SAMSUNG SDI

Automotive Battery Technology – Quo Vadis?

Dr. Walter Schmidt
Samsung SDI Battery Systems GmbH

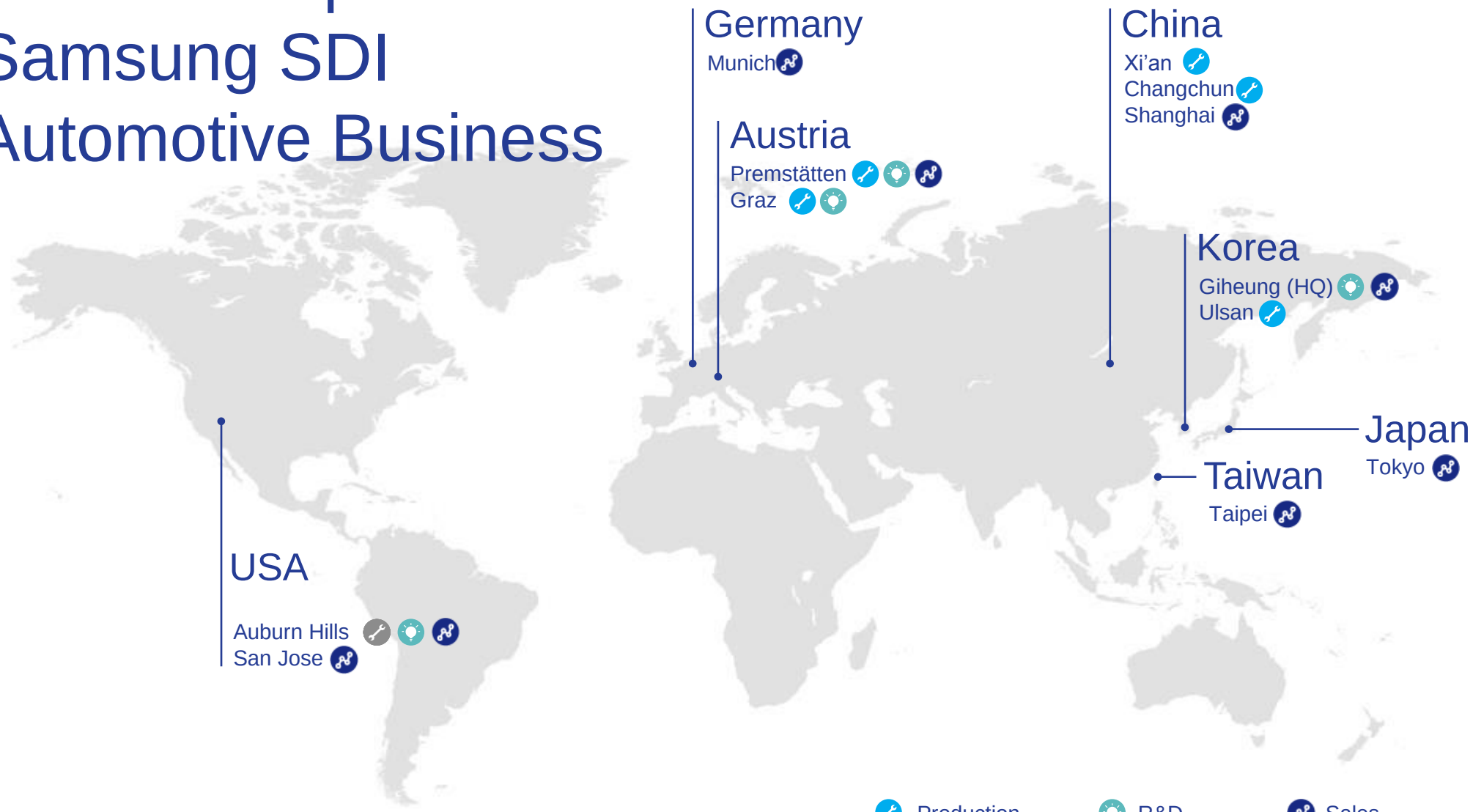
IT Battery

ESS

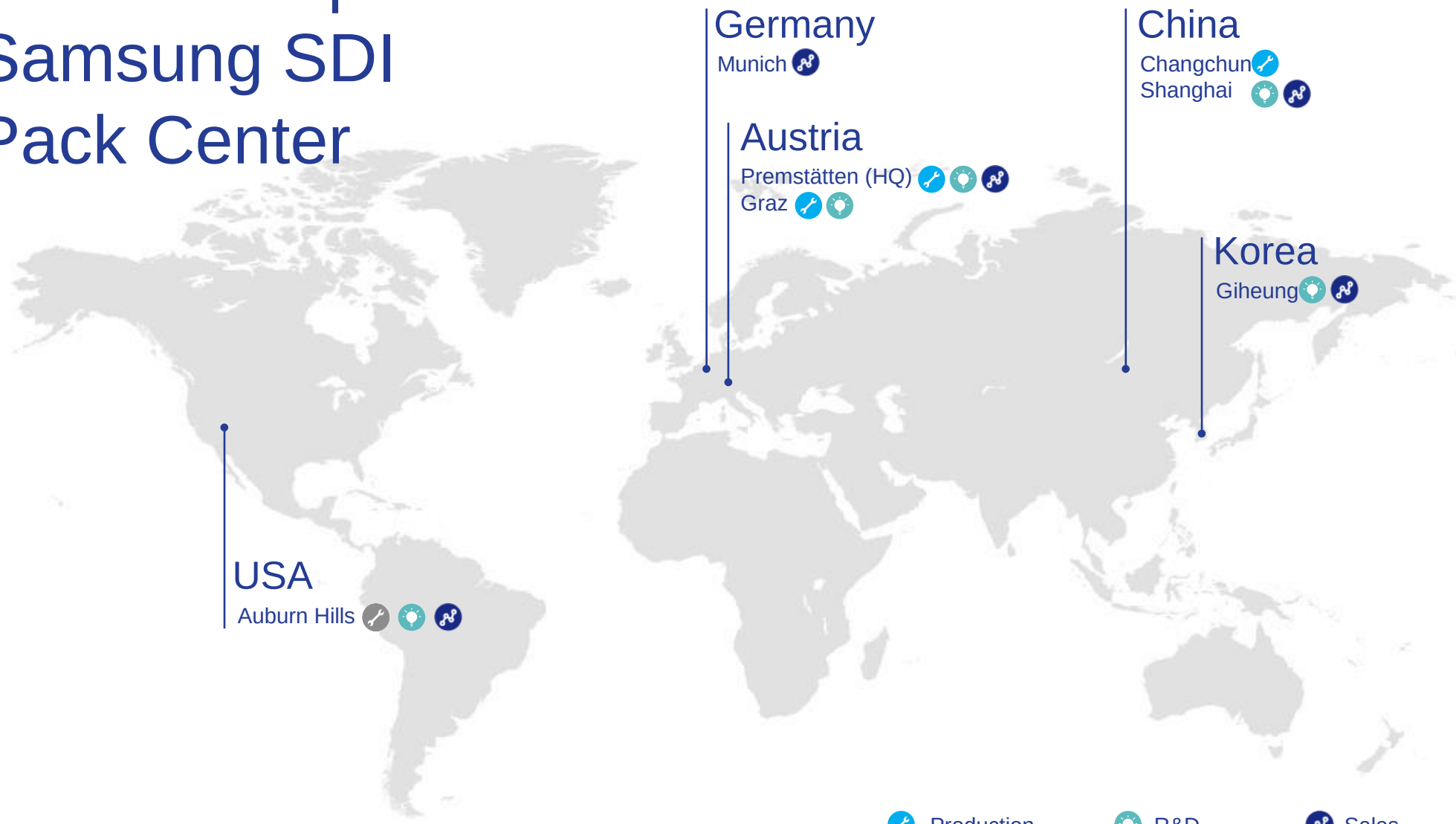
Automotive Battery

Electronic Material

Global Footprint Samsung SDI Automotive Business

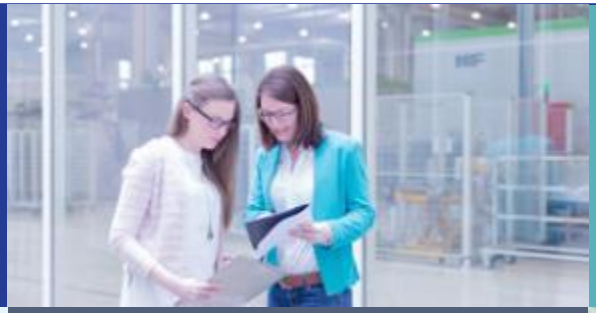


Global Footprint Samsung SDI Pack Center



Samsung SDI Battery Systems HQ

AUSTRIA
Premstätten & Graz



15,260 m²
