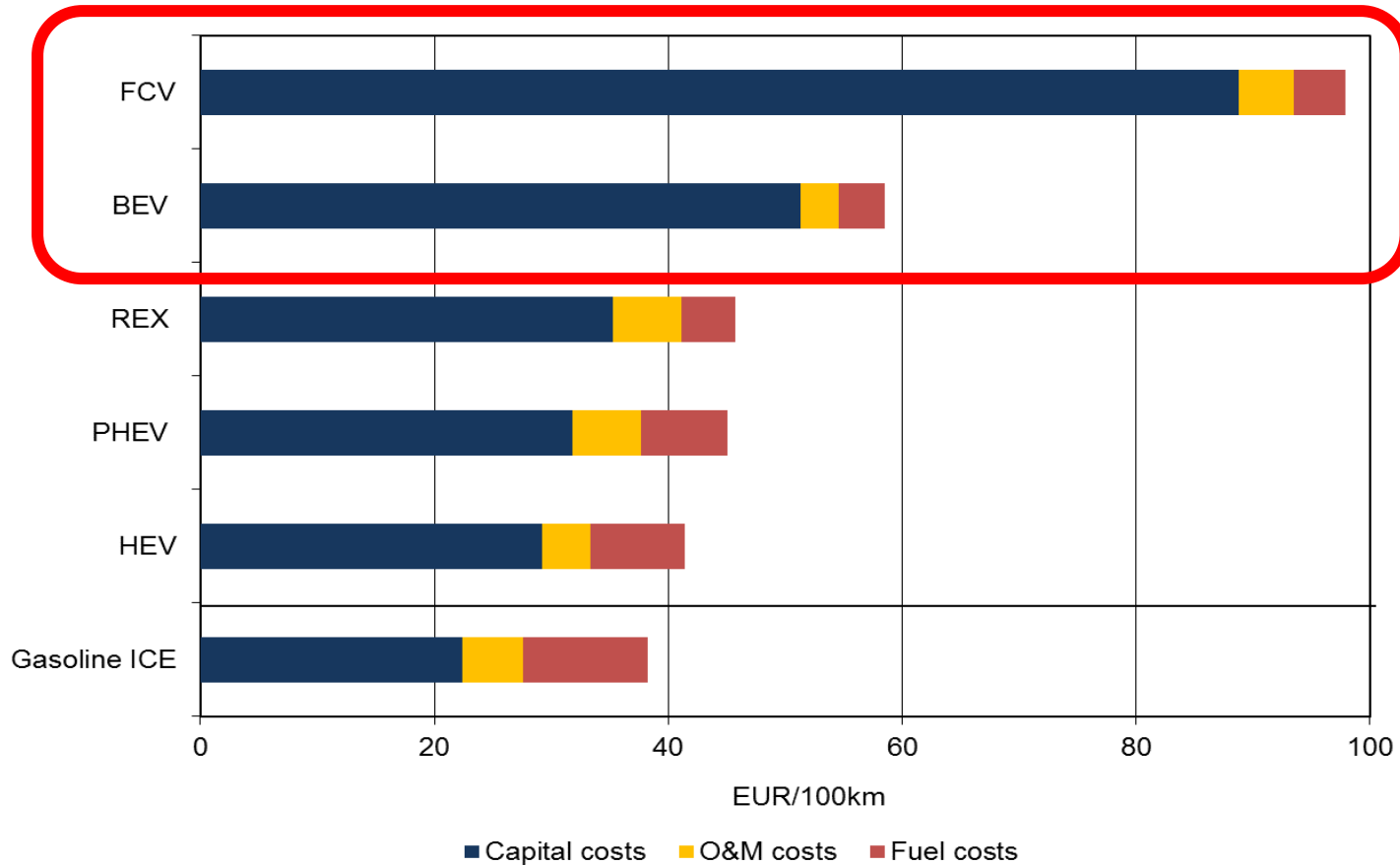


Advantages

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

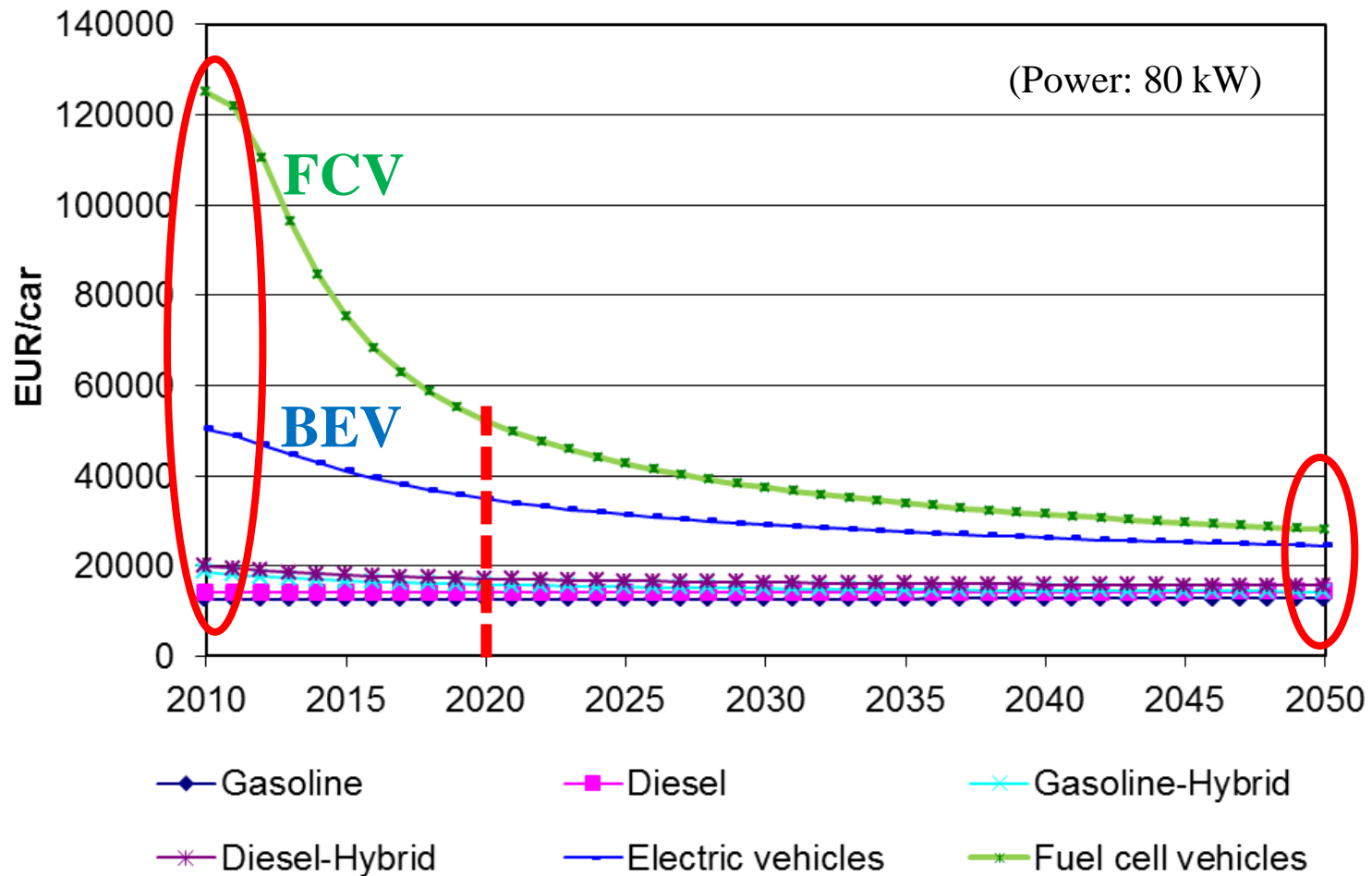
