Semiconductor as key contributor for different powertrain offerings

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November 13th, 2025

Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

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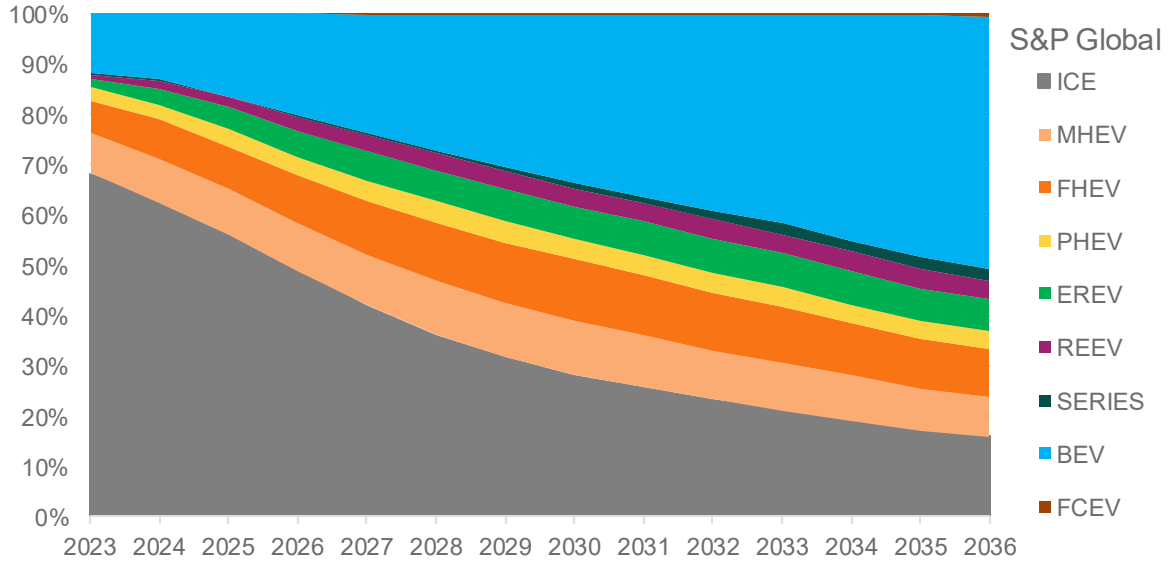
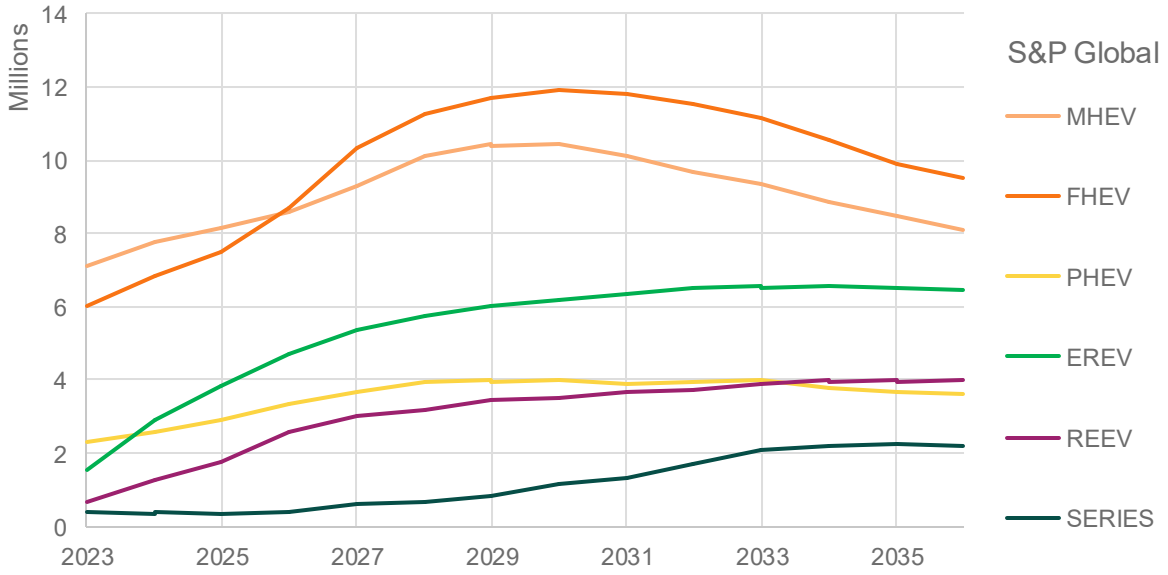
S&P Global Forecast (data 2025-01-11)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
ICE: S + S/S	61.790.894	55.716.080	49.683.923	44.538.332	39.374.262	34.097.672	30.439.696	27.242.679	25.246.553	22.958.823	21.045.350	19.285.787	17.409.839	16.362.371
MHEV	7.122.709	7.750.842	8.146.404	8.565.016	9.273.109	10.119.636	10.434.092	10.465.242	10.102.793	9.679.535	9.355.091	8.869.398	8.484.713	8.100.515
FHEV	6.037.993	6.843.078	7.502.547	8.672.457	10.327.669	11.266.444	11.688.431	11.911.558	11.834.811	11.516.544	11.156.120	10.569.445	9.894.871	9.531.450
PHEV	2.322.898	2.566.521	2.925.285	3.357.644	3.663.135	3.927.082	4.013.384	4.014.119	3.870.050	3.966.377	3.973.484	3.788.939	3.643.340	3.604.832
EREV	1.532.849	2.897.450	3.828.114	4.684.221	5.367.687	5.743.076	6.034.750	6.173.943	6.357.747	6.518.517	6.546.496	6.575.688	6.481.629	6.434.134
REEV	683.248	1.263.968	1.758.412	2.600.016	3.036.378	3.185.977	3.459.989	3.487.672	3.667.556	3.740.776	3.884.617	3.999.267	4.001.316	4.001.819
SERIES	383.031	375.028	312.592	401.851	595.205	686.680	803.512	1.126.033	1.309.854	1.693.058	2.060.515	2.187.582	2.265.588	2.240.640
BEV	10.583.434	11.646.295	14.507.624	18.170.598	21.989.648	25.654.193	29.343.471	32.421.082	35.440.887	38.710.867	41.449.286	45.098.463	48.846.035	51.447.094
FCEV	11.987	5.634	14.707	26.151	33.609	46.165	59.942	92.329	121.468	162.571	206.880	262.847	366.981	443.689
All w/ ICE	79.873.622	77.412.967	74.157.277	72.819.537	71.637.445	69.026.567	66.873.854	64.421.246	62.389.364	60.073.630	58.021.673	55.276.106	52.181.296	50.275.761
Total	90.469.043	89.064.896	88.679.608	91.016.286	93.660.702	94.726.925	96.277.267	96.934.657	97.951.719	98.947.068	99.677.839	100.637.416	101.394.312	102.166.544





