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Drivlineteknologiutveckling

ett hjälpmedel för att
minska klimatpåverkan i tunga transporter

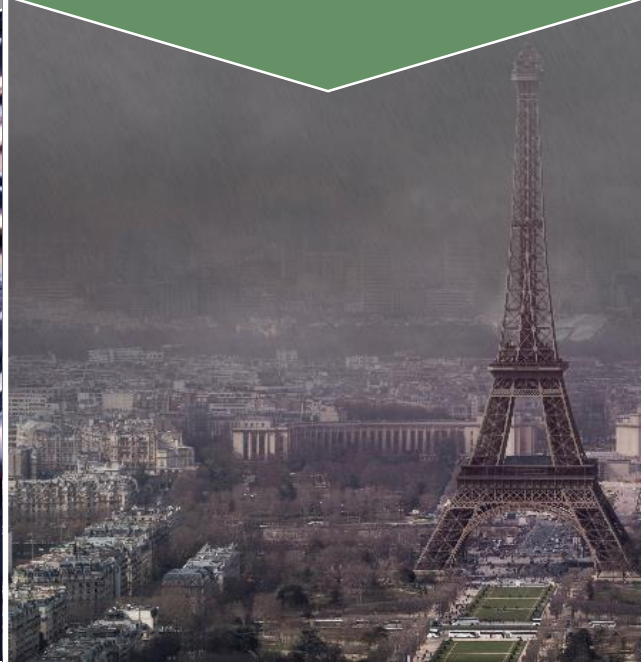
SCANIA

Main drivers for sustainable transport

Congestion



Pollution



Energy security

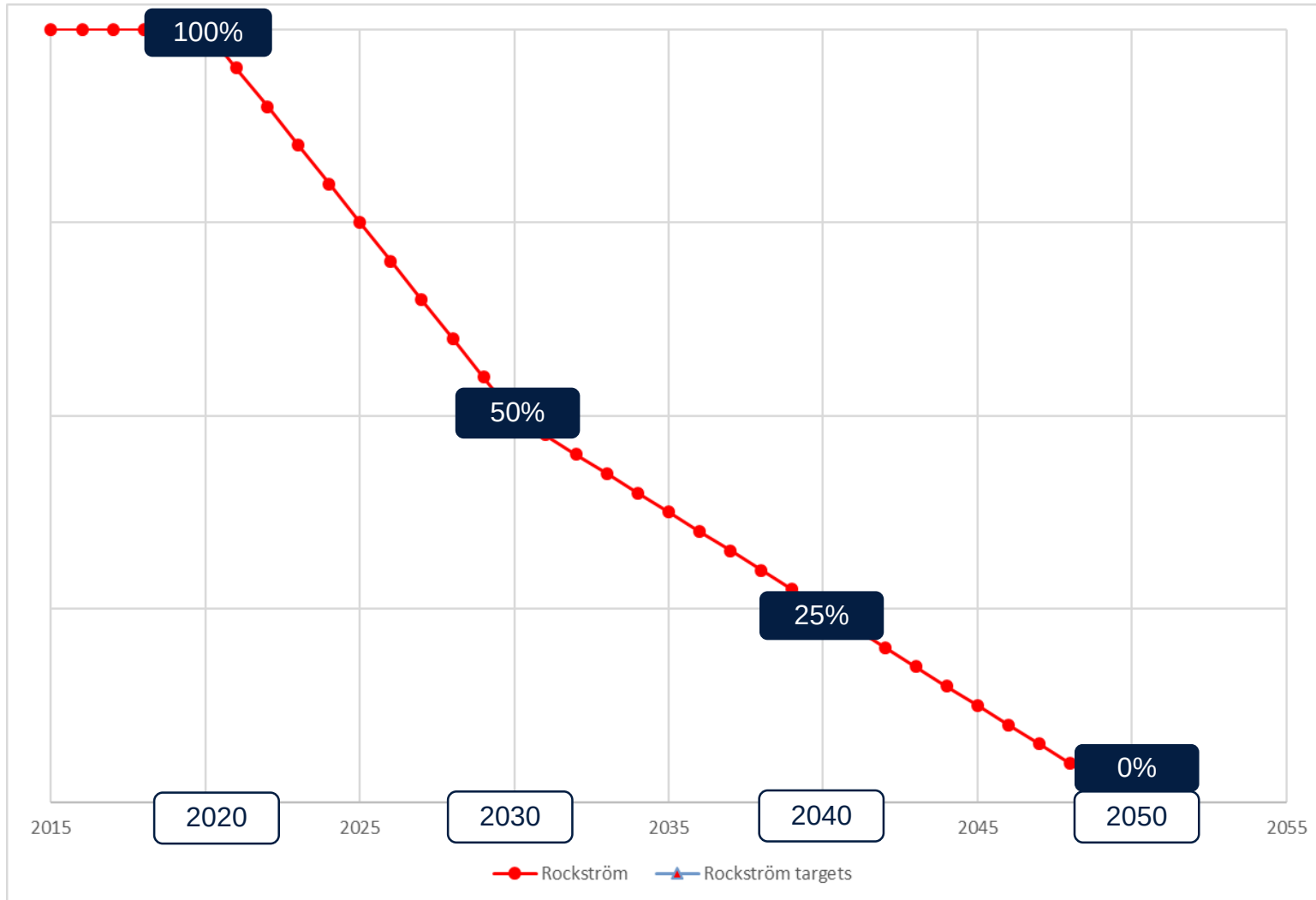


Climate change





"Carbon Law" (-50% every decade)



Rockström:
" Fossil-fuel emissions should peak by 2020 at the latest and fall to around zero by 2050"

