Agora Verkehrswende: Transforming Transport to Ensure Tomorrow‘s Mobility.

12 Insights into the Verkehrswende

Christian Hochfeld
Executive Director, Agora Verkehrswende

Climate Action in Transport Conference

September 19, 2017

Die Dieselstraße in Berlin-Neukölln: Symbol for the *Verkehrswende* in Germany?

The German Transport System in a World of Climate Change

Berlin (Gleimtunnel), July 2016

Foto: Jörg Carstensen, PictureAlliance

Agora Verkehrswende – Transforming Transportation

Who we are.

Picture: Greenpeace

- → Initiative by **Stiftung Mercator** and **European Climate Foundation**
- → Independent **Think Tank** and high-level **Council of Agora**
- → Project Duration: **2016 – 2018**
- → **Mission:** Scenarios, Discourse and Strategies for the **Decarbonisation of Transport** until 2050
- → **Focus:** starting with national land-based transport in **Germany** in an European context

Agora Verkehrswende – Transforming Transportation

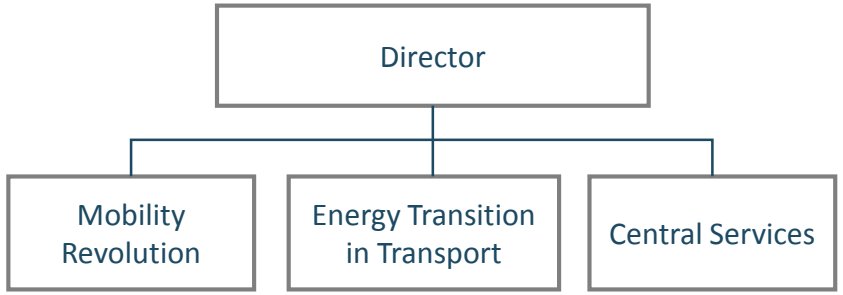
How we work.

Stakeholder

Regular exchange on projects with temporary task forces

Impulse

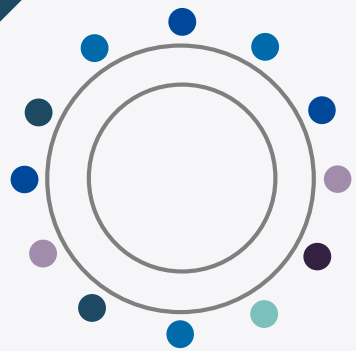
Team of Agora Verkehrswende



Studies, Events etc.

Impulse

Council of the Agora



Internal exchange with standing members of the Council of Agora Verkehrswende

Source: Agora Verkehrswende

The Council of Agora Verkehrswende

The Council is chaired by Achim Steiner, former Under Secretary General of UN and former Executive Director of UNEP.

Picture: Achim Steiner at the Launch of Agora Verkehrswende

Policy:

→ EU-COM; 5 national ministries; main parlimentary groups; 2 federal states; 2 city mayors; 2 Governmental agencies

Economy:

→ BMW; DB; DP-DHL; innogy; Robert Bosch; Siemens; VW; VDV

Civil Society & Science:

→ German Automobile Association; Consumer Association; 3 environmental NGOs; Labor Union; 3 academics

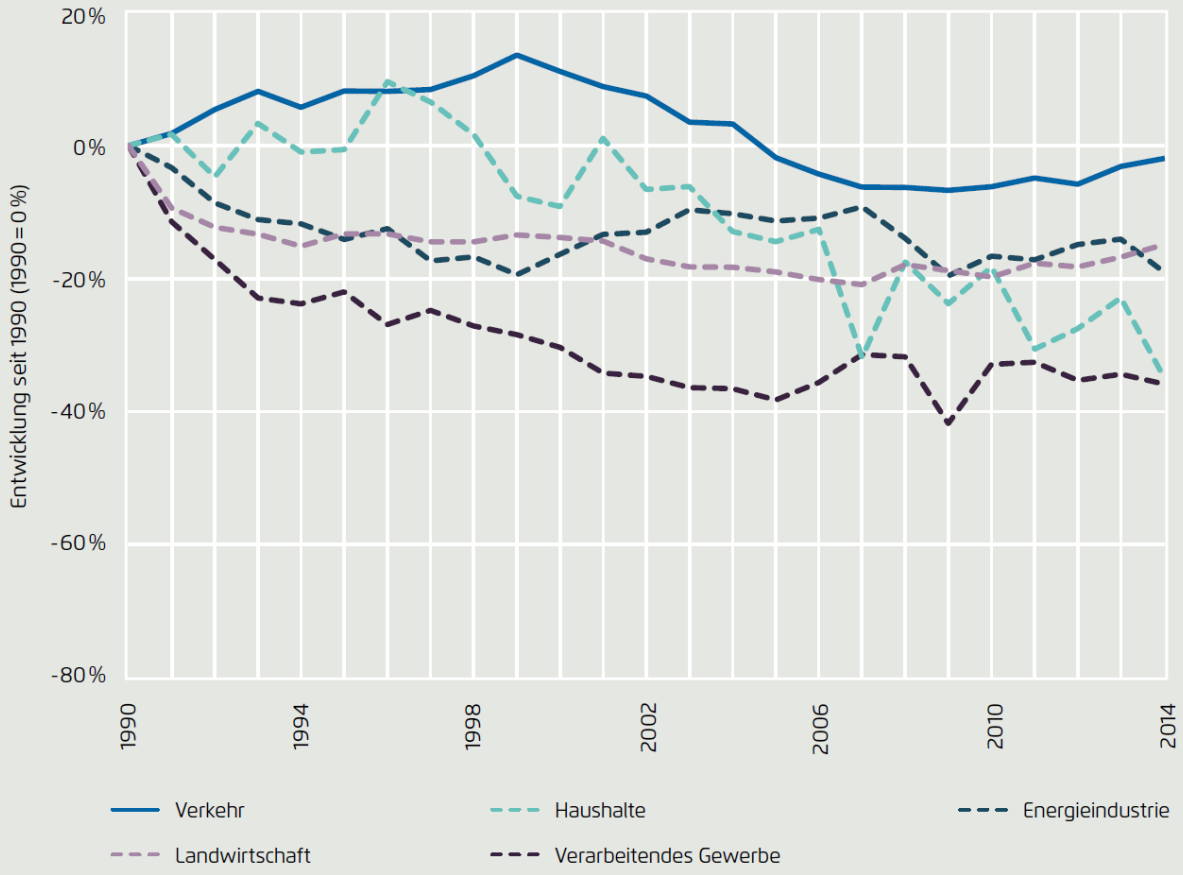
The full list of the council members under:

www.agora-verkehrswende.de

In the past 25 years the Transport Sector in Germany could not contribute to CO_2 Emission Reductions.

