Trends und Herausforderungen in der Nutzfahrzeugindustrie

STS Group - Capital Market Day

Institute of Automotive Technology

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Introduction

2017-2018 Team Lead Truck2030

2018 IAA Commercial Vehicles

2017 PhD Candidate Institute of Automotive Technology

2018 Nationale Plattform Zukunft der Mobilität

2019 Team Lead Vehicle Concepts

Research Focus: Commercial Vehicles, Sustainability, Vehicle Simulation

Agenda

1 Megatrends

2 Transport Efficiency

New Drivetrains

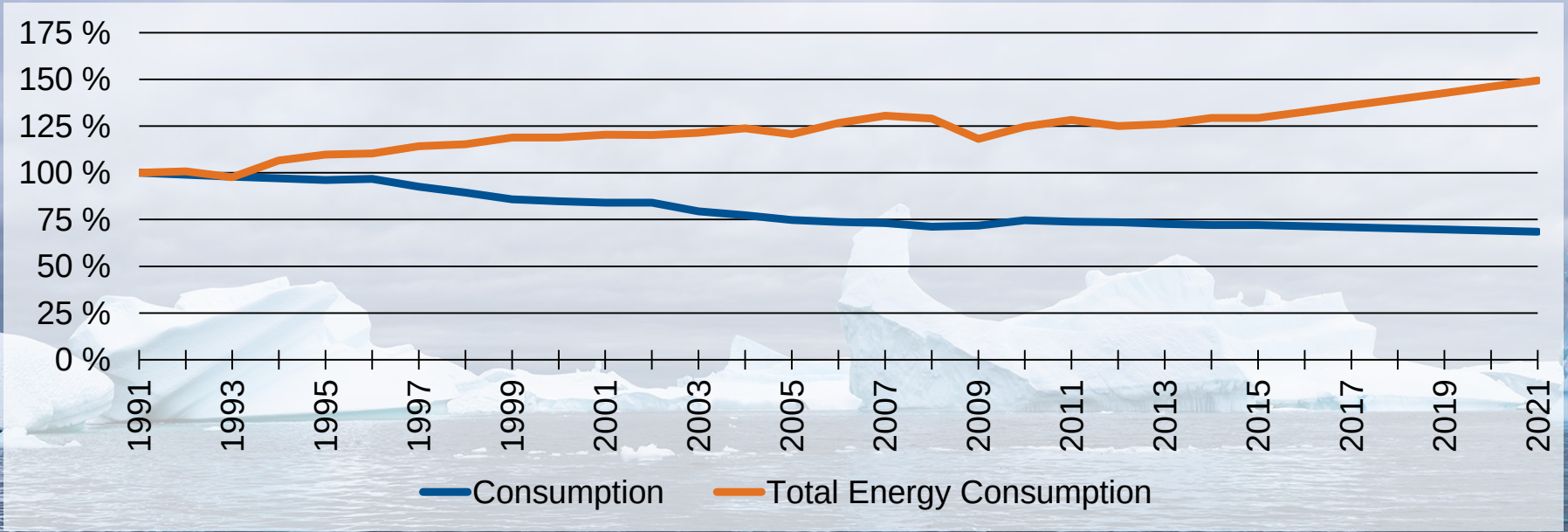
