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Transformation of the powertrain and implication for business strategy

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The Global Challenge

Limited Resources



E.g.: Oil Price



Creeping Mobility



Megacities Top 5 Ranking

	1900	2003	2015
London	6.5	Tokio	35.0
New York	5.5	Mexico City	18.7
Tokio	5.2	New York	18.3
Paris	4.0	Sao Paulo	17.9
Berlin	2.4	Bombay	17.4
		Tokio	36.2
		Bombay	22.6
		Delhi	20.9
		Mexico City	20.6
		Sao Paulo	20.0

Source: Bronger (1996)

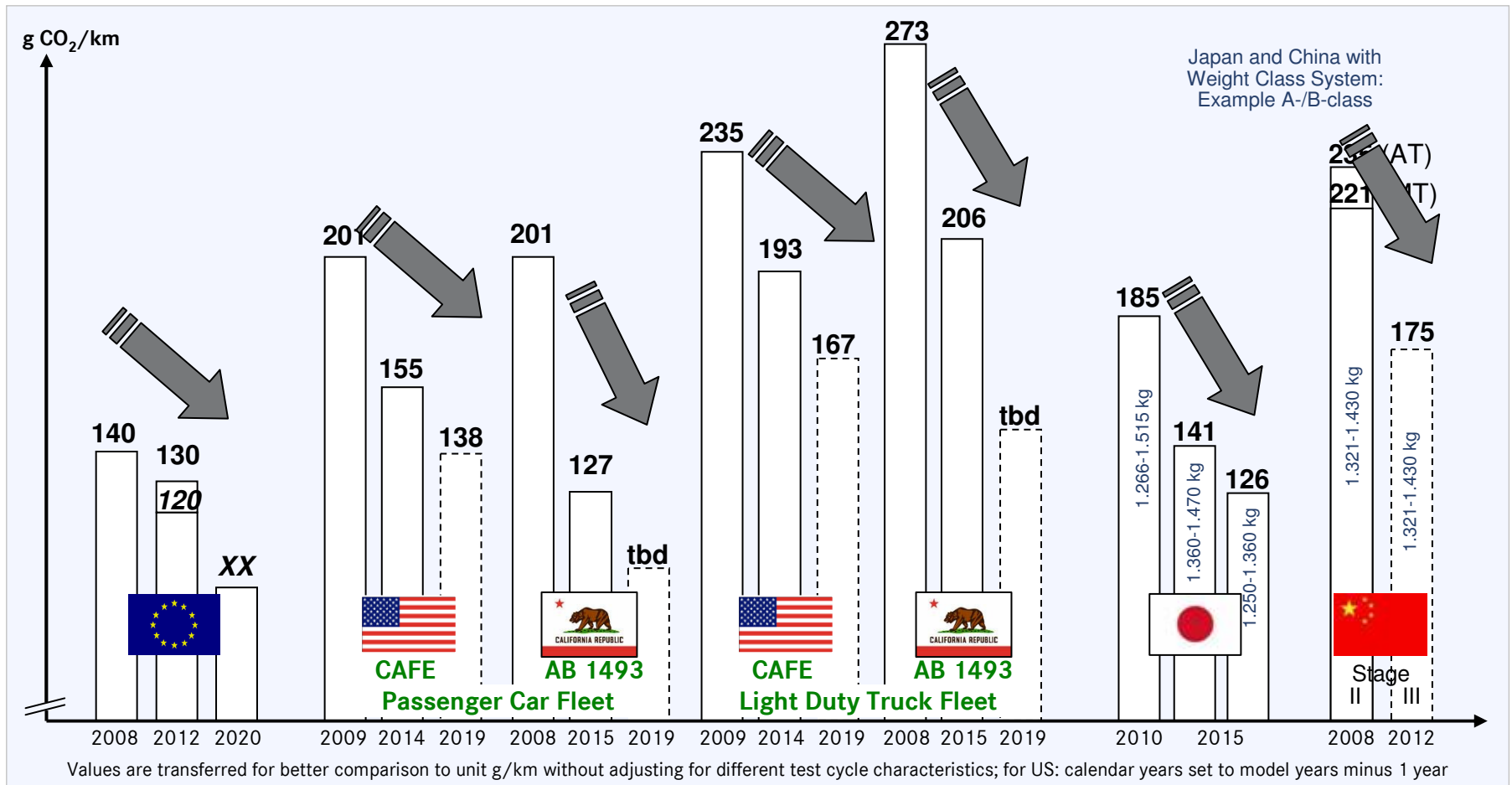
Law / Legislation



City-Maut London

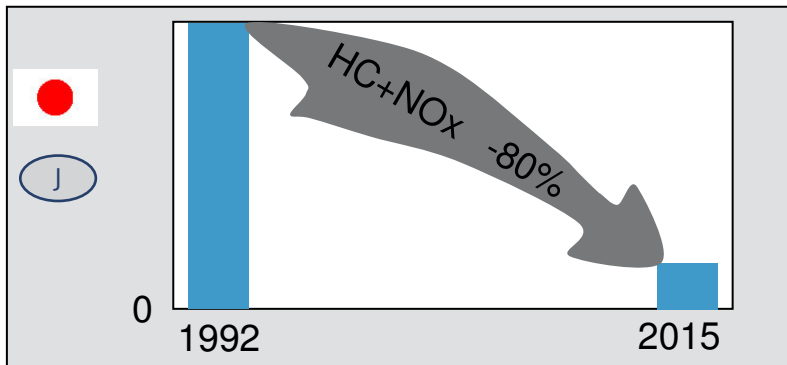
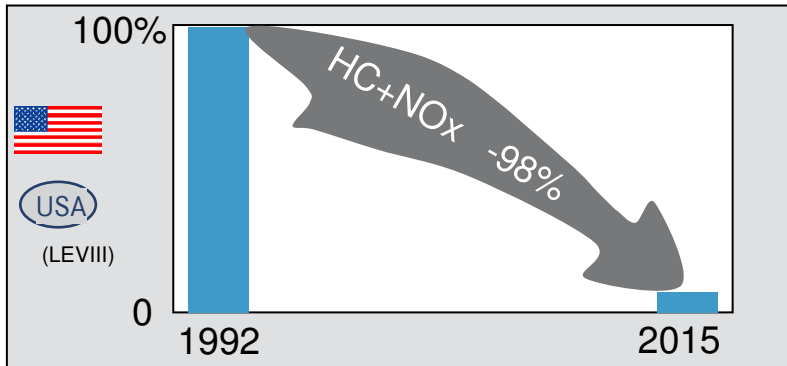
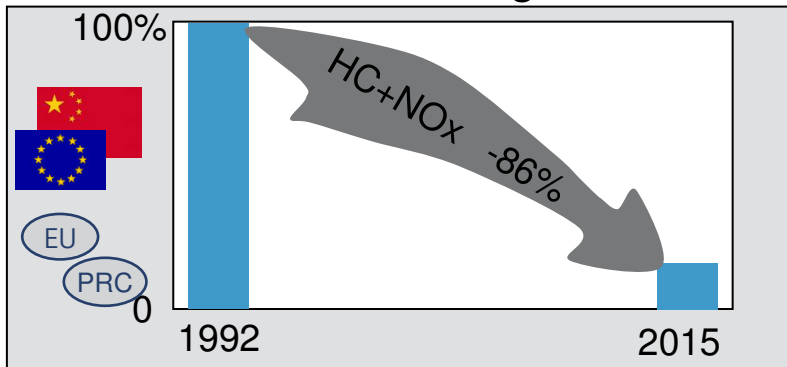
Daily Fee:
£ 8

