EuroSPI Certified Electric Powertrain Engineer

Svatopluk Štolfa, VŠB – TU Ostrava (CZ)

svatopluk.stolfa@vsb.cz,

VŠB - TU Ostrava, CZ

TU Graz, AT

TU Sophia, BG

HS Dusseldorf, GE

I.S.C.N. GesmbH, AT

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ECEPE Course? Motivation and Chalenges

ELECTRIC POWERTRAIN

one of the consequences of many drivers-of-change in the automotive domain

SYSTEM DEVELOPMENT

technology, team, processes

Mechanic vs. Electronics vs. Software

UNDERSTANDING IS THE KEY

Desired functions of the product

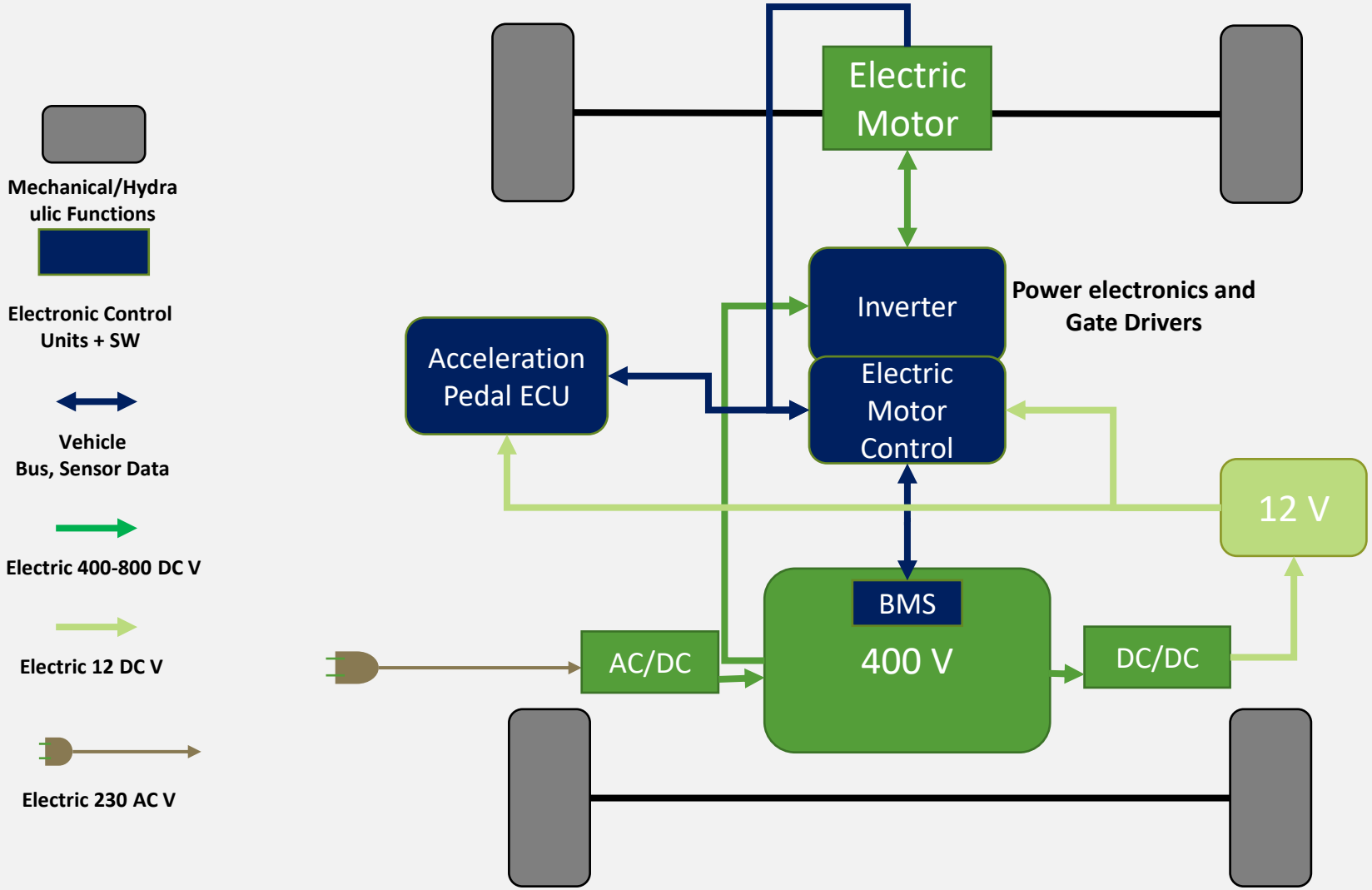
Basic principles

Synthesis of different domains

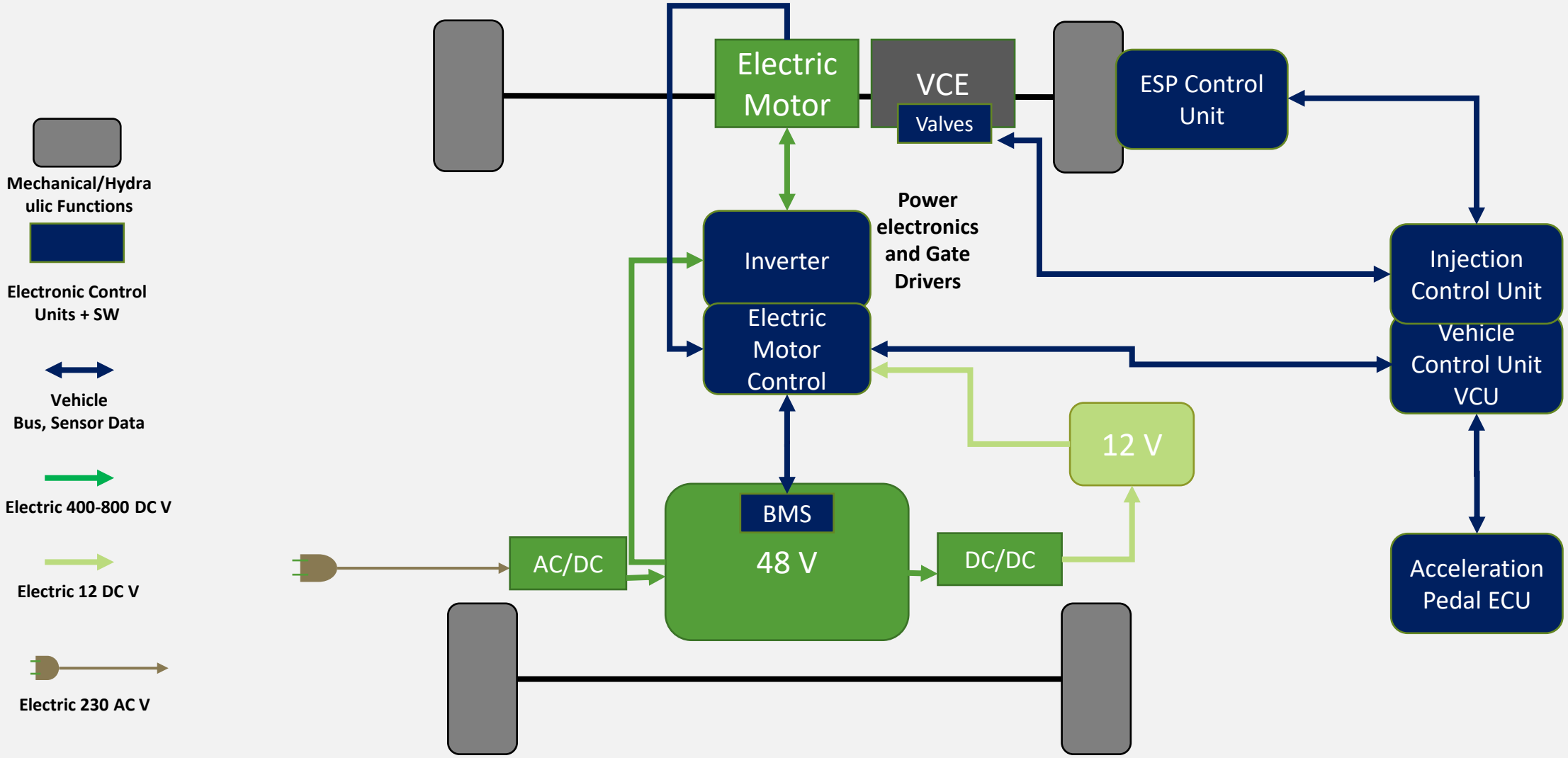
Different e-Powertrain Architectures

- Battery Electric Vehicle (BEV)
- Hybrid Electric Vehicle (HEV)
- Range Extender Electric Vehicle (REV)
- Fuel Cell Electric Vehicle (FCEV)
- In Wheel Concept of an Electric Vehicle (IWEV)