New Vehicle Concepts

3 Automated Driving

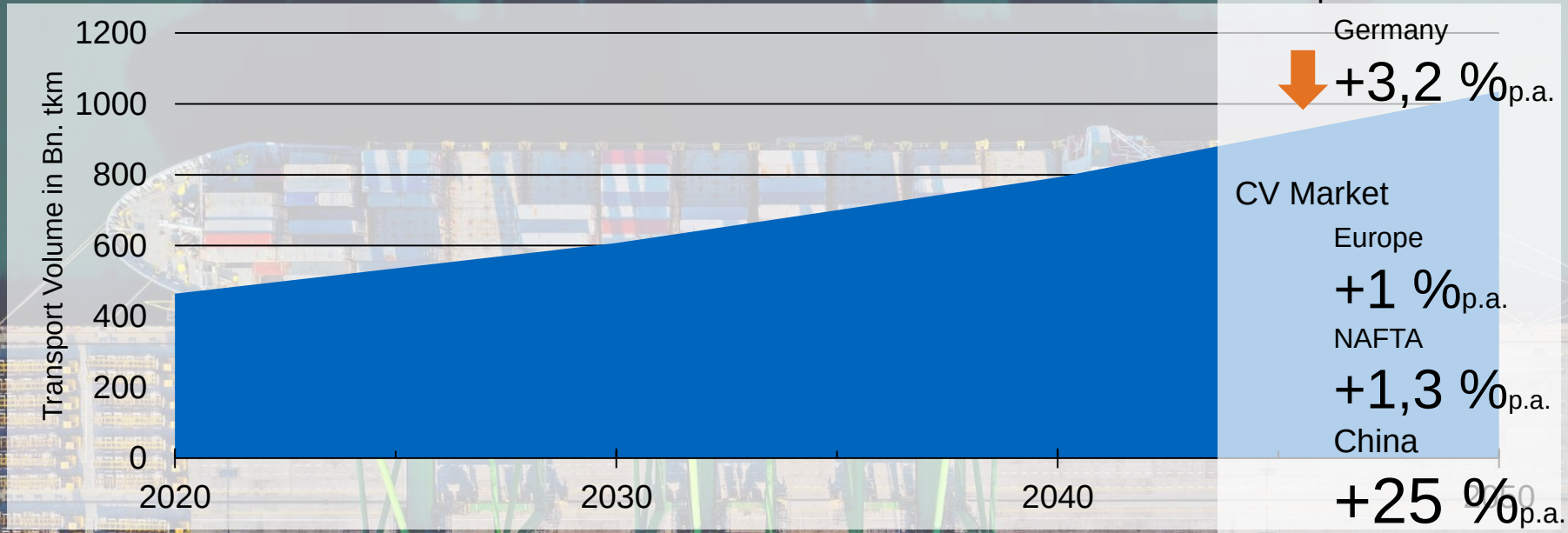
4 Challenges

Megatrends | CO_2-Emissions

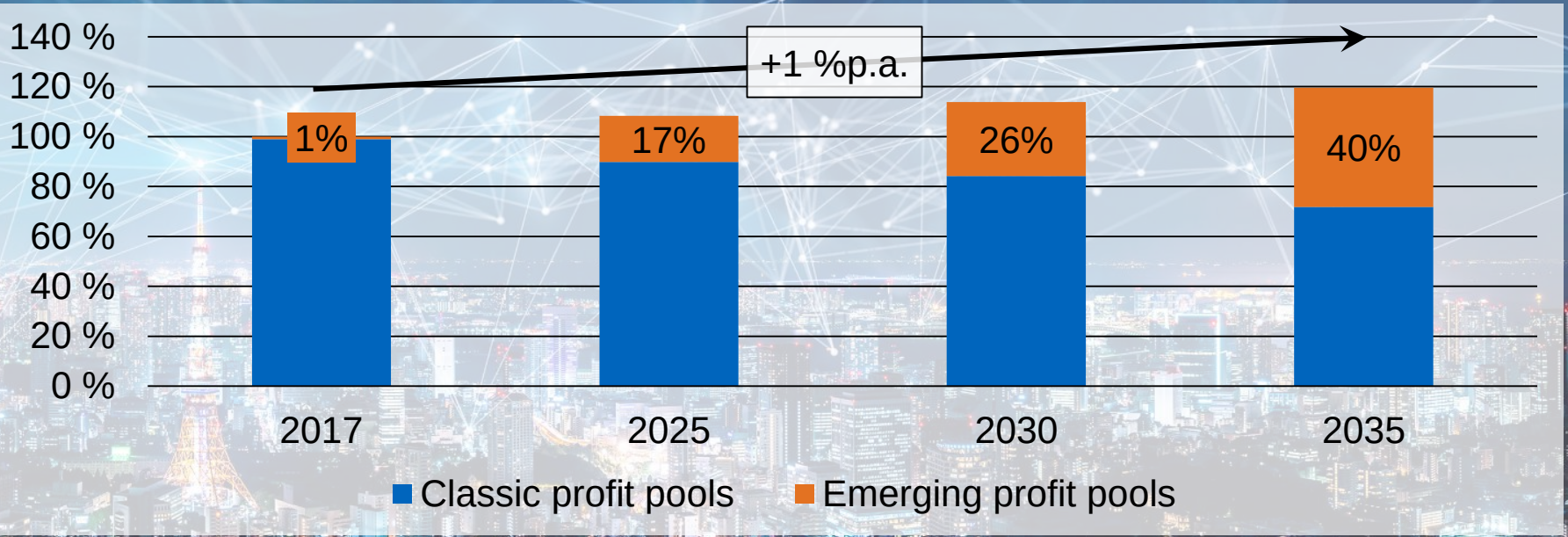
Megatrends | CO_2-Emissions



Megatrends | Transport Volume



Megatrends | Digitalization



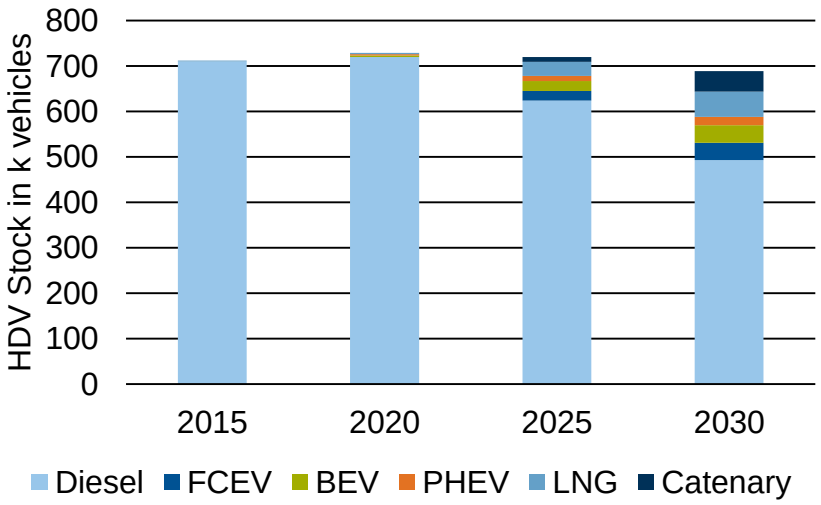
Transport Efficiency

Transport Efficiency | New Drive Concepts 2030

Infrastructre is key factor
Mix of different drives until 2030 and beyond

Light Duty Vehicles (<150 km)
~40 % Alternative drives
BEV will be dominant

Heavy Duty Vehicles
~30-40 % Alternative drives
~10-15 % BEV



Energy Sources

	Diesel	LNG	eFuels	Hydrogen	Catenary	Battery
CO_2-Reduction	0 %	< 1 %	100 %	100 %	100 %	100 %
Local Emission Free	No	No	No	Yes	Yes	Yes
Primary Energy Demand	1	1	4-5	2-3	0,4	0,35
Infrastructure	-	2.5 Bn. €	10 Bn. €	1.2 Bn. €	24 Bn. €	7 Bn. €
TCO	100 %	95 %	125 %	120 %	105 %	150 %
Payload	27.3 t	27.4 t	27.3 t	27.0 t	27.3 t	21.0 t

Transport Efficiency | New Vehicle Concepts

Long Vehicle Concept
High potential to reduce emissions and costs
Majority of road transport is volume critical

