

The Pragmatic Way to Electromobility

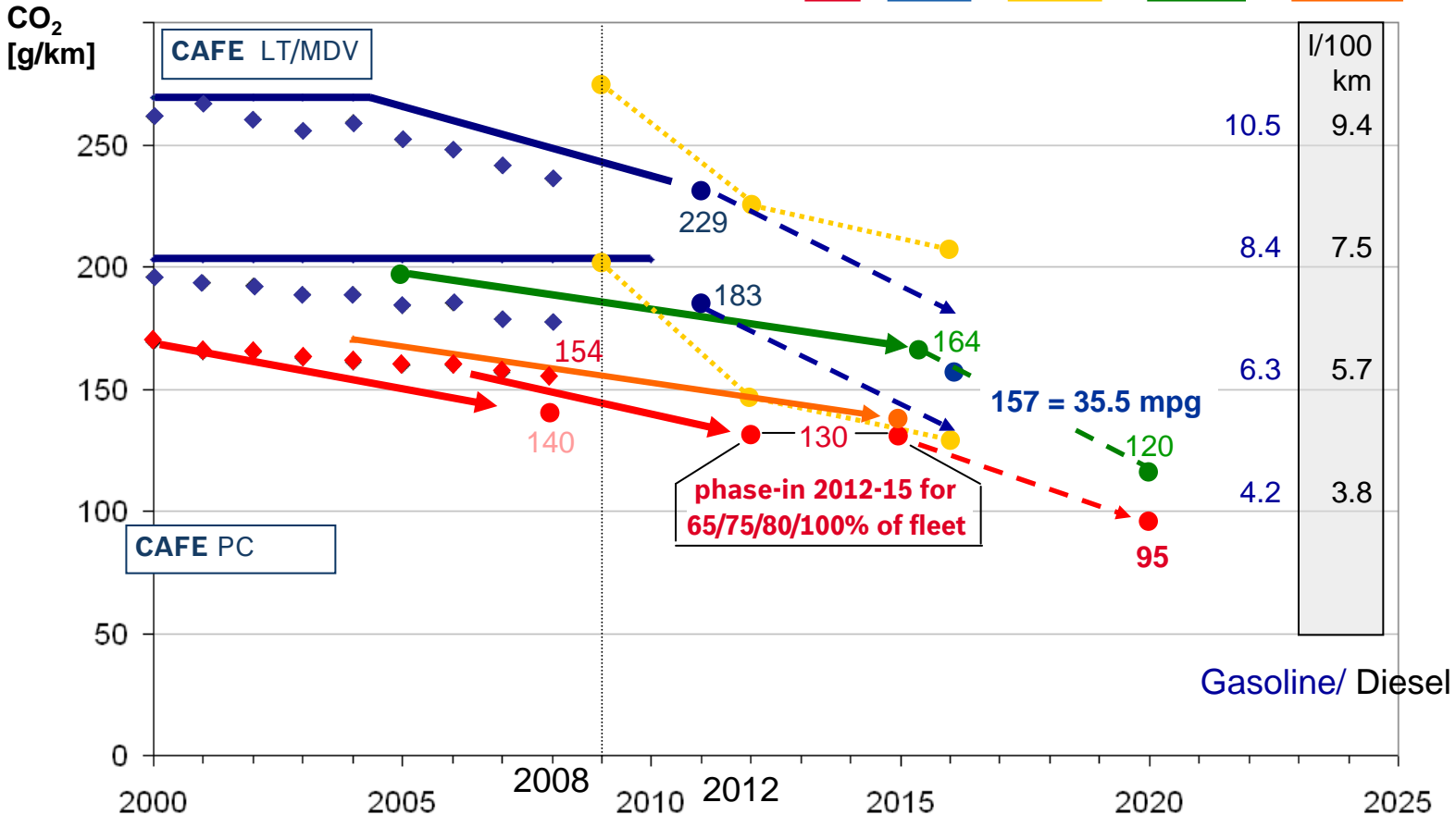
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The Pragmatic Way to Electromobility

