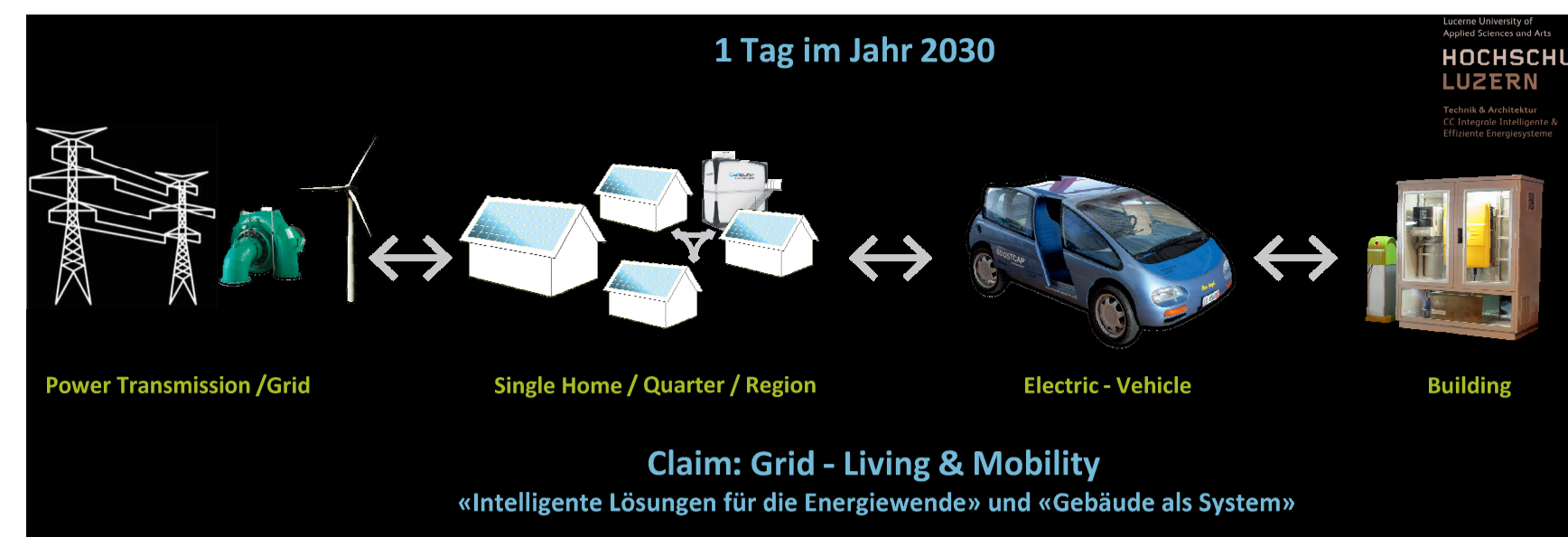




CA B1.1: Integration of new Urban Transport

Autors:
Prof. V. Härrri and O. Duvanel

E-Mobility: The "Switzerland Explorer" (BFE)



Electrical characteristics

Power: 150 [kW]
Max. speed: 100 [km/h]
Weight: 4430 [kg]
Load: 16 Passengers
Battery: 99 [kWh]