The Global Challenge: Fuel economy limits in major markets

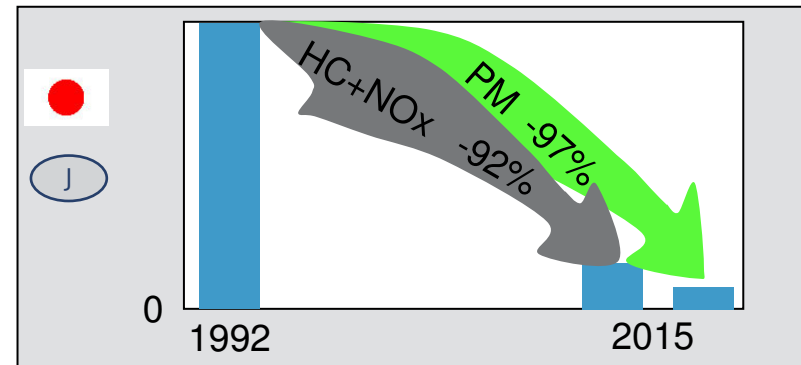
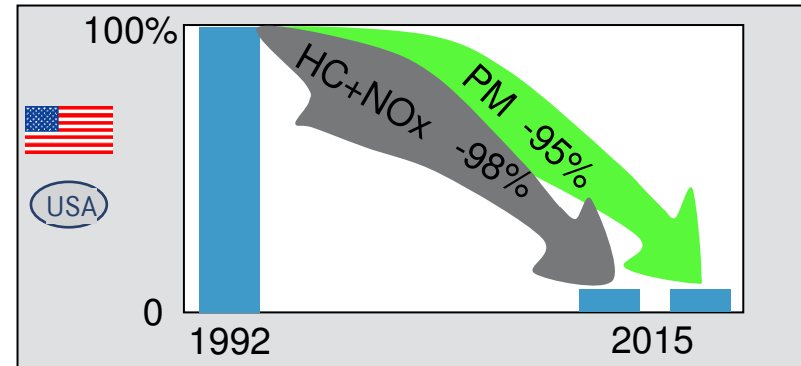
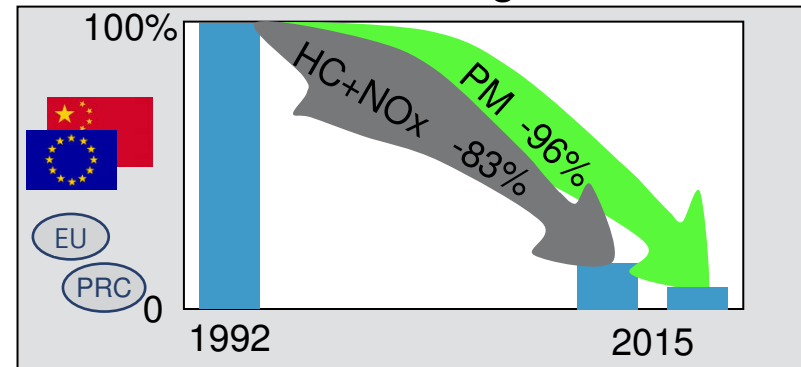


The Global Challenge: Emission Limits in the Triade

Gasoline Passenger Cars



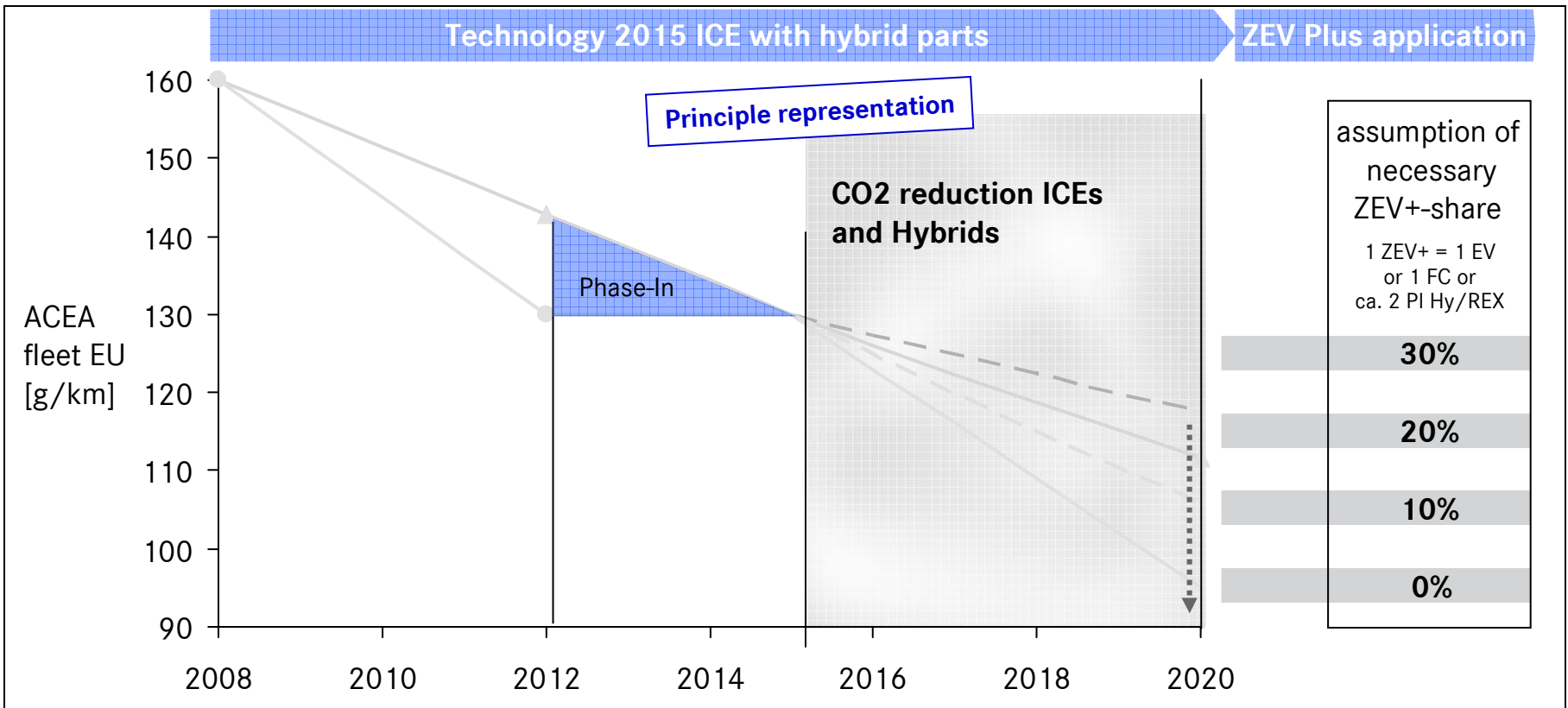
Diesel Passenger Cars



Further CO2 requirements will change the mobility mix.