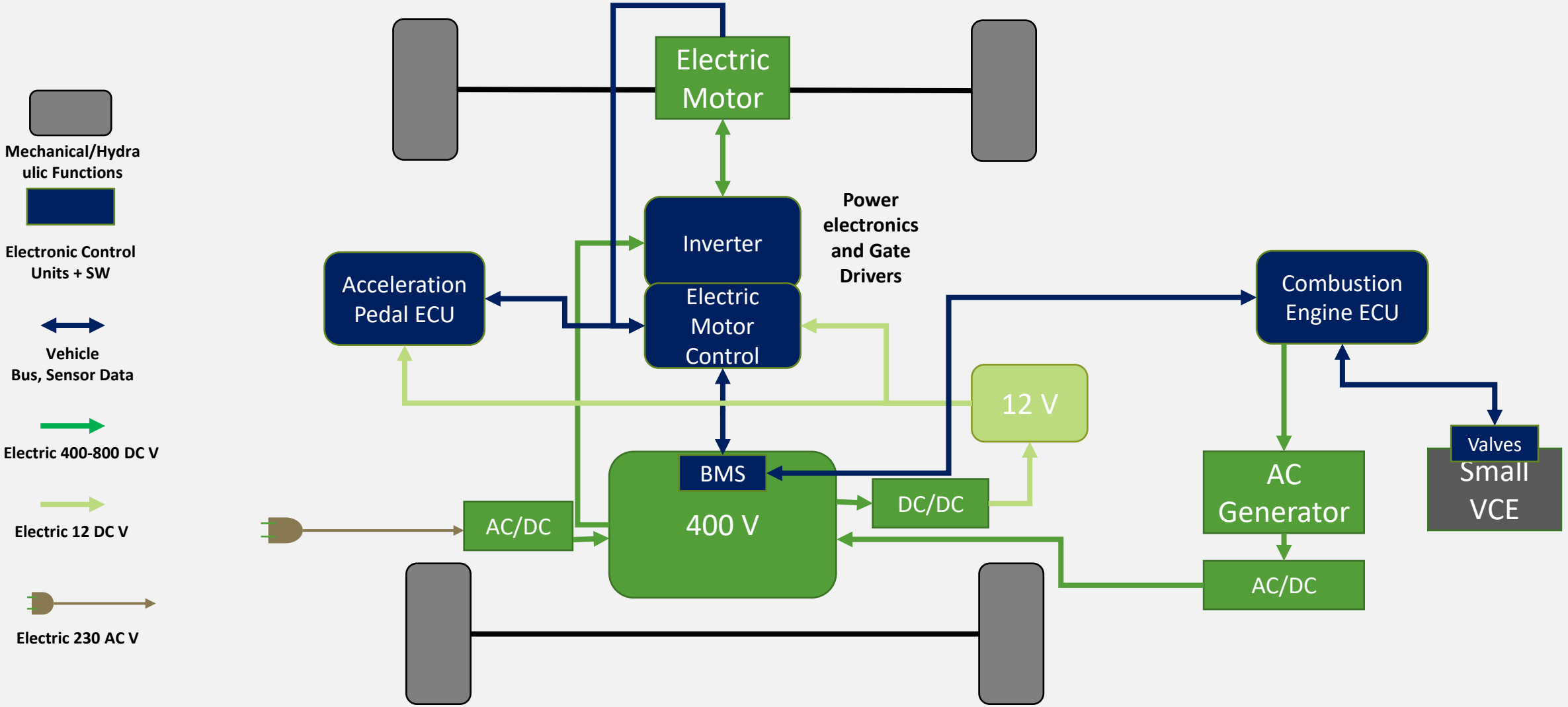
Battery Electric Vehicle (BEV)



