

New Clean Energy Communities in a Changing European Energy System (NEWCOMERS)

Summary case study report

The sonnenCommunity

Funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 837752.



About NEWCOMERS

NEWCOMERS is an international research project that aims to deliver practical recommendations about how the European Union as well as national and local governments can support the development and growth of energy communities across Europe. The project involves a consortium of eight partners across Six European Countries: Sweden, UK, The Netherlands, Germany, Slovenia and Italy. For more information, please visit our website: <https://www.newcomersh2020.eu/>

About this document

This case study report provides a short summary of a full case study report on the sonnenCommunity, a virtual energy community launched in 2016 by a German producer of smart home storage systems. The full case study was guided by 14 research questions, across four themes. The themes and questions are presented in the following table.

Theme	Research questions
Actors	Who is involved in the EC and what are their roles? What knowledge and skills are needed to develop and operate ECs?
Technologies	What technologies are employed in ECs? What are the advantages and disadvantages of certain novel technologies, including smart applications? What implications do they have for the viability of different EC BMs? What influences the choice of technologies employed in ECs?
Values	What forms of value do case study communities currently generate and for whom? What values do ECs provide to the energy systems they are connected to?
Business models	How are actors and technologies connected to deliver products or services? How do ECs emerge? How do they operate? How replicable and/or scalable are ECs likely to be? How might scaling/replication occur?

This summary document focuses on the emergence and operation of the sonnenCommunity, showing how it creates and delivers different types of value to citizens, consumers, and energy systems, as a business model. It concludes with a brief discussion of the potential for the sonnenCommunity to grow or to be copied in new contexts. It presents – in a highly reduced format – the interpretation of the researchers. It does not necessarily reflect the opinion of those involved in its development and operation. Any factual errors remain the responsibility of the authors.

Suggested Citation:

Barnes, J. Hansen, P. Darby, S. Sommer, S. and Andor M. (2022) NEWCOMERS summary case study report: the sonnenCommunity. NEWCOMERS Project, grant agreement No 837752, 9 February 2022

Date: 9 February 2022

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The sonnenCommunity

The sonnenCommunity was launched in 2016 as a virtual community of all sonnen GmbH product or service customers. The sonnenCommunity aims to enable members to 'declare independence' and make traditional energy suppliers 'obsolete' by covering up to 100% of their electricity needs through a combination of self-consumption and community supply coordinated as a 'virtual power plant'. To achieve this sonnen GmbH links and controls the decentralised and privately-owned storage units of those members who chose to participate via their SonnenVPP software. This also helps to stabilise the grid.

Emergence

sonnen GmbH is a producer of intelligent (home) energy storage systems and provider of a range of energy services. The company was founded in 2010. The sonnenCommunity grew out of efforts to innovate the company's business model. The company was a battery storage manufacturer at the time, which was seen as a risk (to its survival) in an increasingly competitive market. In addition to focusing on further innovating their battery storage technology, the company decided to focus on providing energy services too.

The team began thinking about virtual power plants, following market trends, and analysing why people bought storage. They found that people generally seemed to want to take matters into their own hands, for example by investing in renewable energy assets. sonnen believe that their customers are people who want to actively contribute to the energy transition. The sonnenCommunity, set up in 2016, builds on this notion. sonnenFlat, a flat-rate monthly electricity contract for households with domestic PV systems and sonnen batteries, was also introduced in Germany in 2016.

That same year, the company became the first licensed supplier in Germany to rely principally on small-scale distributed energy resources. They emphasise that the virtual power plant is not owned by them but by the people indirectly contributing to it. sonnen operate it for them, acting as a service provider. In March 2019, sonnen GmbH was acquired by Royal Dutch Shell. It is now a wholly owned subsidiary of Shell and sits within its New Energies Division.

Operation

The sonnenCommunity operates at multiple levels (Figure 1). Ownership of a sonnen product (typically batteries) forms the entry level, at which a common interest and ownership results in a loose community of interest. Smart programming in each battery optimises individual self-consumption. Operation of the equipment requires no engagement by owners. In this instance, sonnen acts more like a product supplier. Ownership of sonnen products combined with a service contract forms the next operational level that enables members to 'share' their generation and storage assets with other members of the community. According to sonnen, this allows members to achieve up to '100% energy independence'. Members' operational involvement remains passive: operation and management of member assets is passed to sonnen5 GmbH. Take up of a discrete sonnen service contract – such as sonnenStrom (a supply contract for households without solar PV and battery systems) or sonnenDrive (a complete mobility package, including EV leasing, maintenance, insurance, and electricity) – forms the final operational level. Here, sonnen promises 'power drawn from the sonnenCommunity'. A novel feature of sonnen service contracts is that they consist of monthly flat rate fees. Any additional electricity required by the sonnenCommunity that cannot be sourced from within the community is either supplied via power purchase agreements (PPAs) with distributed renewable generators or purchased on the open market. In this instance sonnen acts more like an energy utility with a new service contract offering.