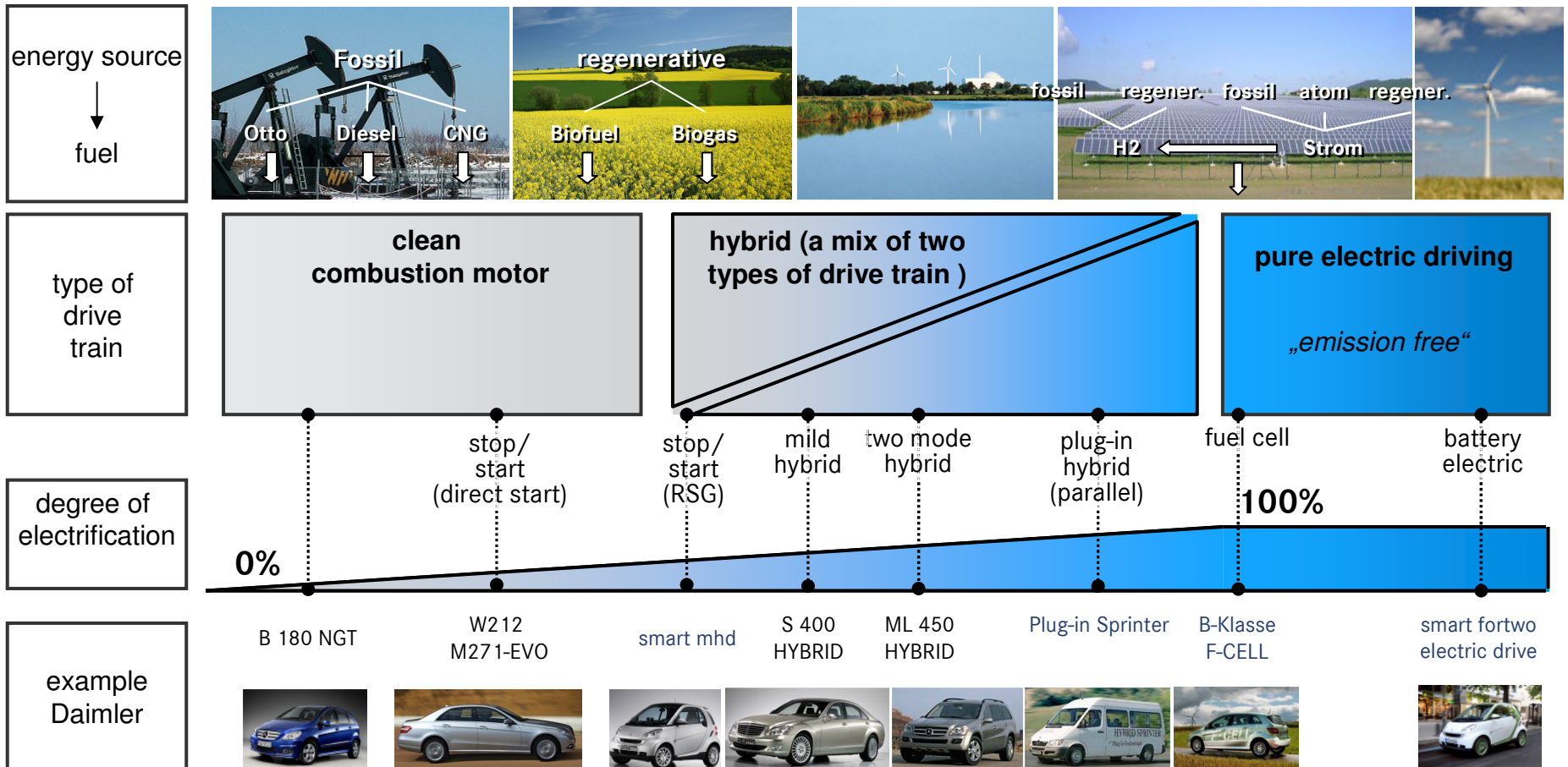


The meaning of ZEV plus in the period until 2020 example Europe



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Competitive Answer: Optimized vehicles with high-tech power trains



Competitive Answer: Daimler roadmap for sustainable mobility

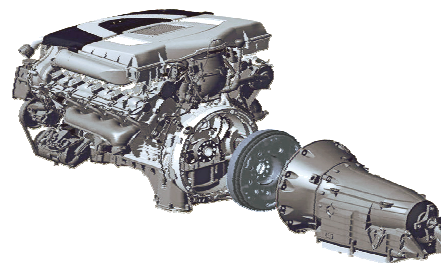
Maximum efficiency
for vehicles with
combustion engines

BlueEFFICIENCY
CGI, BlueTEC
DIESOTTO



Hybridization for
further increase
in efficiency

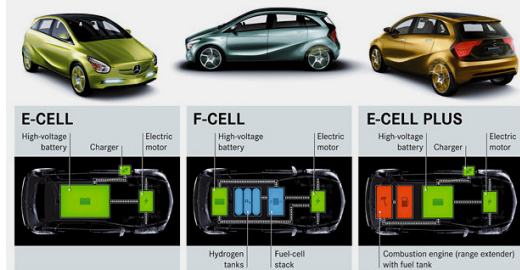
HYBRID
Plug-In



Emission-free driving
with Electric vehicles
fuel cell / battery

**Electric Vehicles with
Battery or Fuel Cell
Drive, Range Extender**

Concept BlueZERO – Modular concept for electromobility



Daimler roadmap for sustainable mobility

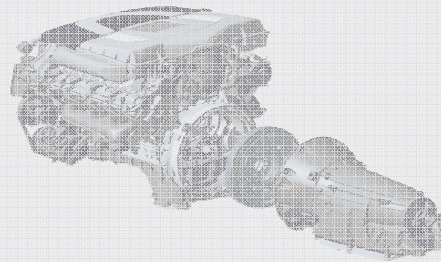
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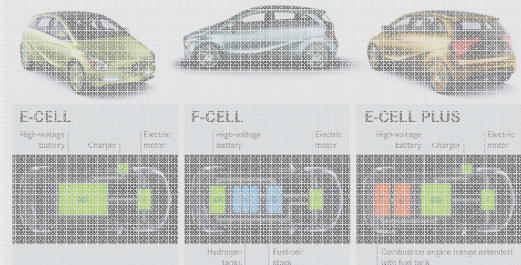
HYBRID
Plug-In



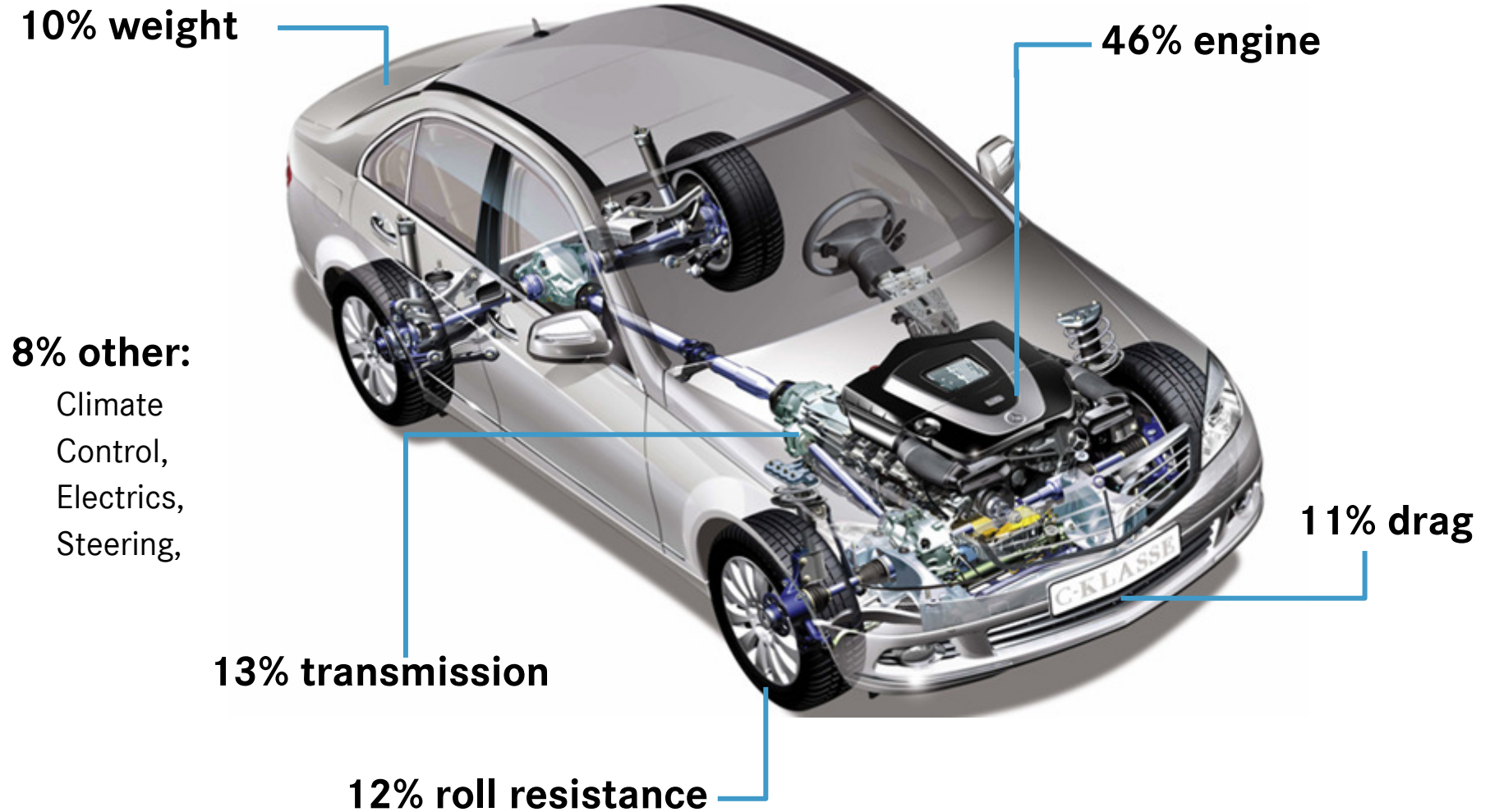
Emission-free driving
with Electric vehicles
fuel cell / battery