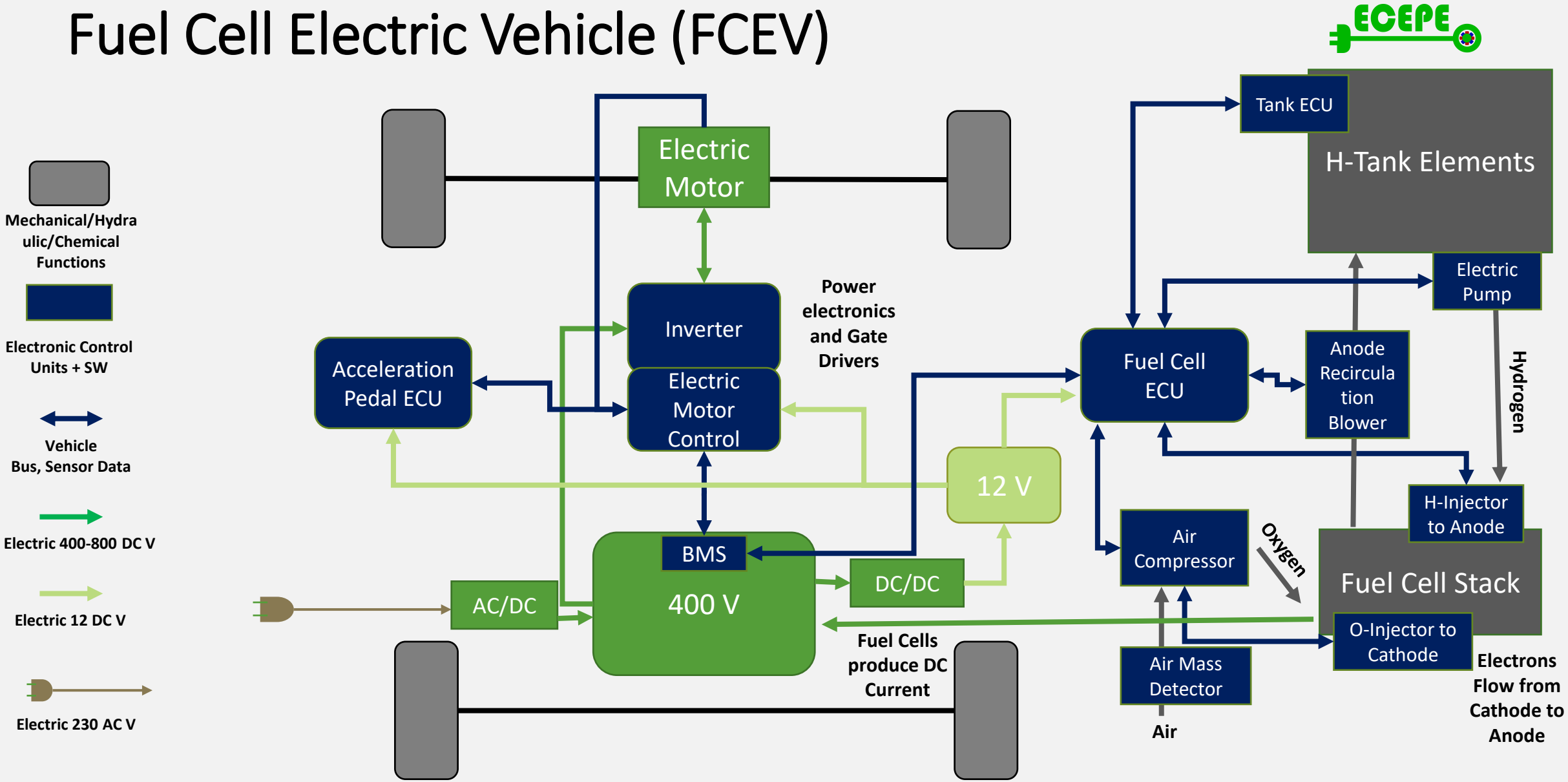
Hybrid Electric Vehicle (HEV)