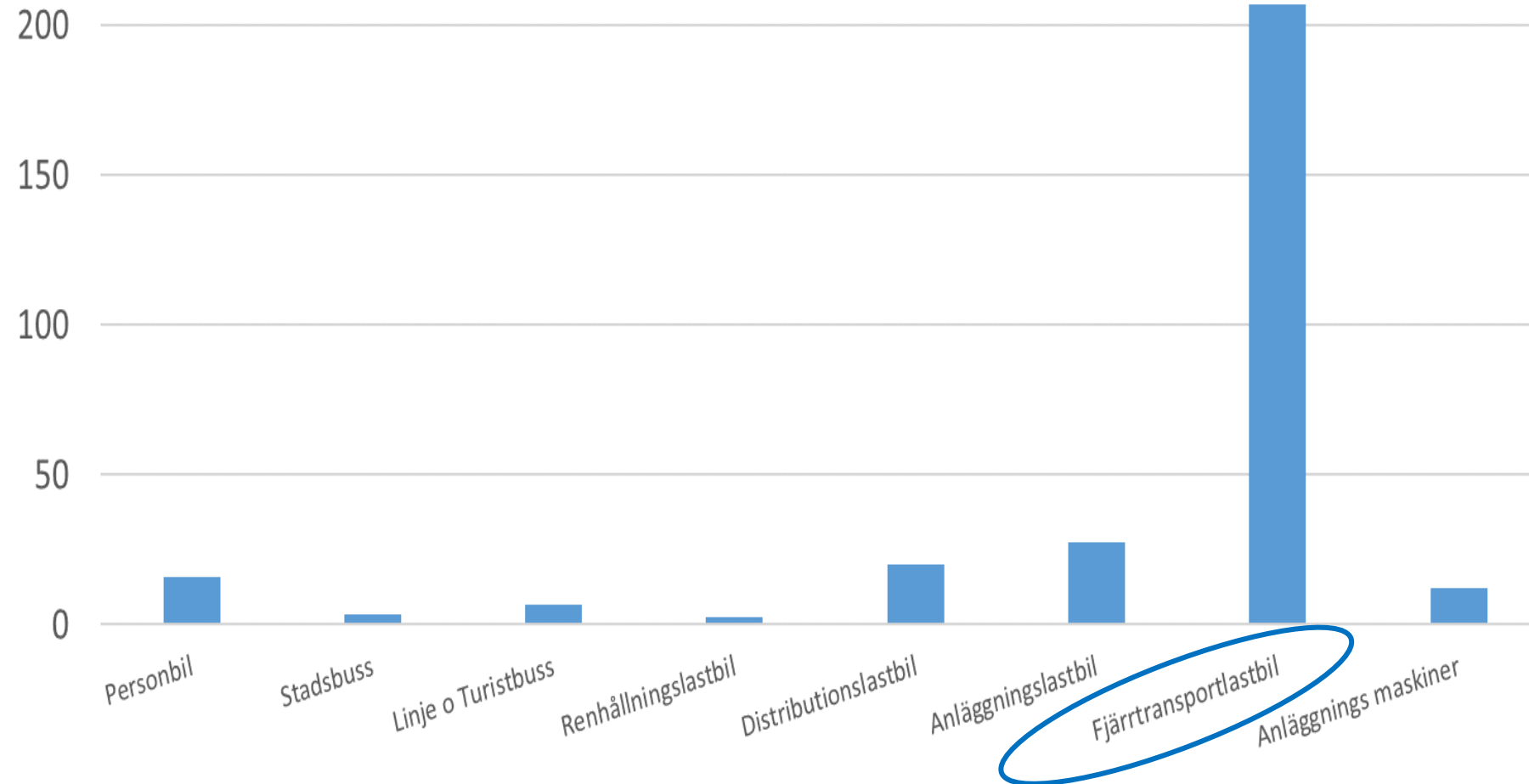
Vehicles engineered by Sweden ~ 5% of world's total transport CO₂

Scania rolling fleet ~ 0,5% (LCA) of total global CO₂

CO₂ impact



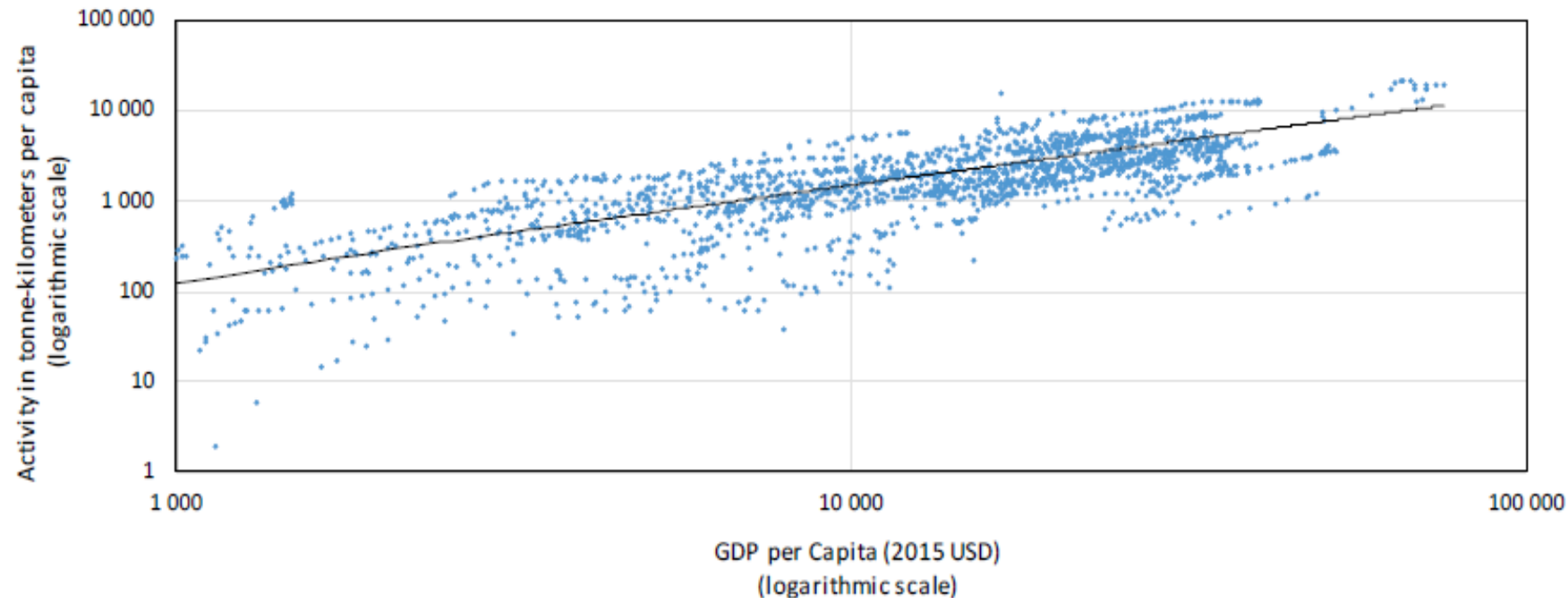
CO₂-produktion WtW från svenska fordonsföretags produkter [Mton/år]



