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#RTR2026

XL-Connect

Large scale system approach for advanced charging solutions

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2ZERO ERTRAC CCAM European Commission | With the support of BATT4EU Batteries European Partnership

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Overall project presentation

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Project overview

Project title: Large scale system approach for advanced charging solutions

Project start: 01.01.2023

Project end: 30.06.2026

Duration: 42 Months

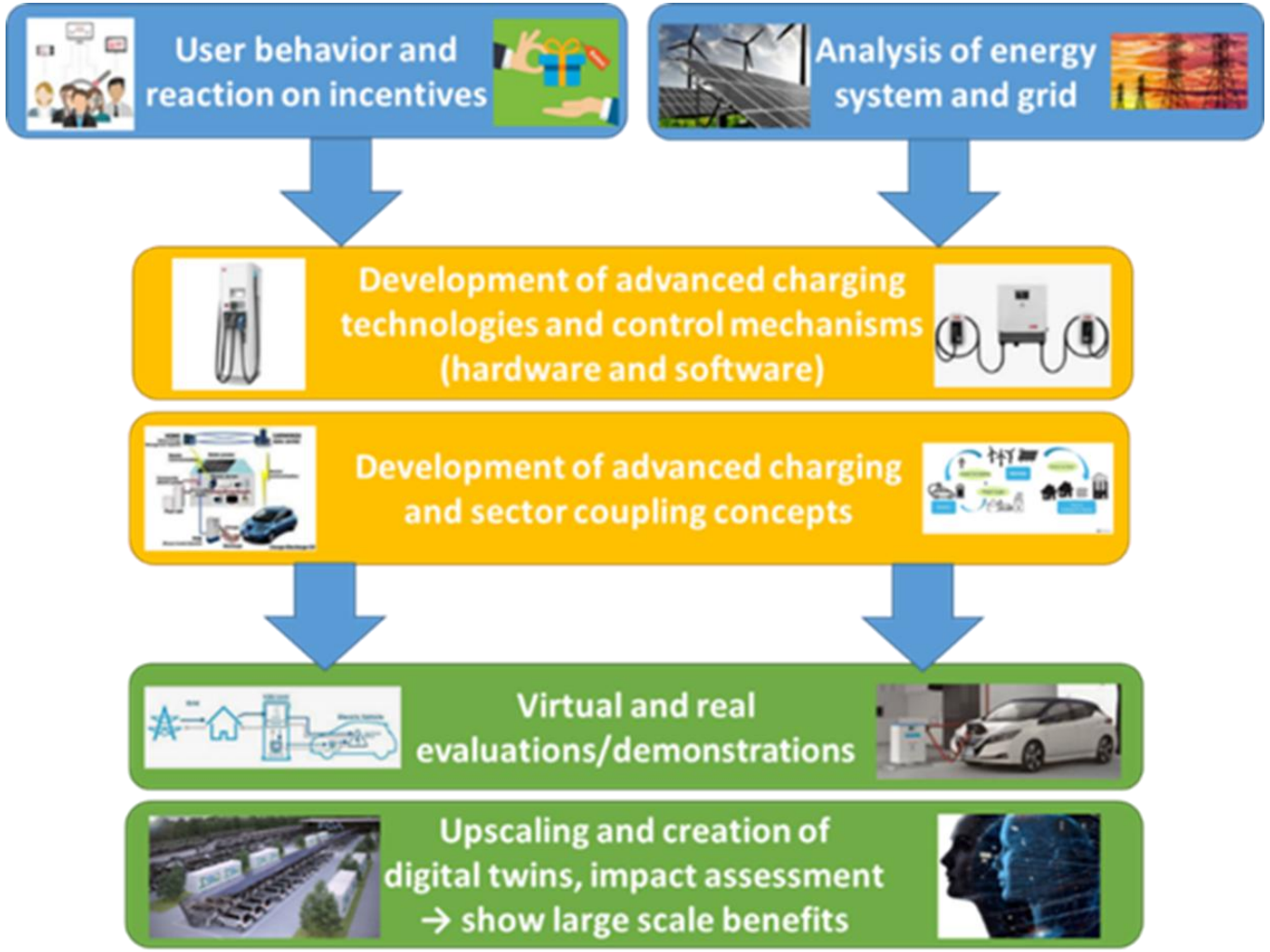
Budget: 8.4 Mio €

# of project partners: 23 from 9 European countries

„Charging chain“