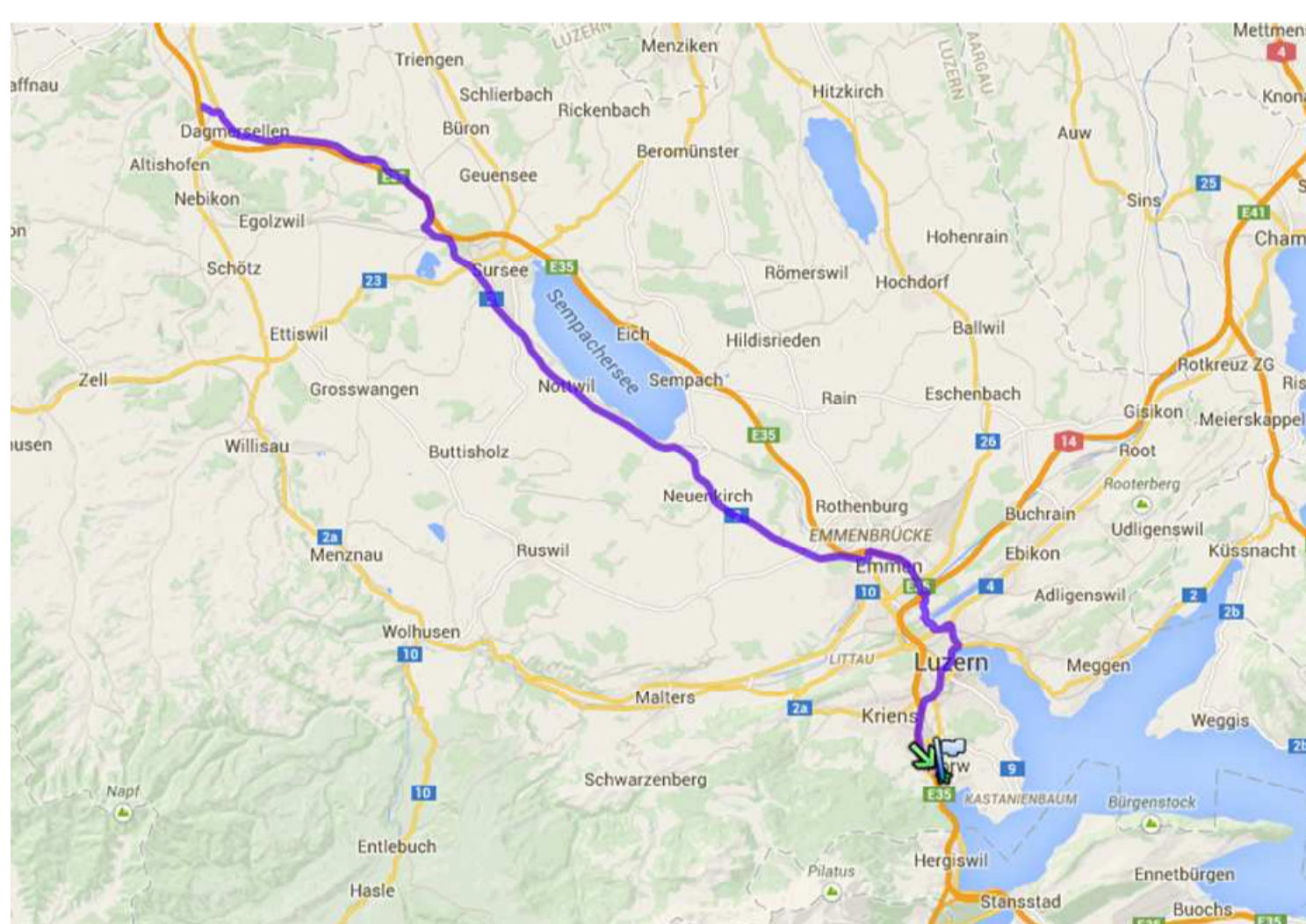
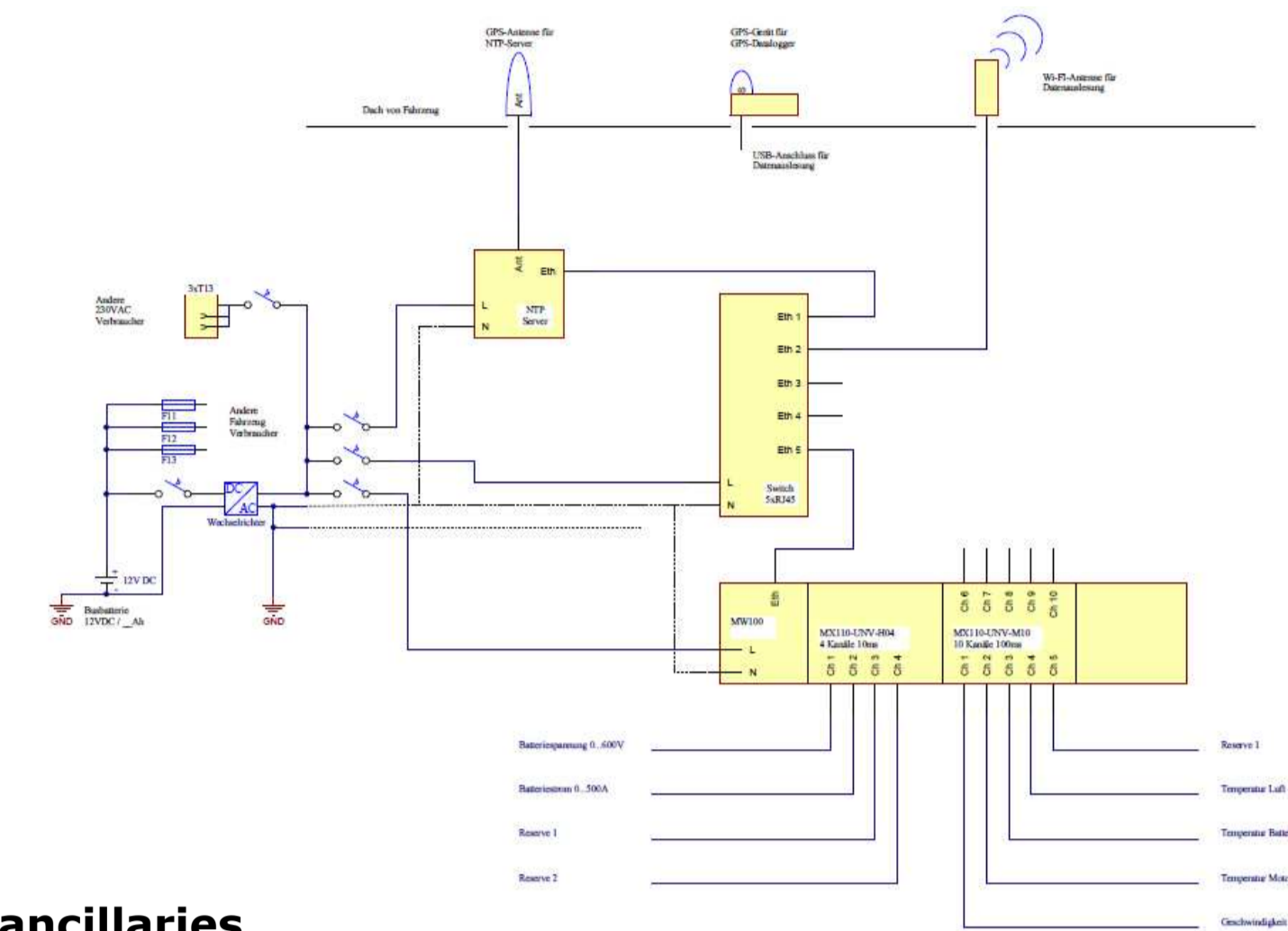
Scientific questions:

What is the maximum range?
Up to 223 km (Weight: 4600kg)
How big is the energy consumption for auxiliaries?
2.2 kWh/100km (5.0% of energy without HVAC)
What is the specific energy consumption (Wh/km)?
42.1 kWh/100km (95.0% of energy)

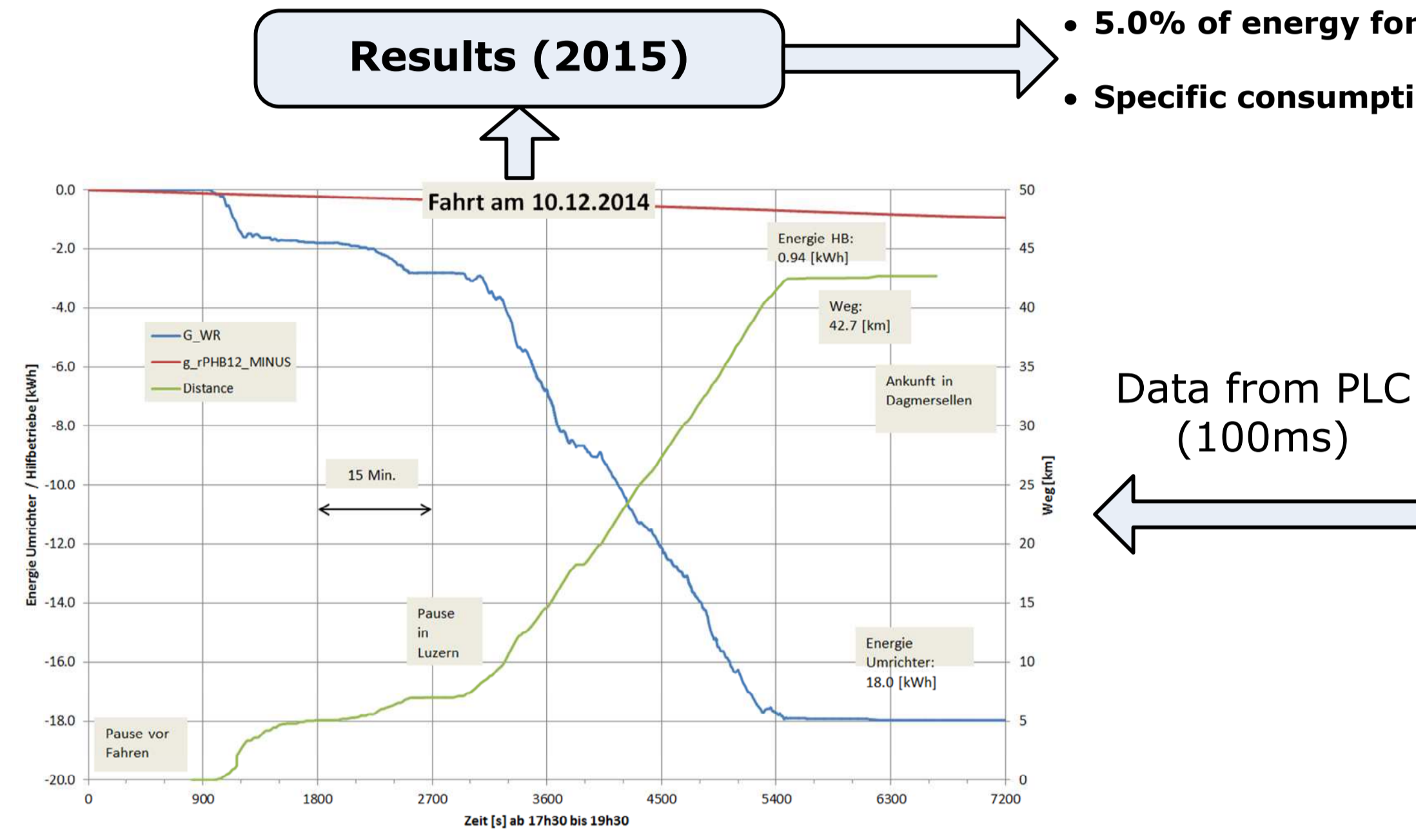
An universal measurement's equipment (2014)

Performance:

- GPS datalogger (1s)
- Time synchronisation with NTP-Server
- 4 voltage and 4 current sensors (100ms)
- Counter for energy and capacity