Infineon at a glance

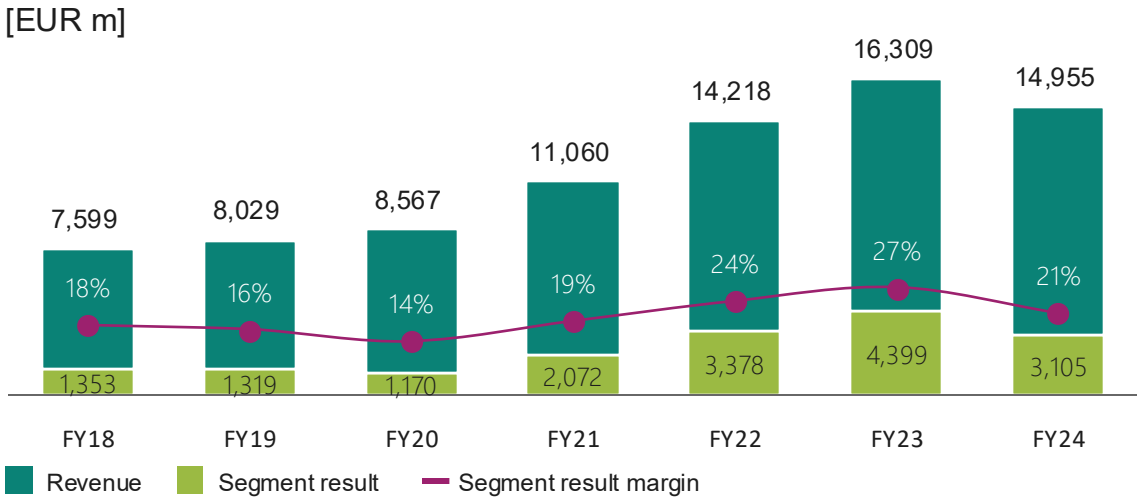
Growth areas

Energy
green and efficient

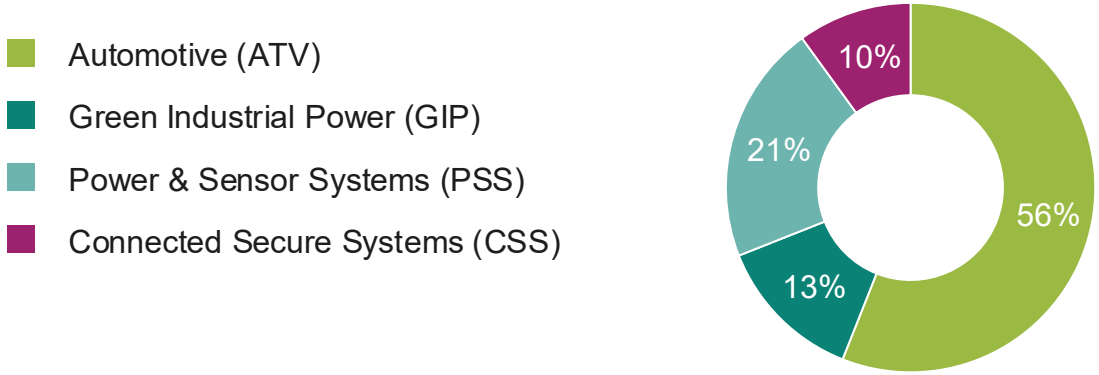
Mobility
clean and safe

IoT
smart and secure

Financials



FY24 revenue by segment[1]

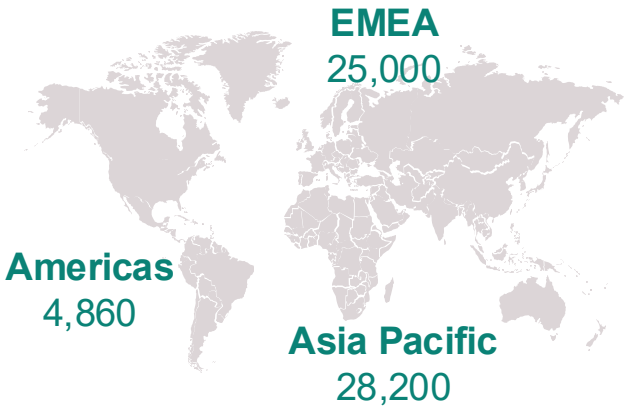


Employees[1]

58,060
employees worldwide

71
R&D and

15
manufacturing locations[2]



For further information: Infineon Annual Report.
1 2024 Fiscal year (as of 30 September 2024) | **2** As of 30 September 2024

Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

Vision: 10 kWh per 100 km!

Smart Charging
Right timing and performance

Energy Management
Energy handling predictive driving

Semiconductor Efficiency
Reduce power losses

Rolling resistance and air drag
Reduce size and weight

Connected Environment
V2x and Infrastructure

10 kwh

100 km

Webinar: 10 kWh per 100 km!

Higher energy utilization of renewable energies

10% smaller battery
10% more vehicles

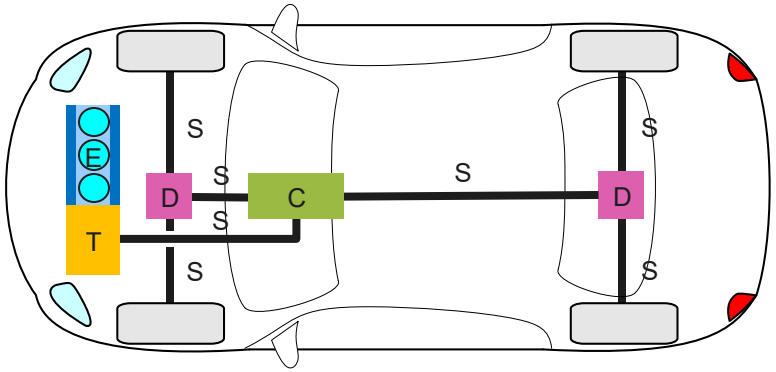
Less dependability in supply e.g. on rare earths