Transport Energy Outlook



Figure 7 • Road freight activity (tkm per capita) plotted against GDP per capita



Sources: National Bureau of Statistics China (2015); Ministry of Road Transport & Highways (2016); Japan Statistics Bureau (2014); North American Transportation Statistics; Federal State Statistics Service; Bureau of Transportation Statistics (2016); Eurostat (2015); OECD (2016); The World Bank (2016); Afghanistan Ministry of Transport and Civil Aviation; Australia Department of Infrastructure and Transport (2011); Inter-American Development Bank (2015); General Statistics Office of Viet Nam (2016); Lao Statistics Bureau (2015); Department of Infrastructure and Transport (2011).

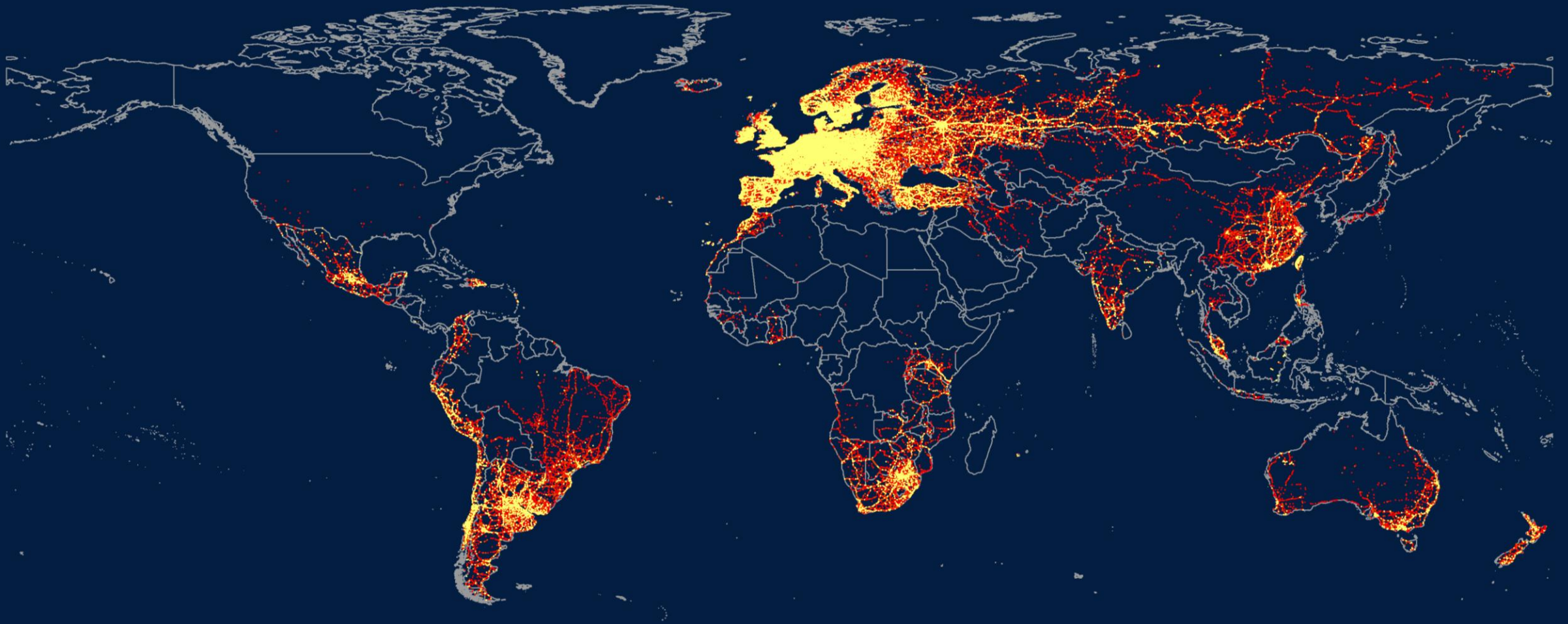
IEA findings

Road freight vehicles are a key enabler of global economic activity.