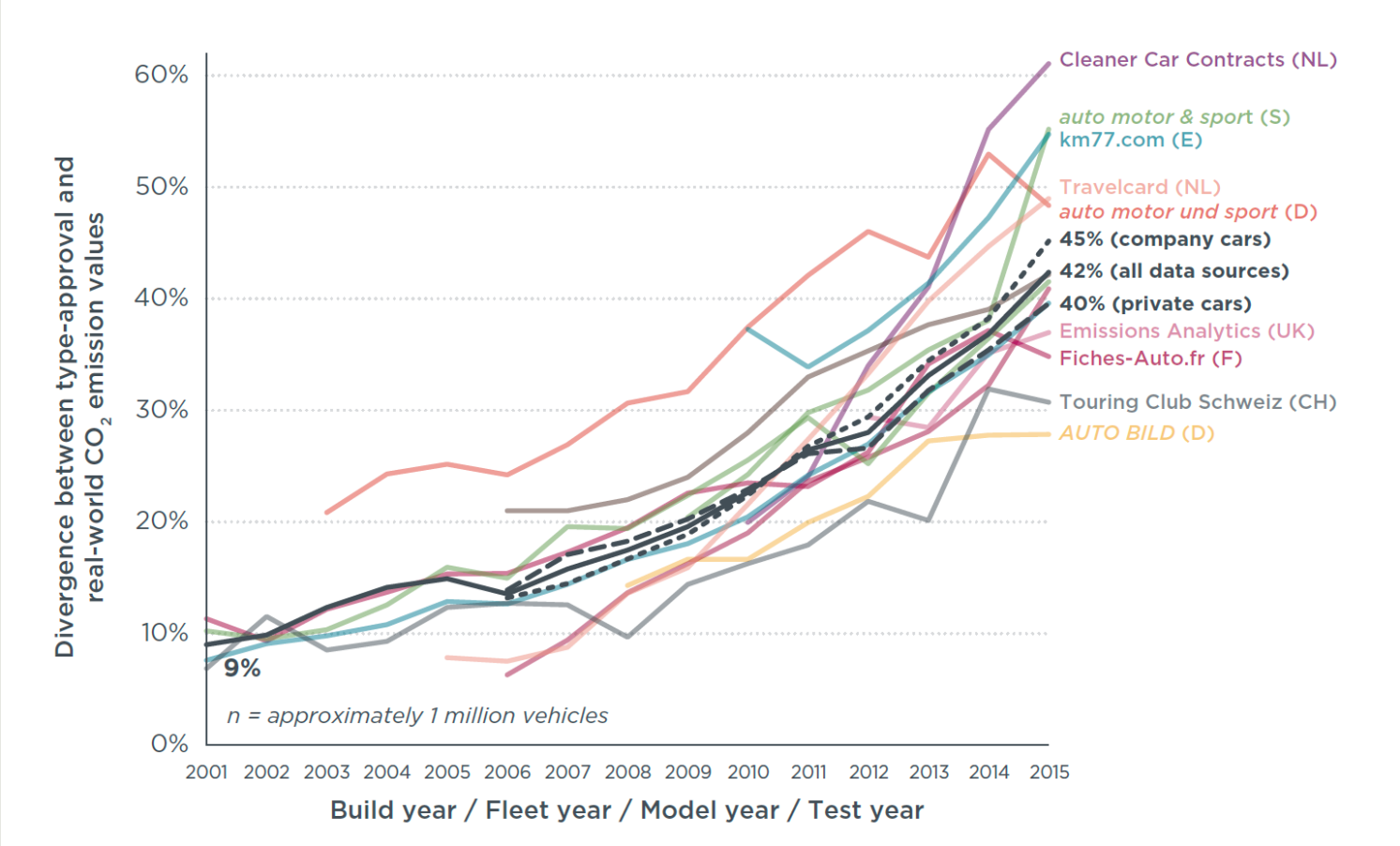
Agora Verkehrswende

Relative Development of Greenhouse Gas Emissions for different Sectors since 1990



From Laboratory to Road:
Missing Link for Climate Protection in Road Transport

Divergence between real-world and manufaturers# type approval CO2 emissions values



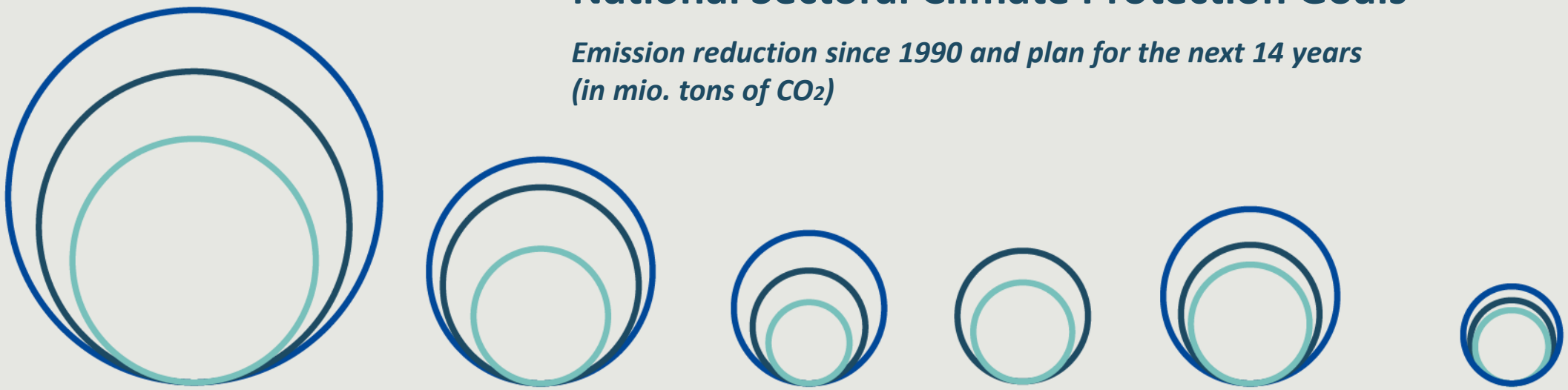
Source: ICCT 2016.

Federal Climate Protection Plan 2050:
The *Verkehrswende* is an official goal of the Government.

For the first time ever the German transport sector has an own ambitious emission reduction target.

National Sectoral Climate Protection Goals

Emission reduction since 1990 and plan for the next 14 years (in mio. tons of CO_2)



	Total	Energy	Building	Transport	Industry	Agriculture
1990	1248	446	209	163	283	88
2014	902	358	119	160	181	72
2030	543–562	175–183	70–72	95–98	140–143	58–61

Source: Agora Verkehrswende

The *Verkehrswende* will be enabled by the Mobility Revolution and the Energy Transition in Transport.

VERKEHRSWENDE

The **Verkehrswende** enables the German transport sector to be carbon neutral by 2050.

MOBILITÄTSWENDE

The **Mobility Revolution** reduces the energy consumption of the German transport sector based on Avoid, Shift and Improve.

+

ENERGIEWENDE IM VERKEHR

The **Energy Transition in Transport** covers the remaining energy demand of the German transport sector with renewable energy.

Source: Agora Verkehrswende.

In Cities, the Mobility Transition has already begun.

Agora Network Urban *Verkehrswende (Transport Transformation)*

Quelle: Eigene Darstellung.

The Mobility Transition has already started in cities around the world…

Picture: iStock

- The interlinked public transport is the backbone of urban transport.
- Private transport becomes more public, public transport becomes more private.
- Fewer cars leave more space for other land use.
- Walking and cycling comes with high benefits for the city at lowest costs.
- Sustainable urban transport policy receives more political support.