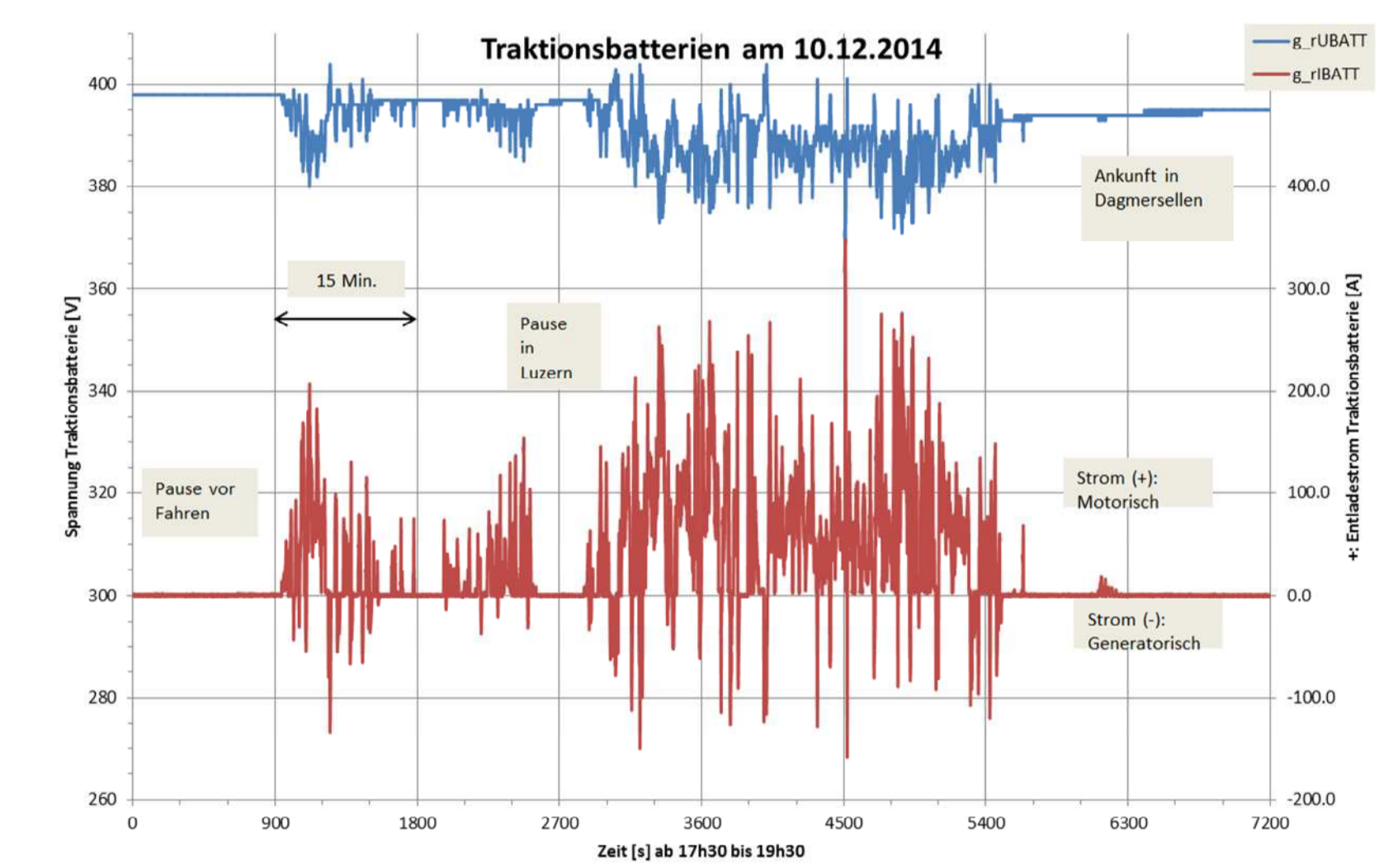


Data from GPS (1s)



- 5.0% of energy for the ancillaries
- Specific consumption 92 Wh/km * t