Disadvantages

- Costs
- Driving range
- Charging time
- Charging infrastructure



Total costs of service mobility of various types of EV in comparison to ICE cars

Scenario for development of investment costs



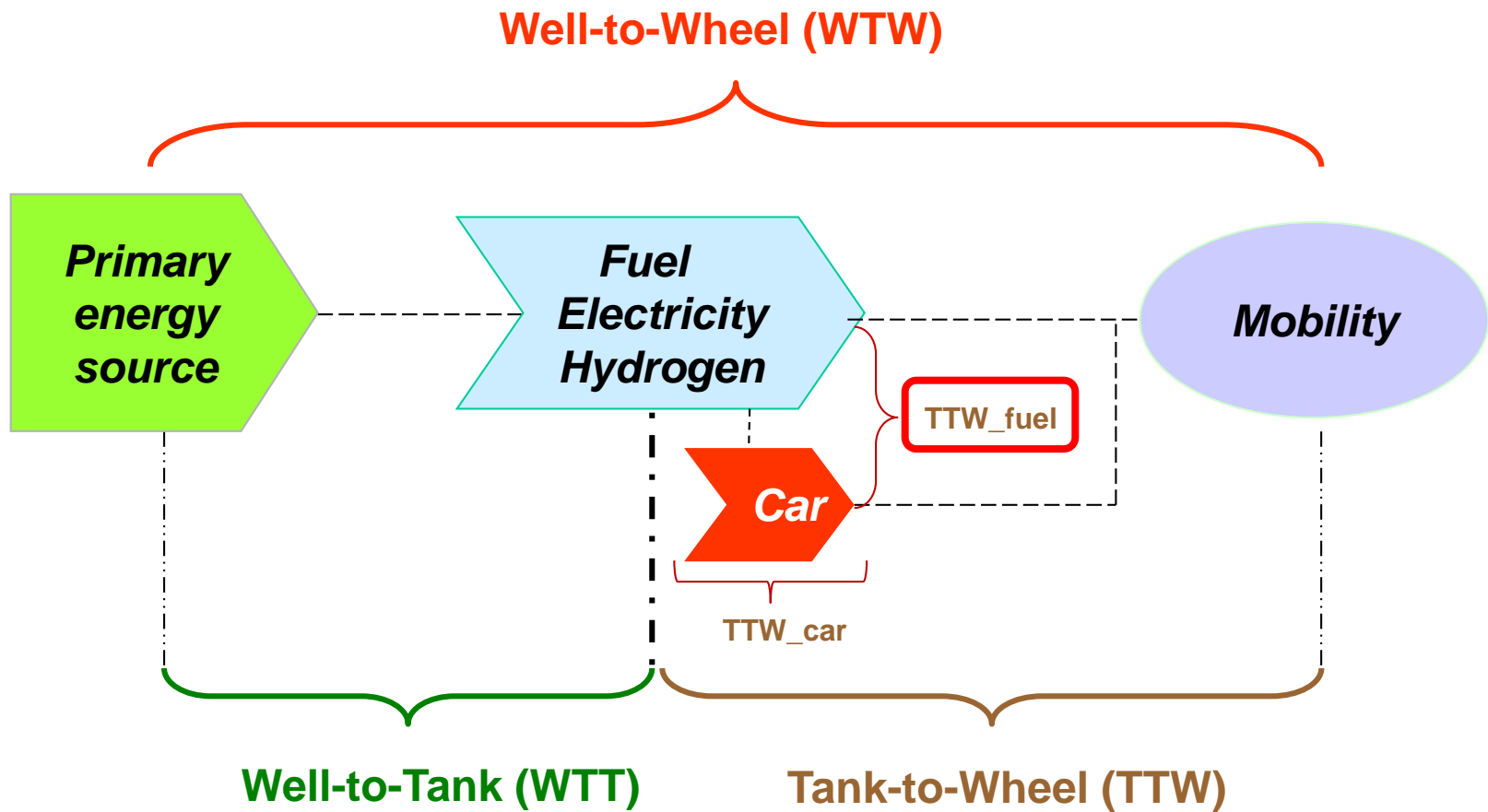
Electric vehicles

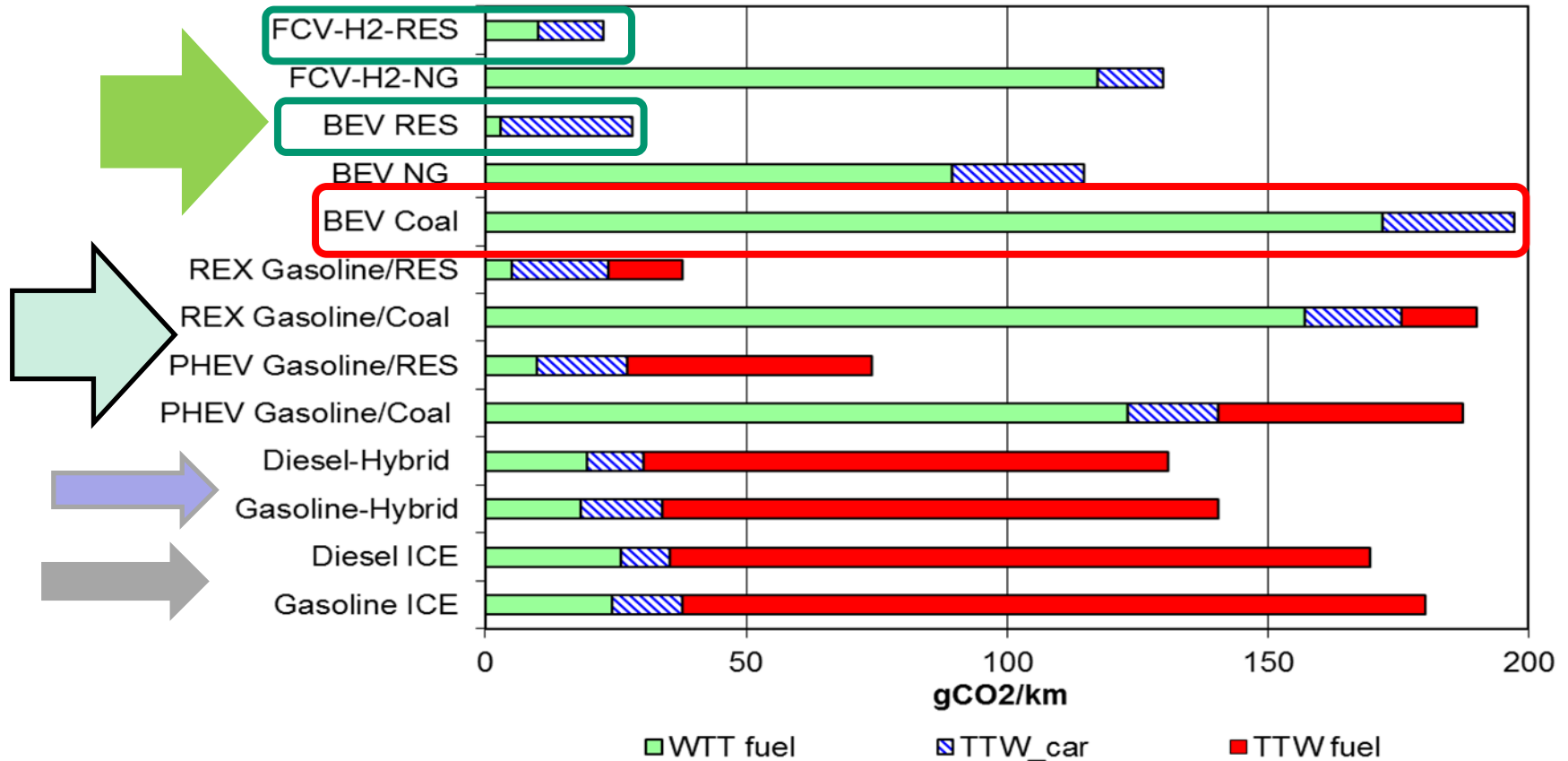