The Mobility Alliance

Public Transport
- Suburban train
- Underground
- Tram
- Bus
- Taxi

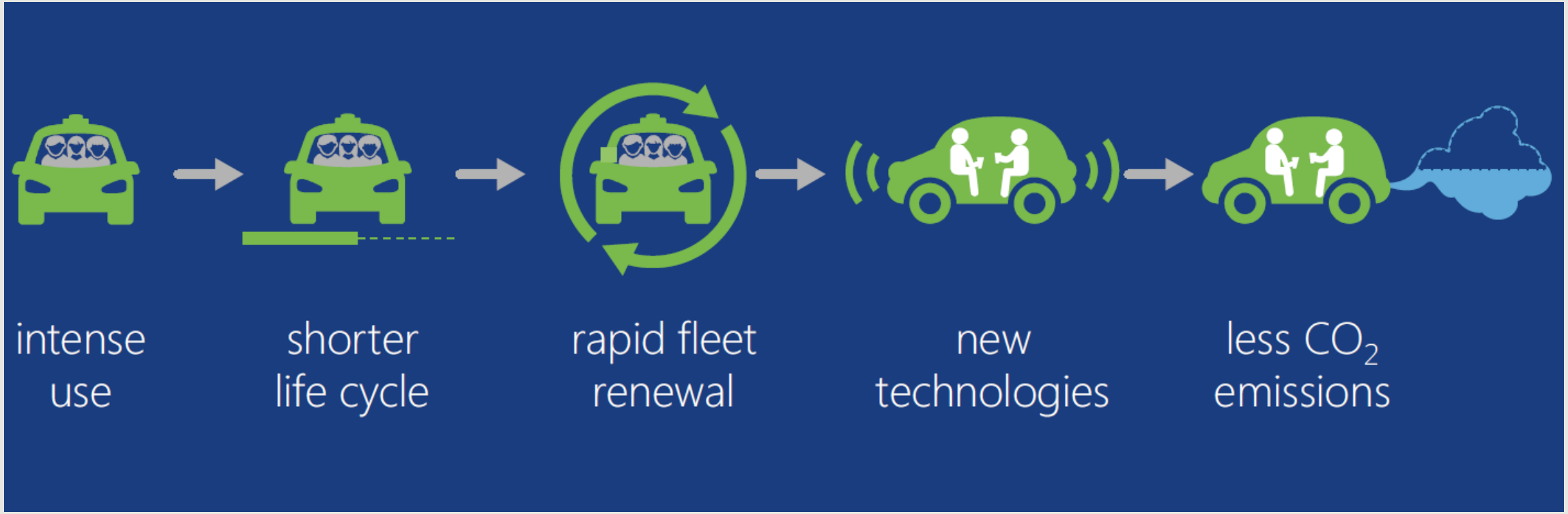
Non-motorised Transport
- Bicycle
- Pedestrians

Collaborative Mobility
- Carsharing
- Ridesharing
- Bikesharing

Source: Agora Verkehrswende

Shared Mobility and Penetration of New Technologiesgoes hand in hand!

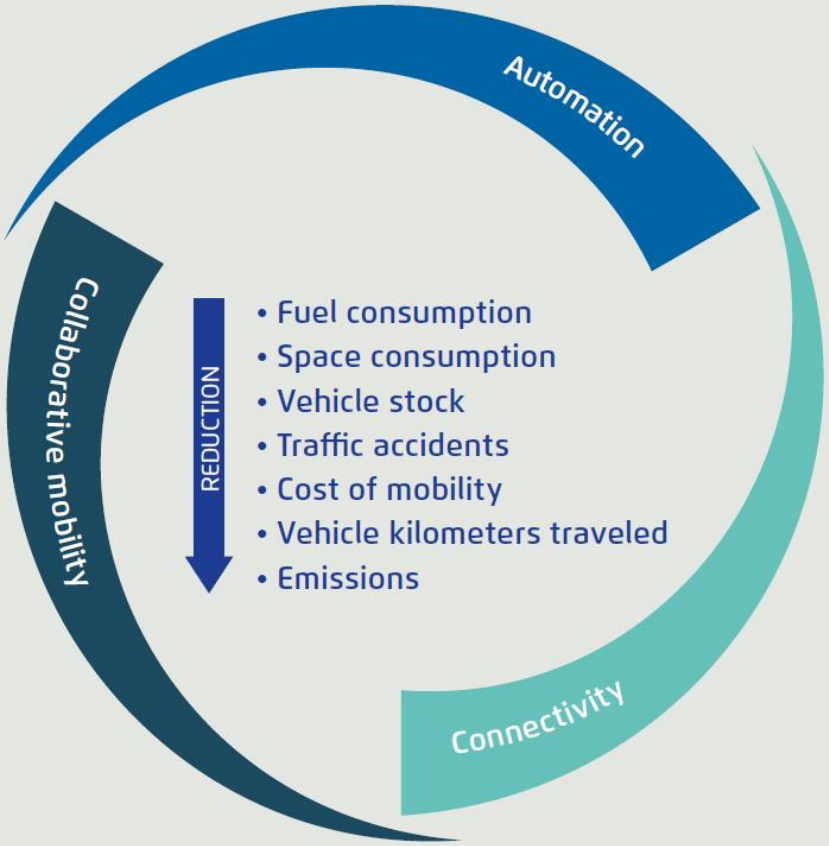
Autonomous vehicles need collaborative mobility.



Source: OECD-ITF 2016.

