

City & Infrastructure

Energy storage – The silicon perspective

Andrej Orel, June 2022



Power Electronics & Energy Storage event
14 juni 2022 | 1931 Congrescentrum 's-Hertogenbosch

ENERGY STORAGE
EVENT 2022



entering Prosumers energy era

- Prosumer = individual who both consumes and produces
- Prosumers, who use their own photovoltaic systems, are looking at how they can not only produce and use the energy they create, but also review how they can then share any excess energy between neighbors, communities and the wider grid
- Bidirectional charging allows the vehicle to supply power back to home/grid
- Residential Battery storage together with Bidirectional EV charging offers the opportunity to become energy self-sufficient when combined with renewable energy sources
- New opportunity to save money by selling excess energy
- PV panels on roof power the house during the day
- Excess energy generated can be stored in EV or local battery storage and used at night, or the next day at home/driving
- Blockchain, a public distributed ledger, is used for storing, verifying and maintaining peer-to-peer transactions. It also has huge potential to disrupt the energy sector, offering a viable transaction alternative to traditional models.

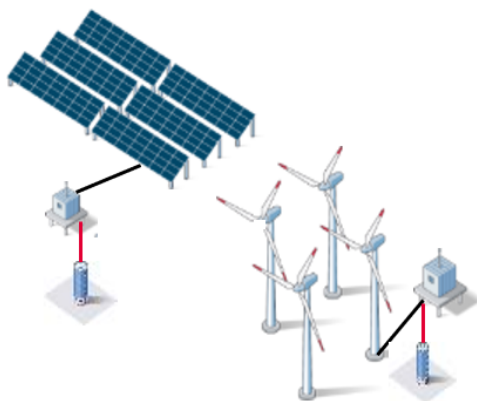


Energy storage is an integral component of electricity generation, transmission, distribution as well as consumption

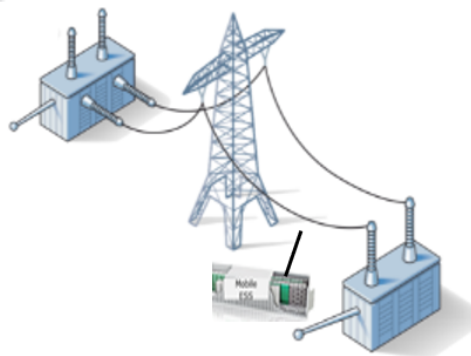
Before-the-Meter

- › Conventional and renewables generation combined with ESS (stationary ESS)
- › Transmission and distribution system with bulk ESS (stationary / mobile ESS)

Generation



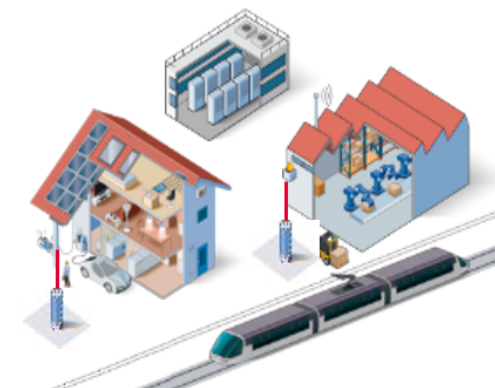
Transmission



Behind-the-Meter

- › Roof top PV, UPS, V2G (stationary / mobile ESS)