**Electric Vehicles with
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Drive, Range Extender**

Concept BlueZERO – Modular concept for electromobility

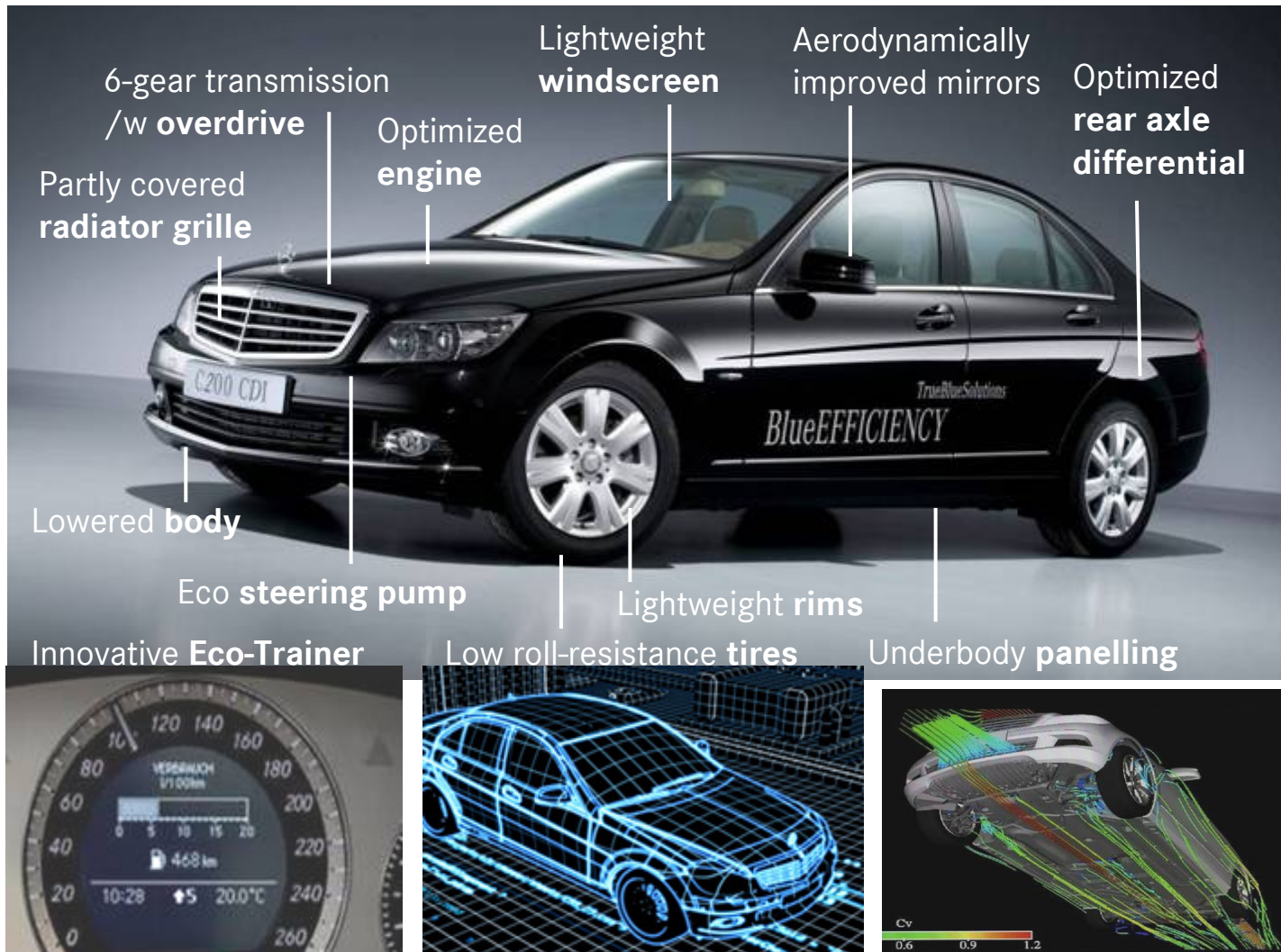


Optimized vehicles: Origins of CO2 emissions in cars



*) data applies for mid class segment
(3-Litre gasoline engine | RWD | NEFZ)

Maximum Customer Benefit - with BlueEFFICIENCY



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Today already more than 70 till end of 2010 85 BlueEFFICIENCY models

examples:



S-Class BlueEFFICIENCY



E-Class BlueEFFICIENCY



C-Class BlueEFFICIENCY



A and B-Class BlueEFFICIENCY

High-tech Powertrains: Potentials for diesel and gasoline engines

Diesel engine



Characteristics

- 😊 Consumption
- ☹️ Emissions

Key technologies:

- Injection system
- Combustion process
- Homogenization
- Turbocharger
- Exhaust gas after-treatment

Gasoline engine



Characteristics

- 😊 Emissions
- ☹️ Consumption

Key technologies:

- De-throttling
- Direct Injection
- Charging
- Reduction of friction
- Engine cooling management

Target

**Gasoline cars as efficient as diesels;
Diesel cars as clean as gasoline cars**

Daimler roadmap for sustainable mobility

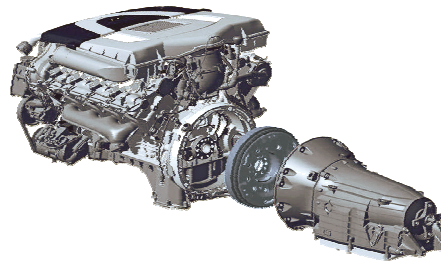
Maximum efficiency
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BlueEFFICIENCY
CGI, BlueTEC
DIESOTTO



Hybridization for
further increase
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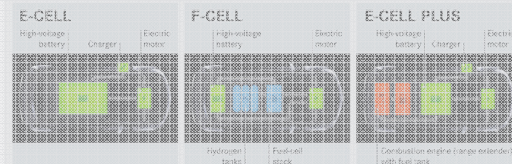
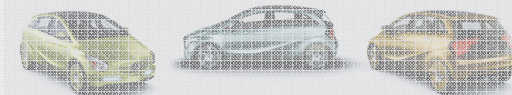
**HYBRID
Plug-In**



