

## Kungsbacka municipality – vehicle to grid

**Participants:** Kungsbacka kommun, Nissan, E.ON

**Category:** Electric vehicle charging infrastructure

**Time plan:** Started in late 2018

**Contact person:** Christer Lindström, Kungsbacka kommun

**Location:** Kungsbacka

**Possible to visit:** Yes

### Background

The municipality of Kungsbacka is performing a project together with E.ON and Nissan, where vehicle to grid (V2G) technology is tested. As Kungsbacka is an area with a high penetration of solar power generation, the municipality wishes to utilize this environment friendly electricity as far as it is possible. To accomplish this, the batteries of the municipality's electric cars is used as an energy storage, and energy can be moved in time to smoothen the power usage in Kungsbacka.

### Implementation of the project

In the project, ten chargers with vehicle to grid compatibility are installed outside the city hall, and the municipality's own cars will be used as an energy storage. The idea is to charge the cars when local production is larger than the consumption, and then be able to feed this energy back when there is a power peak. This means that locally produced energy is moved in time and used in the municipality's activities when there is a shortage of production.

The ten chargers are also connected to a smart control system that determines what the best usage of energy is at every instant. This means that the flow can be reversed between the car and the grid in a matter of seconds.

### Benefits

Kungsbacka sees the vehicle to grid concept as a possibility to smoothen out the power profile over the day and avoid taking all energy from the grid under peak conditions. With over 100 electric vehicles owned by the municipality, the ability to store energy and use it when appropriate is good. Another important benefit of the concept is that the municipality by using vehicle to grid is able to keep important services running even in case of a shorter power outage. While backups already exist at many important locations, the possibility to use energy stored in the car batteries gives increased security for critical services.

In addition to a more stable power grid and an extra energy storage for backup services, Kungsbacka also sees economic benefits with the V2G concept. The ability to charge the cars when electricity is cheap and return this energy to the grid at peak loads, with high electricity prices, is one of the reasons that Kungsbacka has chosen to try out V2G.

### Scalability

In the initial stage Kungsbacka is using ten V2G charging points for their 140 battery vehicles. If the trials are well received, additional locations can be added.

### Interoperability

As long as there is compatibility between car and charger and the charger is designed for V2G operation, the installations are compatible with the present grid.

### Investment horizon

The project is at an early stage, and the economy of the V2G setup is yet to be evaluated. However, Kungsbacka is hoping that there can be a cut of about 10 000 SEK off the electricity bill for every car.

## International potential

Vehicle to grid is being tested at several locations internationally. However each setup is different, and every project can possibly give new insights about the concept.