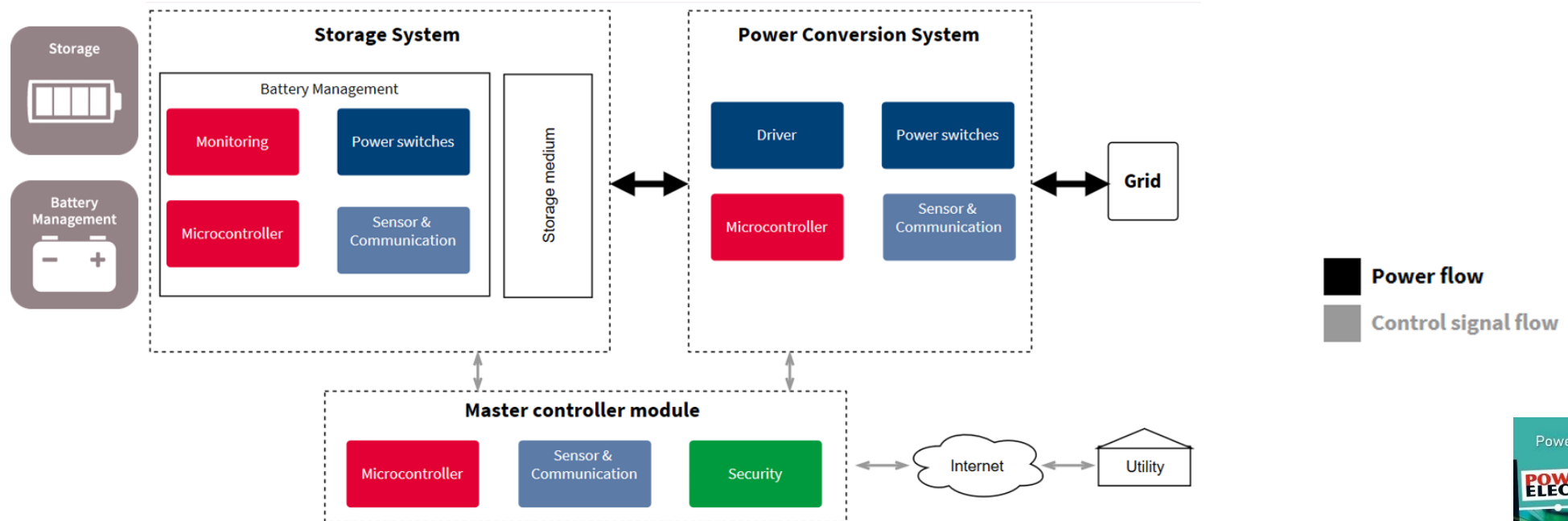
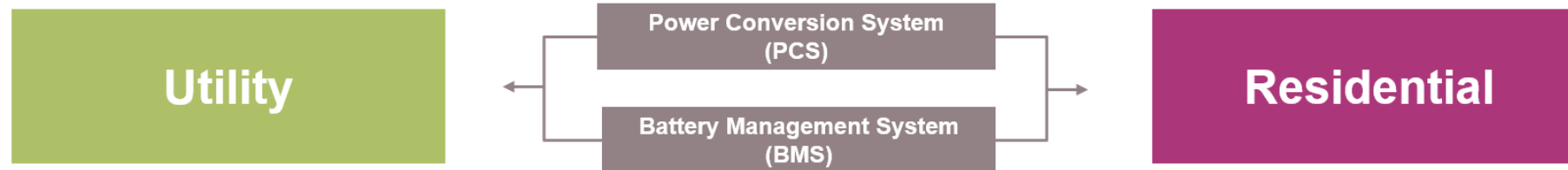
Consumption



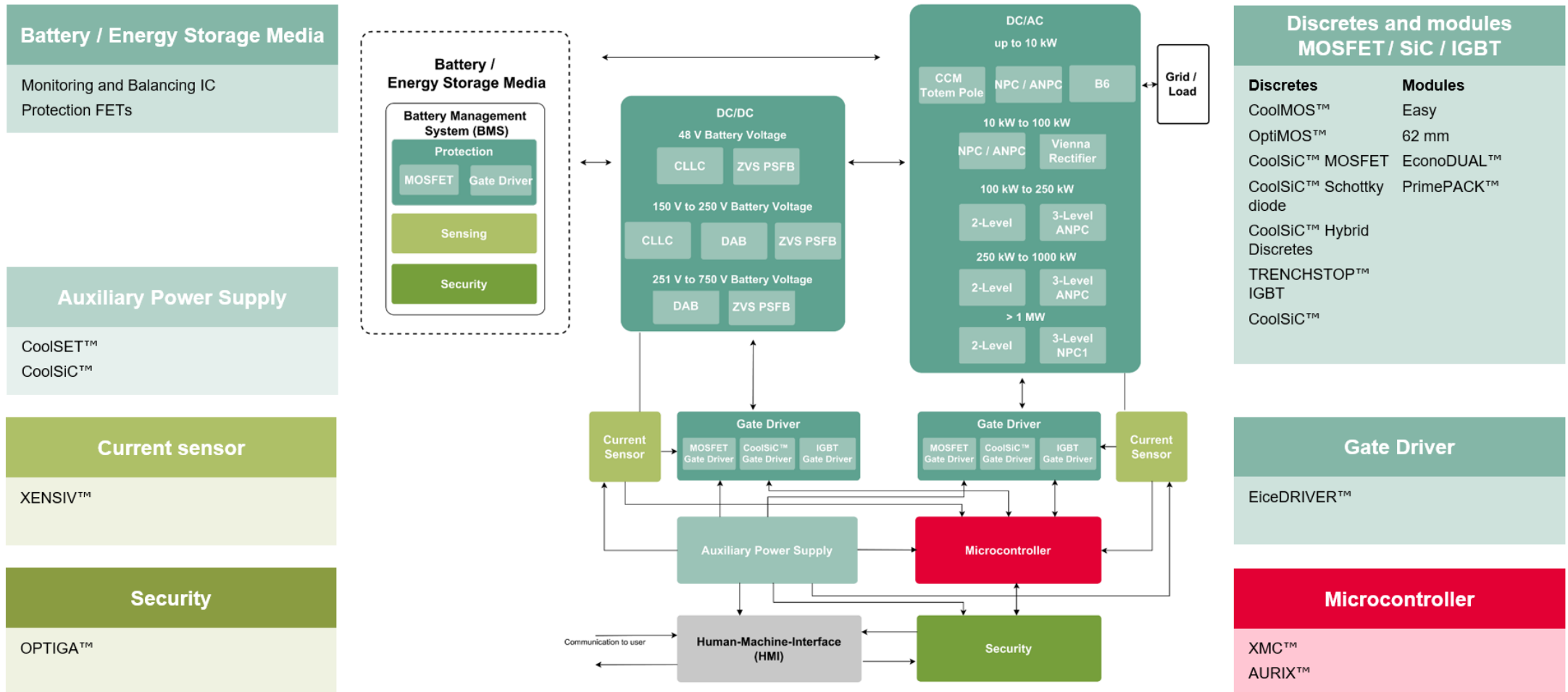
Bulk storage, substation, utility wind & utility photovoltaic (PV)