Fuel Economy - Targets

■ EU
 ■ CAFE
 ■ CARB
 ■ CHINA
 ■ JAPAN



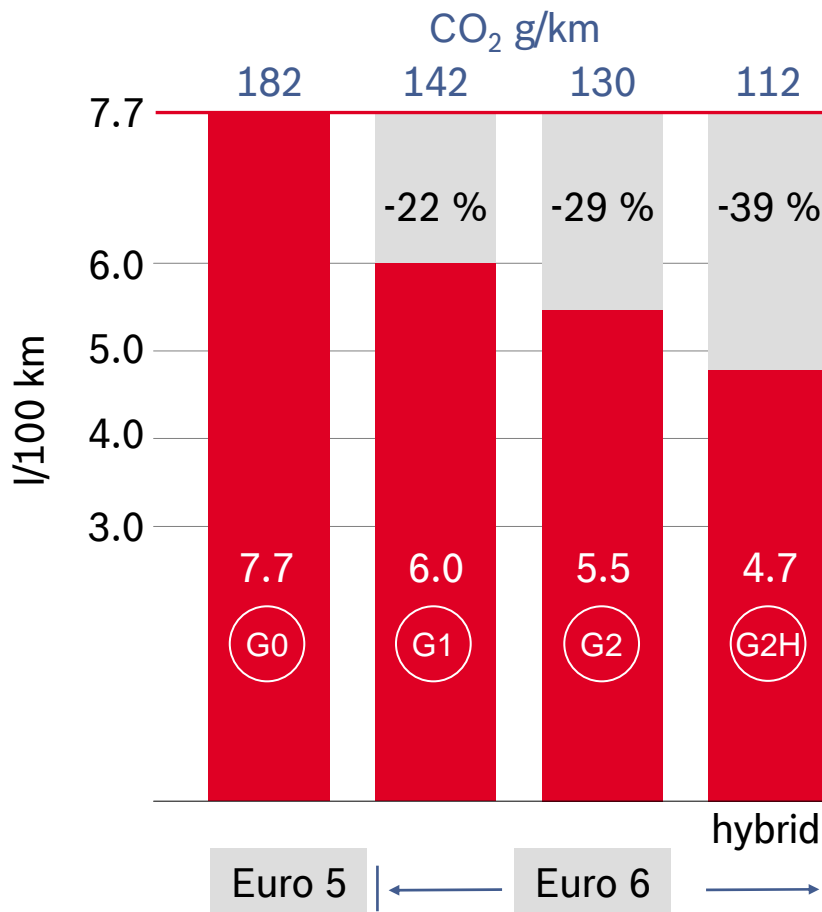
CAFE = Corporate Average Fuel Economy PC = Passenger Cars, LT / LDT = Light Trucks (pick-ups, vans, SUVs), MD(P)V = Medium Duty (Passenger) Vehicles GHG = Greenhouse Gases
 NHTSA = National Highway Transportation and Safety Administration CARB = California Air Resources Board mpg = miles per gallon China weight based limits (here for 1,3 tons curb weight)
 CAFE data NHTSA report October 2006 EU data for ACEA (Association des Constructeurs Européens d'Automobiles) 6th EU Report 24.8.2006, for MY05 and 06 from T&E 2006 / 2007

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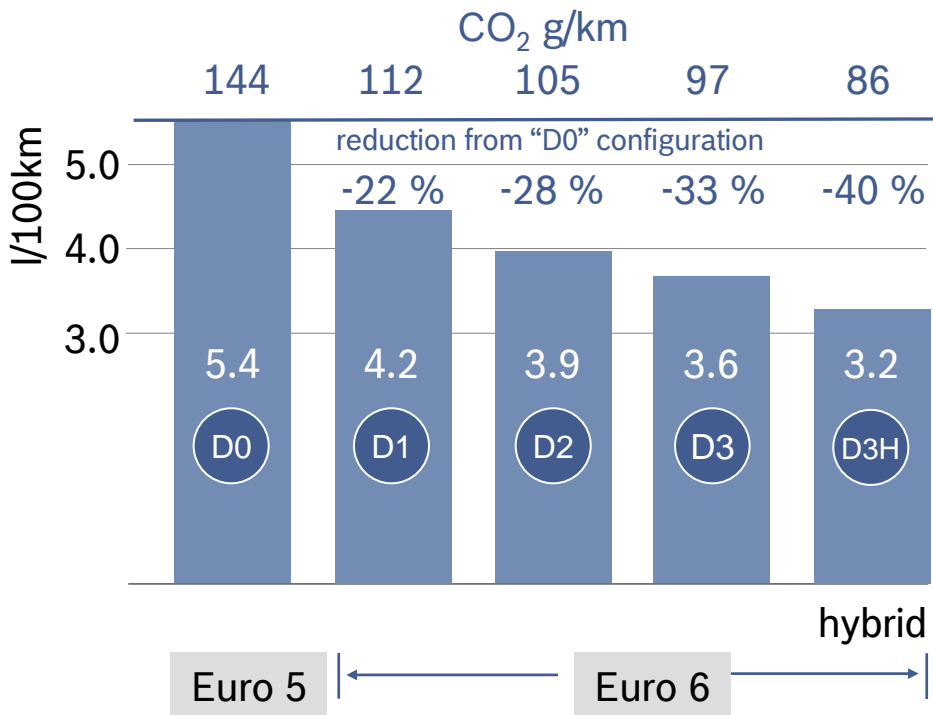
Gasoline technologies – potential fuel economy



