User motivations and requirements for Vehicle2Grid systems

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Vehicle to Grid

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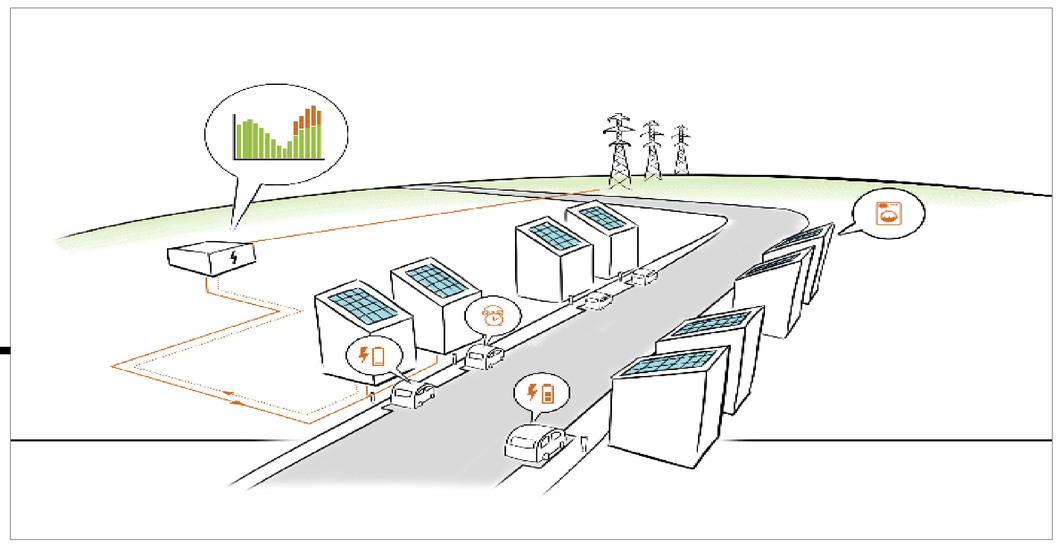
Vehicle2Grid

- Vehicle2Grid (V2G) is a charging strategy that allows for charging and discharging of Plug-In Hybrid Electric Vehicles (PHEV) and Full Electric Vehicles (FEV)
- The discharged energy can be supplied back to the (local) energy grid
- V2G requires adequate input from users if the local energy grid is to fully benefit from the discharged energy



Research on user motivations and barriers to adopt V2G systems is needed

Focus groups

- 2 focus groups - 14 participants, all engaged in sustainable energy and/or electric mobility
- Preperation before the session by mapping daily activities on energy, sustainability and mobility
- Aim of the focus group was to explore barrierers, motivations and expectations to use a Vehicle2Grid system

Pilot experiment

- Two households (1 PHEV, 1 FEV) with a bidirectional charger on their driveway
- Smartphone application to adjust (I) departure time, (II) minimal State of Charge and (III) emergency State of Charge
- Users were interviewed bimonthly and kept daily diaries
- Financial experiment to test monetary reward

Conclusions

Optimal use of renewable energy, self-generated solar energy specifically, is the main motivation to make use of a Vehicle2Grid system. This can also be linked to the contribution to grid stability

A financial reward does not appear to be a motivation, but rather a compensation for the adjustments in flexibility, provided that the amount of money is considered reasonable by the user

Inform users by providing (I) a historical overview of charging sessions, (II) information per charging session on the charged and discharged energy and (III) information on the self-generated solar energy that has been used to charge

The system should be enjoyable to use: a gamification functionality could supplement the system by rewarding the user with points and allowing for both historical comparison and social comparison (e.g. with neighbours)

Planning and control were less of an issue than initially presumed. Customizable settings in the app allow the user to schedule the charging sessions according to the user's own agenda, also strengthening the user's sense of control

Provide data privacy and transparancy to remove this as an adoption barrier: which data can be viewed by which party?

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