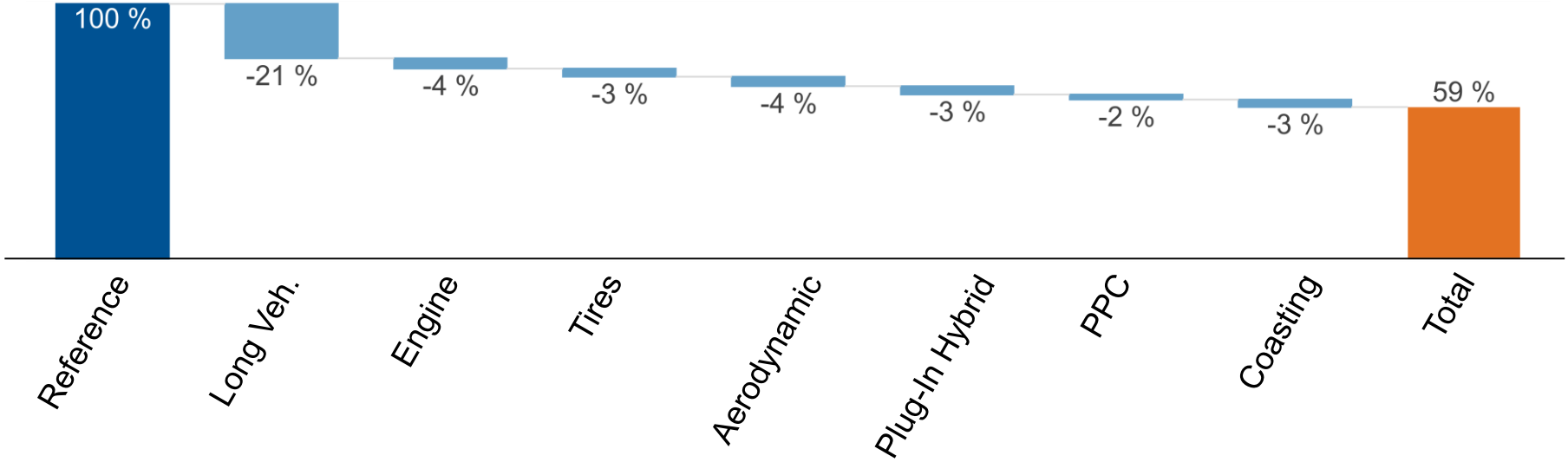
Aerodynamic
EU Directive 96/53/EC: +500 mm at rear
Extended front further benefits efficiency and security