Emission-free driving
with Electric vehicles
fuel cell / battery

Electric Vehicles with
Battery or Fuel Cell
Drive, Range Extender

Concept BlueZERO – Modular concept for electromobility



HYBRID modules for individual powertrain solutions

HYBRID technologies are an integral part of our strategy



smart mhd



S 400 HYBRID with lithium-ion battery



HYBRID light truck



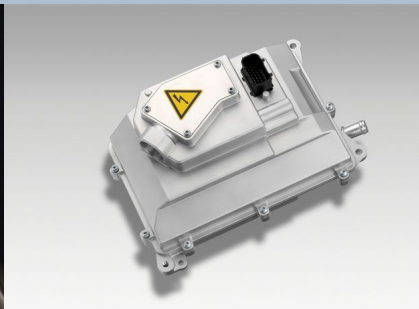
HYBRID city bus



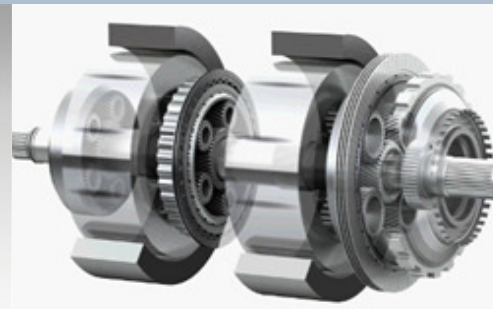
Pooling expertise and resources



energy storage battery



power electronics

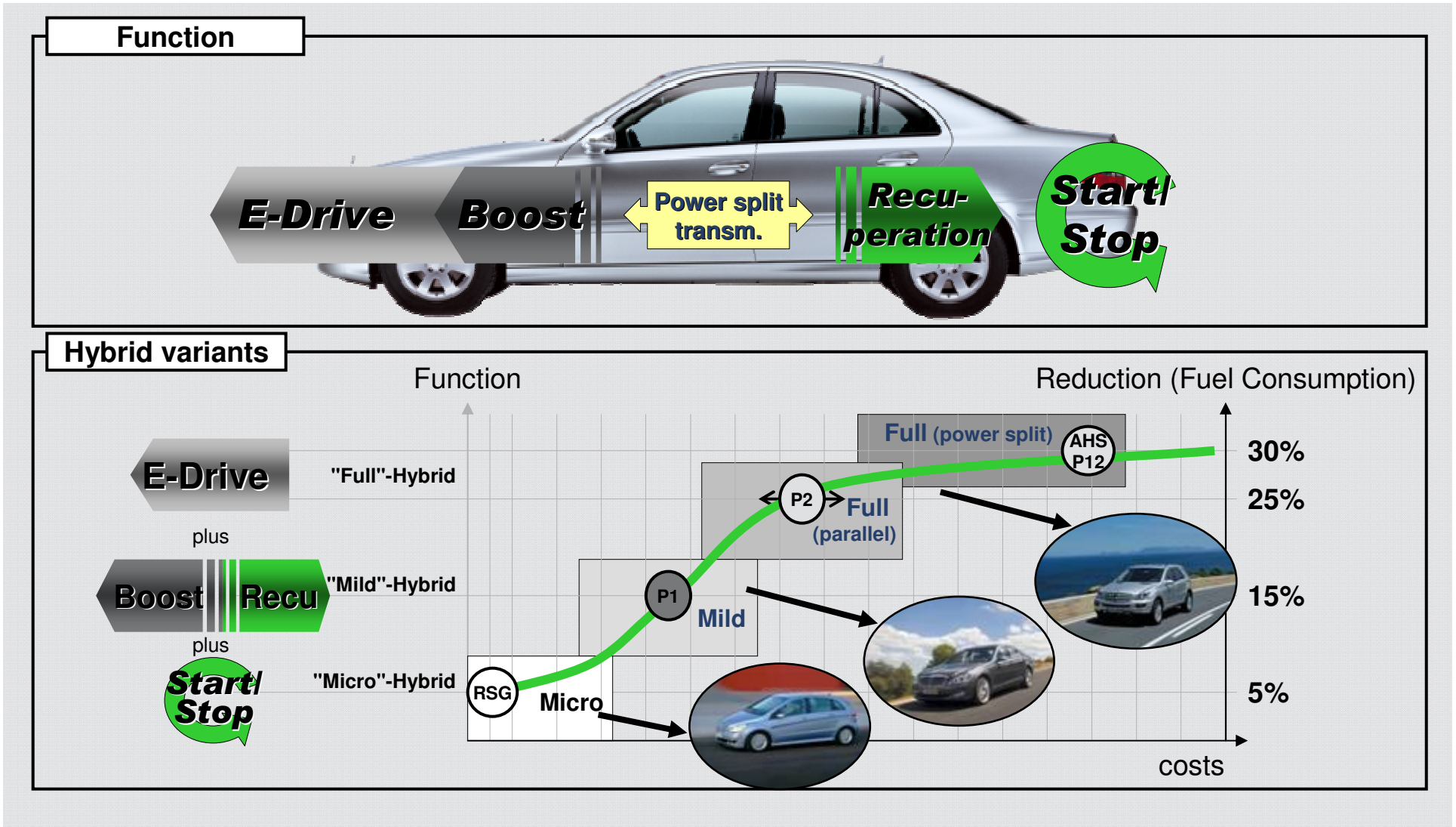


hybrid transmission



powertrain integration

Hybrid variants



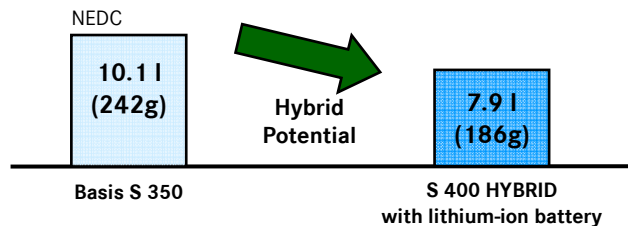
Mercedes-Benz S 400 HYBRID

Advantage for hybrid vehicles:
mainly in interurban & urban traffic

S 400 HYBRID



fuel economy



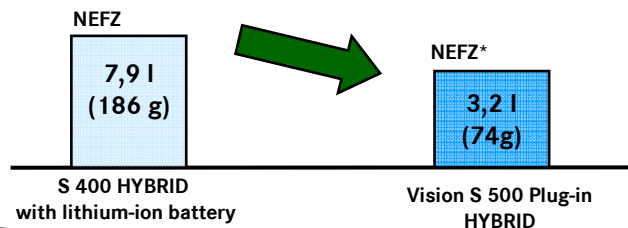
Key benefits

- comfortable start-stop technology
- better performance
- recuperation of braking energy
- better energy management
- improved fuel efficiency

Vision S 500 Plug-in HYBRID

Advantage for Plug-In hybrid vehicles:
e-drive mainly in intra-urban traffic
hybrid-drive in interurban & urban traffic

Vision S 500 Plug-in HYBRID



Key benefits

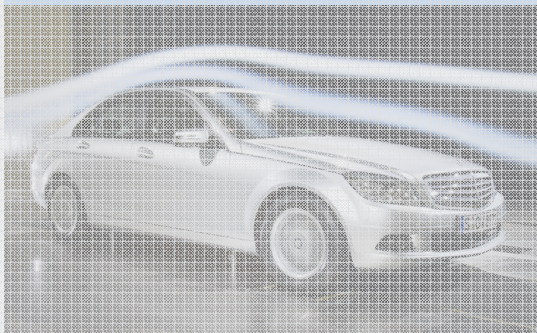
- better performance with less fuel consumption
- comfortable e drive
- comfortable start-stop technology
- recuperation of braking energy
- better energy management

*incl. BEVs CO₂ Bonus (preliminary value)

Daimler roadmap for sustainable mobility

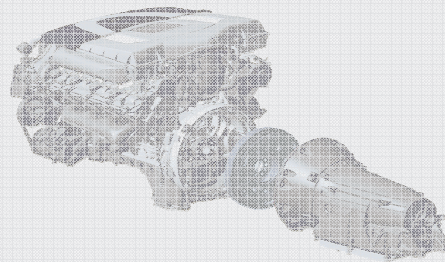
Maximum efficiency for vehicles with combustion engines

BlueEFFICIENCY
CGI, BlueTEC
DIESOTTO



Hybridization for further increase in efficiency


HYBRID
Plug-In


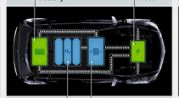



Emission-free driving with Electric vehicles fuel cell / battery

Electric Vehicles with Battery or Fuel Cell Drive, Range Extender

Concept BlueZERO – Modular concept for electromobility



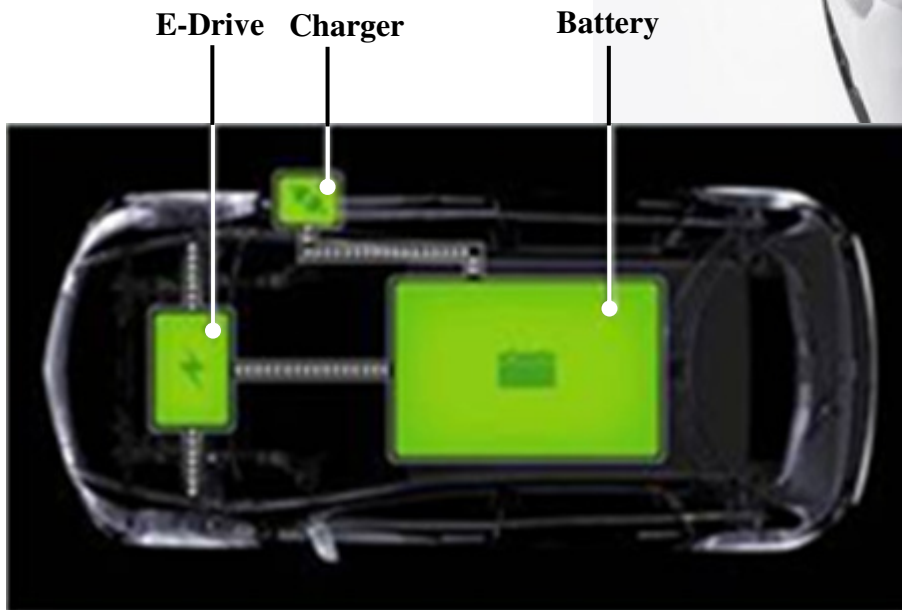
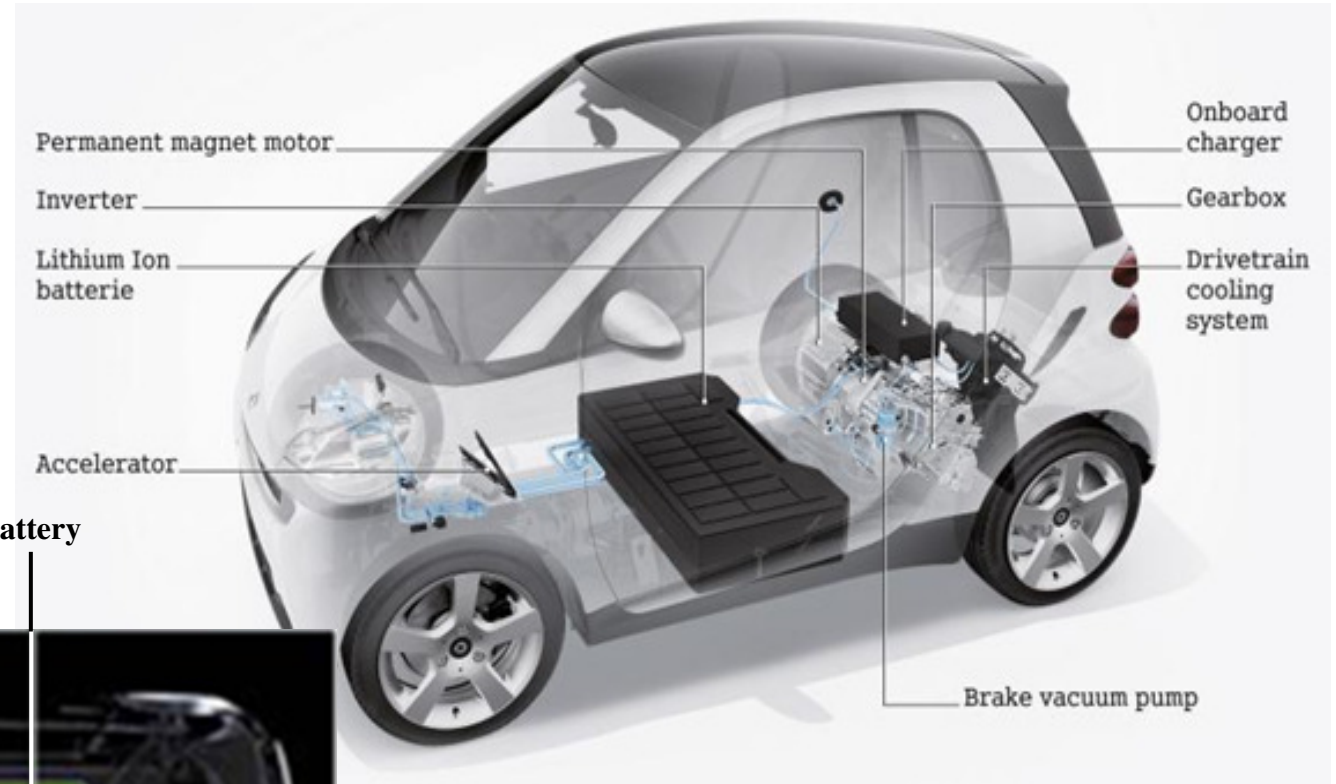
E-CELL	F-CELL	E-CELL PLUS
High-voltage battery Charger Electric motor	High-voltage battery Electric motor	High-voltage battery Charger Electric motor
		