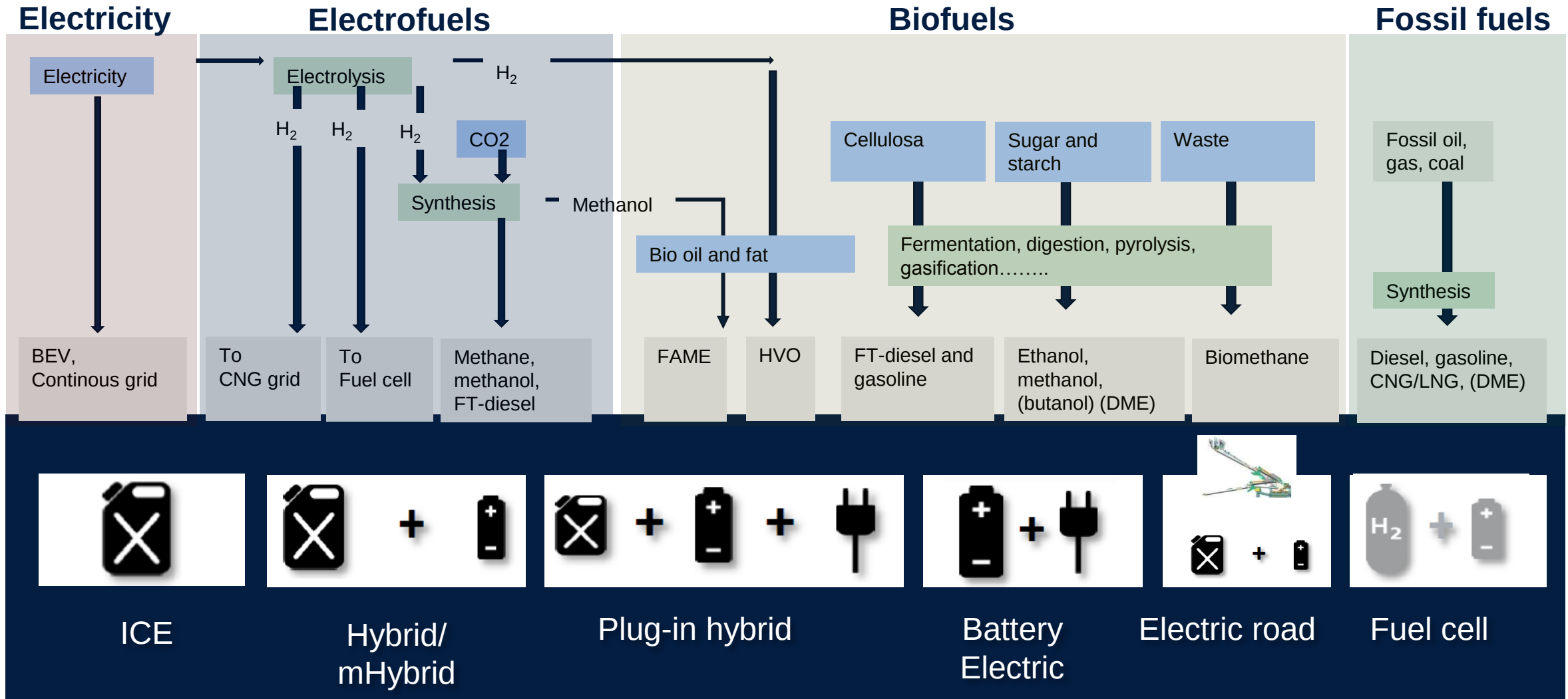
Strong correlation between GDP and Road Freight (IEA)

GDP growth → improved infrastructure and logistics → **More HFT**

World of Scania

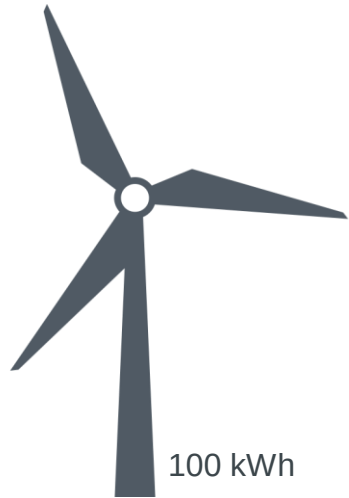


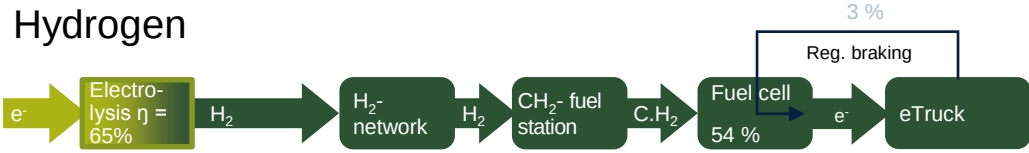
Best combination of energy carrier and converter for each HD transport solution





Fully electric solutions are efficient



Pathway	Range	Efficiency WTW
Battery/Electric roads 	61 km	76%
Hydrogen 	22 km	28%
E-gas 	14 km	18%
E-diesel 	16 km	20%

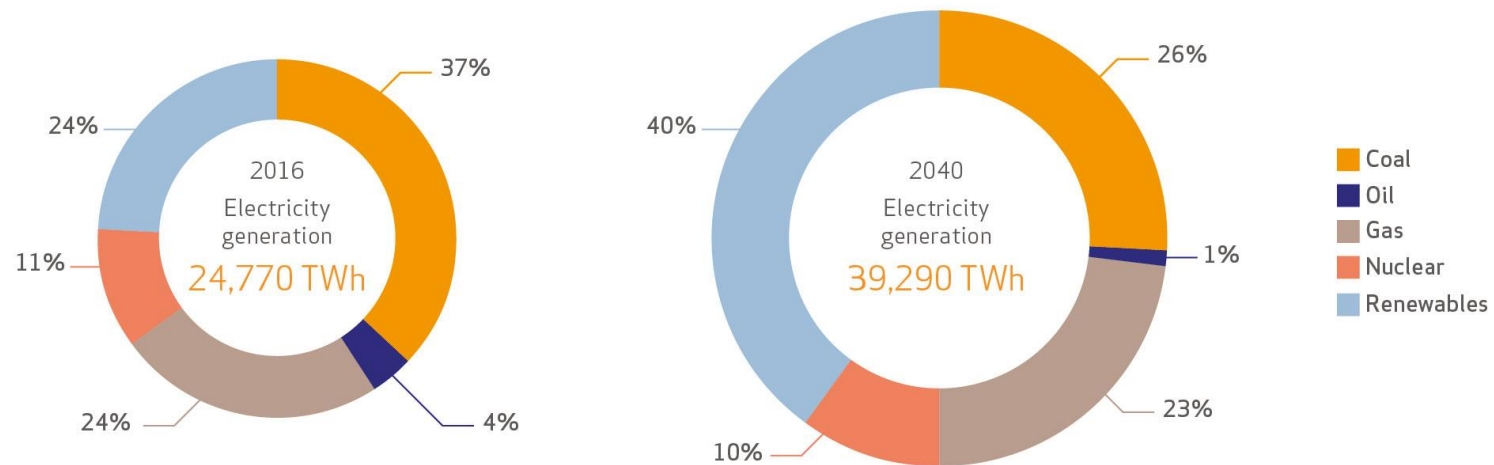
Rounded values. No contributions for hydrogen or CNG transport.