Monetary measures

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

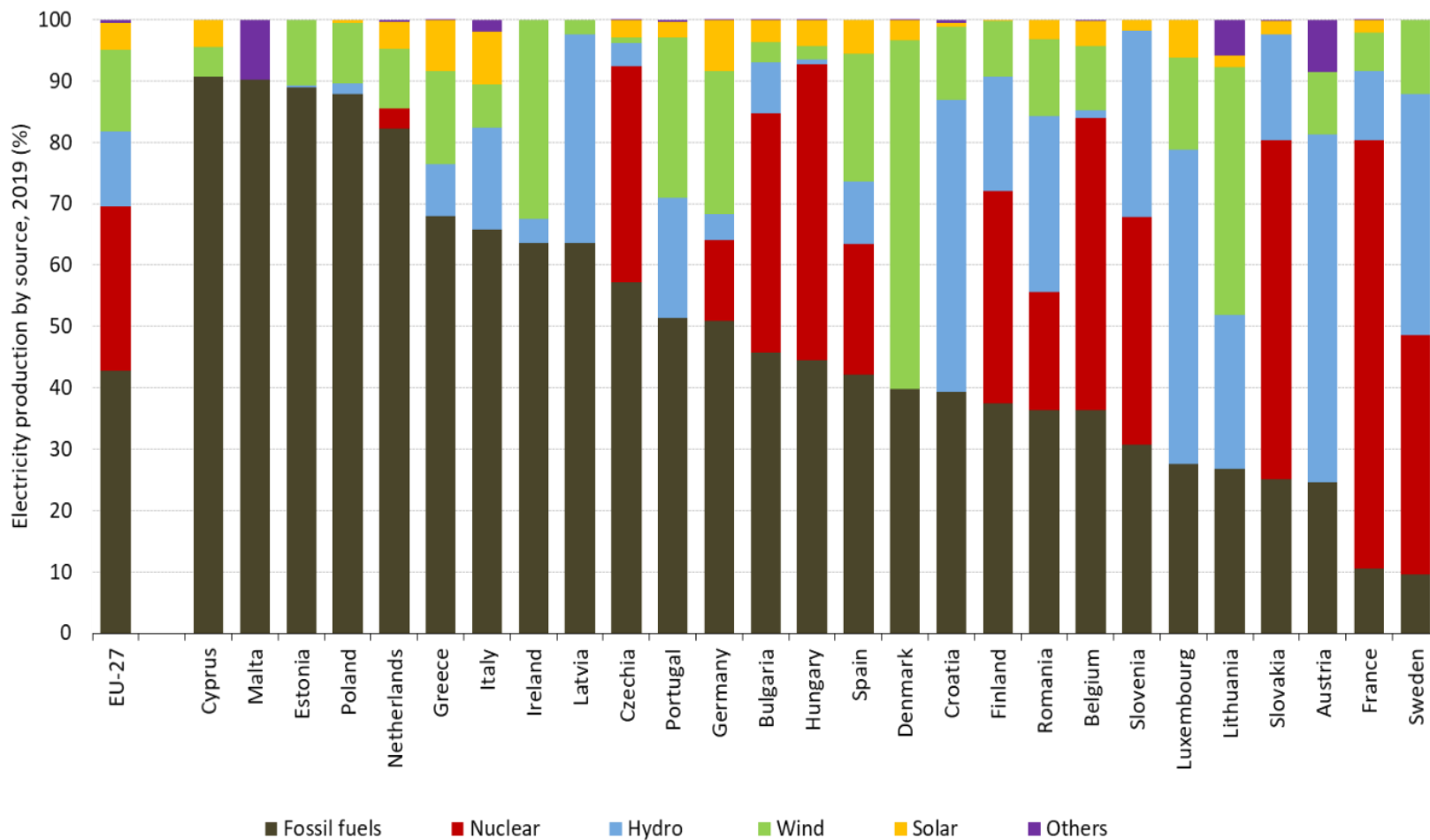
Non-monetary measures

- free parking spaces
- possibility for EVs drivers to use bus lanes
- wide availability of charging stations
- permission for EVs to enter city centers and zero emission zones