Energy providers, grid operators	Software devolopers, data analytics	Charging equipment manufacturers	Car manufacturer
- E-Redes (PT)	- DCCS	- ABB	- BMW
- ESTRA (IT)	- Mycroftmind	- Circontrol	
- Regionetz (DE)		- Eavy Charging	

XL-Connect approach



Results presentation

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Development of V2G equipment: bidirectional charging station

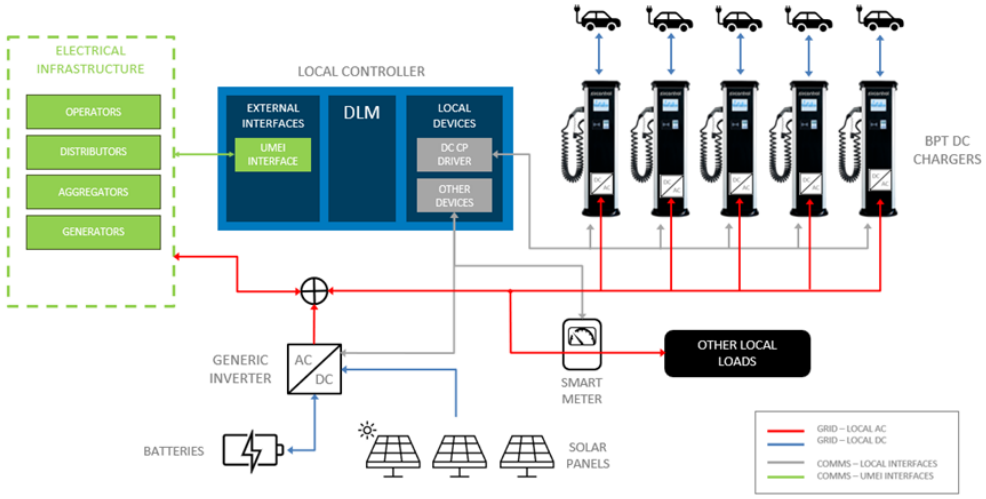
LOCAL CONTROLLER

Technology:

- Platform based in EdgeX Foundry
- Load balancing algorithm
- Online / Offline charger management
- Interface to energy markets (UMEI)

Status:

➢ Solver Algorithm → Integrated and tested



BIDIRECTIONAL CHARGING STATION

Technology:

Up to 30kW

RFID identification

ISO 15118-2
ISO 15118-20

IEC 61851

Status:

➢ Communication between simulator and CS (w/ ISO 15118-20) → Tested and OK

➢ First charge with power (w/ ISO 15118-20) → Tested and OK

XL-Connect Demonstration Sites

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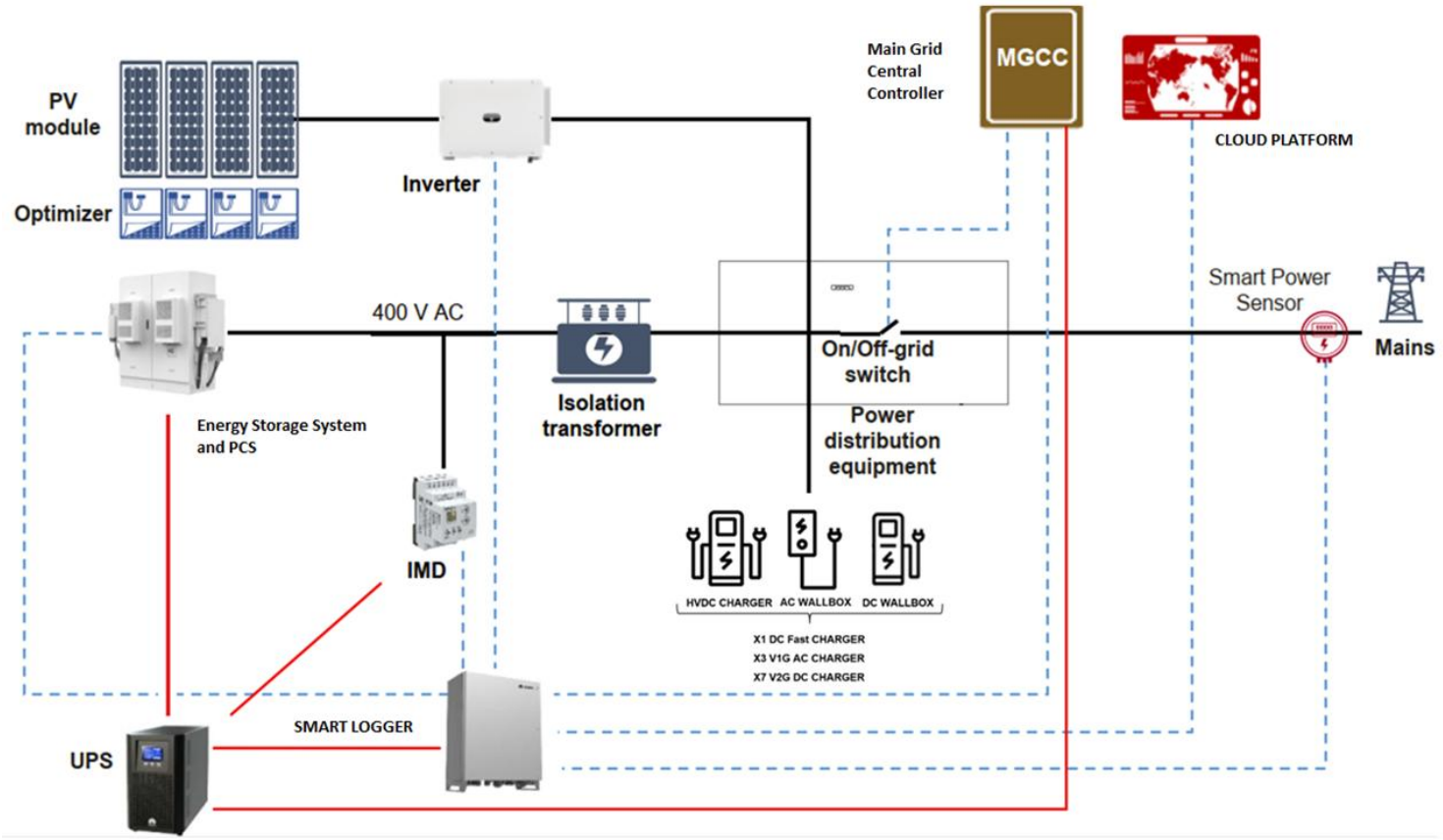
Real-World Demonstration at ABB (Italy): AC Microgrid



Chargers

- 7x11kW DC V2G chargers with CCS
- 3x22kW AC wall-boxes
- 1xDC fast charging (Heavy Duty vehicles)

EVs (V2G capable)

- Pool cars with CCS and V2G capable
- Vehicle Emulator (V2G tests)