Calculated 2018 by Vehabovic & Dahl Öberg, Scania. Sources: JEC Well-to-wheel 2014, Brynolf et al., Moro et al., ABB, Pennstate University, Hydrogenics

Electricity mix – to take into account

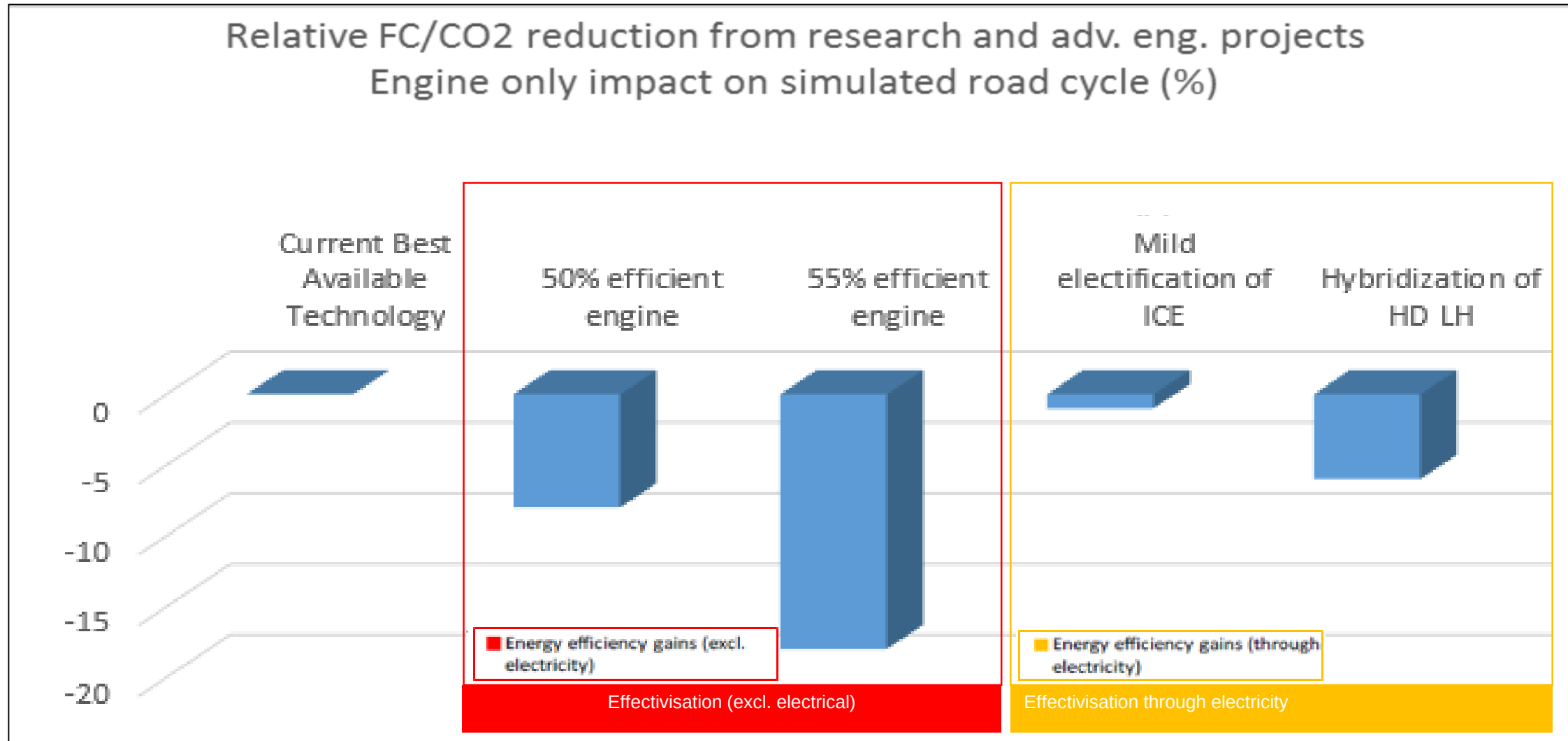


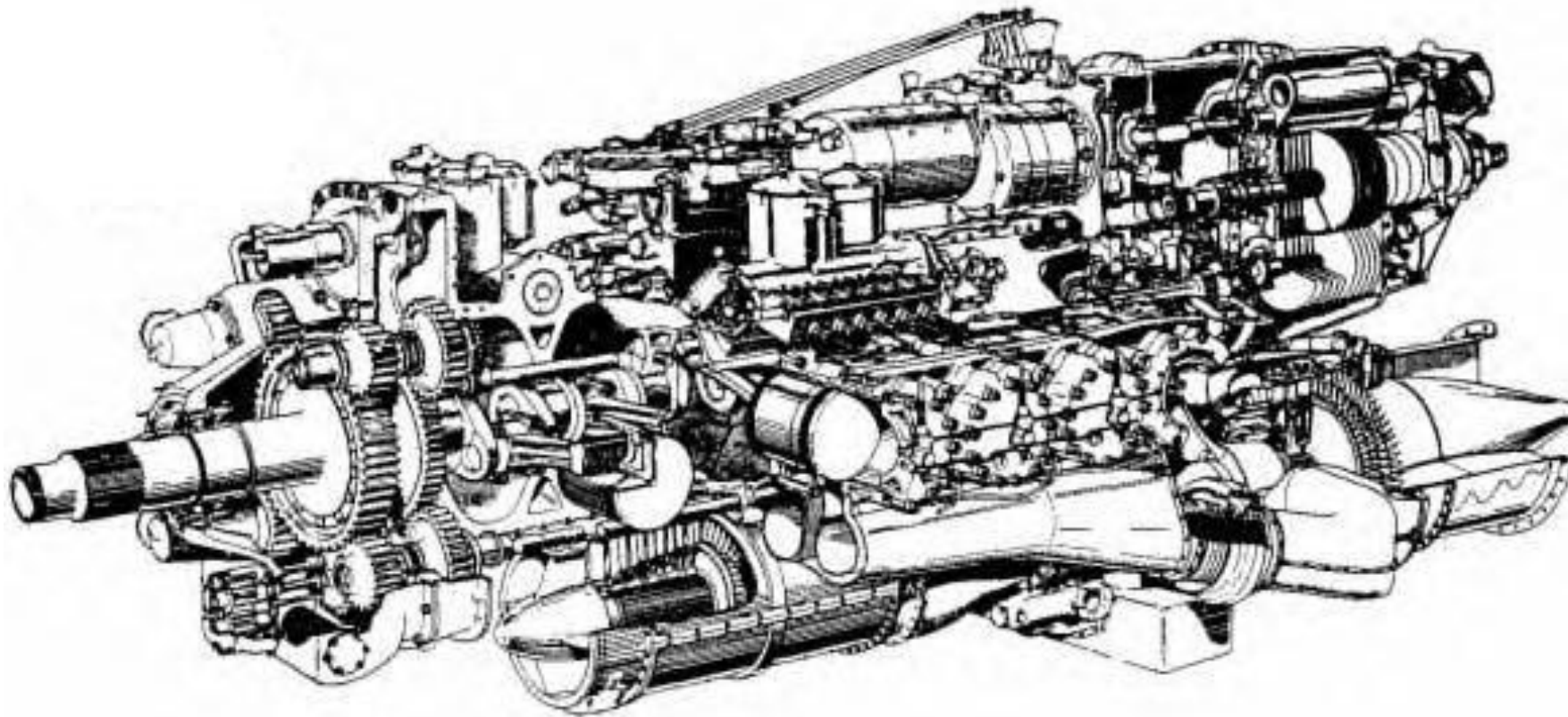
Global electricity mix under the IEA's New Policies Scenario



Note: IEA's 2016 data is estimated
Source: International Energy Agency, World Energy Outlook 2017

