

Reusing old EV (electric vehicle) batteries



Main sector

- Smart urban mobility

Overview

One of the new ideas of the project in the field of transport is to reuse electric vehicle (EV) batteries for storing energy. As EVs are gaining popularity virtually everywhere, solutions for repurposing their rather quickly deteriorating, but still valuable batteries (delivering 70-80% of their original output at end of life) have significant market potential and could yield many environmental benefits. Tartu – having built up a considerable electric taxi fleet (ca. 60 vehicles in the taxi park of OU Takso) – is a suitable test site for piloting these solutions.

The objective of this activity is to use EV batteries in a sustainable way by giving them a second life. Reusing old batteries will considerably benefit the environment as less resources will be used to produce new batteries and energy storages and at the same time, renewable solar energy will be used to charge the EVs. As such, the EV taxis of the private company OU Takso will be partially recharged based on renewable energy that is produced on-site with PV panels and stored in used EV batteries. OU Takso will install a recharging point (for reusing the EV batteries) and 300 m² of PV panels (aiming to generate 50kW of solar energy).

The system will thus consist of old EV batteries, PV panels, EV chargers and battery charging equipment. The latter is the most important part of the system as this equipment is currently not available on the market and will be separately developed during the SEC project. The planned system allows to fully charge in a sustainable way around 30 EVs each day, depending on the location of the system. Also, depending on the climate conditions, surplus electricity produced by the PV panels can be used for other on-site purposes (e.g. lighting) or sold to the grid.

Business model

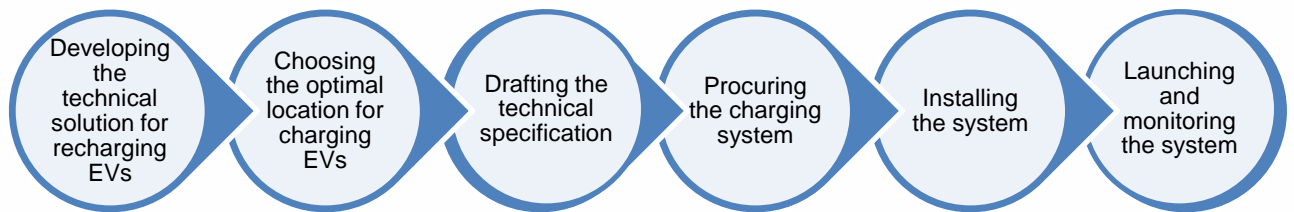
The development of the EV battery reuse system will be funded by H2020 (70%) and the SME itself (30%).



Citizen engagement

For this solution, citizen engagement will mainly take the form of awareness-raising. After developing and installing the system, it will be introduced to the citizens at information events in order to raise their awareness of sustainable mobility solutions in general and battery re-use in specific.

Process



Benefits

- Decarbonizing the electricity supply
- Increase of grid stability
- New business opportunities
- Increased resource efficiency
- Independence in energy supply
- Extending the lifetime of EV batteries
- Reducing the environmental impact of manufacturing/recycling batteries
- The system is able to work in an off-grid mode (autonomy)

Stakeholders

Owner of the solution	OU Takso
Service/technology provider	Nissan, Eaton, OU Takso
Users	OU Takso
Investors	H2020, OU Takso

Investment/Finance

Ca. 170,000 €



Potential for replication

As the EV market continues to grow and manufacturers are announcing more and more models that are affordable to the end users, the market for second-use EV batteries can be expected to increase remarkably as well. Besides offering a solid business opportunity as replaced batteries are expensive to discard and recycle while still having most of their capacity, reusing batteries reduces waste and adds another 5-10 years of effective lifetime. Several automakers are already experimenting with alternative uses for these second-life batteries in stationary energy storage, so the solution that will be developed and piloted in Tartu could considerably contribute to these efforts.

The solution can be easily replicated. The crucial part of the solution is the equipment that enables to manage (charge) the battery blocks. Until now, no commercial solutions have been available for doing this. In cooperation with Tallinn University of Technology, the Estonian University of Life Sciences and Eaton, a Finnish company, the necessary equipment will be developed. Once completed, the solution can be commercialized and produced in large scale.

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