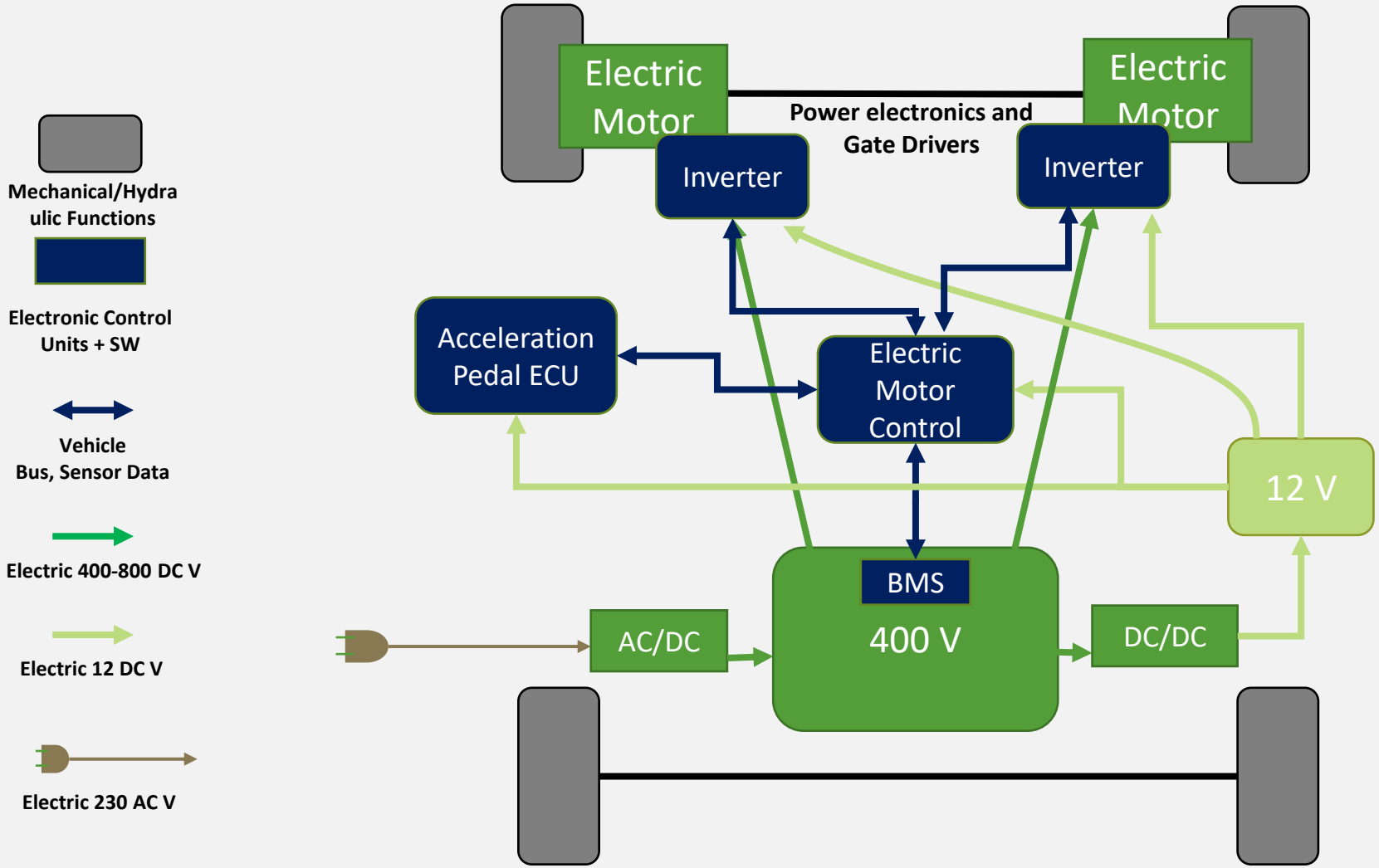
Range Extender Electric Vehicle (REV)



Fuel Cell Electric Vehicle (FCEV)



In Wheel Electric Vehicle (IWEV)



ECEPE Course – Skill Card

ELECTRIC POWERTRAIN

U.3 Propulsion systems

- U3.E1 eMotor
- U3.E2 Power electronics, inverters
- U3.E3 Motor control unit
- U3.E4 Hybrid control systems
- U3.E5: Energy transformation systems
- U3.E6: Transmission systems

U.4 Energy Storage Systems

- U4.E1 Battery systems
- U4.E2 Battery management systems
- U4.E3 Fuel cells

SYSTEM DEVELOPMENT

U.2 System engineering (Function-based-Development)

- U2.E1 Function based development
- U2.E2 Functional safety aspects
- U2.E3 Cyber security aspects

U.5 Life Cycle Management

- U5.E1 Product life cycle
- U5.E2 Life cycle management and business models

UNDERSTANDING IS THE KEY

U.1 Introduction

- U1.E1 Motivation and challenges
- U1.E2 Product life cycle
- U1.E3 Product homologation and standards
- U1.E4 Embedded automotive systems
- U1.E5 ePowertrain architecture

ECEPE Course – Practical part

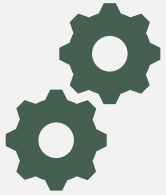
ELECTRIC POWERTRAIN

U.3 Propulsion systems

- eMotor principles and its control unit
- Transmission systems

U.4 Energy Storage Systems

- Battery balancing example



SYSTEM DEVELOPMENT

U.2 System engineering (Function-based-Development)

- Function is fulfilled by sensor-control-actuator principle
- Realized by the combination of mechanical parts, HW, SW

U.5 Life Cycle Management

- Lifecycle models

UNDERSTANDING IS THE KEY

U.1 Introduction

- Drivers-of-change - Where are we heading to?

ECEPE Summary

Training consist of 5 units divided to 19 Elements
- approx. 25 slides each
- more than 7 practical examples
- full version 45-65 hours of learning

Erasmus+ 2019-2021
100 pilot trained trainees
10 trainers trained

For

Trainees or students with mechanical, SW or HW background that needs to be part of the development or assessment team

Covering

Technology insights
System development insights
Understanding and motivation

Modular - Units and Elements

Customization of length and focus based on trainee's background or needs
- E.g.2-5 days

ECQA Certificate

Thank you for your attention

More information:

www.project-ecepe.eu

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