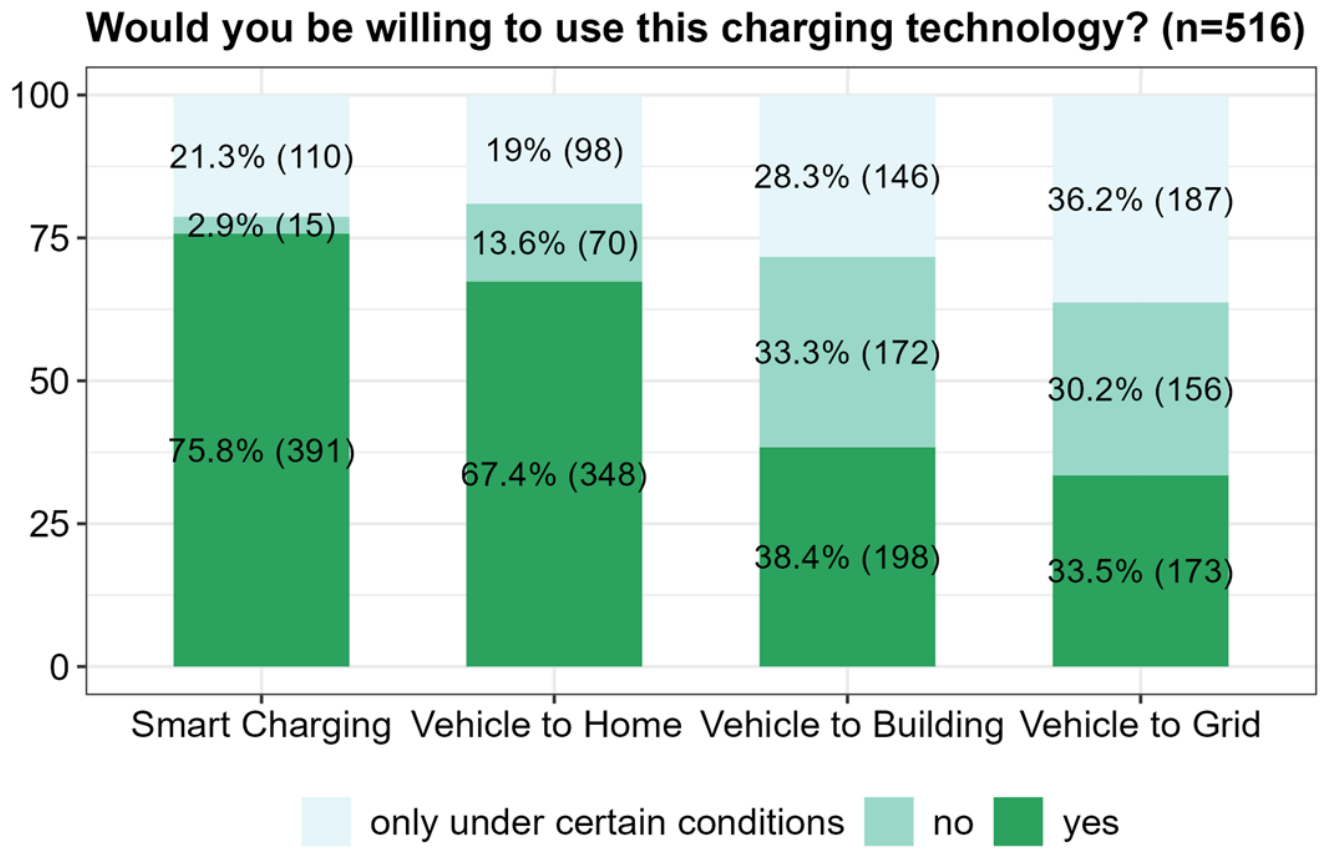
Microgrid

- BESS, PV System and Chargers
- Microgrid EMS:
  - PV optimization and Peak Shaving
  - Smart Charging Strategies for EVCI
  - Islanding operations (ON/OFF GRID)

Investigation of user behavior

Results:

- Participants are willing to use Smart Charging and Vehicle-to-Home (Optimize their homes)
- Participants are sceptical towards Vehicle-to-Building and Vehicle-to-Grid



Investigation of user behavior

Results:

“I would like to know how much ageing occurs”

„Compensation for battery ageing necessary“

“It should be financial beneficial for me to offer these services to the grid”

“It seems like modern highway robbery”

“A minimum charging state has to remain in the battery (for urgent personal trips)”

→ Informing the end-users

→ Tailored incentives

→ Guaranteed boundary conditions (e.g. minimum SoC)