Data from PLC (100ms)



Grid-Living & Micro-Mobility



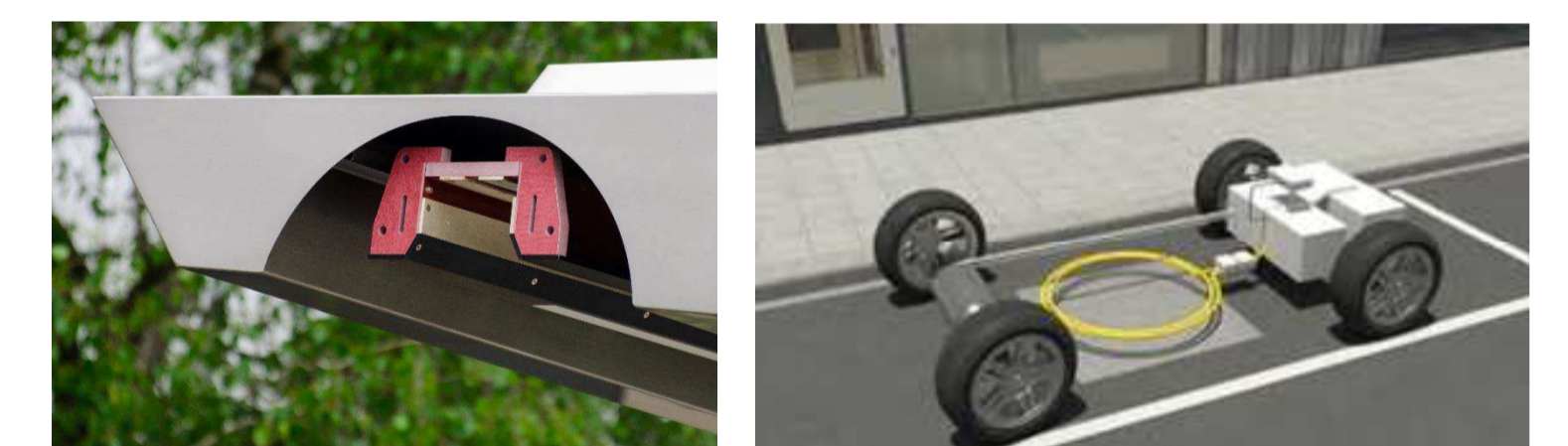
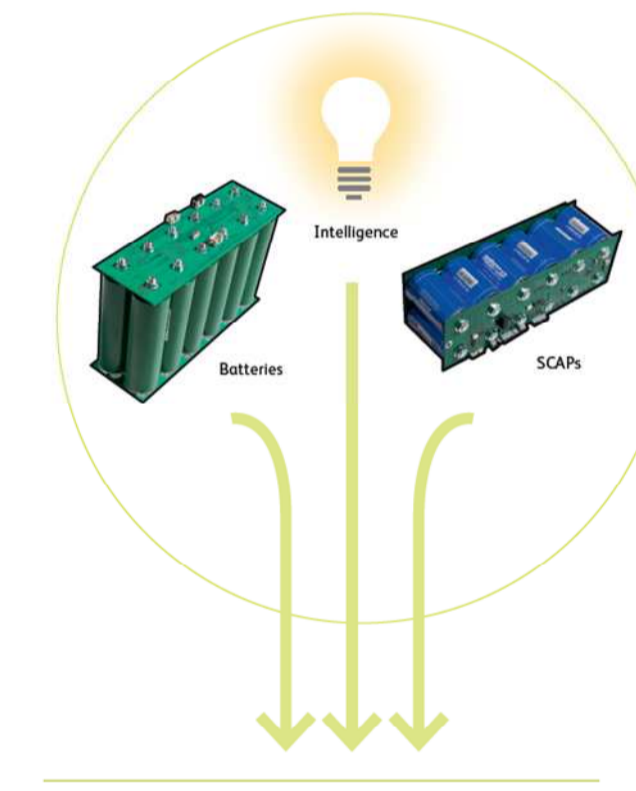
E-Bikes