Commercial, residential PV & charging stations

Basic overview of the Energy Storage System



Energy Storage System from Infineon

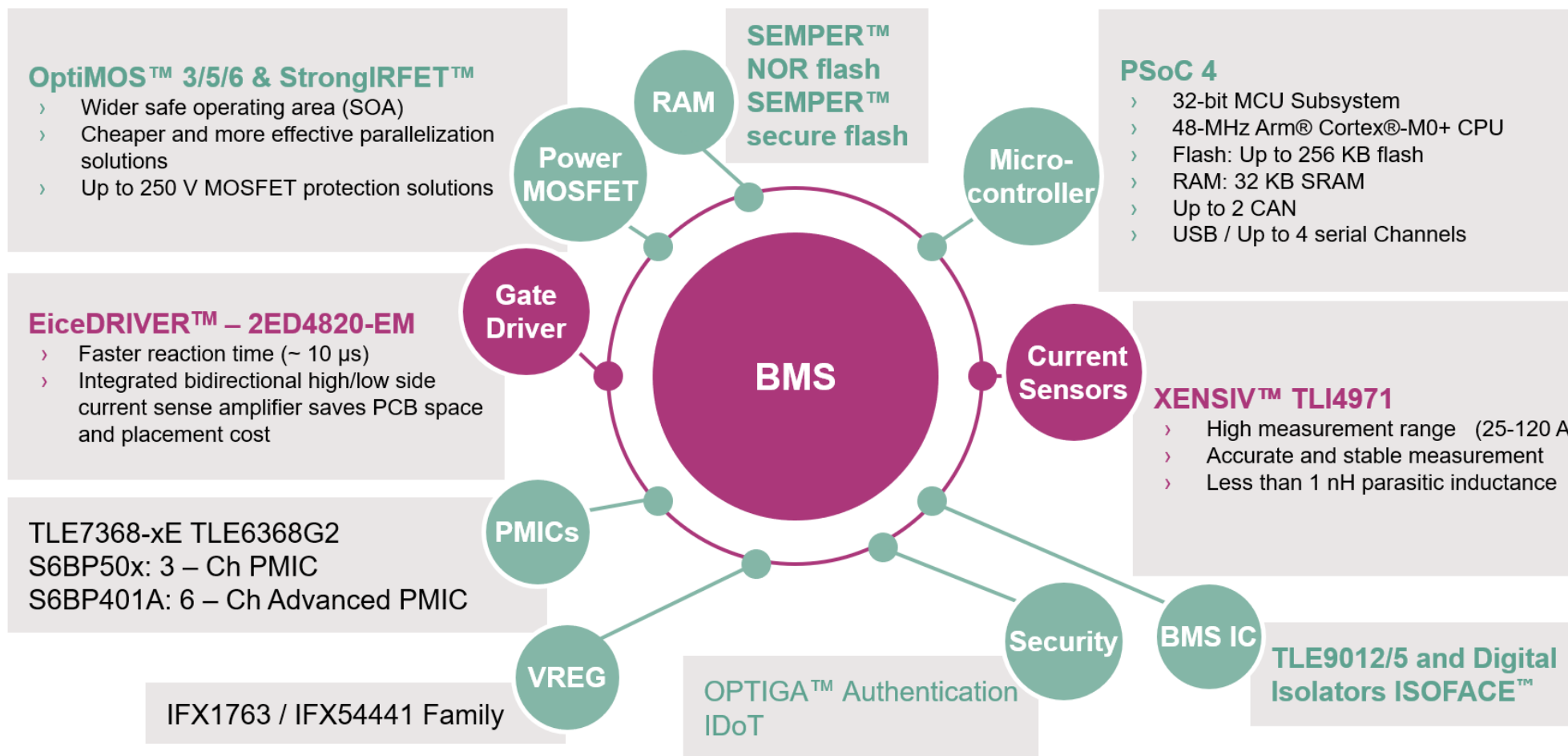


Discretes and modules MOSFET / SiC / IGBT	
Discretes	Modules
CoolMOS™	Easy
OptiMOS™	62 mm
CoolSiC™ MOSFET	EconoDUAL™
CoolSiC™ Schottky diode	PrimePACK™
CoolSiC™ Hybrid Discretes	
TRENCHSTOP™ IGBT	
CoolSiC™	