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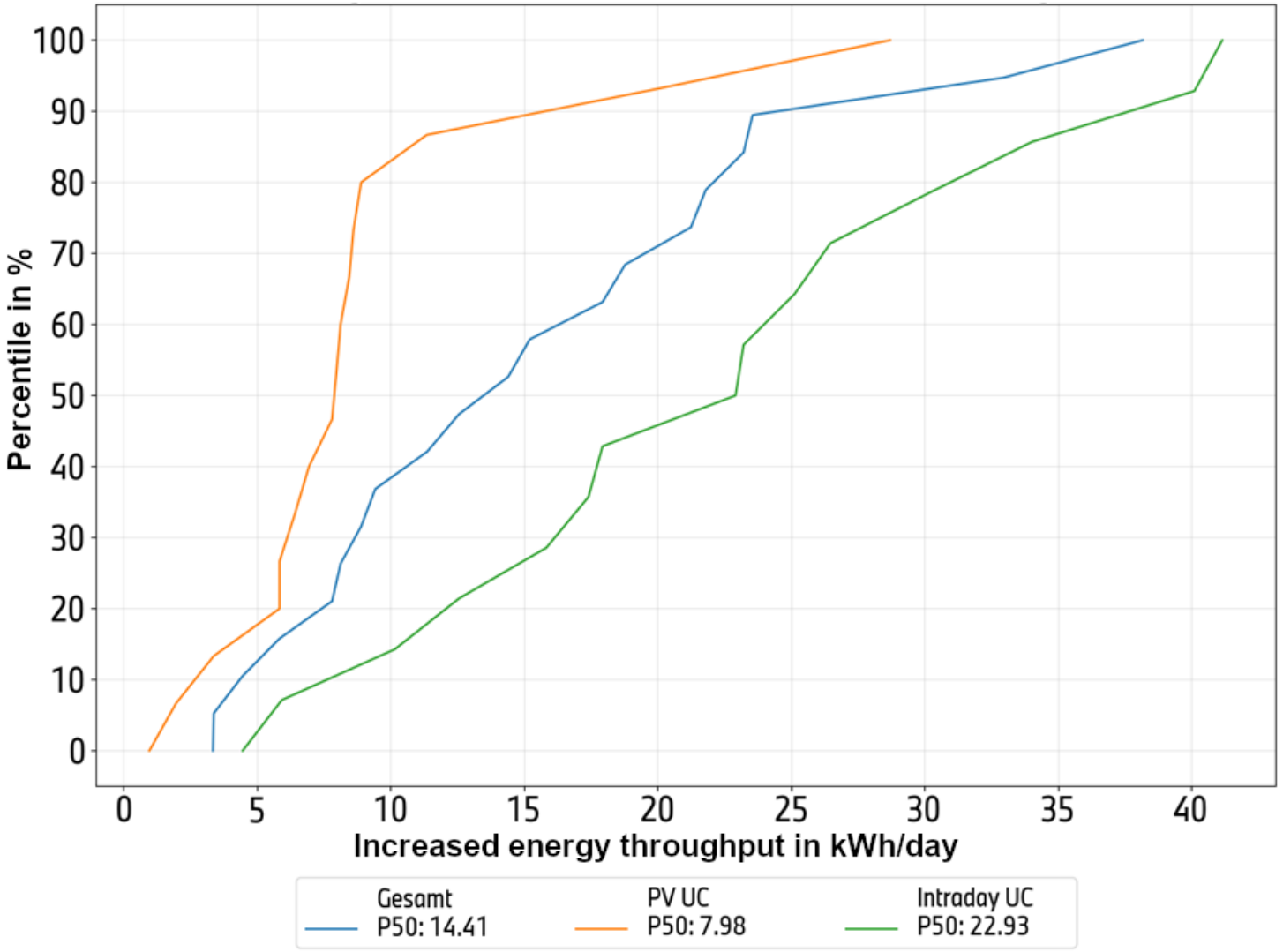
Increased energy throughput for PV & Intraday UC

Increased energy throughputs...