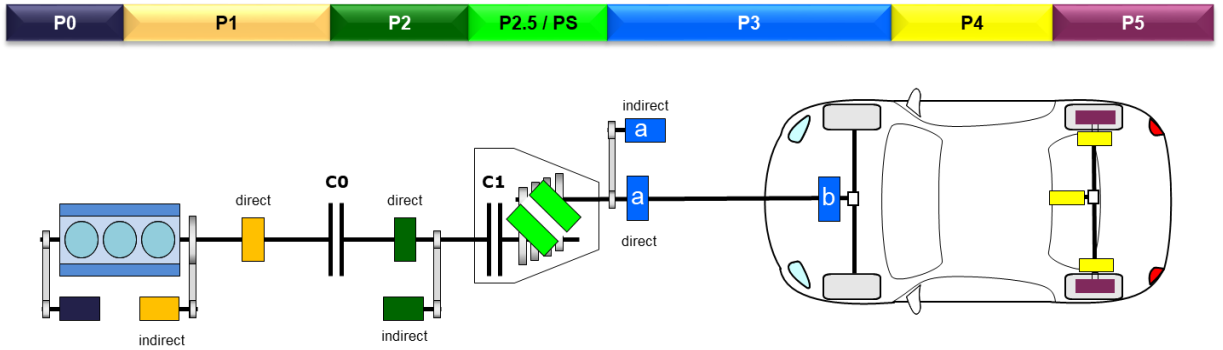
Less weight for less PM2.5 & better driving performance