Trends and Potentials of Digitalisation in Transport

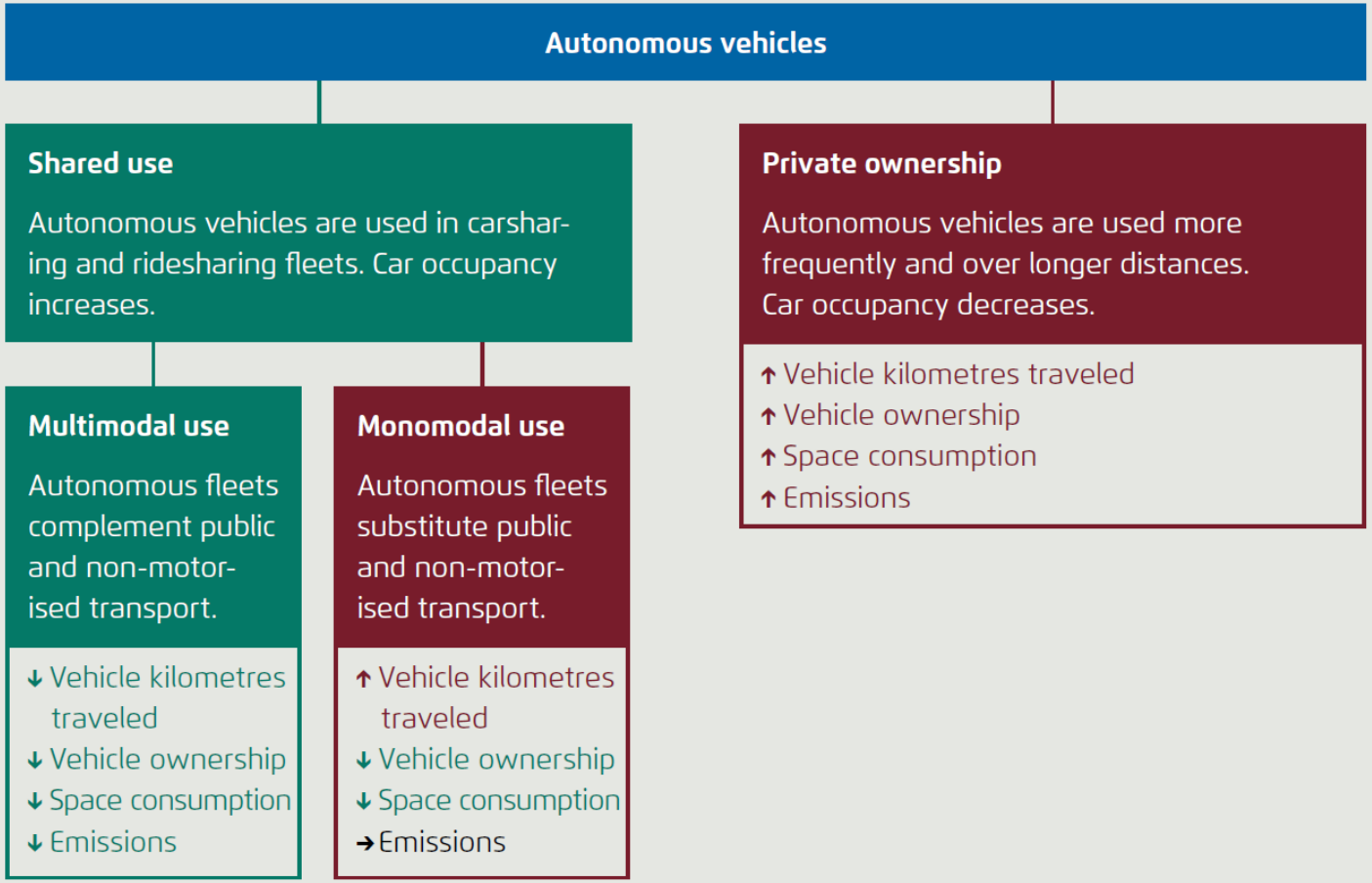
Optional Synergies between Automatisation, Collaborative Mobility and Connectivity



Source: Agora Verkehrswende

Even a Small Number of Driverless Cars Can Increase Traffic.

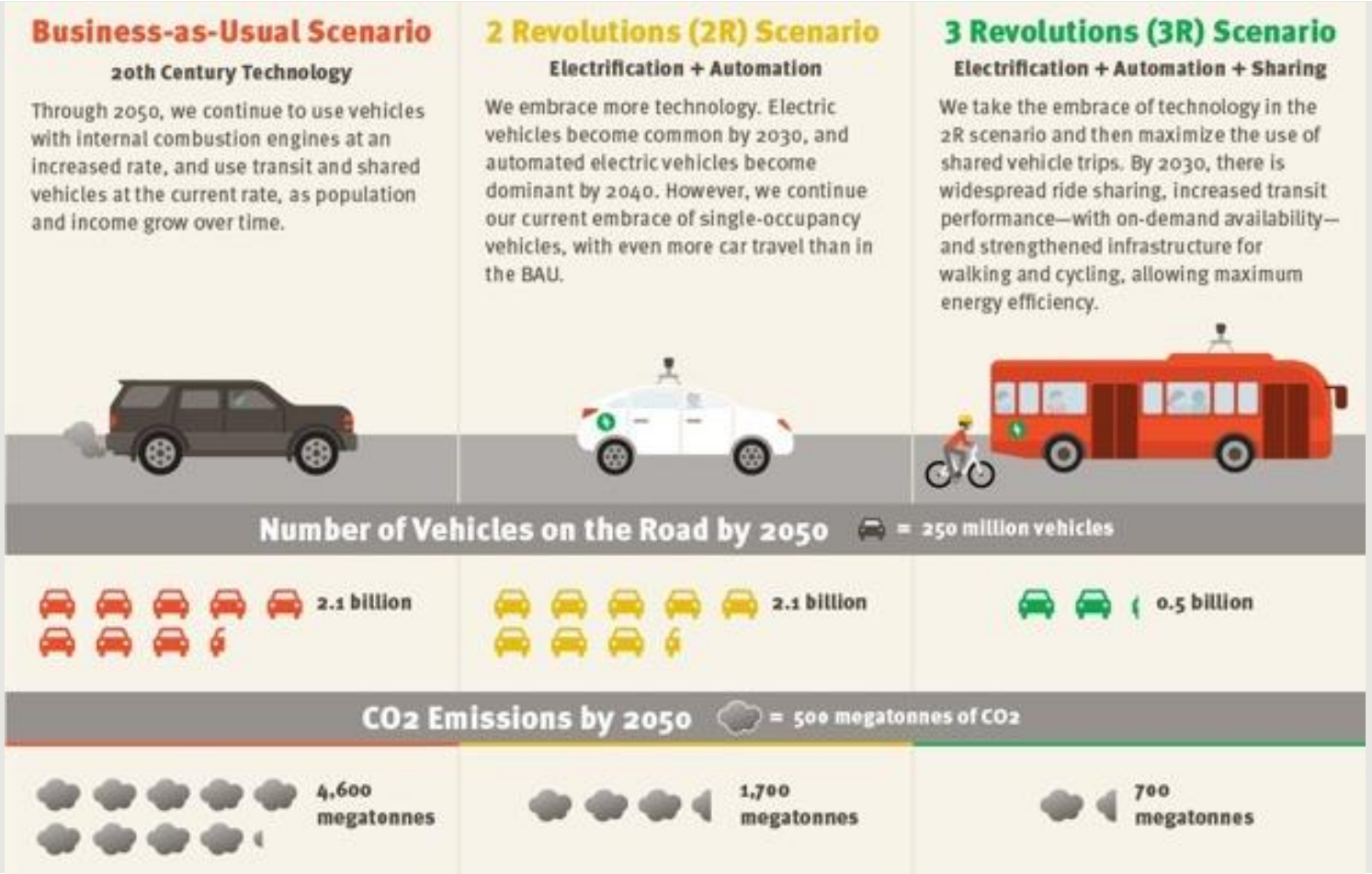
Usage forms and possible effects of vehicle automatisation