	Hydrogen tanks Fuel-cell stack	Combustion engine (range extender) with fuel tank

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smart fortwo electric drive, test fleet in London:
Due to the excellent feedback, we will continue!



Basic configuration BEVs



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'e-mobility' projects – Daimler introduces a new era of E-Mobility



- E-mobility Berlin

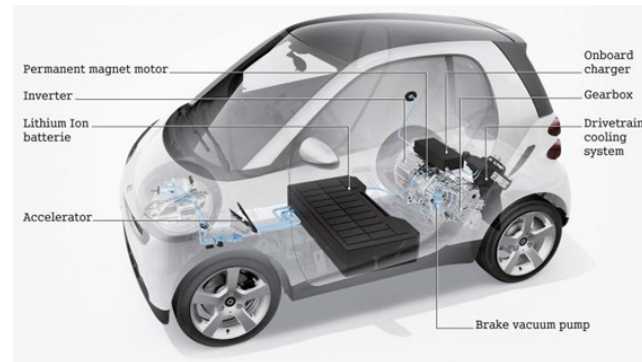


- E-mobility Italy

Battery Electric Vehicle (BEV) Technology

Next Challenges

Technology



- Power Density
- Energy Density
- Fast charge capability
- Low temperature performance

Infrastructure

- Reliable, easy to use technology
- Competitive cost
- In-time Availability
- Sufficient Coverage

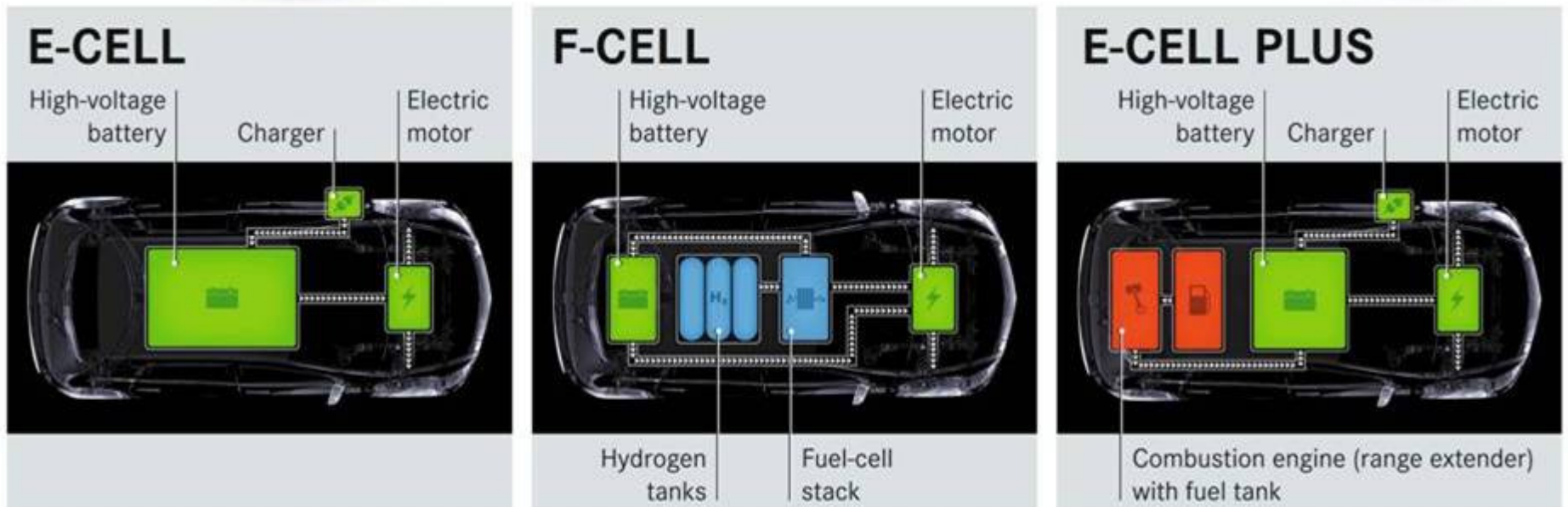


Costs

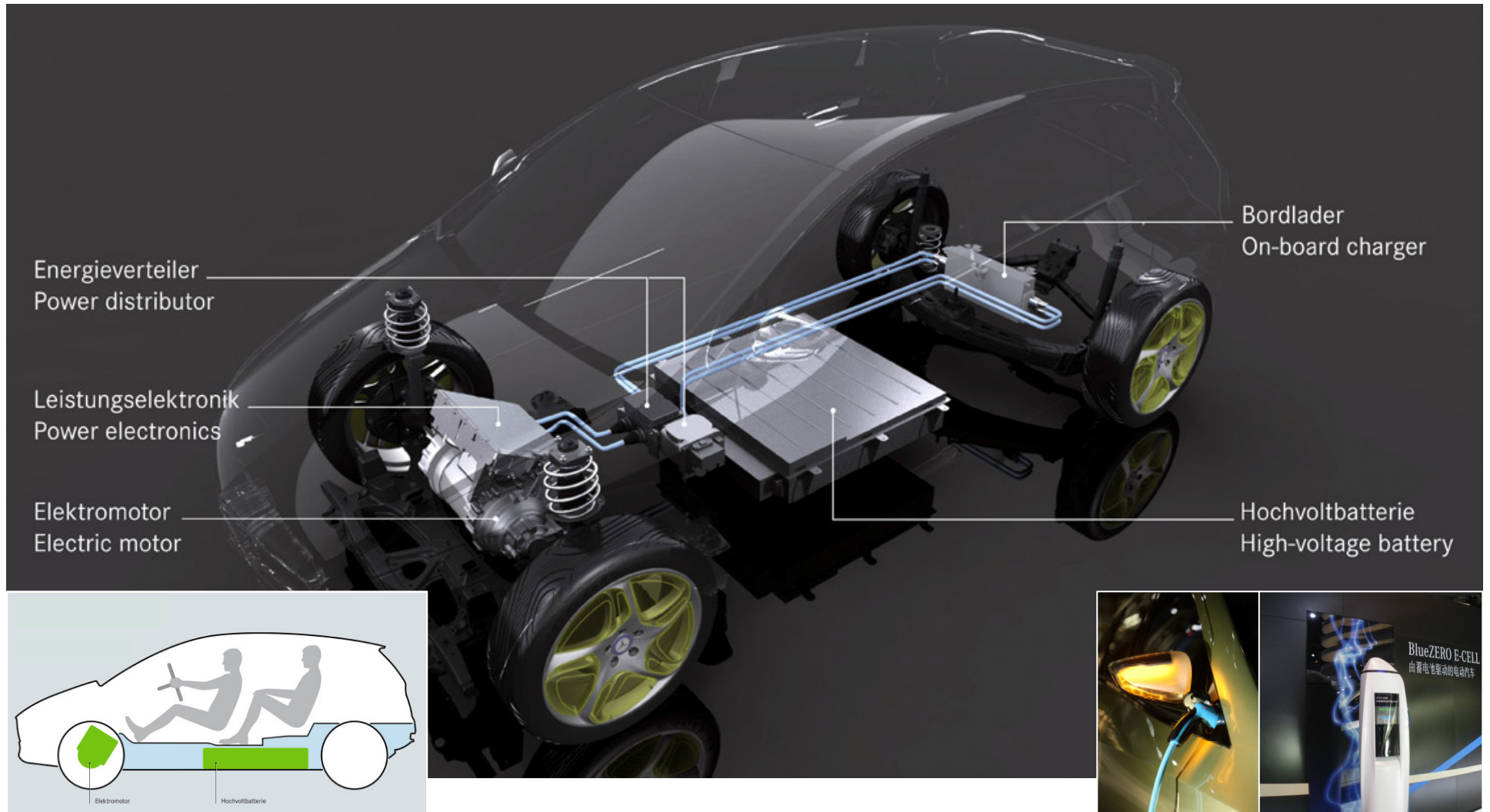
- Battery
- Electric Drive
- Infrastructure