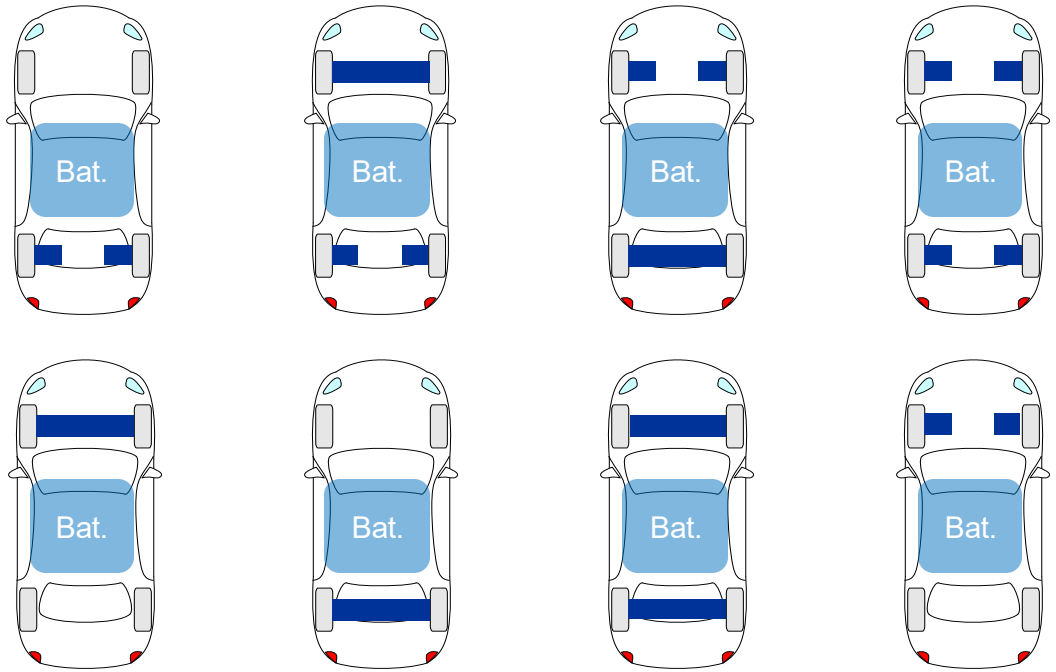
Vehicle to x (V2x):
new business models

Vehicle driveline

Init.	Full name
E	Engine
C	Transfer Case
D	Differential
S	Schaft
T	Transmission



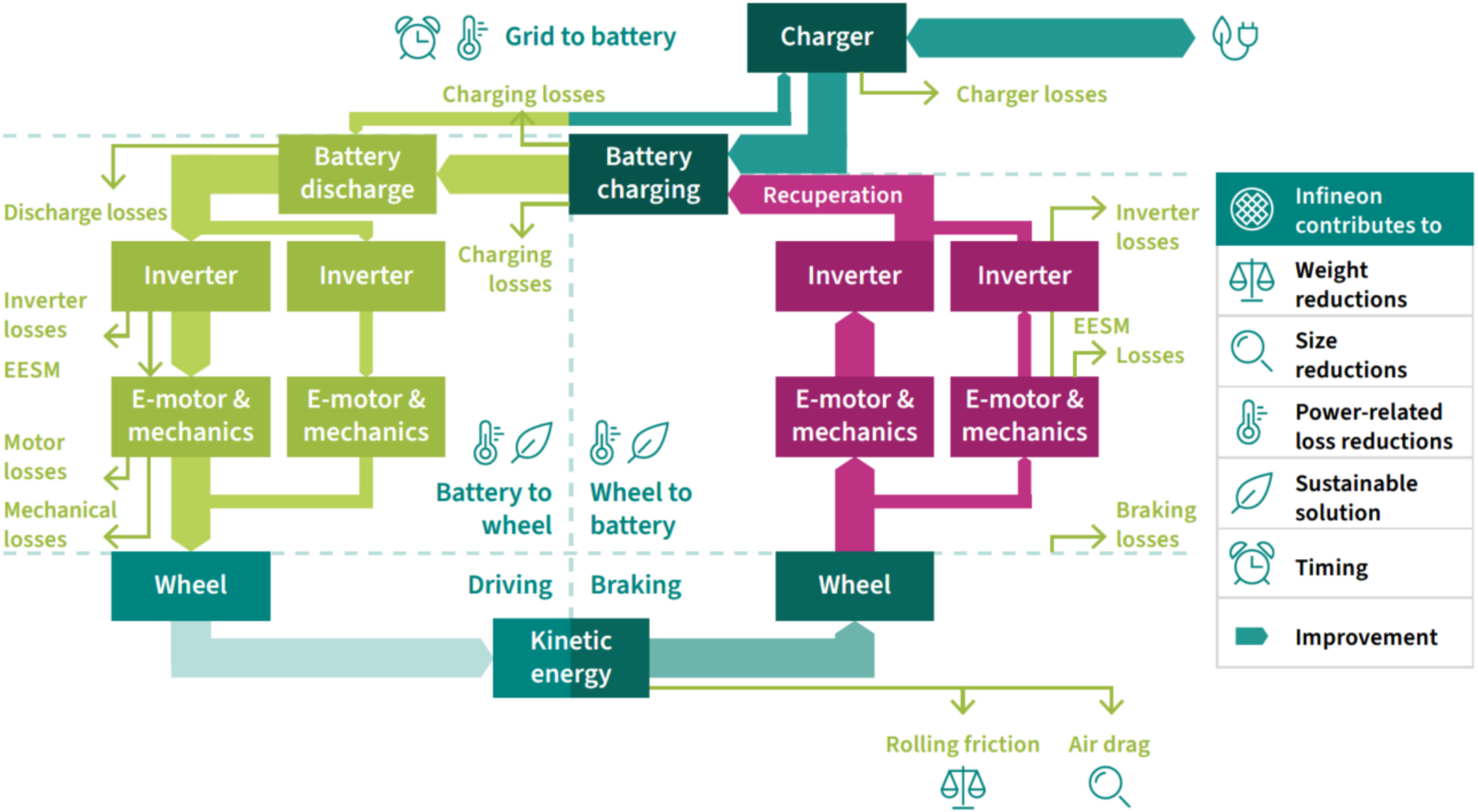




Acronym	Name	ICE vs EM
ICE	ICE only	ICE
ICE S/S	ICE w/ Start-Stop	ICE
MHEV	Mild Hybrid Electric Vehicle	ICE
FHEV	Full Hybrid Electric Vehicle	ICE
PHEV	Plug-in Hybrid Electric Vehicle	ICE
EREV	Extended Range Electric Vehicle	EM
SERIES	Serial Hybrid Electric Vehicle	EM
REEV	Range Extender Electric Vehicle	EM
BEV	Battery Electric Vehicle	EM
FCEV	Fuel Cell Electric Vehicle	EM

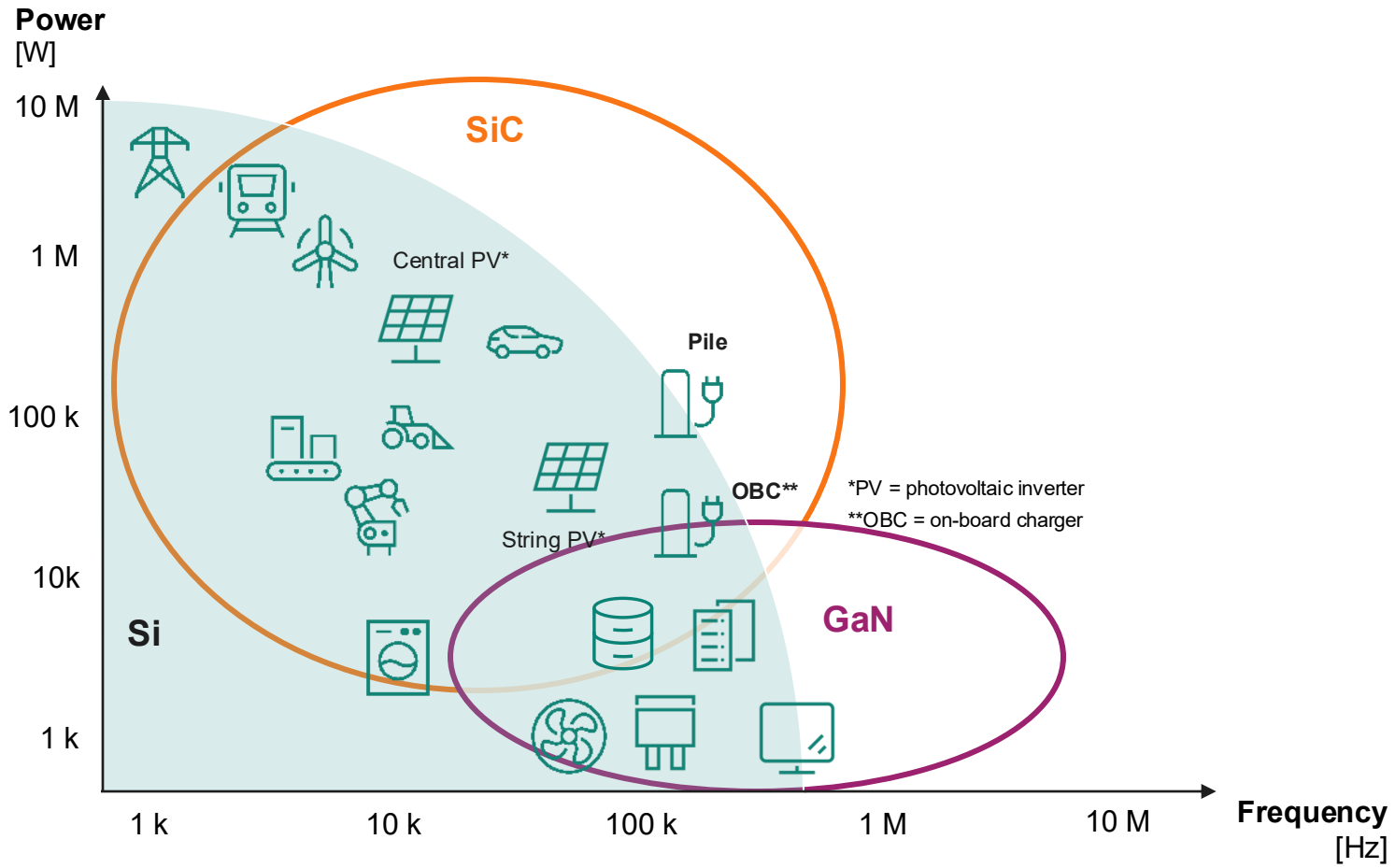
Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

Semiconductors contribute to improved energy efficiency, but also to size and weight reduction, to improve the vehicle dynamics



Leveraging full potential based on the power ratings and switching frequency required by the application

Comparison of technologies



Si

- Si remains the mainstream technology
- Targeting 25 V – 6.5 kV
- Suitable from low to high power