Within our control



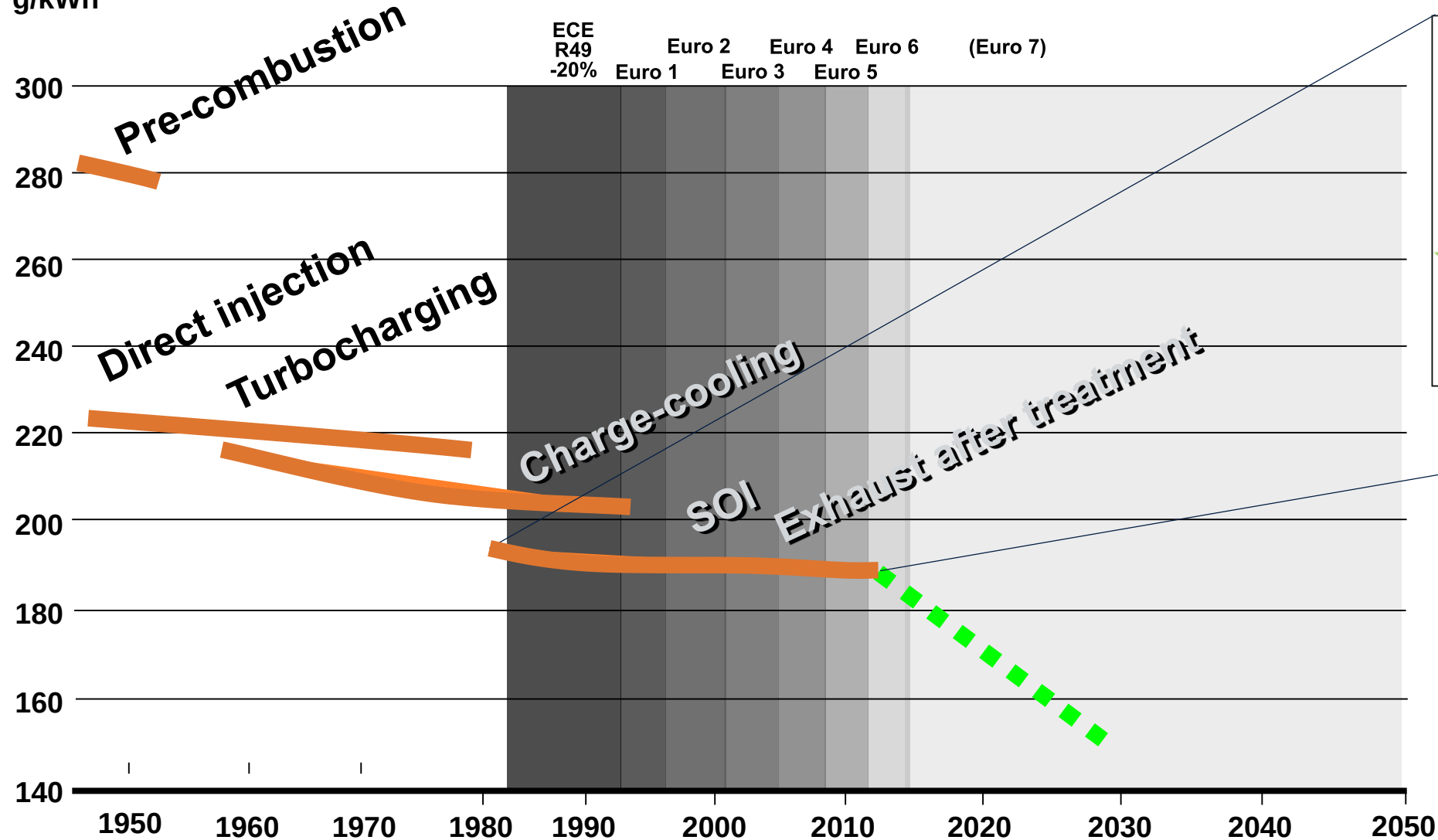


Diesel engine development

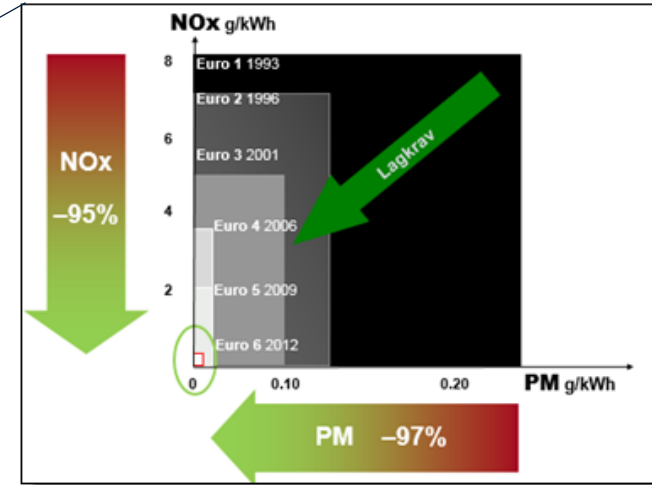
Minimum specific fuel consumption over emission legislation



g/kWh

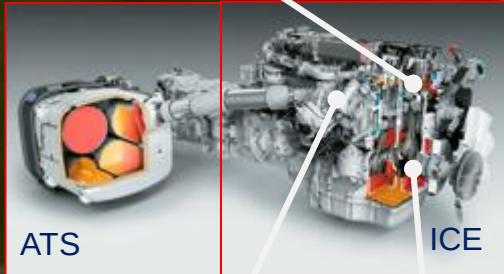


Emission legislation development

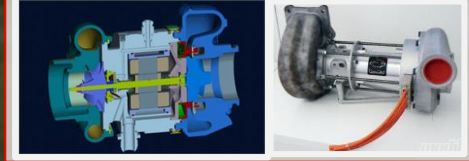


System integration synergies!

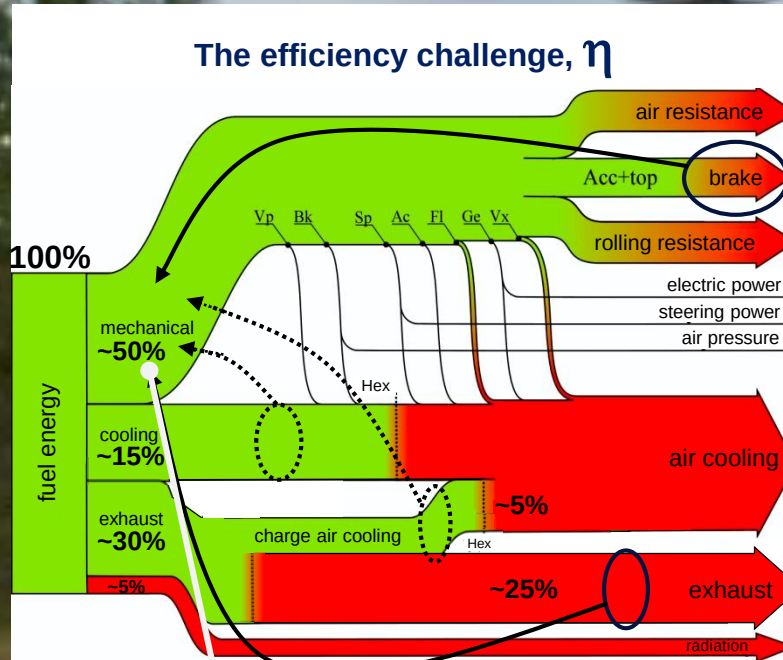
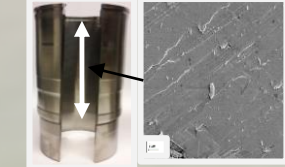
Injection- and combustion system