... 8 kWh/day for PV use case

... 23 kWh/day for Intraday use case

→ Significantly higher energy throughput for Intraday use case



Increased operation time for PV & Intraday UC

Increased operation time…

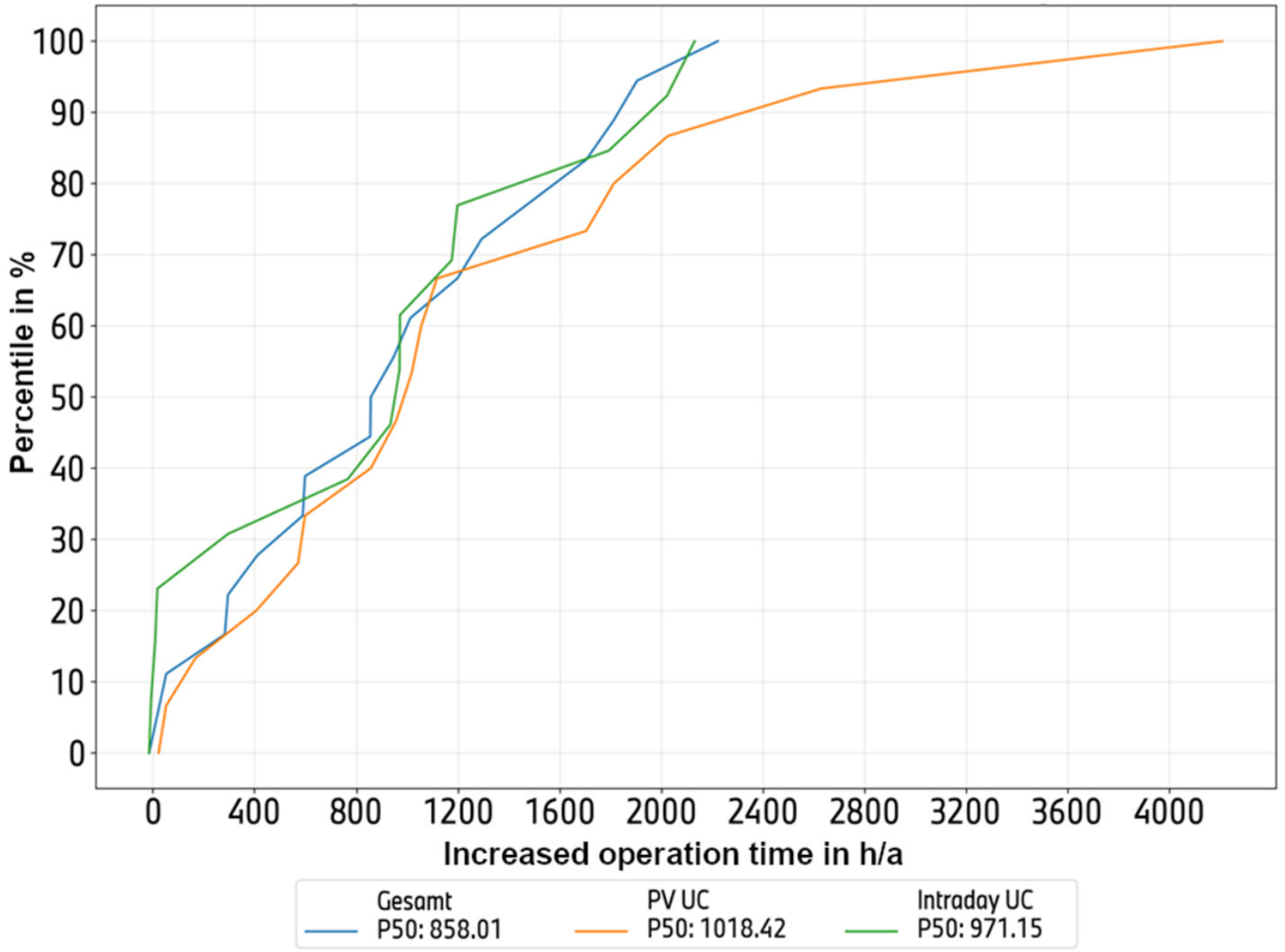
… 1020 h/year for PV use case

… 970 h/year for Intraday use case

Average operation time for a vehicle: 200-400 h/year

→ Dramatically higher operation time for PV & Intraday use case

→ Could lead to lifetime issues for power electronics



Mid to long term expected impacts of the project