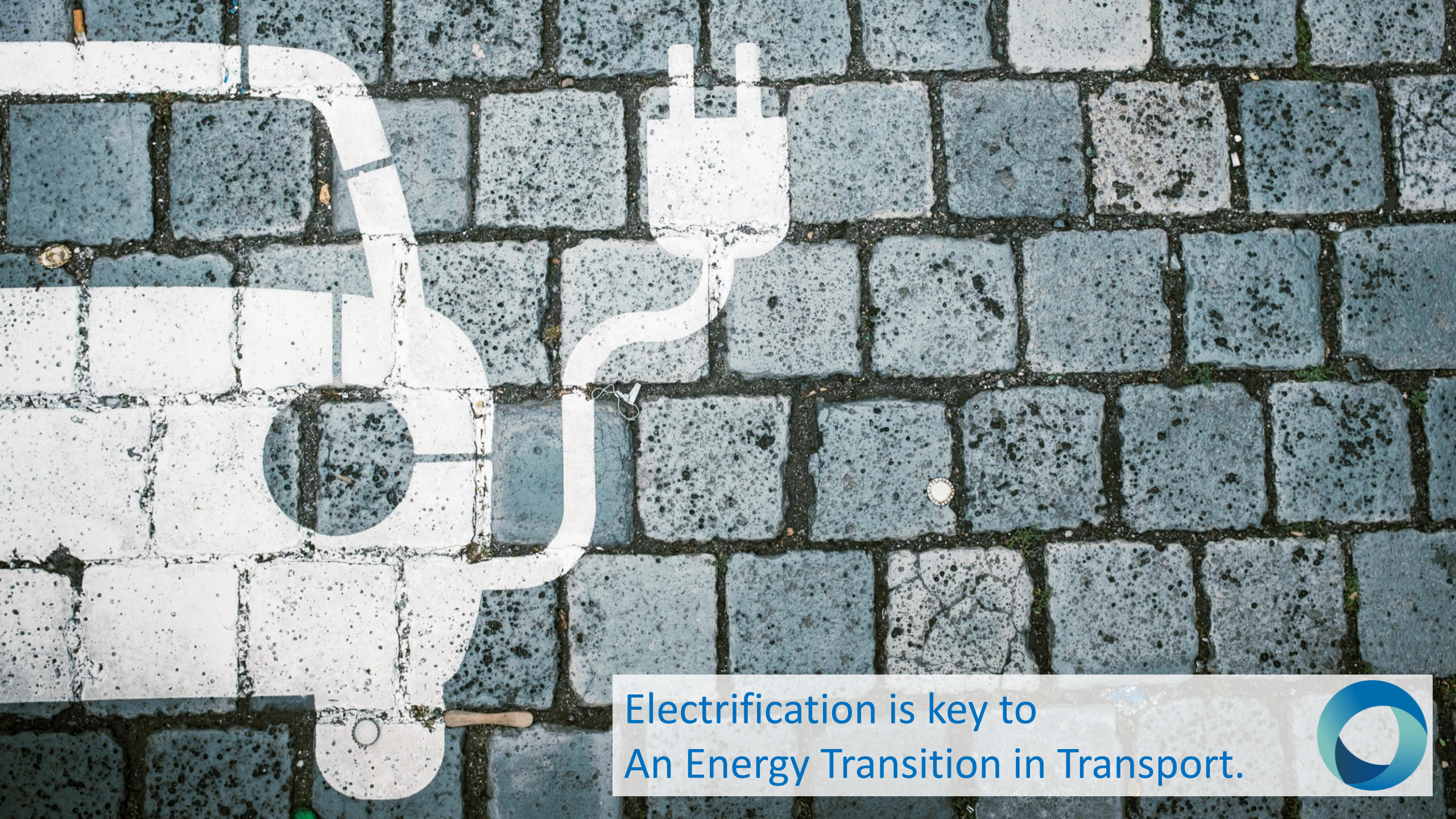
Source: Agora Verkehrswende

Autonomous vehicles will have to be shared vehicles.

Scenarios for monomodal and multimodal usage of autonomous vehicles



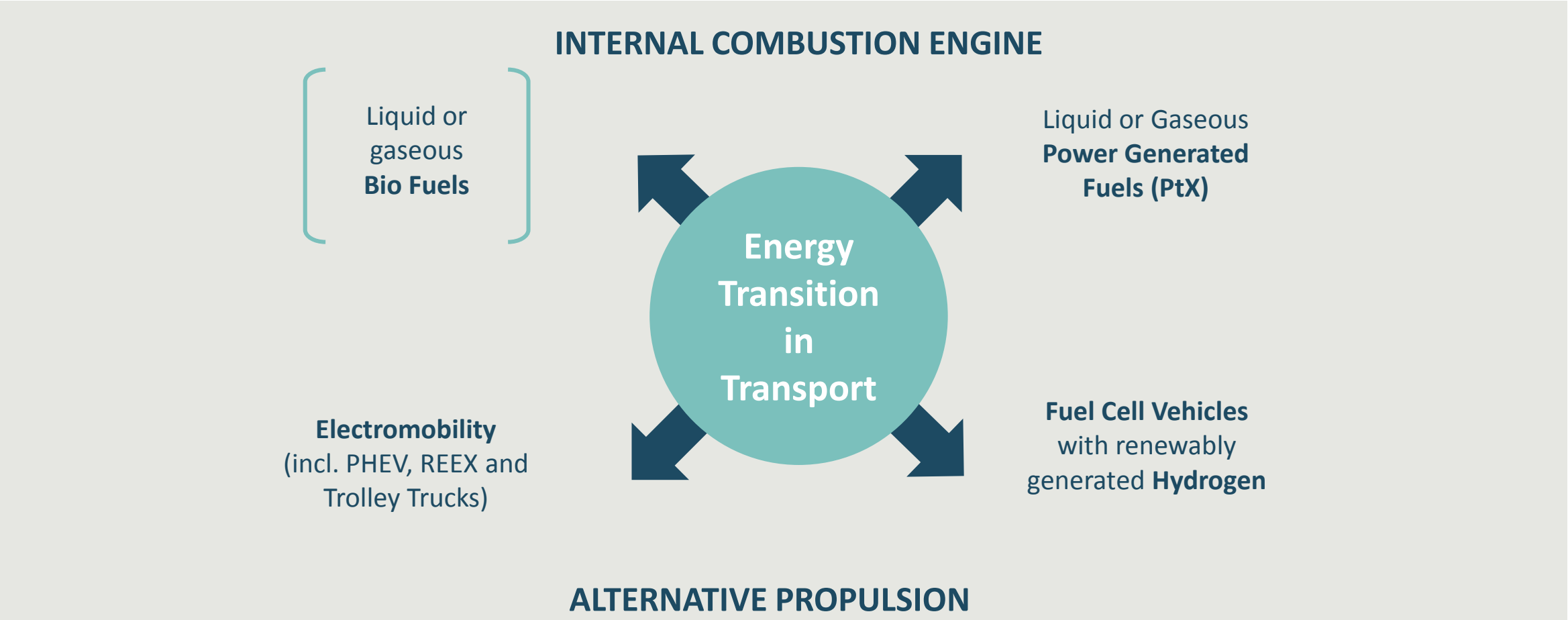
Source: ITDP, UC Davis



Electrification is key to An Energy Transition in Transport.