Gate Driver
EiceDRIVER™

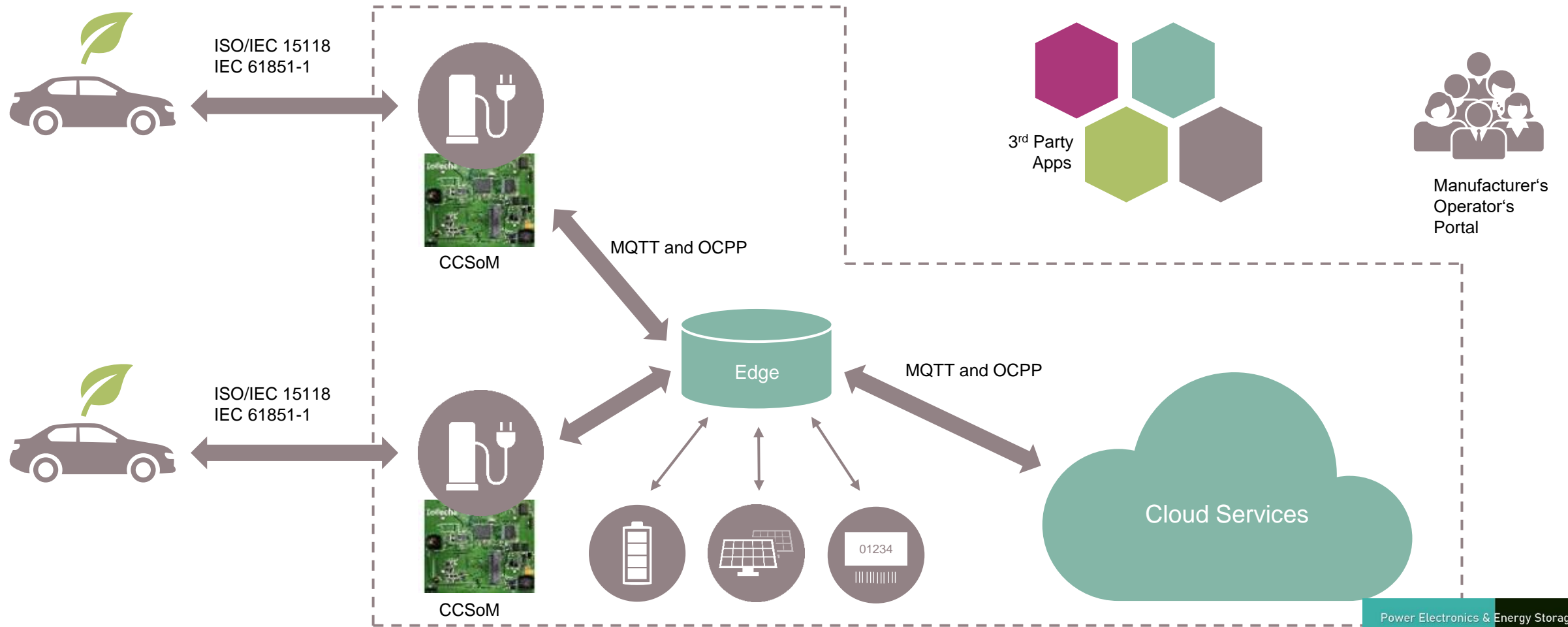
Microcontroller
XMC™
AURIX™

Beyond power conversion - BMS from Infineon



The Big Picture of Energy Infrastructure

EBV Elektronik



Battery storage & EV charging solutions from EBV Elektronik

Connectivity

Ethernet, Wi-Fi, and HomePlug AV/GP for local network

ZigBee for smart energy

LCD for the local UI

USB for mass storage

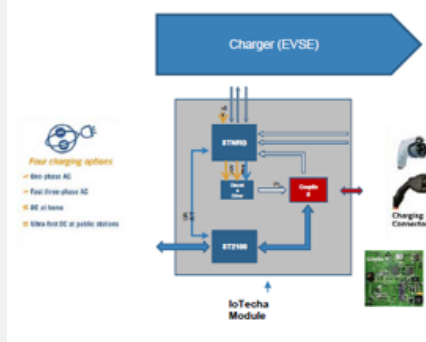
3G/4G for the cloud connectivity

HomePlug GP for the communication with EV

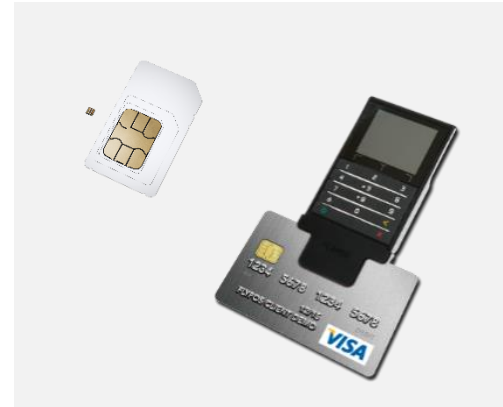
Smart charger



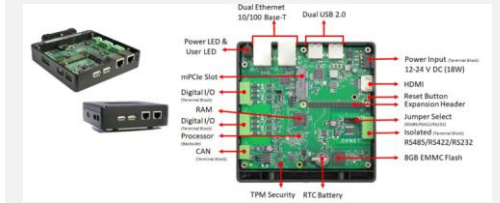