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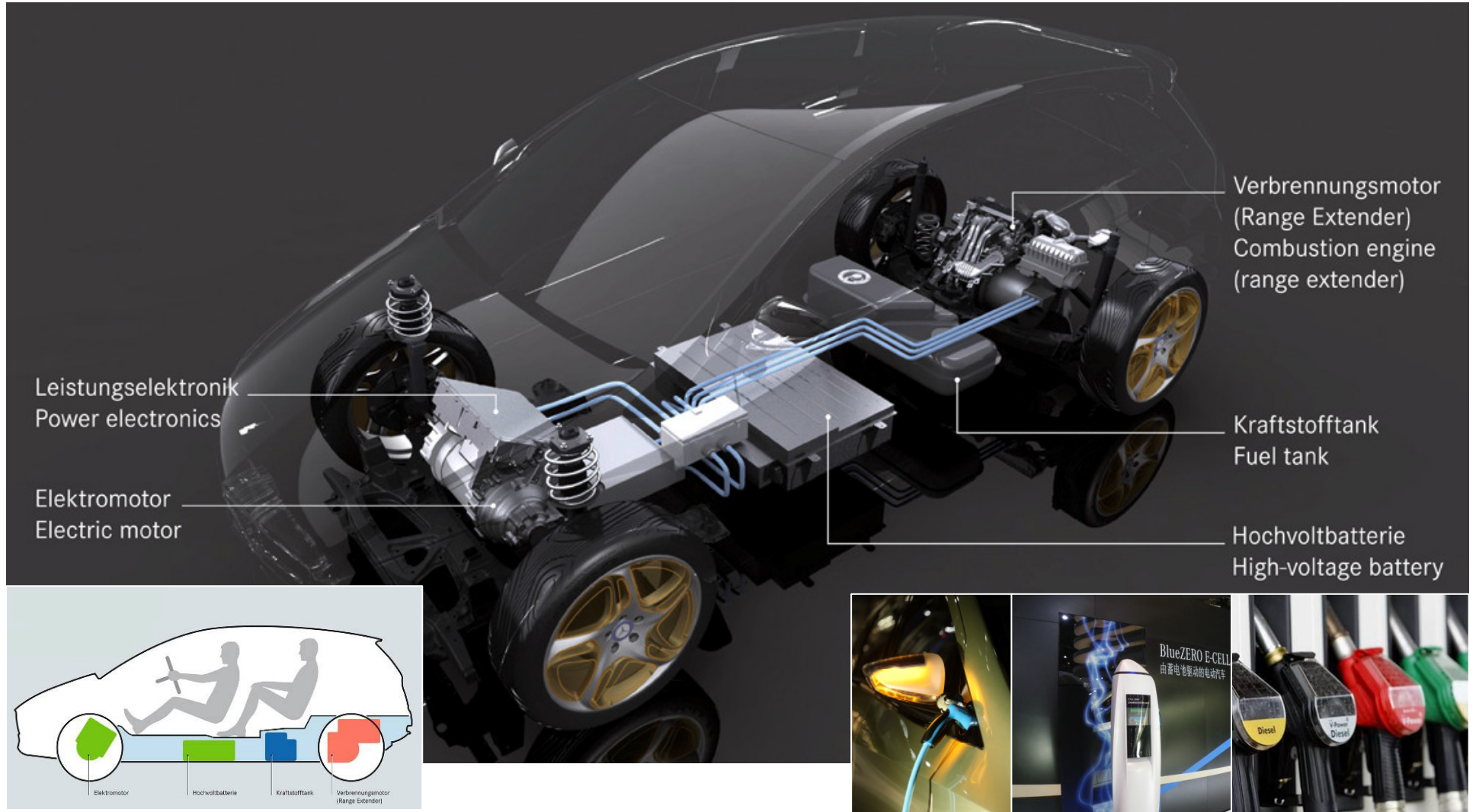
BlueZERO: Modular Concept for E-Mobility