Options for the ‚*post fossil*' future of transport

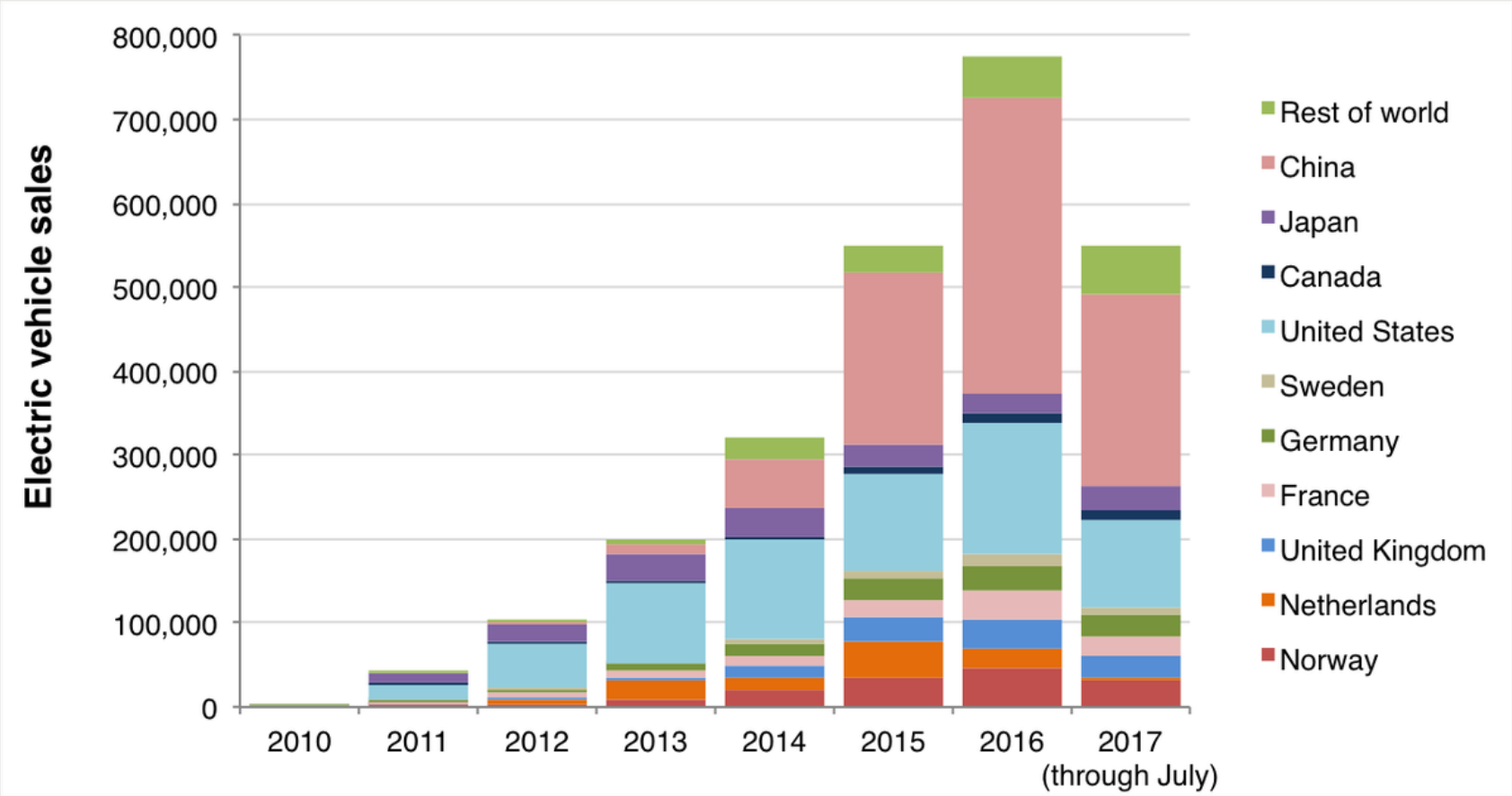
Renewable energy from sun and wind replaces fossil fuels.



Source: Figure by INFRAS

Global Transition to Electric Drive

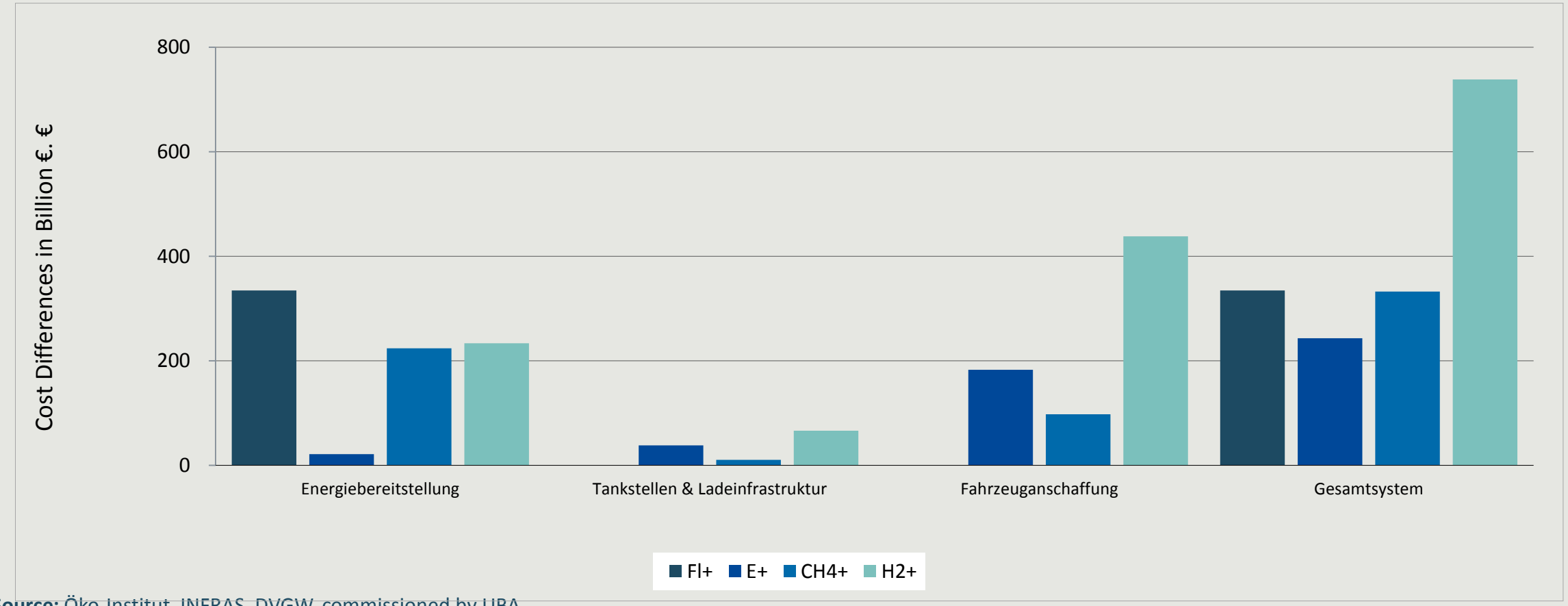
Cumulative sales are now at 2.5 million and 3 million is looking to be likely by the end of 2017.