ISO15118



EUICC (ESIM)



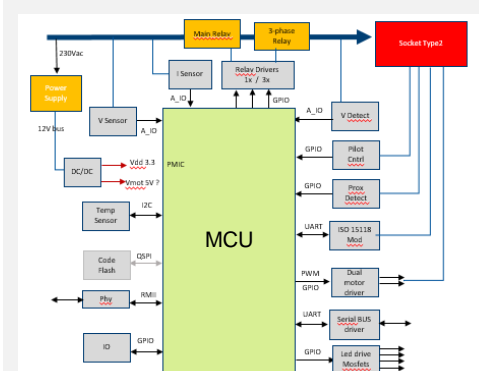
Smart gateway



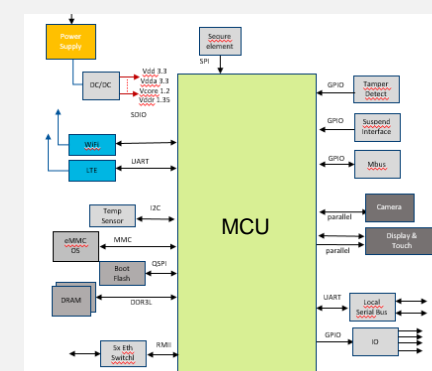
Power stage



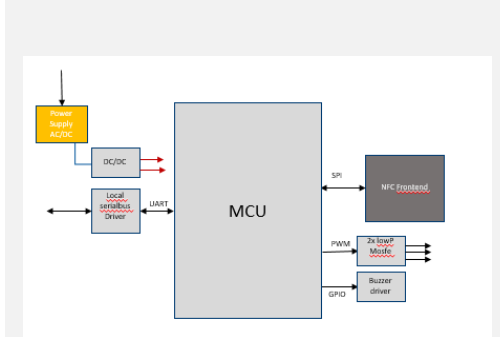
Socket control



Controller hub



Payment/billing



Get connected with the Best

AMD
XILINX

amlogic OSRAM

AVNET
EMBEDDED / MSC

 BROADCOM

EBV Chips

 infineon

 ISSI  LUMISSIL Microsystems
A Division of ISSI

 MICROCHIP

 Micron

nexperia

 NXP

onsemi

power
integrations™

RENESAS

SAMSUNG

 SGMICRO

 SIMCom
a SUSEMIOT company

 ST
life.augmented

TOSHIBA

 VISHAY

Thank you

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