Truck2030 Vehicle Concept

Truck2030 | Summary

Improvement in transport efficiency

Reduction of specific CO_2-emissions (gCO_2/tkm) of ~40 %



Aerodynamic

Trailer

-2 %cD

Rearflaps

-9 %cD

Camera Mirror

-4 %cD

Side Skirts

-5 %cD

Underbody

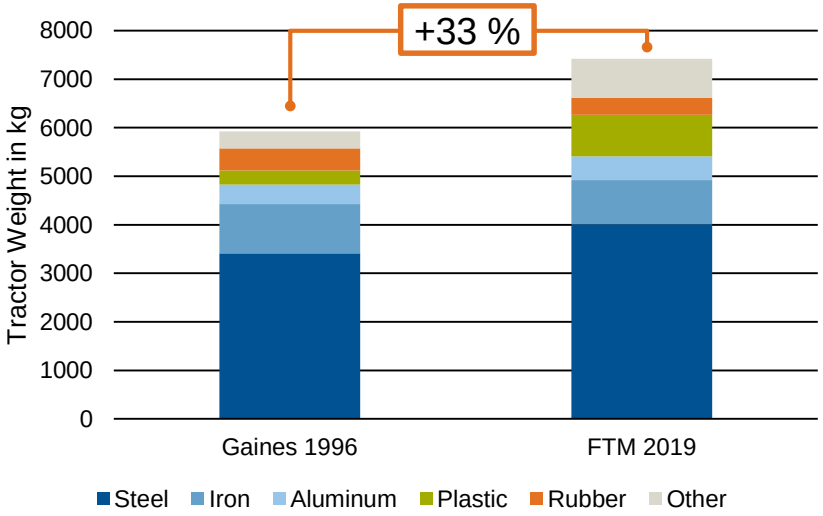
-4 %cD

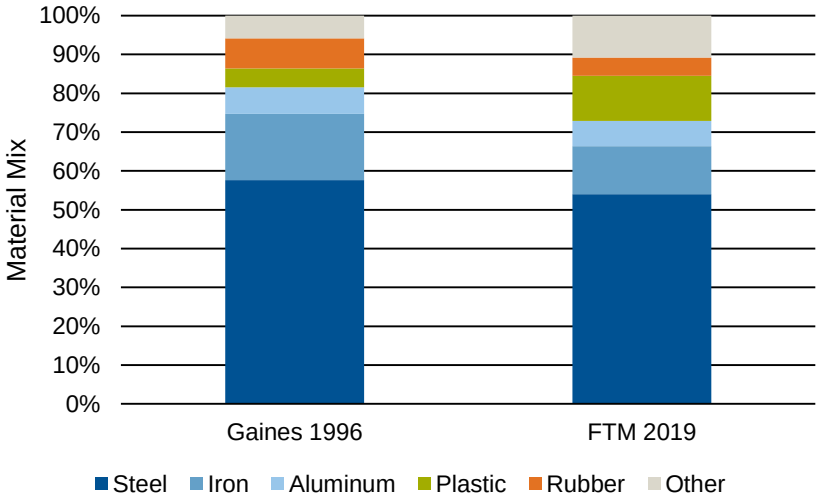
Total

-20 %cD

Lightweight Design

Important future lever to improve transport efficiency





Automated Driving

Automated Driving | Platooning

Possible Distance

10-15 m

Consumption

-3 %

TCO

-1 %

Requires high degree of V2X connectivity

Use case better for full autonomy

Automated Driving | Driver‘s Workplace

Vacant positions:

185000

until 2027 in Germany

Average age

> 47 years

Health problems

> 41 %

with back pain

> 75 %

can imagine doing sports while driving

[14,15]

Autonomous Driving | New Vehicle Concepts

Total share

~10 %

in 2030

Adoption rates

10 % LDV

20 % HDV

Use Cases: Long-haul, closed space

TCO saving

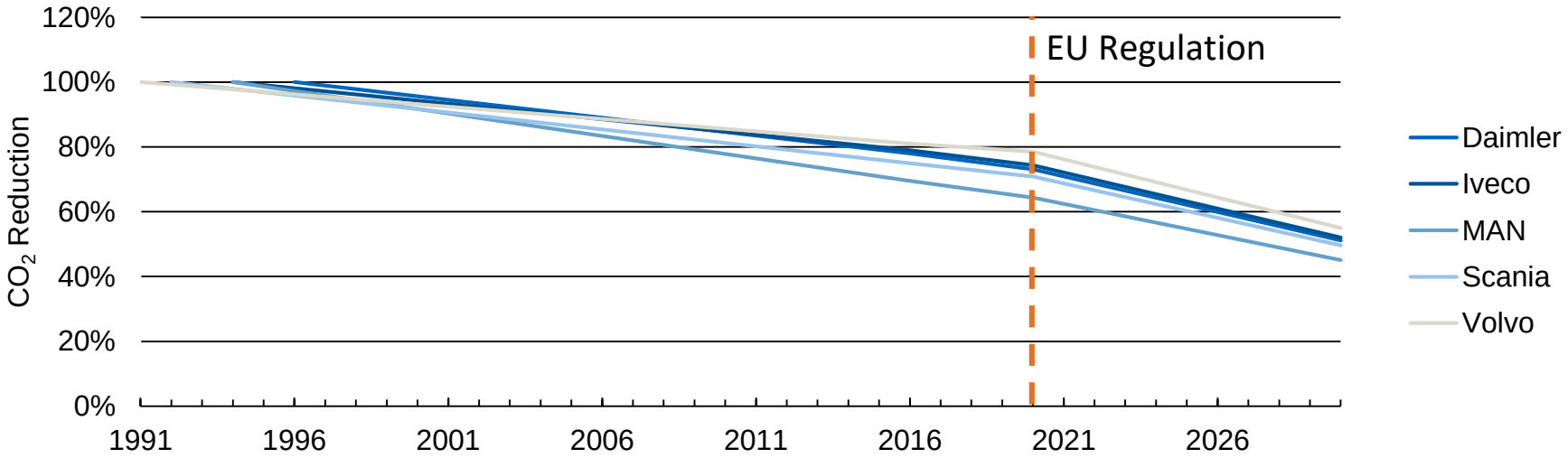
15-45 %

[7,8]