plant size

435
employees

HQ SDI Battery Systems

Battery Pack Production

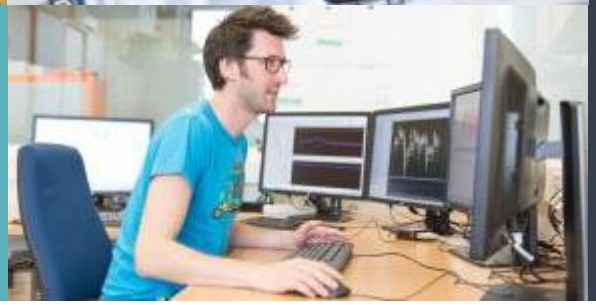
Engineering

Testing & Validation

PT Production

3
PHEV pack production lines

1
HEV truck pack production line



What we do at Samsung SDI Automotive Business

Cell

Samsung SDI's battery-cell portfolio covers the complete automotive range with leading edge production facilities in Korea and China.

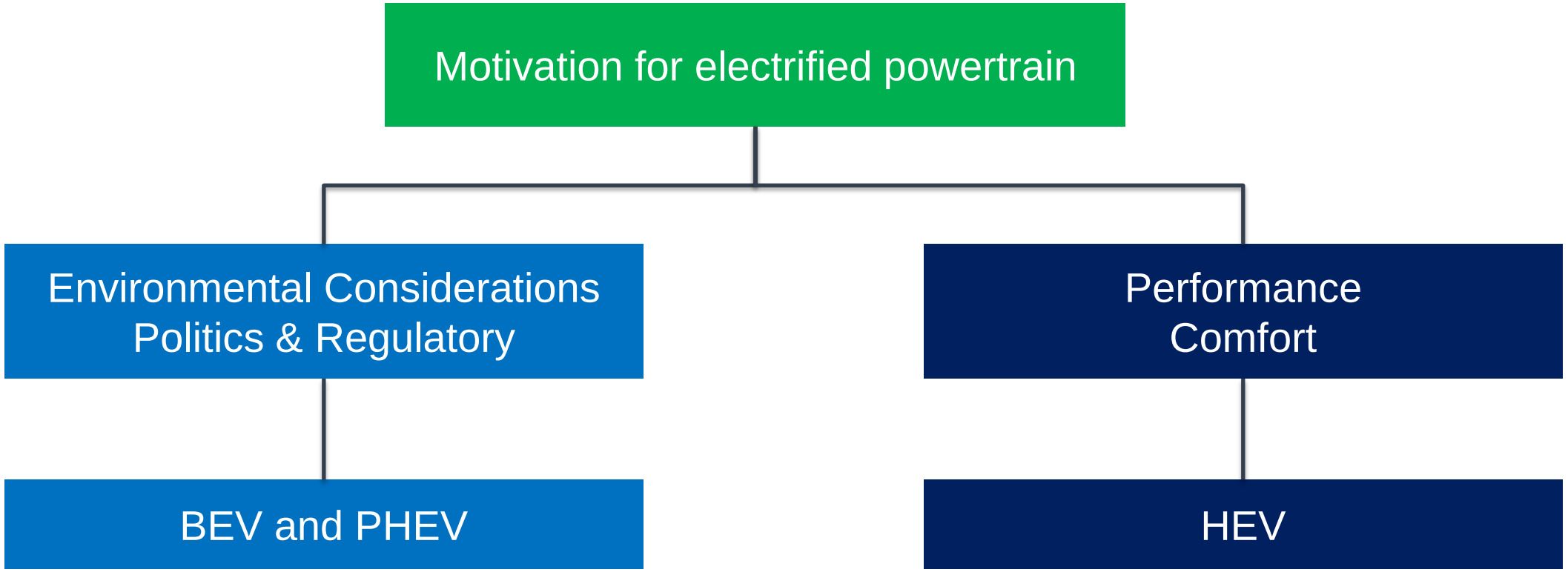
Module

Samsung SDI has developed light-weight, durable modules with integrated cell-management systems. Our modules cover a wide range of possible cells and possible interconnections tailored for HEV, PHEV, and BEV applications.

Pack

Samsung SDI develops and produces high-performance battery-packs for low-voltage (12V / 48V) as well as HEV, PHEV, and BEV applications. Our packs are usually tailored to our customer's needs and specifications.