Advanced charging systems



Parasitic / friction



electric energy storage

Advanced Thermal management

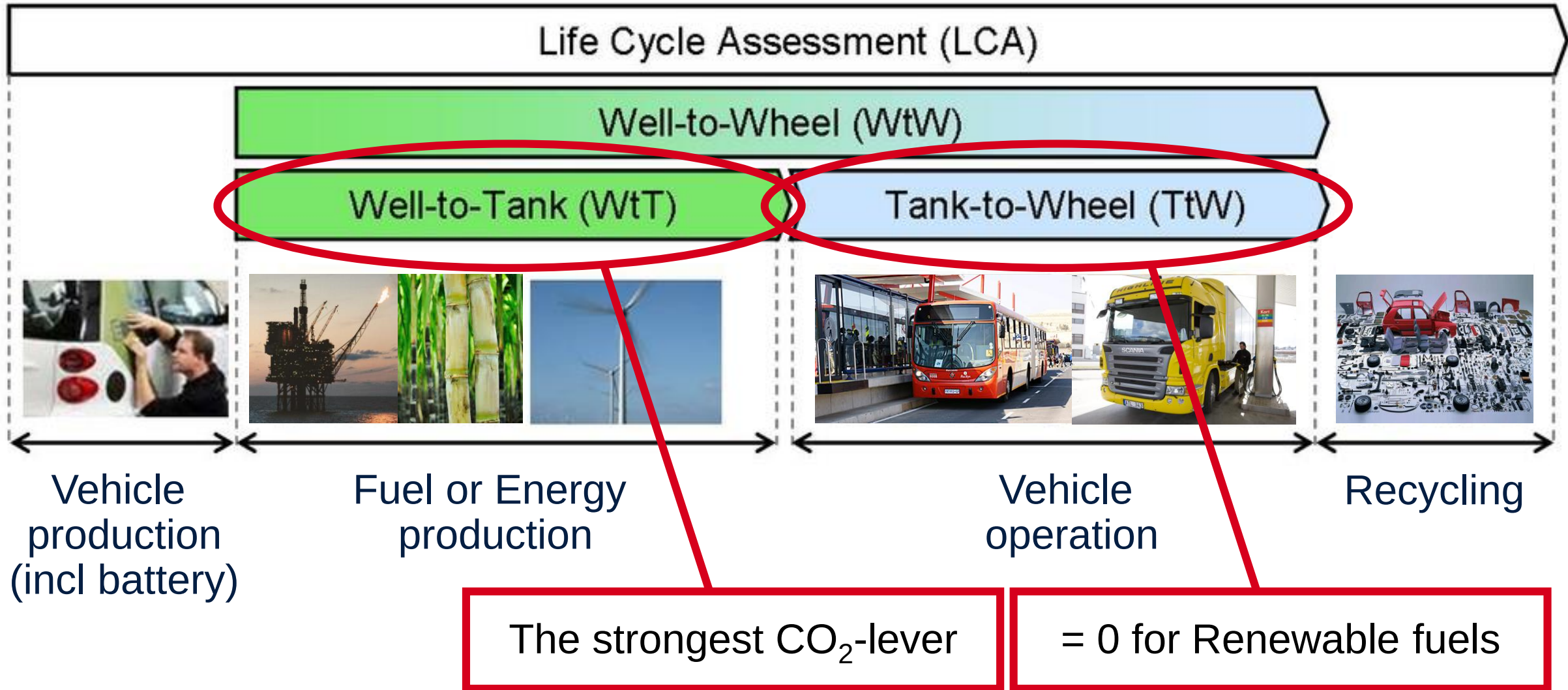
Active Prediction



Advanced transmission



LCA, WtW, TtW and WtT



Renewable fuels - the strongest lever

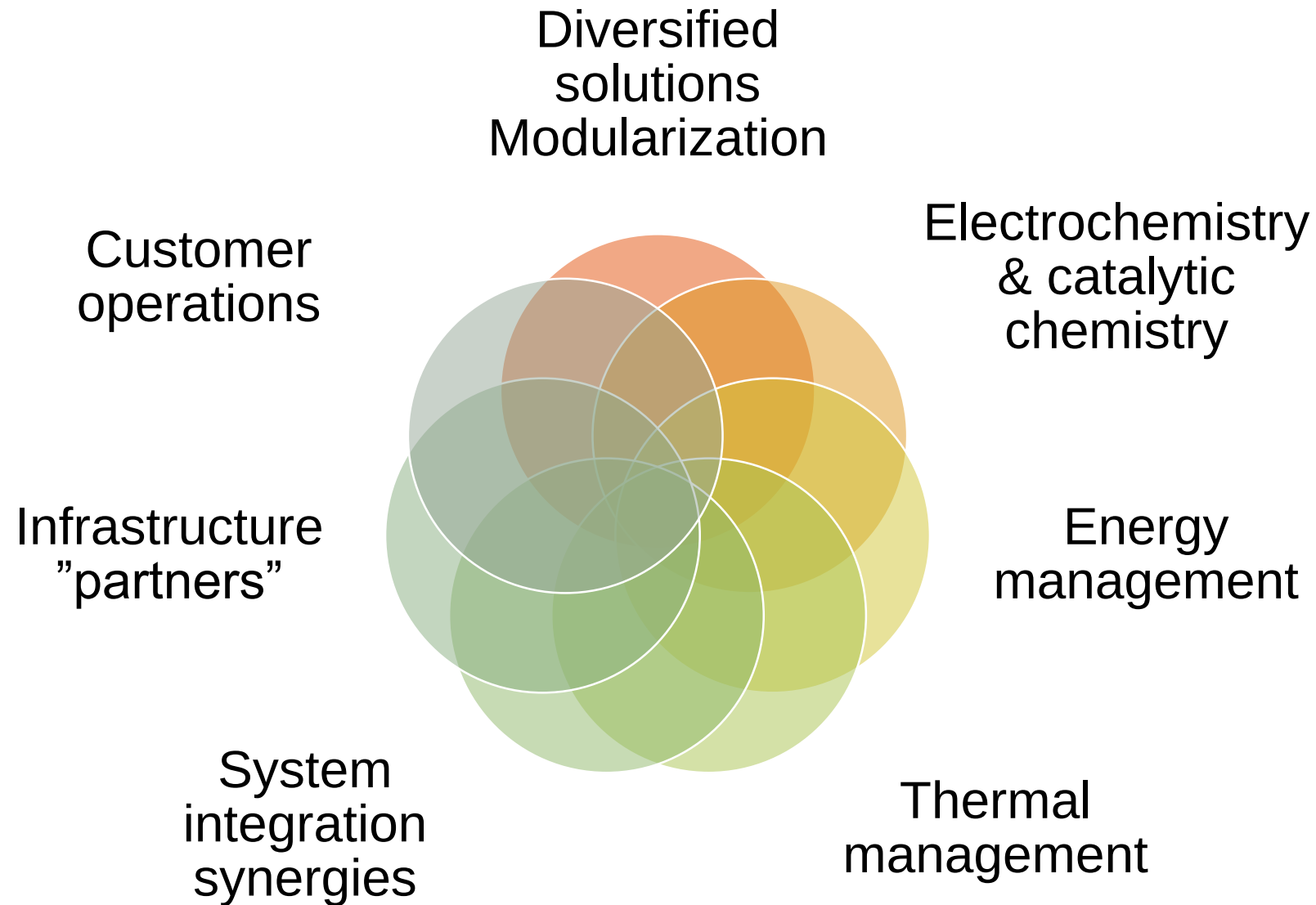


1st priority- Drop-in fuels
Fuels that may be used in existing fleets and blended with fossil equivalents in high proportions
Biogas, paraffinic fuels, Alcohols, E-fuels

2nd priority - Fuels for adapted engines
E.g. alcohols, POM (polyoxymethylethers)



Challenges ahead





We're in this together!

