



Unlocking the Full Potential of E-Mobility in Switzerland

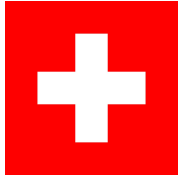
The case of Rolling Solar Storage and Electric Agricultural Transport

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Early-stage
research idea
– part of
SWEET EDGE



Project Description

This project aims at accelerating the growth of locally-sourced decentralized renewable energy in Switzerland by investigating the intersection of renewable energies, electric mobility and storage while differentiating between urban, midlands, and alpine settings. The focus lies on how customer preferences can be integrated into business models to scale up e-mobility in Switzerland. This enables unlocking the full potential of e-mobility by ensuring that it is powered by locally generated renewable energies. We here present our initial research ideas contributing to the project SWEET EDGE.

Project 1: Rolling Solar Storage



Motivation

The integration of high shares of intermittent renewable energy from distributed energy resources, such as solar PV and wind, requires scaling up innovative solutions to reap the flexibility potential from electric vehicles. While technical solutions for coupling the power and mobility sectors are widely available and have been validated in demonstration projects across Switzerland, the rapid deployment of such solutions has become a bottleneck that jeopardizes the Swiss Energy Strategy 2050 and the Paris Agreement Goals. To fast-track the deployment, EV owners, charging station installers and operators, and the grid operator must work together, and business models must tap into the financial and non-financial interests shared by all actors.

Research Questions

- What are viable business models for using «Rolling Solar Storage» to scale up e-mobility and stabilize the grid?
- How should the benefits of rolling solar storage be shared between EV owners, charging station installers, and grid operators for optimal scale-up?

Methodology

- Semi-structured expert interviews
- Case studies
- System dynamics simulation

Expected Results



Business models and measures for scaling up smart charging and rolling solar storage

Project 2: Electrifying Agricultural Transport



Motivation

The agricultural industry strongly shapes the Midlands of Switzerland and runs at risk of undermining the climate goals and Energy Strategy 2050. While the electrification of light-duty vehicles is well on its way, heavy-duty vehicles are lagging behind. Farmers face unique challenges that call for specific solutions that satisfy their needs. Analyzing the market potential and demand for electric agricultural vehicles in combination with solar PV supply and storage will contribute to foster the decarbonization of this sector.

Research Questions

- What is the market potential for electric agricultural transportation in midland Switzerland?
- What are the social acceptance, effective policy incentives and ways to mobilize and coordinate the key actors in agriculture?

Methodology

- Expert interviews
- Surveys
- Case studies

Expected Results



Customer journey of farmers in purchasing new agricultural vehicles



Analysis of farmers' decision-making process



Policy recommendations to incentivize the purchase of agricultural EVs