CROSSCHARGEPOINT

CrossChargePoint - Integrated Multi-Energy Storages Coupling the Power Network to the Transportation

"CCP addresses the resulting bottleneck of supplying new mobility concepts with a solution that integrates the management of energy supply of road transportation in a new way.

CrossChargePoint aims at providing solutions for the optimised allocation of surplus energy to long- or short-term energy storages as well as transportation supply. Particular concerns of different regions with differing geographical, climatic and economic conditions are taken into account to develop a CrossChargePoint. The CrossChargePoint is a new type of charging station functioning as virtual power plant, combining fast charging capabilities with energy generation, transformation and storage. The CrossChargePoint provides fast charging simultaneously for multiple electric vehicles in periods of heavy transit traffic, as well as demand-side management capabilities covering fluctuating demands from transportation and consumption in the local electricity grid. Energy transformation by electrolysis and power-to-gas enables the CrossChargePoint to support gas/hydrogen vehicle fuelling and to operate as energy storage for the local grid, using different carriers for shortterm and seasonal energy storage.

Figure 1. CrossChargePoint overall architecture

Project Duration
01.02.2021 - 31.01.2024

Project Budget
Total Budget: € 2,791,078.-
Funding: € 2,074,703.-

Project Coordinator
Deggendorf Institute of Technology (Germany)

Project Partners
- Salzburg Research Forschungsgesellschaft mbH (Austria)
- Urban Software Institute GmbH (Germany)
- Yeruham Local Council (Israel)
- FENECON GmbH (Germany)
- AVL List (Austria)
- Bvw its GmbH (Switzerland)
- HyCentA Research GmbH (Austria)
- Livolt Ltd (Israel)
- ASKI Industrie-Elektronik GmbH (Austria)
- Energie Kompass GmbH (Austria)
Main Objectives

The main goal of the project is to investigate how intelligent planning and operation of regional fast charging stations with integrated energy storages for e-mobility supply can contribute to (1) cost-efficient grid reinforcement and grid stabilisation, (2) increased local energy consumption, and (3) increased local value generation through business models.

The long-term interest is clear: to acquire the necessary knowledge to develop products and services that address the emerging energy-aware ICT solutions and consulting for their B2B and B2C portfolio.

Expected Key Results

At the end of the project a working system for a CrossChargePoint prototype demonstrated in three relevant environments (demonstrators) will be available. The conditions for planning and operating a CrossChargePoint will be accumulated and put into a Localization & Optimization tool that by feeding the necessary data, will specify optimal locations, sizing and technologies such as an energy management system for new CrossChargePoints. A particular focus is given to the development of a blueprint to enable the easy transfer to other regions with different economic, infrastructural and geographical conditions.

Technology

- Generation of Location & Optimization tools accounting for local conditions
- Evaluation of forecasting processes required as input for a smart metering and monitoring structure
- Specification and implementation of a comprehensive and reliable ICT architecture for a regional energy management system

Market

- Definition of a CCP operation structure, considering the benefits of stakeholders and need-owners
- Evaluation of an operational control algorithm to achieve grid adequate operation to provide ancillary services

Adoption

- Estimation of business opportunities for CCP operators through integration of local electricity production, storage- and energy conversion capabilities, in three demonstrators
- Estimation of business opportunities for CCP operators through integration of local electricity supply for mobility