Motivation – Key Technology Strategies and Drivers



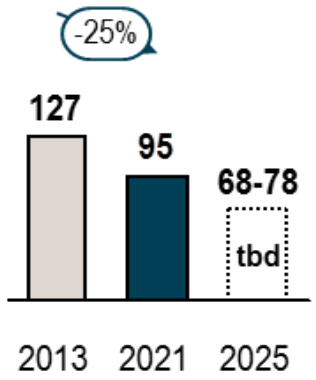
Motivation – Key Technology Strategies and Drivers

Full e-mobility: *Environmental & Politics*

Specified targets

EU:

- CO_2 emissions target[1)]



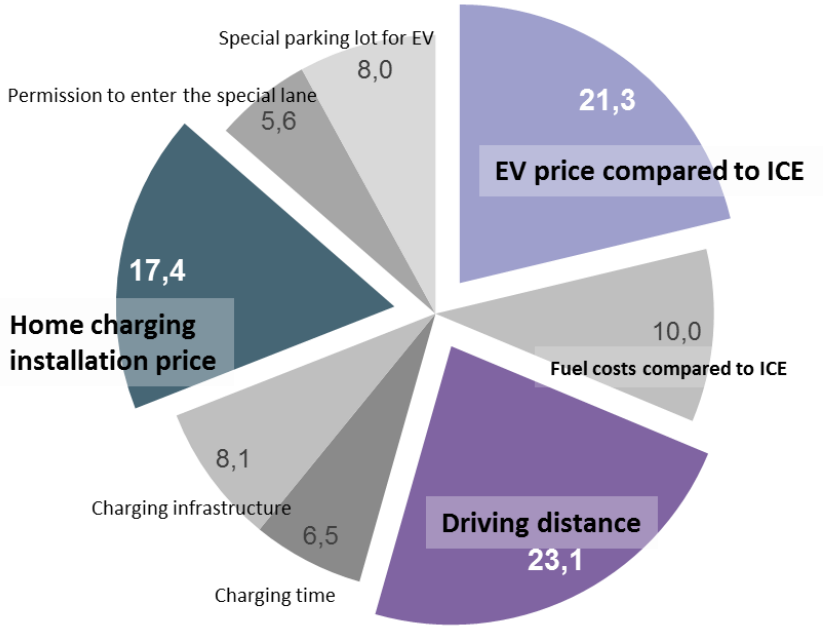
Global

US: -21%
China: -32%

1) Weight-based corporate average
Source: Press research; ICCT; Roland Berger

EV buying decision-drivers

At today's technology level, the end customers' key barriers to buy pure EVs are price, distance and infrastructure:



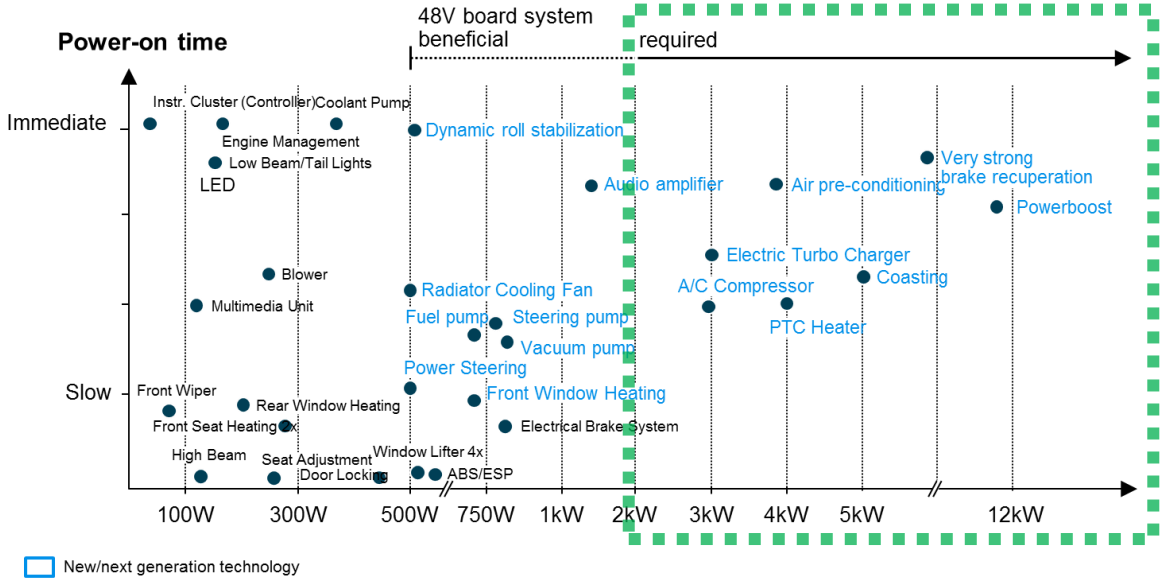
Source: Samsung SDI

Top 3 Drivers

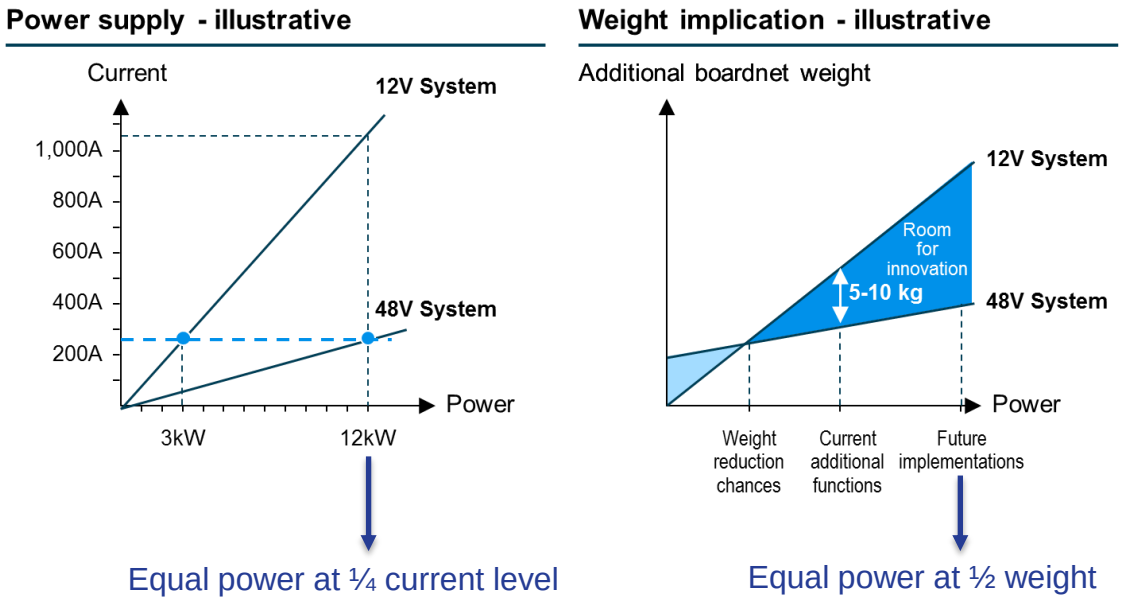
- Driving distance
- Vehicle price
- Home charging price

Partly conservative hybridization: *Performance & Comfort*

Overview additional on-based consumers



12V vs. 48V systems – Power supply and weight implication



Source: SK-Conti (AABC 2015)

Environmental & Politics
Technology: BEV / PHEV

Market demand
- Increase energy density 25%-30%
- Vehicle range targets
  - Small/Mid: ~300km
  - Large: >500km
- Fast charging <20min
- EV price max. +20% of pure ICE

Research Focus 2020
- EV Flat- Pack
- Optimized mechanical integration
  - Scalability of pack size
  - Crash capability of housing
  - Cooling (Liquid / Passive)
- Cost-down

Performance & Comfort
Technology: 48V

Market demand
- Higher power demand up to 12kW
  - Power- Boost
  - Autonomous driving
- High efficiency level
- Low-cost solutions

Research Focus 2020
- Standardization
- Cost-down

Current Battery Packs & Portfolio

	12V	48V	PHEV	BEV Pack
				
	Serial Production	Serial Development	Serial Production	Serial Production (D/C)
Energy Content	0,15 – 0,5 kWh	0,2-3 kWh	6 – 18 kWh	36 – 100 kWh
Power	3 - 6 kW	12 - 25 kW	50 - 120 kW	100 – 500 kW
Voltage	12 V	48 V	400 V	400 V / 800 V
Weight	4 - 5 kg	< 10 kg	80 - 210 kg	400 - 600 kg
Cooling	passive	passive / air / liquid	liquid	passive / liquid
First SOP	2013	2018	2013	2010

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The Power behind Electromobility

Dr. Walter Schmidt

Advanced Development & Cell Technology

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