SiC

- SiC complements Si in many applications and enables new solutions
- Targeting 650 V – 3.3 kV
- High power – high switching frequency

GaN

- GaN enables new horizons in power supply applications and audio fidelity
- Targeting 80 V – 600 V
- Medium power – highest switching frequency

Infineon 3-level concept supports motor efficiency improvements for 800V powertrains

Lowest System Cost* 175kW/800V/2L		Battery Cost [105€/kWh]	Battery Cost [85€/kWh]	Battery Cost [65€/kWh]
Battery Size	22kWh	Fusion	Fusion	Fusion
	45kWh	SiC	SiC	Fusion
	75kWh	SiC	SiC	SiC
	95kWh	SiC	SiC	SiC

*evaluation assumes equivalent WLTP range & 2027 cost predictions

800V BEV/PHEV
175kW 2WD

800V BEV 4WD

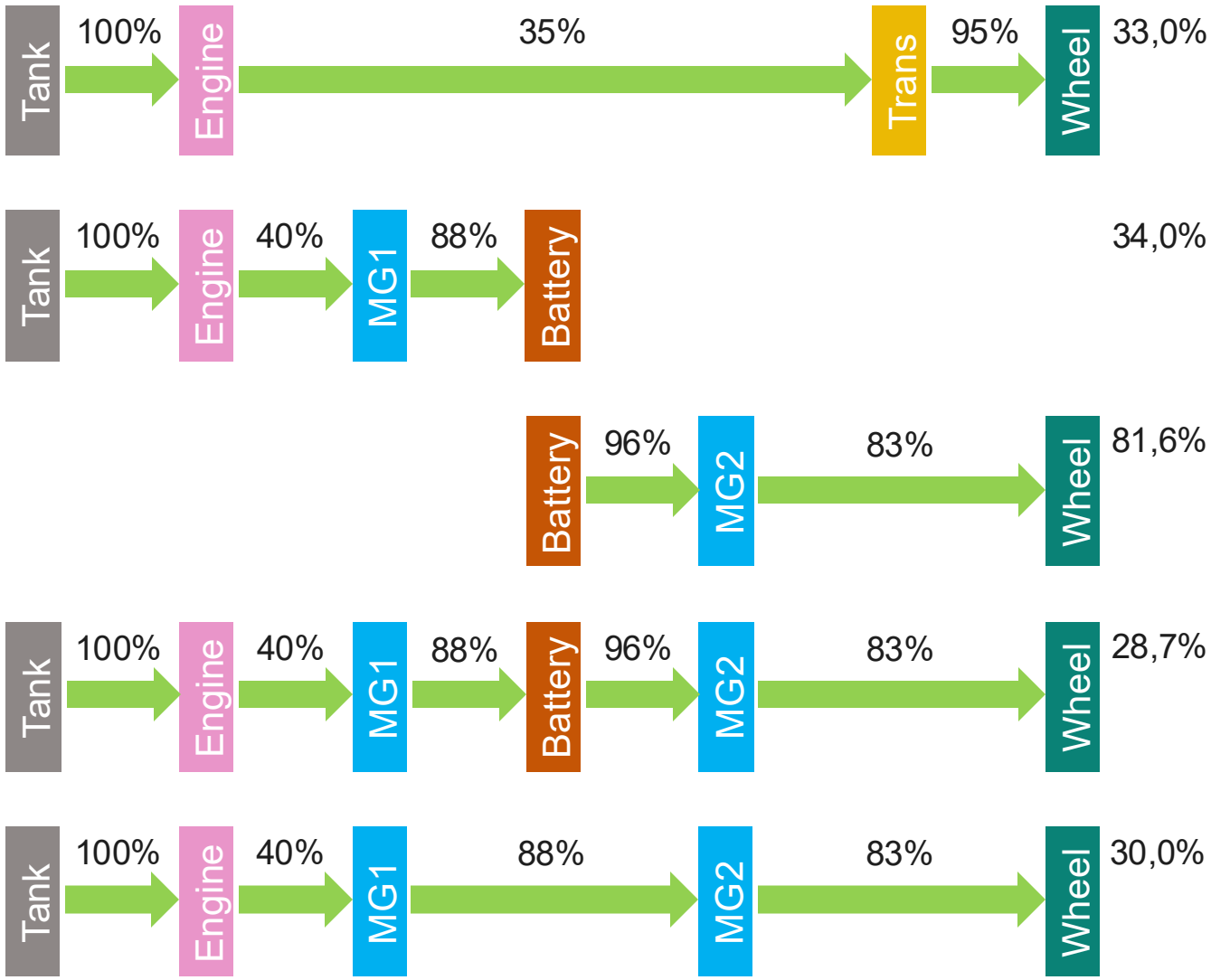
Note: SiC/sGaN = Smart T-type

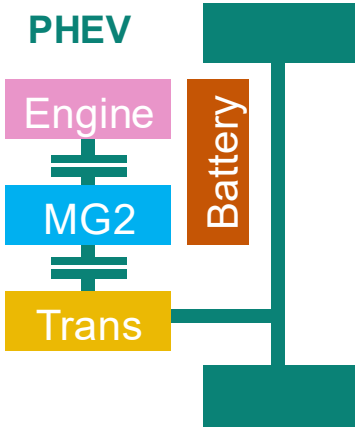
Lowest System Cost* 175kW/800V/3L		Battery Cost [105€/kWh]	Battery Cost [85€/kWh]	Battery Cost [65€/kWh]
Battery Size	22kWh	3L Si	3L Si	3L Si
	45kWh	3L SiC/sGaN	3L SiC/sGaN	3L Si
	75kWh	3L SiC/sGaN	3L SiC/sGaN	3L SiC/sGaN
	95kWh	3L SiC/GaN	3L SiC/sGaN	3L SiC/sGaN

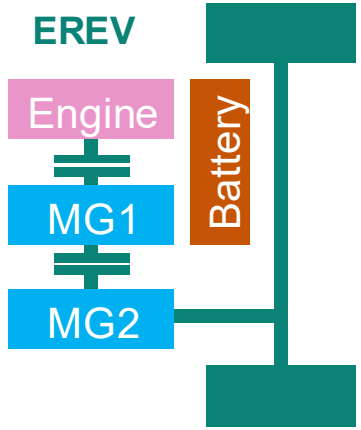
*evaluation assumes equivalent WLTP range & 2027 cost predictions