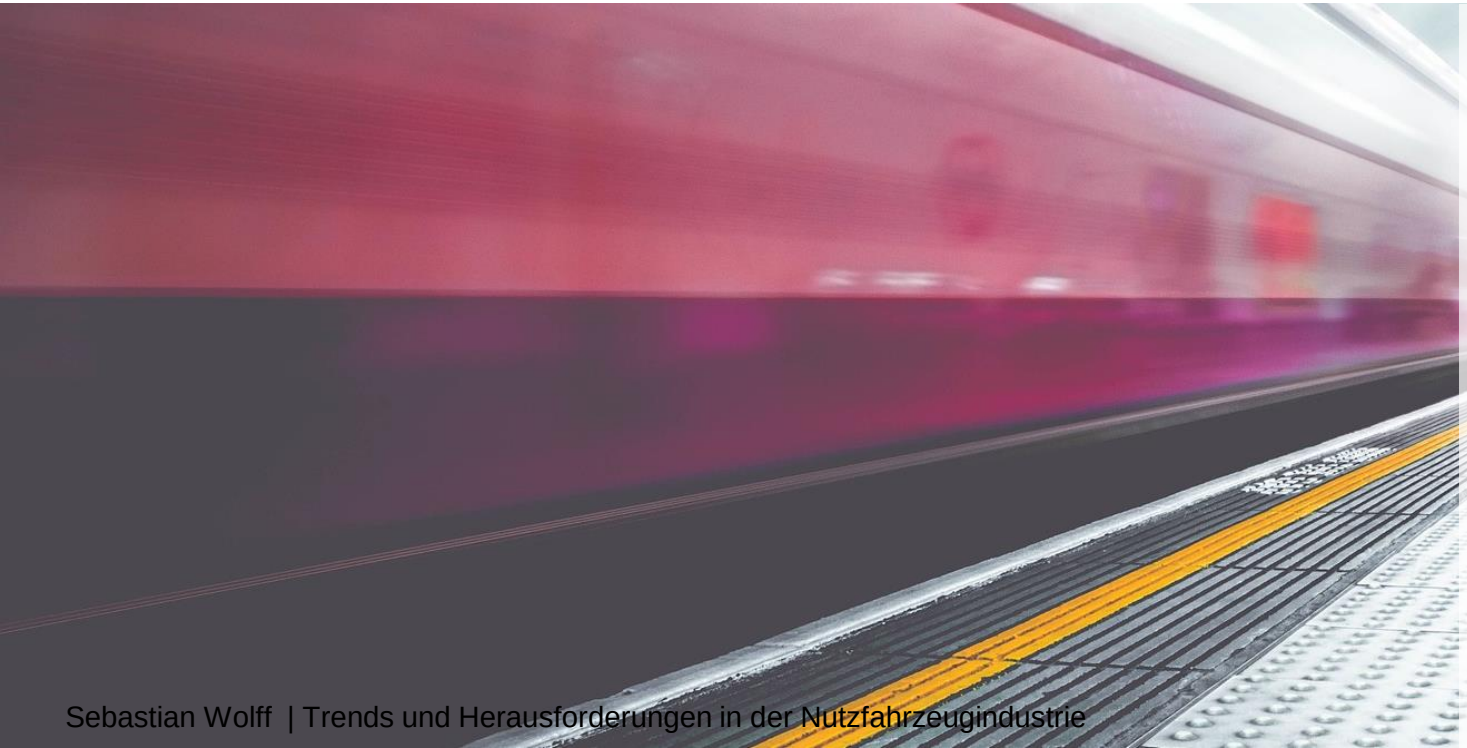
Challenges

Restrictions and Regulations

Historic development: 1.06 %p.a.
Required for emission reduction target: 2.7-3.8 %p.a.



New Business Models



Securing and integrating critical technology

OEMs expand downstream to emerging profit pools

Pay per Use Models
Fleet Management
Transport as a Service

New and emerging profit pools for suppliers

[7,8]

Summary

In 2030 there will be a mix of different drives and fuels.

HDV adopt AV technology early and fast due to attractive conditions and use cases.

The industry faces the challenge to merge economical and ecological requirements.

Thank you!

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