G0	port fuel injection	2.0 l 200 Nm
G1 = G0	+ direct injection, + downsizing, start/stop, + thermal management, + turbocharging	1.4 l 210 Nm
G2 = G1	+ cylinder downsizing (4 → 3 cylinders) + var. valve lifting	1.1 l 204 Nm
G2H = G2	+ hybrid battery 1 kWh, electric motor 25 kW	1.1 l 204+140 Nm

Vehicle weight 1400 kg, 100 kW, NEDC
 G0-G2: manual transmission
 G2H: automatic transmission

Diesel technologies – potential fuel economy



D0	Common-rail system, turbo	2.0 l 340 Nm
D1 = D0	+ optimized combustion + start/stop + thermal management + downsizing	1.6 l 340 Nm
D2 = D1	+ NO _x exhaust-gas treatment	1.6 l 340 Nm
D3 = D2	+ cylinder downsizing (4 → 3 cylinder)	1.2 l 290 Nm
D3H = D3	+ hybrid battery 1 kWh, E-motor 25 kW	1.2 l 290 + 140 Nm

Planned EU Energy Taxation and it's Consequences

- **High percentage of diesel cars in Europe guarantees to reach CO2 limits**
- **Higher diesel prices at pump endanger TCO-calculation for owners**

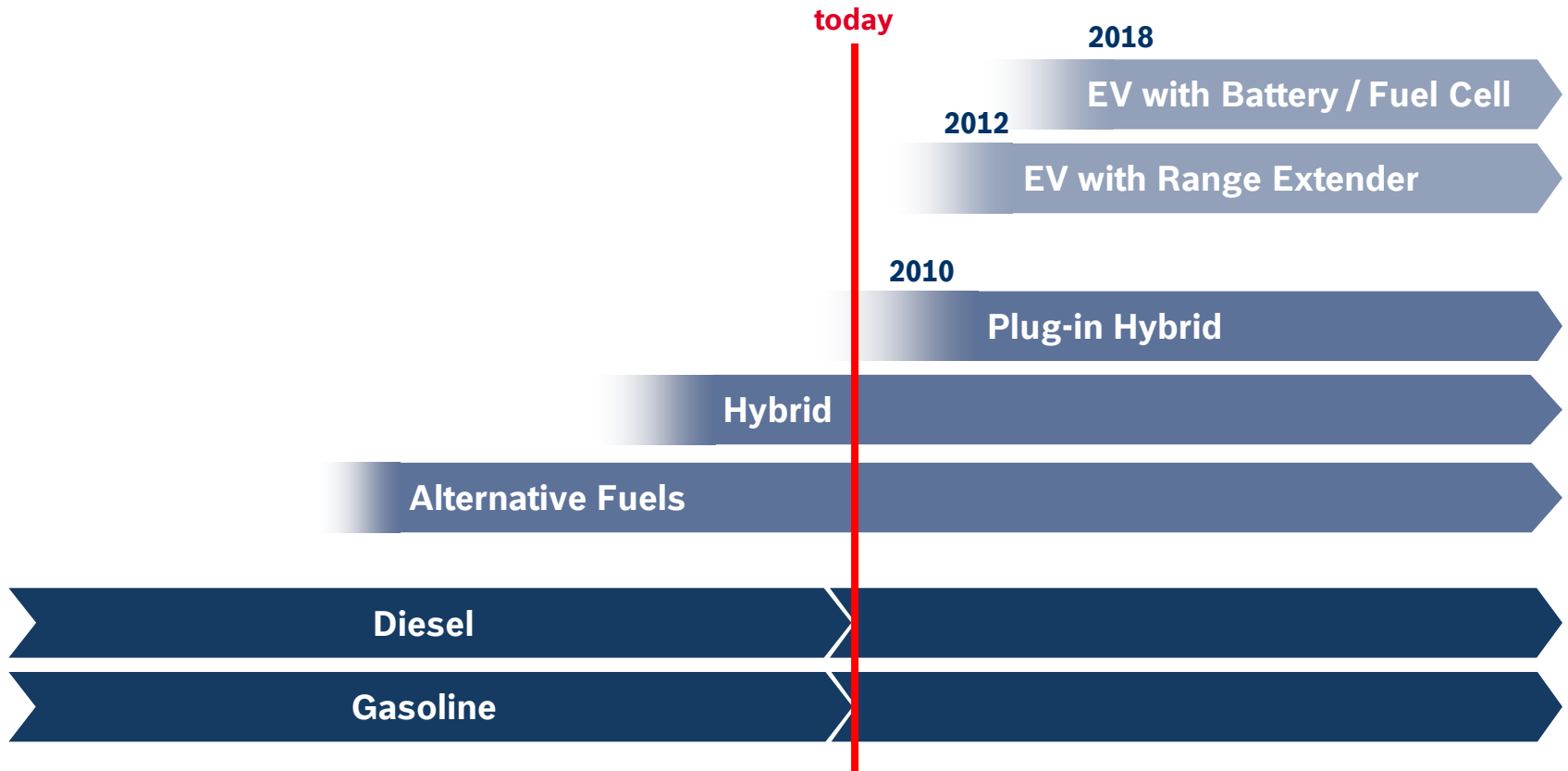
Consequences:

- **Reduction in demand for diesel cars in small and medium segment**
- **Loss of EU competitiveness in this field**
- **Accessibility of CO2-fleet target endangered**
- **Negative effects on environment**



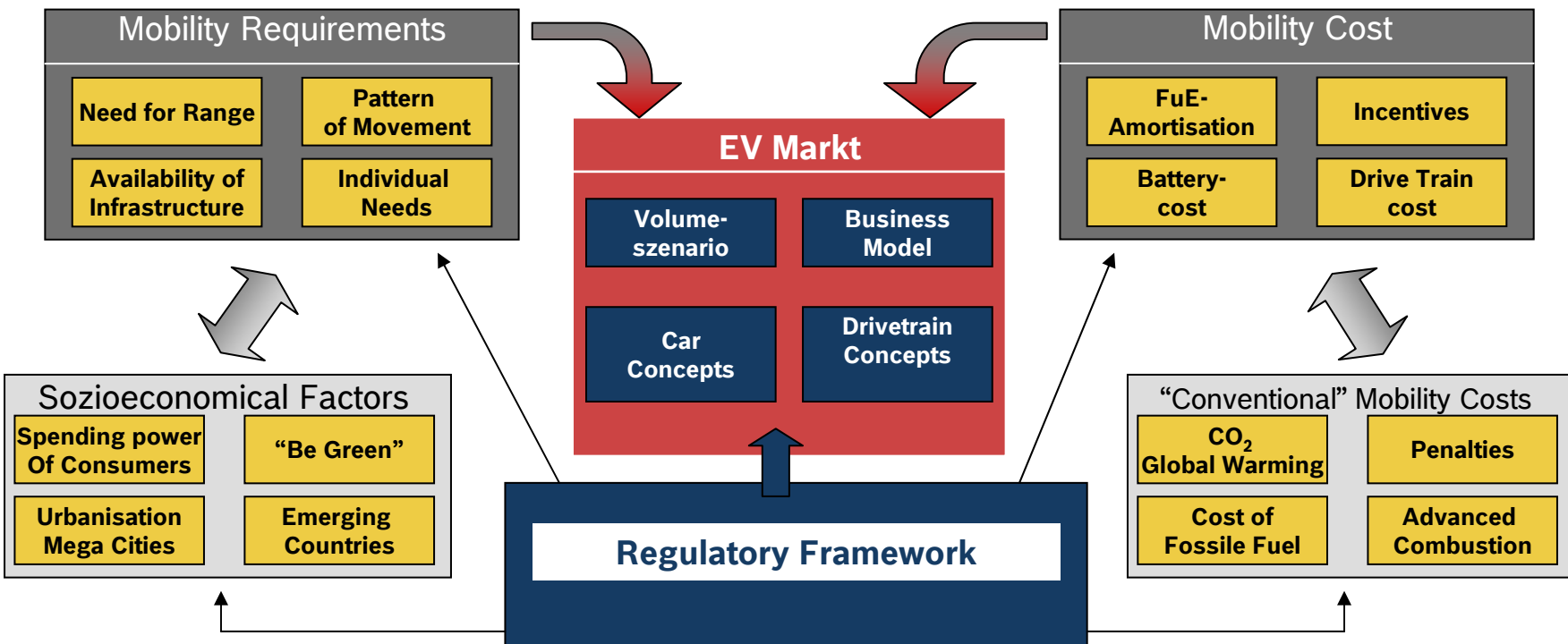
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Diversification of Powertrains



