Places for People

Feasibility study Padiham site

PUBLIC SUMMARY

NEW ENERGY LANDSCAPE

The energy landscape is in a transition from centralized generation with fossil fuel to decentralised sustainable energy generation. The rapid increase of decentralised production calls for a different setup in this energy landscape. To avoid problems with the power grid and mismatch between demand and supply, electricity demand will have to be aligned with its production. A smart energy system is ideally suited to optimize energy demand as well as making it possible to integrate and upscale the sustainable production of solar and wind energy.

Places for People (PfP), supported by Bax & Company, asked Lyv to do a feasibility study for smart energy systems based on data gathered in their Padiham estate. The study includes a proposal for a pilot at the Padiham site and an indication of the scale up potential. In 2017-2018 the properties at this site were renovated and upgraded, with special attention to their energy efficiency. Previously they were particularly energy inefficient. During the renovation the dwellings were insulated, new efficient storage heaters were installed, windows and DHW systems were replaced. In Q3 2018 each property was equipped with rooftop solar. After the renovation, metering hardware was installed to monitor consumption of 9 properties on a detailed level for 2 years.

DATA ANALYSIS

Lyv performed this study on the metering data of 9 dwellings out of a total amount of 100 Places for People owned dwellings at the Padiham site. Two of these dwellings are gas heated, the others are electrically heated. The study focuses on the 7 all-electric properties.

As a start, the total energy consumption of the households has been examined and the individual consumption patterns are compared.

Since solar production was not metered, the solar yield is modelled and calculated per 15 minutes and that is compared with the consumption per 15 minutes. This provides insight in the (timing of) surplus of solar yield now being wasted as export to grid. Detailed analysis and modelling of the metering data provided insight in the flexibility (ability to shift consumption in time) for various assets, like the available electric storage heaters, DHW systems, and optionally to be installed home storage batteries. This flexibility can either be used to store solar energy when there is more production than the home consumes, or to act in an external market like, for example, frequency control reserve markets.

PILOT

Lyv's advice is: 'Keep it simple'. Behind the meter (in the home), the first step is reducing consumption through creating awareness at the consumer level, by providing insight in consumption and feedback on consumption patterns compared to reference groups in an understandable and user-friendly way.

Second step is reducing losses of solar generation by introducing flex capacity in the home, which can store energy when it is not needed. While thermal storage solutions like DHW and ES heaters can help in increasing self-use, the heaters provide most of their flex in the wintertime when solar production is low, and they have the disadvantage that they have no capacity to discharge electricity. With that in mind, the home battery is the most flexible solution, which also can be used in a later stage in advanced scenarios like trading on external energy markets.

The pilot also offers the possibility to check the 'in front of the meter' case for the scaled-up scenario, where the flex capacity of aggregated assets can be monetized.

CONCLUSION

Smart energy systems can be in front of and behind the meter. The pilot and the upscaling scenario have also been approached in this way. The end user is confronted with the behind the meter application. Both the UI and the used hardware of this application must therefore be user-oriented.

There are major differences in consumption. Consumption can be reduced with the right tools and feedback. This immediately provides financial benefits for the tenant.

With the right scale, a business case with a smart energy system is possible without relying on subsidies. The business case is positively influenced by the strong price drop of rooftop solar and storage.

The analysis brought to light the fact that the data was not complete, the missing data has been calculated by Lyv.

ABOUT LYV

Lyv is young Dutch company, founded to give substance to the scaling up of smart energy systems and thereby facilitating the energy transition. For the success of smart grid and demand response services, the participation of the end user is of particular importance. By providing attractive, safe products and services, Lyv wants to involve consumers in the new energy systems.

Because of the rapidly growing international demand for smart energy systems, Lyv cooperates with multiple national and international companies. This allows Lyv to quickly offer the most suitable solution in various countries. International partnerships have been formed, through which Lyv gained access to a significant number of IT and hardware engineers on a global scale.