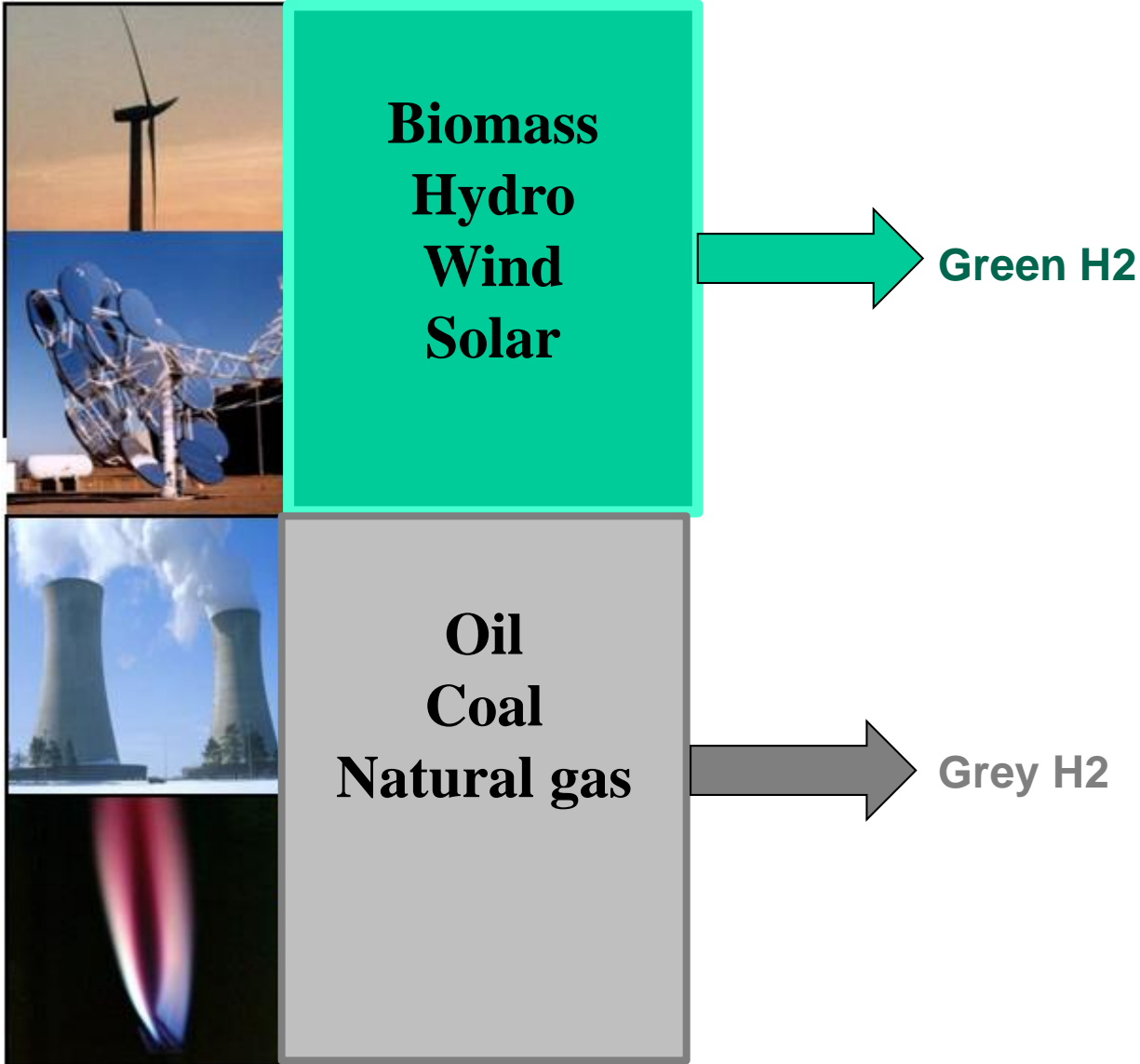




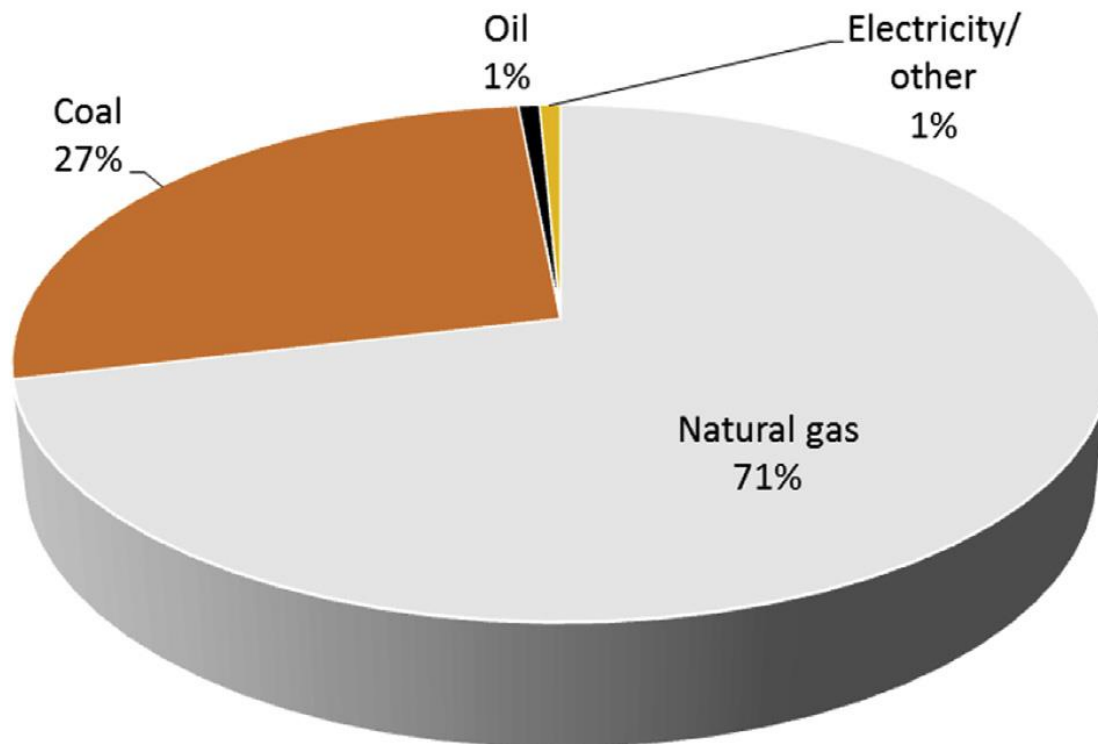
CO₂ emissions per km driven for various types of EVs in comparison to conventional cars (power of car: 80kW)