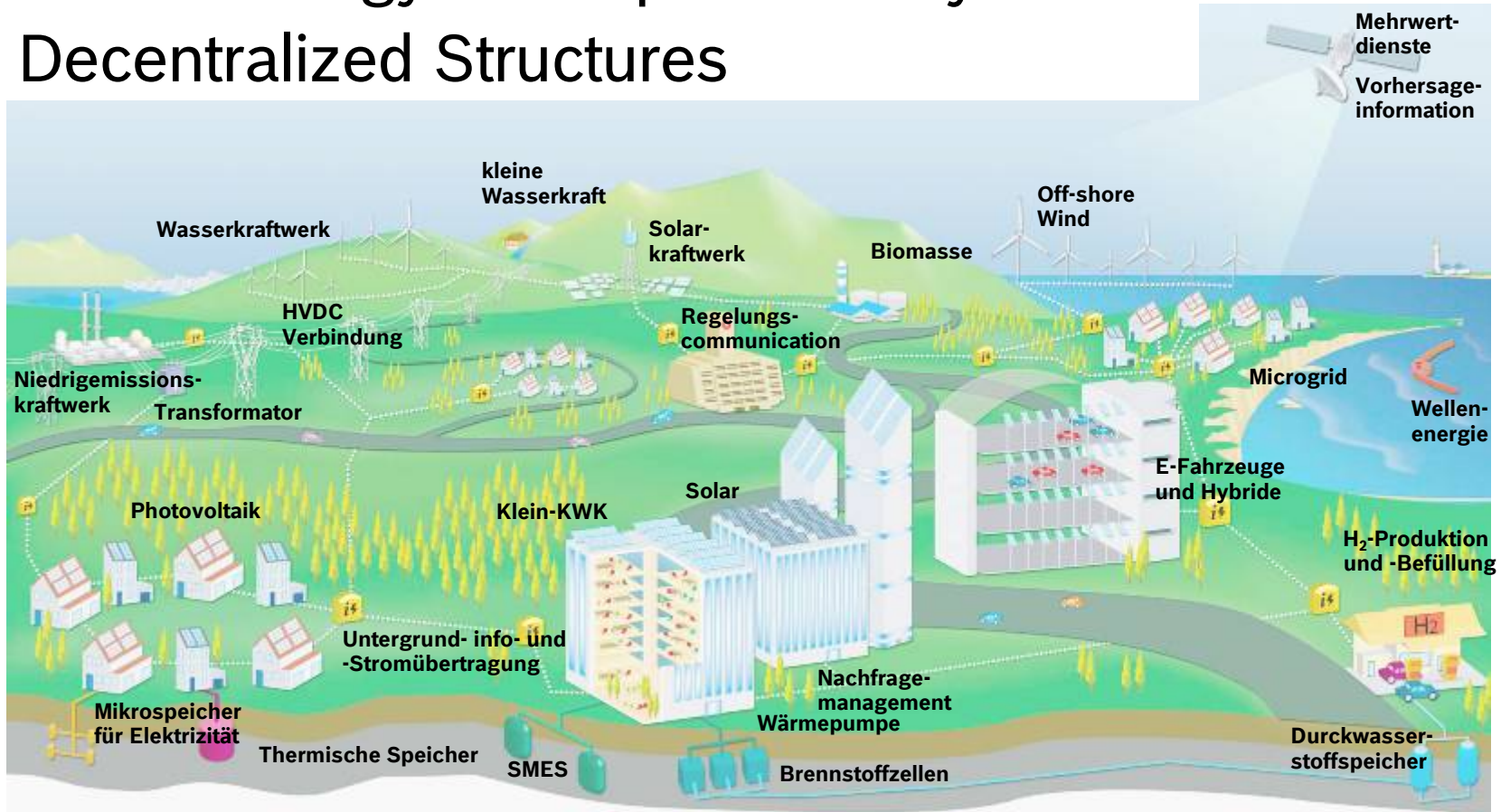
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Factors influencing EV-Marketdevelopment



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Future Energy Concepts will Rely on Decentralized Structures



Legende: SMES = Supraleitende Magnetische Energiespeichersysteme, HVDC = High Voltage Direct Current, KWK = Kraft-Wärme-Kopplung, Quelle: European Smart Grids Technology Platform: Vision and Strategy for Europe's Electricity Networks of the Future, European Commission, 2006

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