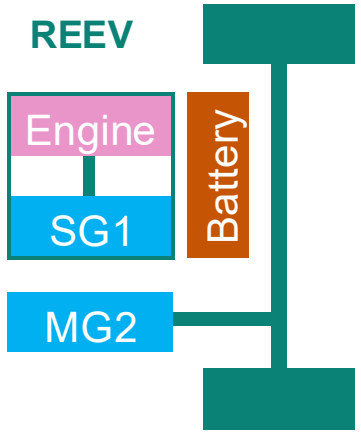
Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

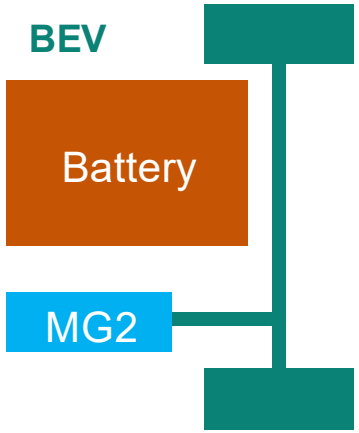
Example: REEV vs EREV (Efficiency Tank to Wheel)



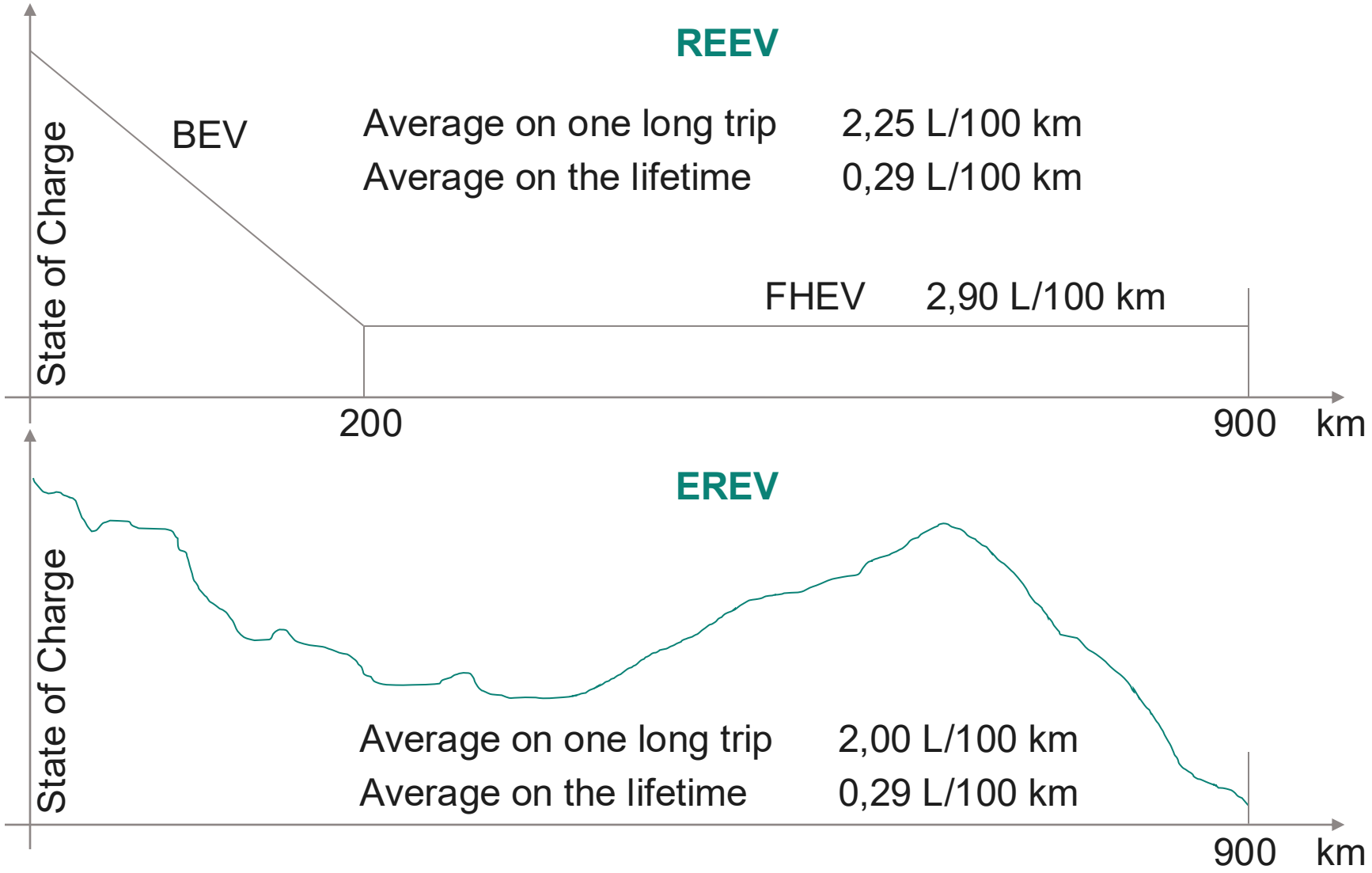


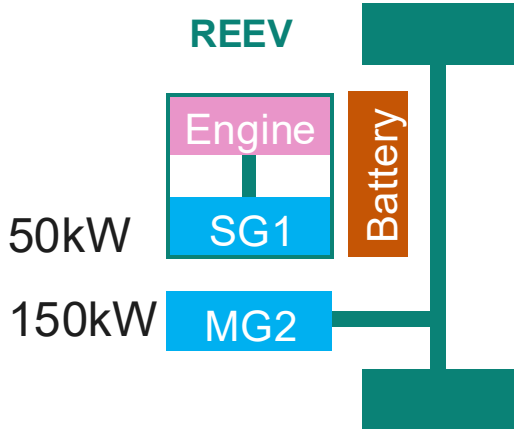


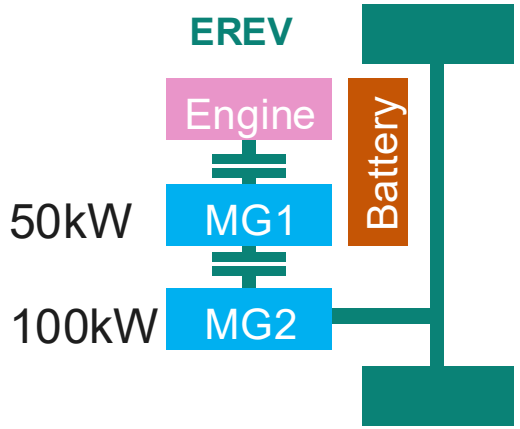




Example: REEV vs EREV







Takeaways on range extender

- The roadmap for internal combustion engines (ICE) and on-board generators is promising in terms of vehicle efficiency, as well as the reduction of mass and size.
- The vehicle will provide an electric range of 200 km, which represents 90% of your use case.
- If you drive longer, a range extender will add 700 km of additional range, which represents only 10% of your use case.
- The vehicle will produce less than 7 gCO_2/km over its lifetime with a gasoline E10 ICE.
- We can reduce carbon emissions to zero if the vehicle uses carbon-neutral fuel.

Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

Hydrogen from production to consumption
Infineon focus on electrolysis & fuel cells

Production	Transformation	Transportation	Consumption
From electricity (electrolysis)	Direct use of hydrogen	Shipping	Industrial applications • Metallurgy, cements • Ceramics, glasses • Chemical industry • Refineries • Fertilizer
From biomass	as ammonia NH_3	Trucks, trains	Buildings & agriculture • Heating Power generation Mobile applications • Shipping • Aviation • Rail • Passenger cars • Trucks, coaches, buses • Construction, agriculture
From fossil sources	as eFuel • Methane CH_4 • Methanol CH_3-OH • Dimethyl DMC, DME • Poly(oxy-methylene) ethers OME	Pipelines	
Hydrogen as by-product	as a compound • LOHC	Storage • Compressed • Liquide	

Gas sensing is an emerging opportunity for various applications

FCEV

- Leakage Sensor
- Exhaust Sensor
- BMS TR Sensor
- HRS

H2-ICE

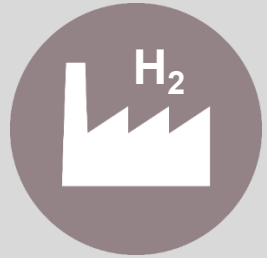
- Leakage Sensor
- Crankshaft leakage Sensor

BEV

- Thermal runaway detection
- Water intrusion

Infrastructure

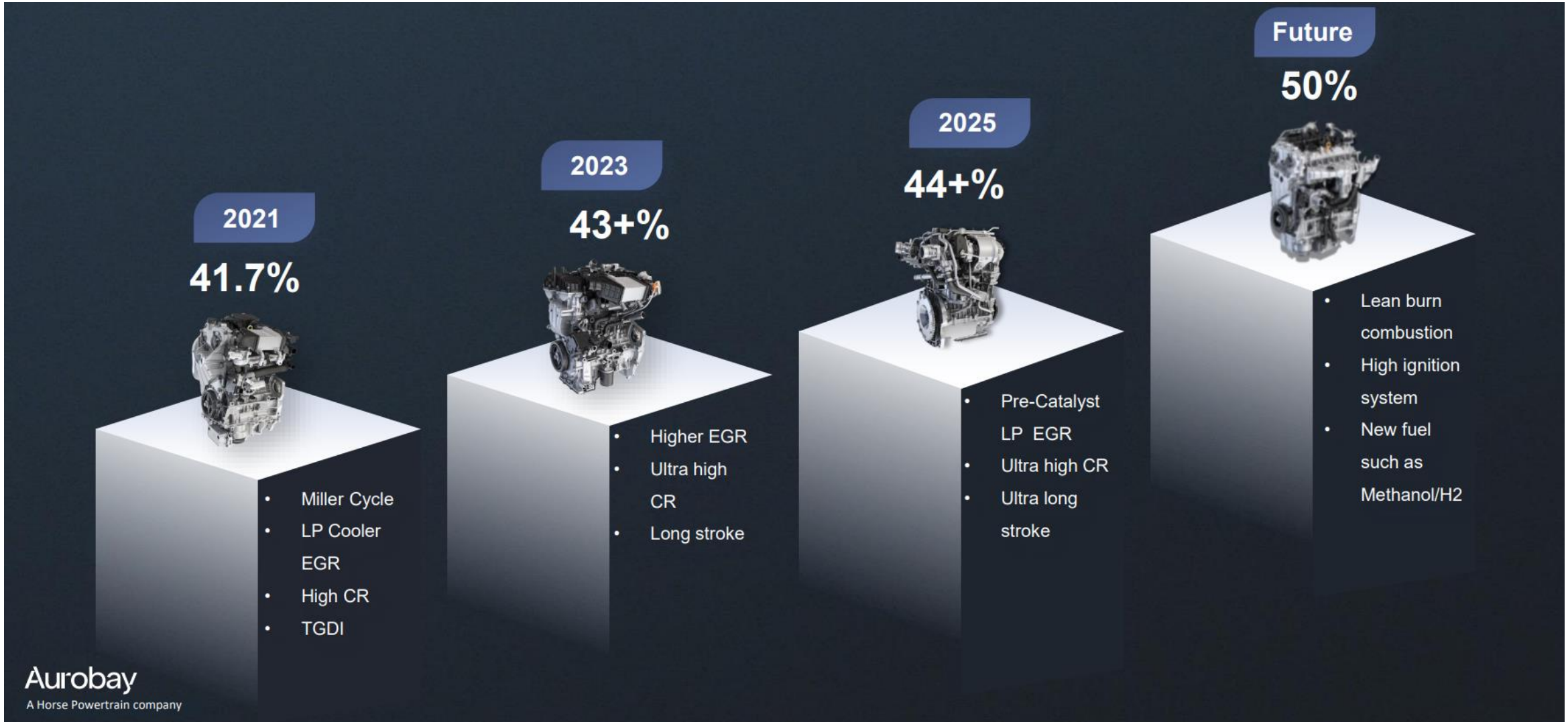
- Gas Quality
- Other Gases (CO_2)
- Coolant leak (HVAC)
- Seasonal storage
- ESS
- H2 Electrolyzers