Source: ZEV Alliance 2017

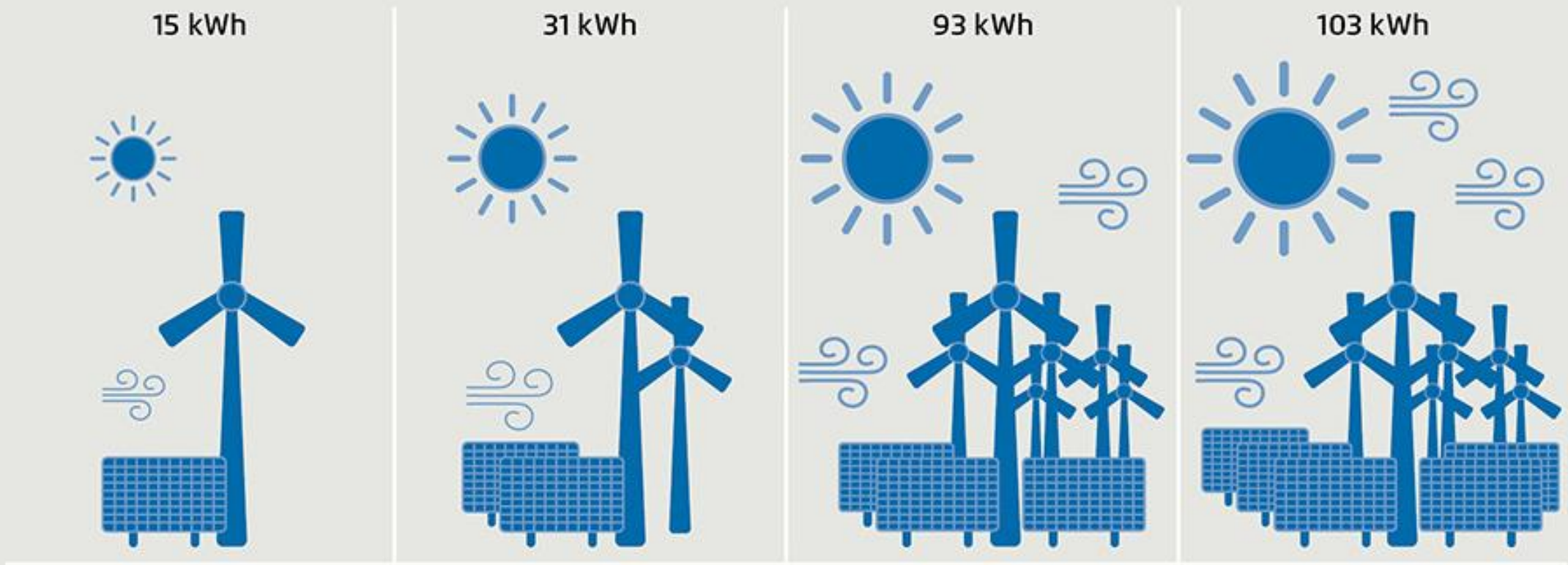
From a National Economy Perspective Battery Electric Vehicles are the Option with lowest Transformational Costs.

Cumulative cost differences of technology options for decarbonisation in comparison to business-as-usual.



Source: Öko-Institut, INFRAS, DVGW, commissioned by UBA

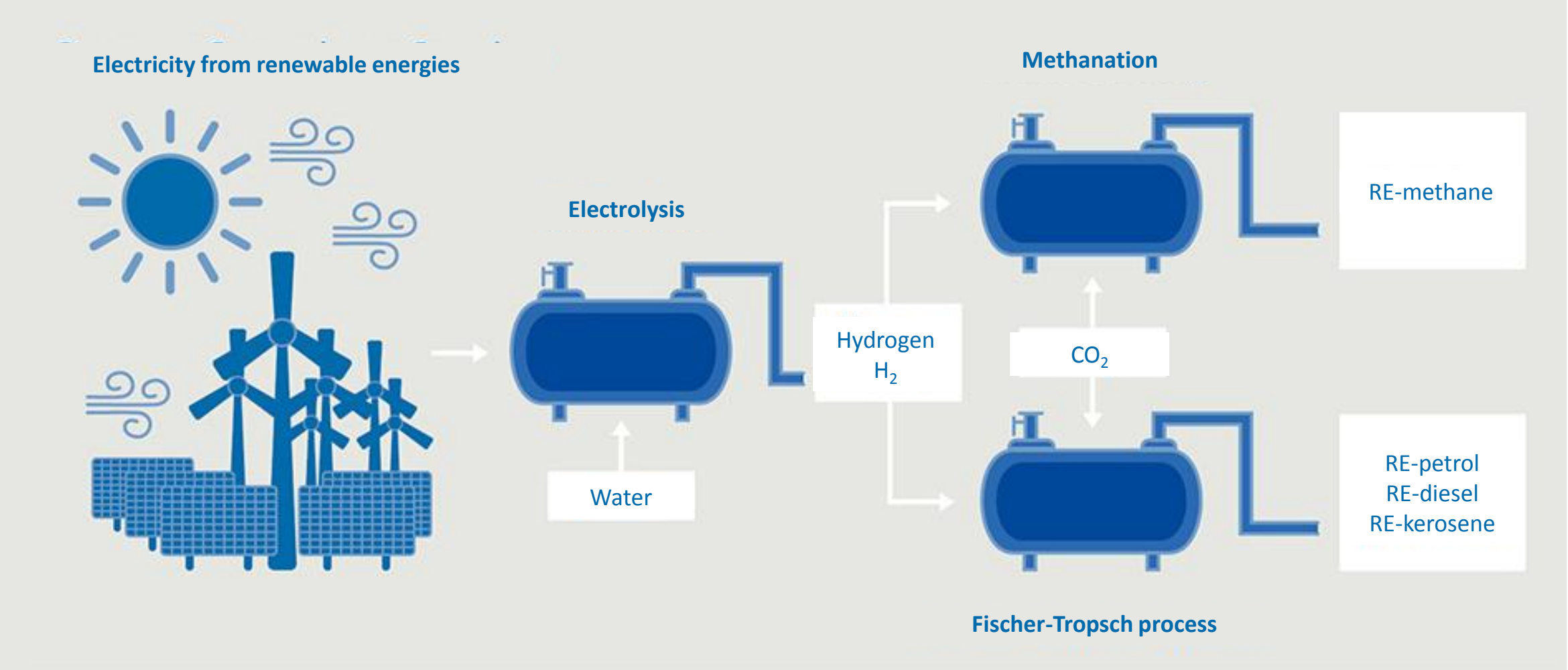
Electricity demand from renewable energies for different propulsion and fuel combinations (per 100 km/passenger car)



Battery electric vehicle + direct use of electricity	Fuel cell electric vehicle + hydrogen	Combustion engine vehicle + “Power-to-Gas”	Combustion engine vehicle + “Power-to-Liquid”

Source: own calculation and illustration, DLR, Ifeu, LBST, DFZ (2015), p. 15

Process steps for the production of hydrogen, PtG-methane and PtL-fuels from renewable energies



Source: Agora Verkehrswende

Core options for the Energy Transition in Transportation (until 2050)

Core options for the Energy Transition in Transport by mode (until 2050)