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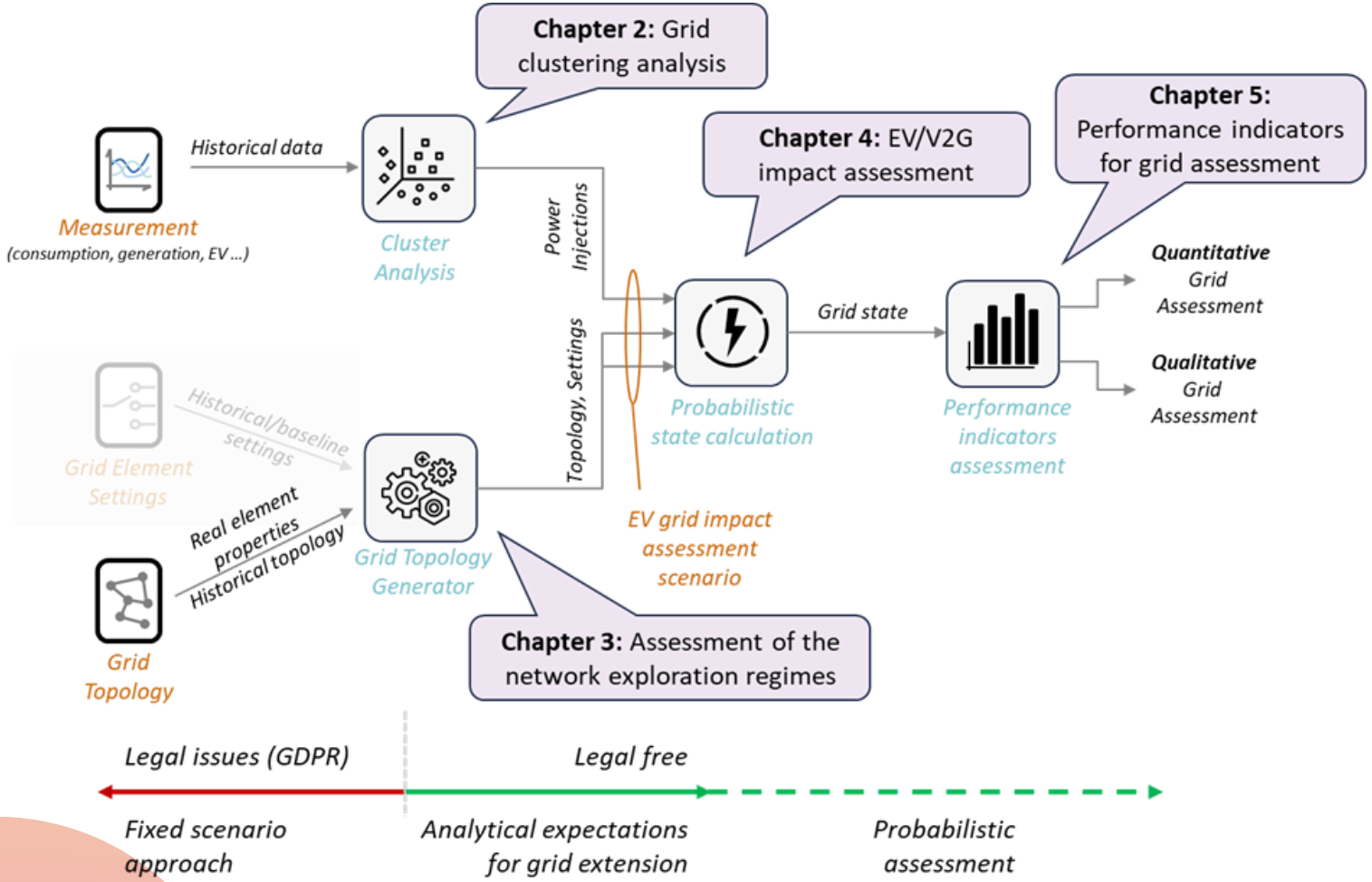
Methodology for assessment of grid impact



Expected results:

- At least 20% reduction of power losses in distribution networks
  => e-mobility absorbing PV power
- Approximately 40% reduction of overflows to higher voltage levels (400V -> 22kV)
  => better matching of production & consumption

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THANK YOU

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