Colors of hydrogen

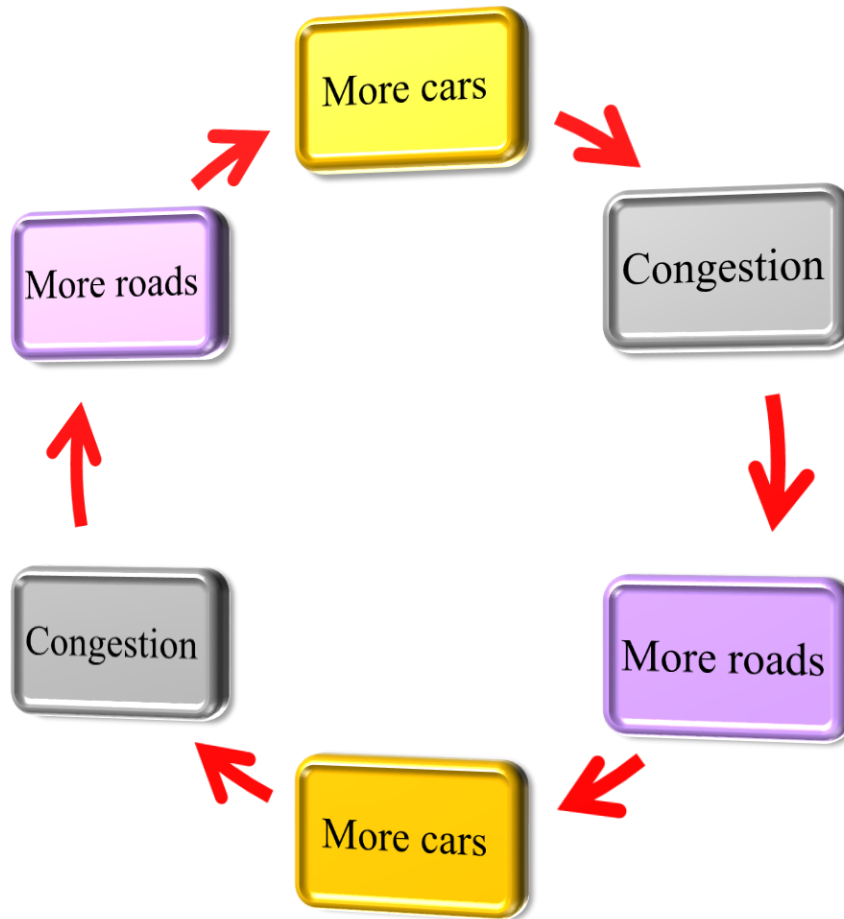


Hydrogen production



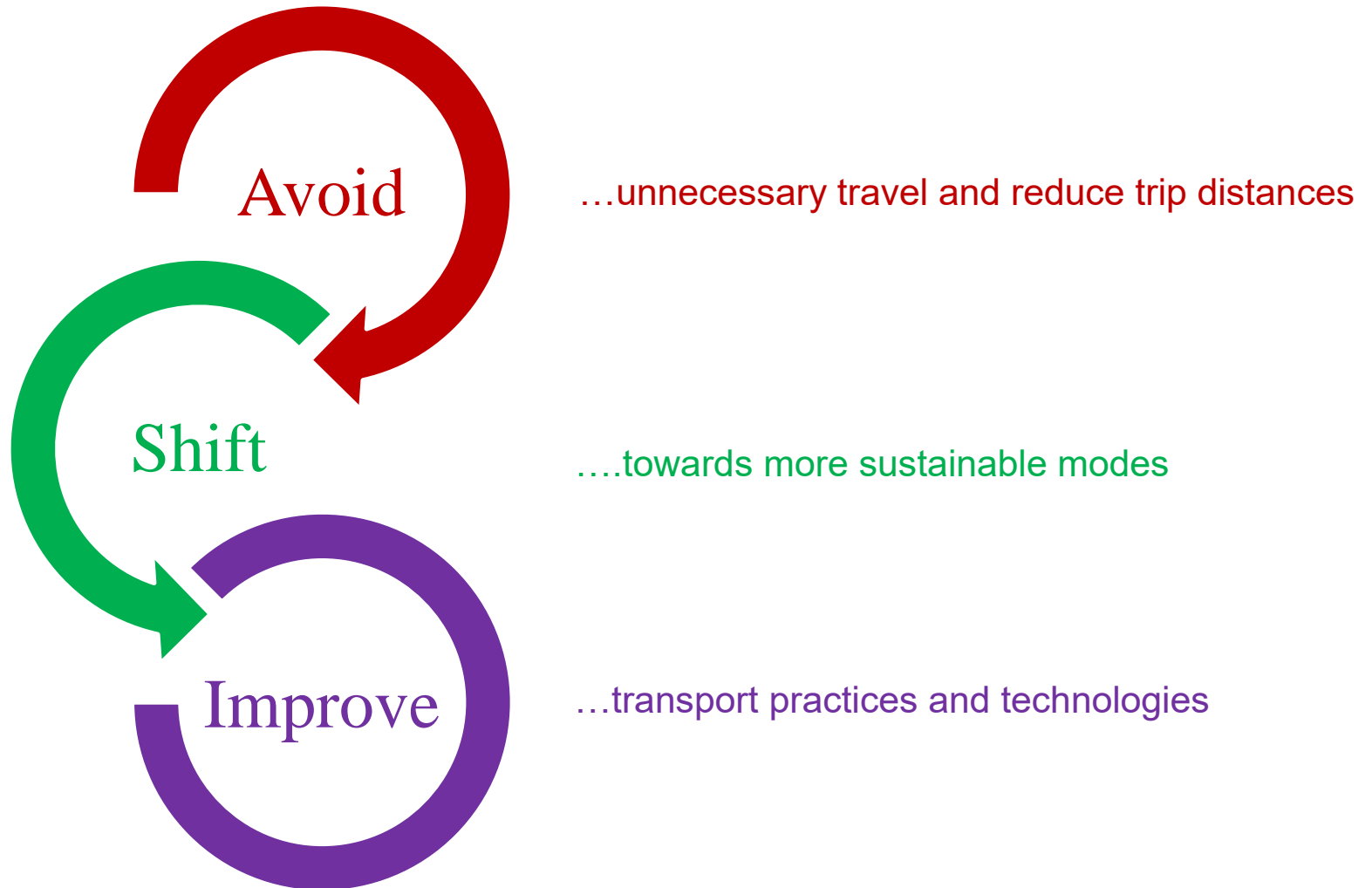
- Biofuel – dependent on markets created by government policy
- Biofuels...in aviation, shipping and heavy goods vehicles
- EVs ...part of the solution...cost reductions, improvement of battery characteristics, as well as development of infrastructure
- Most of the policies implemented will be abolished with the increasing number of EVs...Future policy design should ensure high environmental benefits of EVs.

Car-oriented mobility





Car-oriented transport development



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