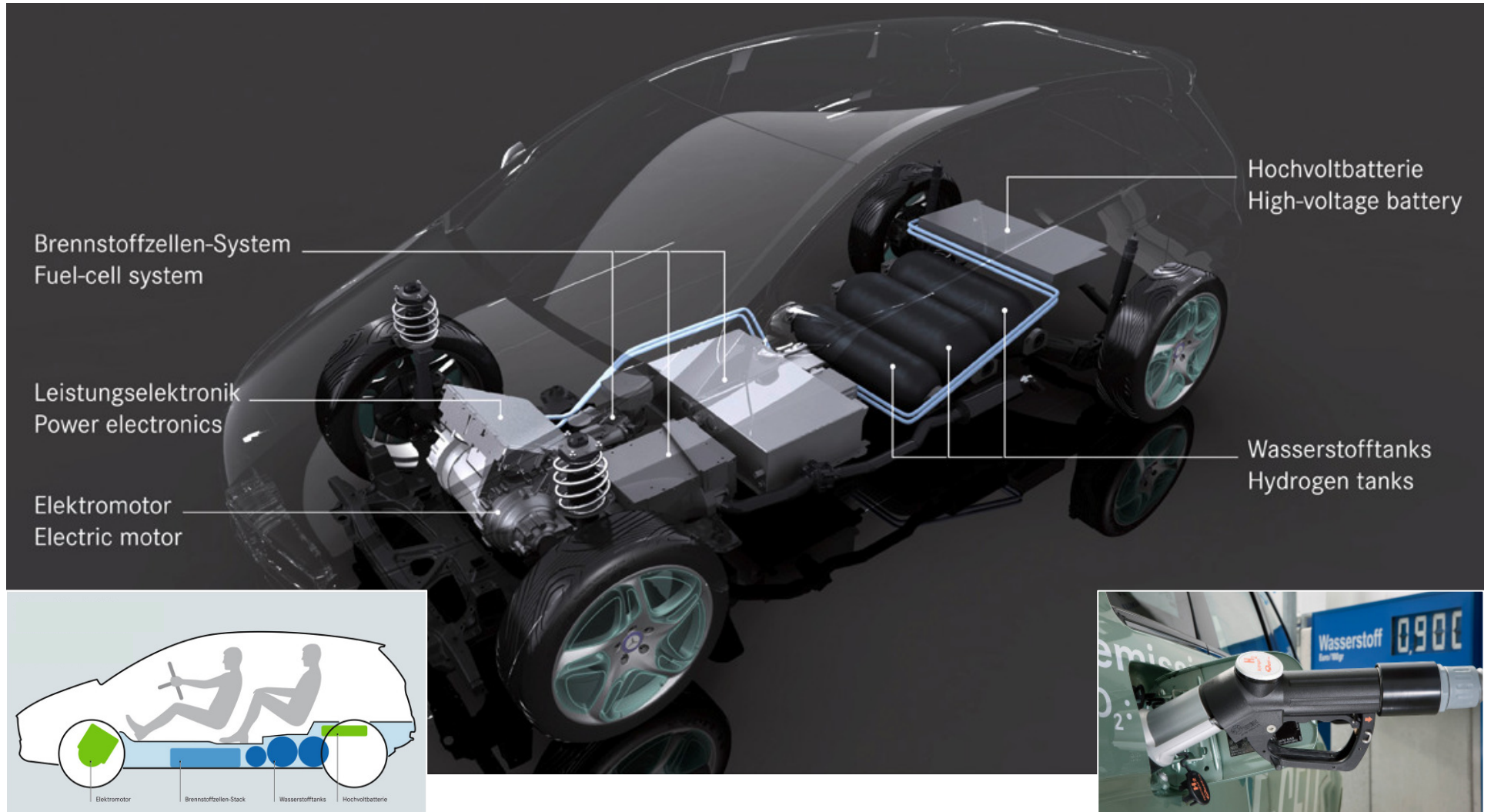
Concept BlueZERO E-CELL



Concept BlueZERO E-CELL PLUS



Concept BlueZERO F-CELL



Concept BlueZERO – electro mobility for every requirement

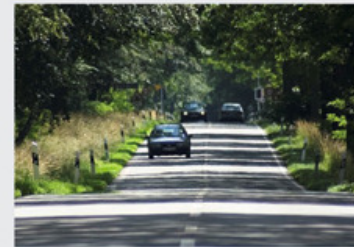
Modular concept
for electromobility:

- Battery-electric drive
(BlueZERO E-CELL)
- Fuel-cell drive
(BlueZERO F-CELL)
- Battery-electric drive
with range extender
(BlueZERO E-CELL PLUS)

Urban use



Extra-urban use



Long-distance use



E-CELL

F-CELL

E-CELL PLUS



Daimler Experience with fuel cell vehicles

60 F-CELL vehicles in customer hands (since 2004)



~ 2.200.000 km*

37 buses (Citaro) Europe, Australia & China



~ 2.200.000 km*

3 light duty vehicles at UPS Europe & USA



~ 64.000 km*

* Data November 2009

- Daimler is a pioneer of the Fuel Cell Vehicle (FCV)
- Daily operation of more than 100 FCV's all over the world
- Long experience with FCV's (first FCV in 1994)
- End of 2007: F-Cell A-class reached 150.000 km and 2500 operating hours with 1st fuel cell stack
- Operation of FCV's at customers in different climate zones with varying ambient temperatures

Fuel Cell Technology

Next Challenges

Technology



- Energy density
- Cooling (performance)
- H₂ storage (range; currently ~400km)

Infrastructure

- Sufficient number of refueling stations
- Reliable and easy to use technology
- Cost efficiency
- Hydrogen produced by regenerative energy sources



Costs

- FC System & Stack
- H₂-Tank
- Battery

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Initiative “H2 Mobility” in the lead market of Germany

Daimler together with infrastructure partners is making sure that the nationwide construction of the infrastructure is ensured.



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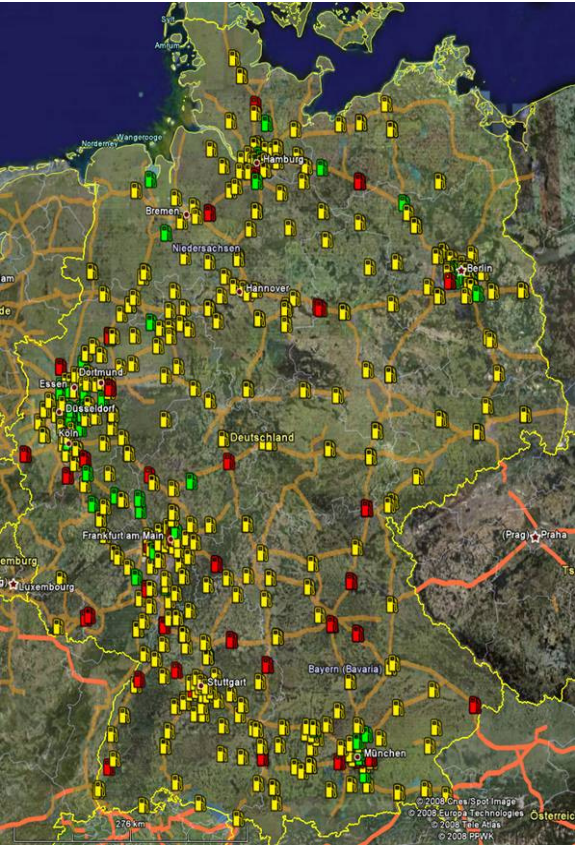
Possible roll-out scenario of H2-gas stations 2010 – 2017 (H2-Station density comparable to natural gas station density)

2013



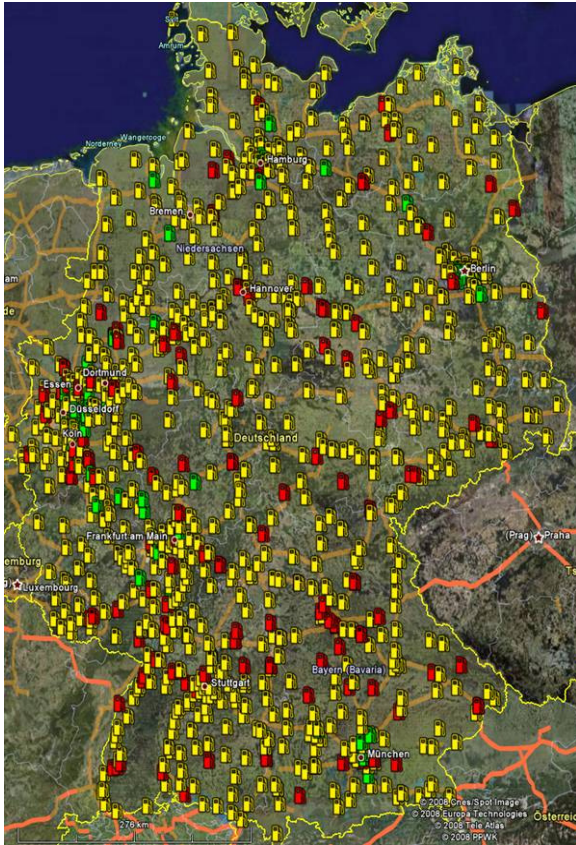
of TS 159

2015



500

2017



1,000

Big Medium Small

Conclusion: Daimler's activities in the domain of mobility

- **Sustainability is a core value of Daimler AG**

- **For each step towards emission free driving Daimler has the premium technology available**
 - **High-Tech combustion engines**
 - **Hybrid drivetrains**
 - **Premium electric vehicles with fuel cell / battery**

- **The market introduction of each technology follows a trade off between technology leadership and economical reason**

Thank you for your attention!



Disclaimer

This document contains forward-looking statements that reflect our current views about future events. The words “anticipate,” “assume,” “believe,” “estimate,” “expect,” “intend,” “may,” “plan,” “project,” “should” and similar expressions are used to identify forward-looking statements. These statements are subject to many risks and uncertainties, including a lack of or a considerable delay in improvement or a further deterioration of global economic conditions; a continuation or worsening of the tense situation in the credit and financial markets, which could result in ongoing high borrowing costs or limit our funding flexibility; changes in currency exchange rates and interest rates; the introduction of competing, fuel-efficient products and the possible lack of acceptance of our products or services, which may limit our ability to adequately utilize our production capacities or raise prices; price increases in fuel, raw materials and precious metals; disruption of production due to shortages of materials, labor strikes, or supplier insolvencies; a further decline in resale prices of used vehicles; the effective implementation of cost-reduction and efficiency-optimization programs at all of our segments, including the repositioning of our truck activities in the NAFTA region and in Asia; the business outlook of companies in which we hold an equity interest, most notably EADS; changes in laws, regulations and government policies, particularly those relating to vehicle emissions, fuel economy and safety; the resolution of pending governmental investigations and the outcome of pending or threatened future legal proceedings; and other risks and uncertainties, some of which we describe under the heading “Risk Report” in Daimler’s most recent Annual Report and under the headings “Risk Factors” and “Legal Proceedings” in Daimler’s most recent Annual Report on Form 20-F filed with the Securities and Exchange Commission. If any of these risks and uncertainties materialize, or if the assumptions underlying any of our forward-looking statements prove incorrect, then our actual results may be materially different from those we express or imply by such statements. We do not intend or assume any obligation to update these forward-looking statements. Any forward-looking statement speaks only as of the date on which it is made.