- CTI-Check in preparation
- Better regeneration



Magic Bike

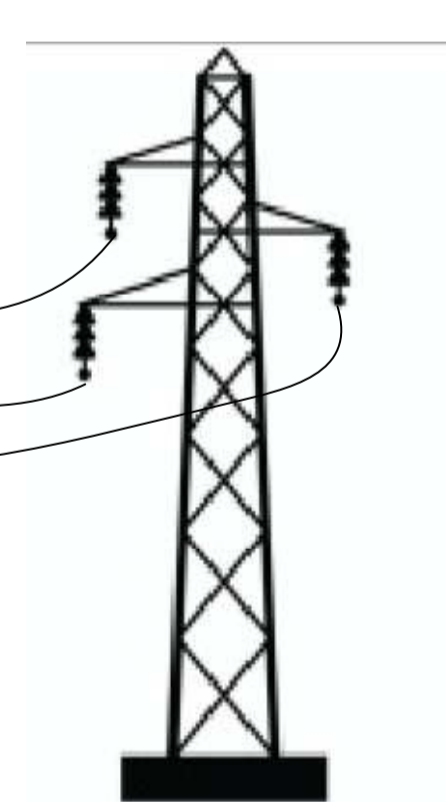
- CTI-Check
- Optimisation / Extension



Mobility ⇔ Grid (Furies WP4.5)



Integration and Intelligence of Storage, Mobility and Renewables



EV, Storage and PV

- Intelligent control system
- High autonomy
- Easy grid's integration

Flexibility for E-Vehicles

- Width of vehicle, seats
- Speed, power
- Autonomy, type of Storage
- Charging's infrastructure



Small Electro Bus for Zürich with Ceekon AG (VBZ) 2015-2017

Publication at the 5th EDPC 2015 in Nürnberg

The Energy-Pack APU-Replacement for Catenary Free Operation of Overhead Wired Buses

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Abstract—The so called Energy-Pack (EP) is a storage based replacement unit for traditional emergency auxiliary power units for overhead wired buses or trolleybuses. Besides the replacement, other important functions such as normal catenary free operation are possible. The design, realization, testing and pilot run in Switzerland are presented in this paper. The previous work of several other projects and investigations are first summarized and consist of concepts for the additional use of supercapacitors, the multifunctional use of the EP and simulations for understanding the significance for the supply quality of the EP's use for several buses on the same line and at the same time. Secondly, the specification and realization of the EP are commented on. Finally, the results, testing procedure, commissioning and pilot run of a bus operator in Switzerland are described, followed by conclusions of this extensive and for future transport application very important project.

Keywords—batteries; supercapacitors; electric buses; overhead wired buses; energy management; electrical drive chain



Fig. 1. New 24m HESS trolleybus for 220 passengers (ref. VVL)

Lighthouse Project: in discussion/planning

SCCER Transportation Vision & Best Practice in "Luzern-Süd" (Mattenhof)



- VVL and TUs
- Verkehrsverbund Luzern
- Mobimo AG
- IVT Axhausen