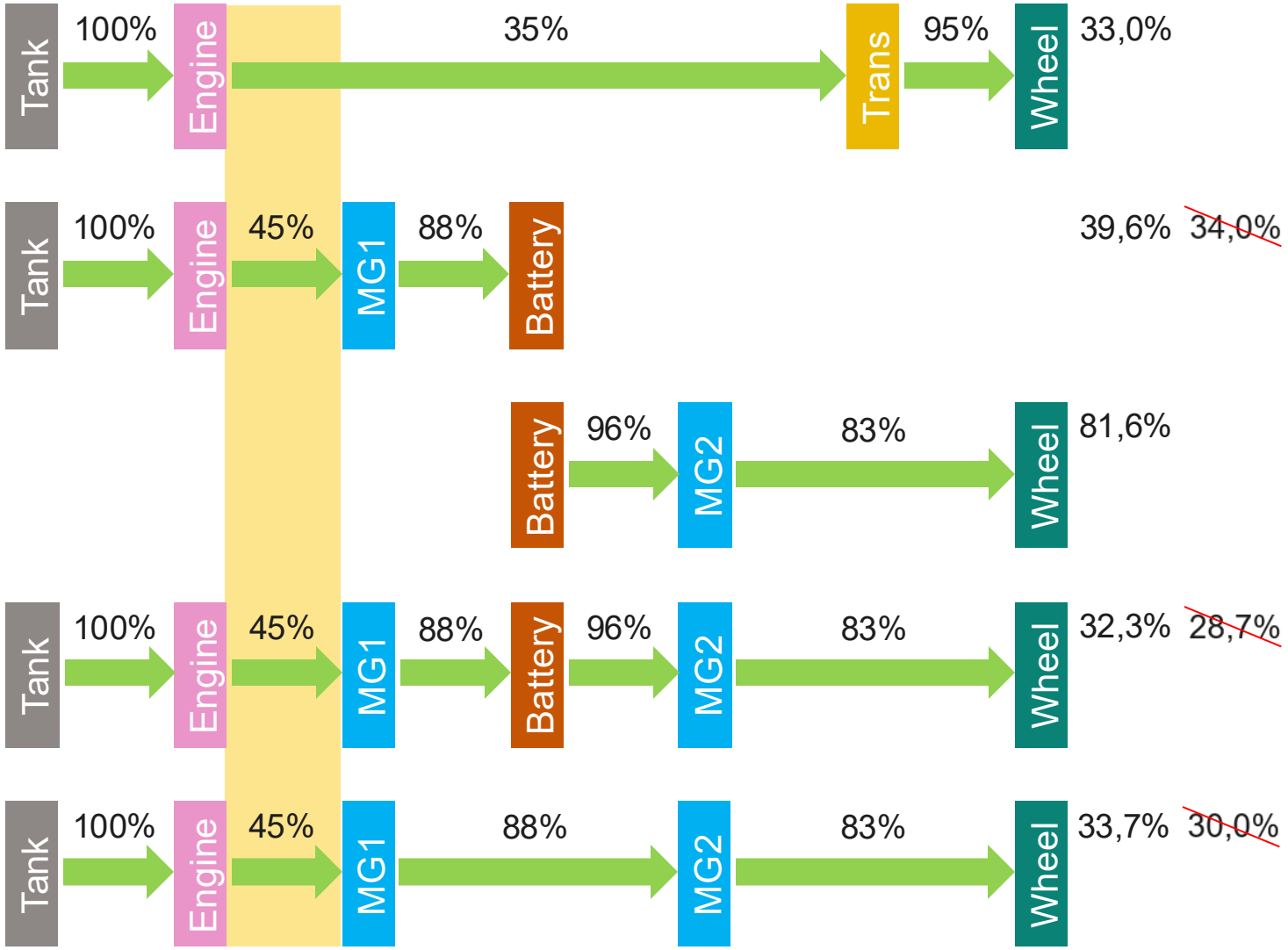
* TC: Thermal conductivity

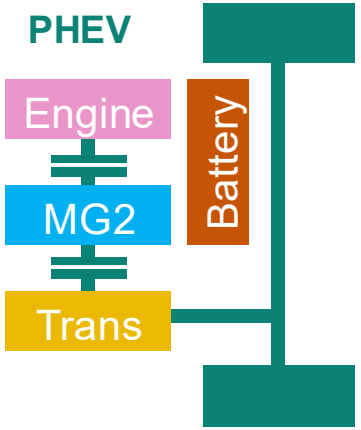
Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

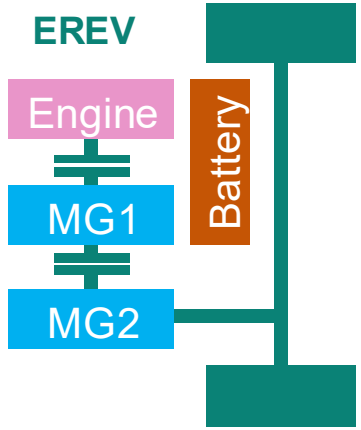
Engine efficiency enhancement
Hybrid engines continue to be more efficient

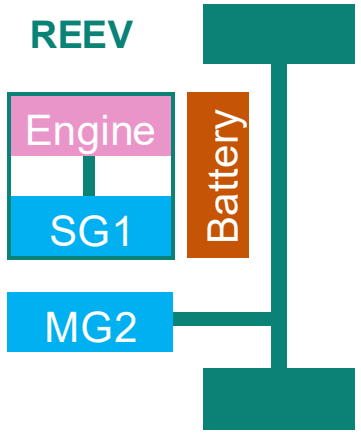


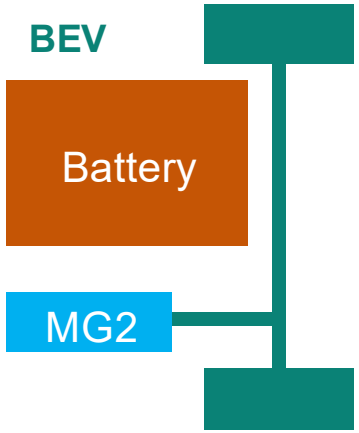
Example: REEV vs EREV (Efficiency Tank to Wheel) with the engine at 45% efficiency











Energy systems for powertrain - a balance of competitiveness, regional relevance and affordability

Balance of competitiveness, regional relevance and affordability

Efficiency of electric machine at 82% on the vehicle
Efficiency of gasoline ICE at 33%
Efficiency of hydrogen 70% target 2030

Multi-energy system will make the mobility system more robust and affordable
E-mobility will become a part of the smart grid infrastructure
Regional regulation have an impact
Never underestimate the user acceptance

Semiconductors contribute significantly to all versions of powertrain up to the mobility system in general


Infineon