LDV
BEV as benchmark

HDV ?
Preferential technology **open**

Bus
BEV as benchmark

Aviation
Power-to-Liquid as alternative to Biokerosene

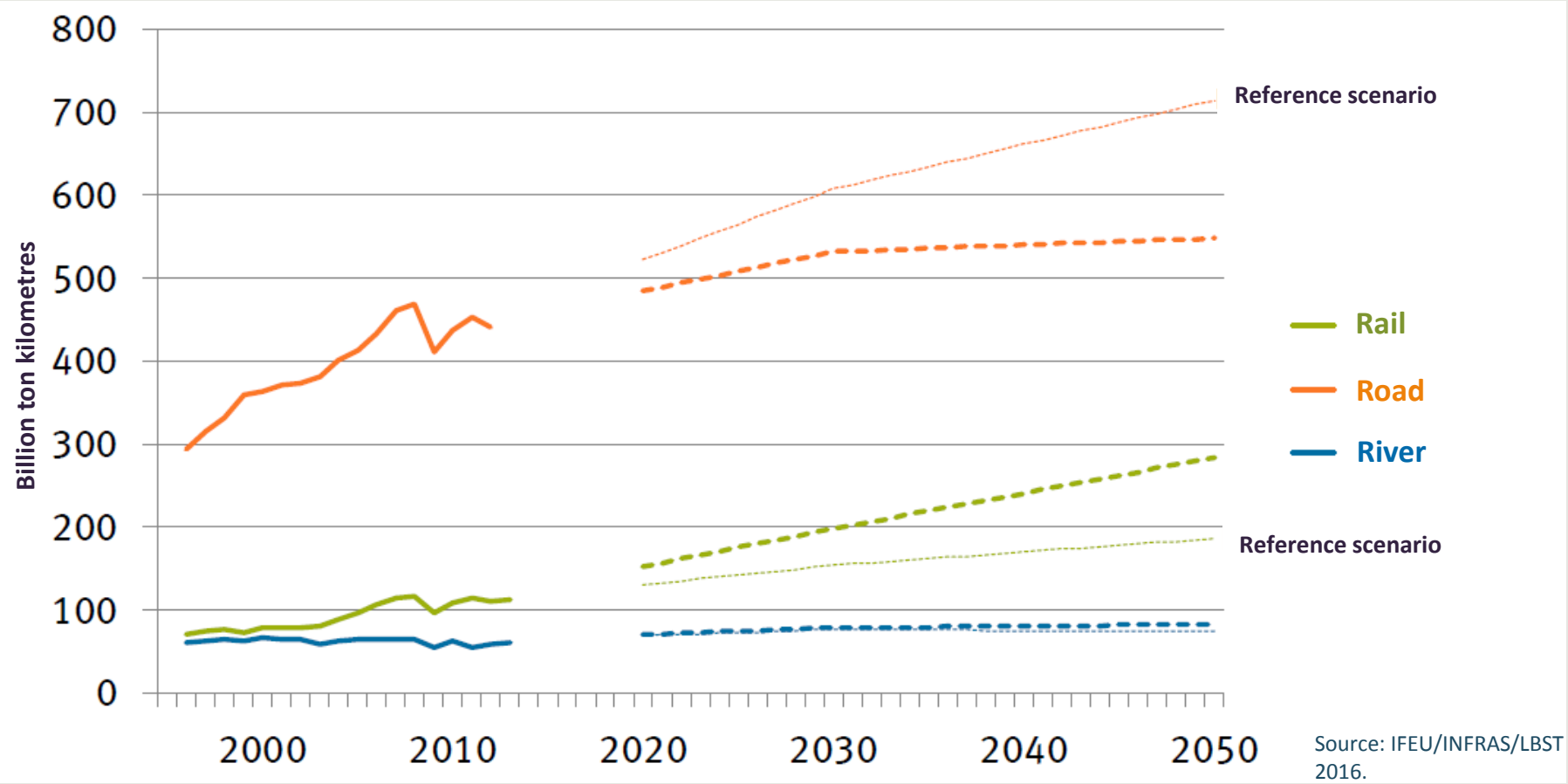
Maritime
PtX indispensable

Rail
Complete electrification

Source: INFRAS/Quantis 2015.

The decarbonisation of freight transport requires more cooperation between rail and (decarbonised) trucks!

Maximum potential in Germany to shift freight transport from road to rail.



Source: IFEU/INFRAS/LBST 2016.

Power Sector and Transport benefit from Sector Coupling.

Transport infrastructure:
Rethinking Planning, Design, and Finance.

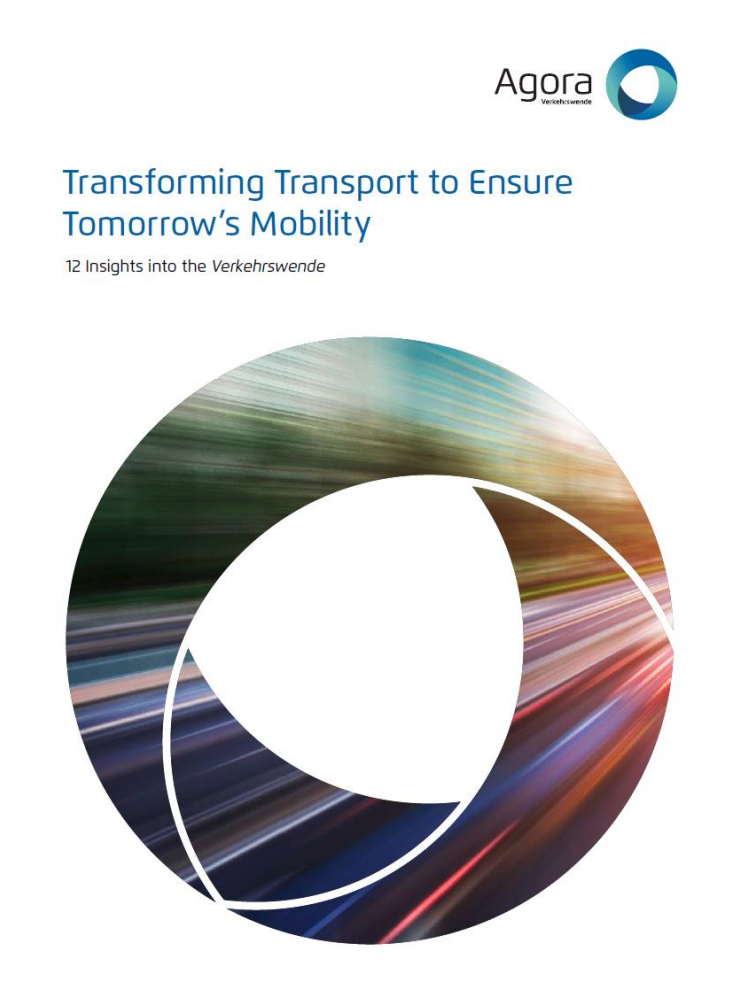
The Transport Transformation will be driven by its Benefits to Society.

Transforming Transportation requires cooperation on the national and international level.

Picture: iStock

- Transforming Transportation is a joint effort.
- The increasing pressure on urban transport in emerging markets and developing countries drives innovation.
- Exchanging strategies and mutual learning can reduce the costs of the transformation.
- Emerging markets and developing countries can profit from new vehicle and fuel technologies.

Transforming Transport to Ensure Tomorrow‘s Mobility
12 Insights into the *Verkehrswende*



Download link:
www.agora-verkehrswende.de/12-thesen/

English version available as of September 2017

Agora Verkehrswende

Thank you very much for your attention!

Comments or Questions? – Please do not hesitate to contact me:

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Agora Verkehrswende is a joint initiative of Stiftung Mercator Foundation and the European Climate Foundation (ECF).