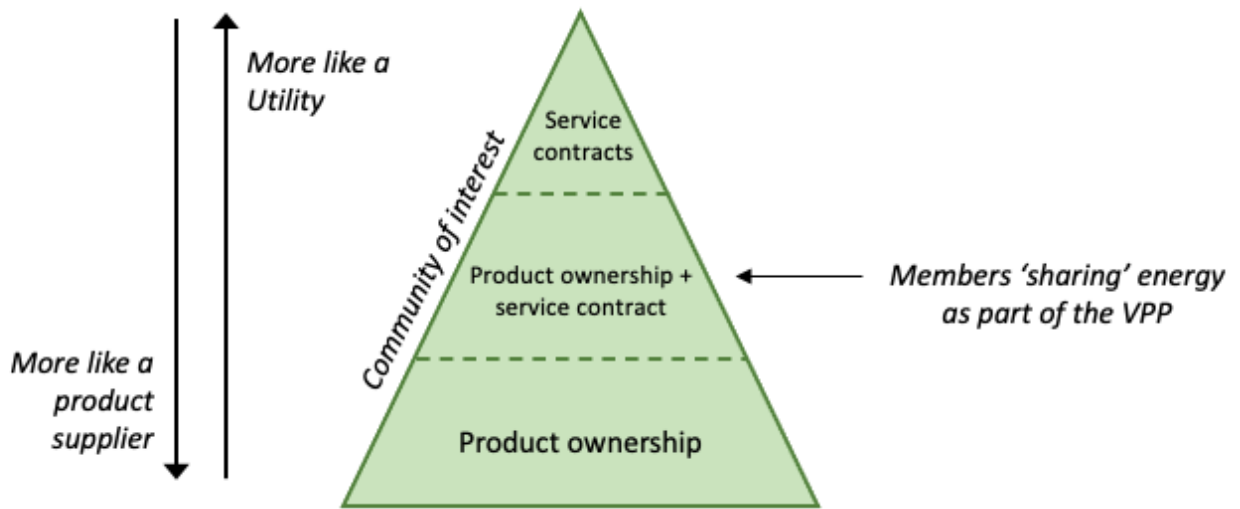


Figure 1: Operational levels of the sonnenCommunity

In this middle tier of Figure 1, members ‘share’ their generated electricity by relinquishing control of their distributed assets to sonnen GmbH. sonnen GmbH describe this relationship as member participation in the sonnen Virtual Power Plant (sonnenVPP). Operation of the VPP is controlled exclusively by sonnen GmbH. Cloud-based computer software then maximises collective self-consumption of member-generated electricity, whilst providing a range of ancillary services to the public grid. PPAs with distributed renewable generators and wholesale market trading provide additional electricity to meet community demand. Operating the VPP for the sonnenCommunity, sonnen GmbH acts as a (licensed) supplier managing all regulatory compliance issues whilst delivering a range of back-office services required for selling energy. The central actors and relationships within the sonnenCommunity are depicted in Figure 2 and the primary electricity and finance flows in Figure 3.

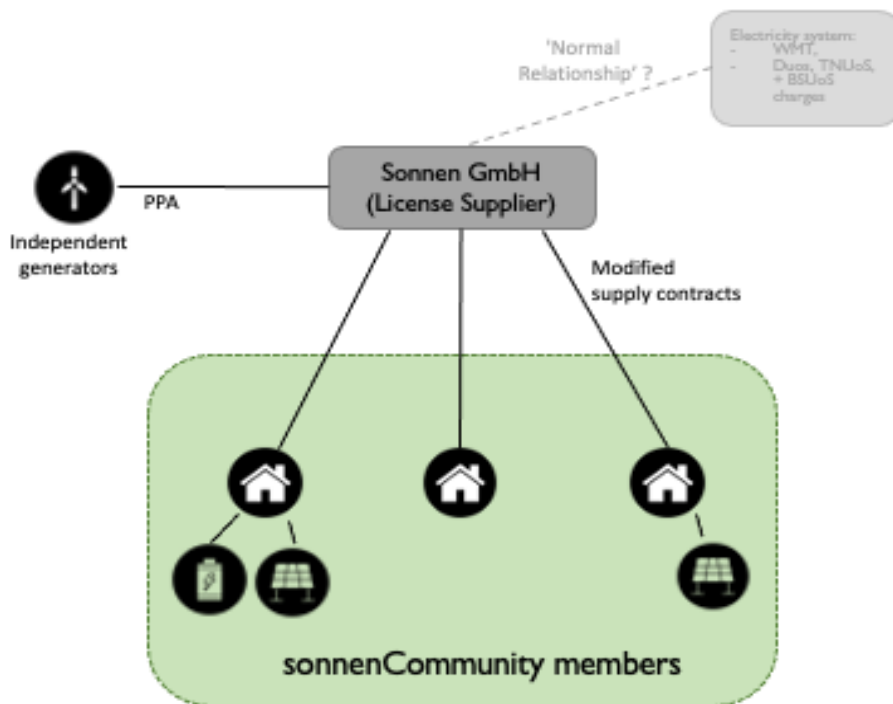


Figure 2: Central actors and relationships within the sonnenCommunity

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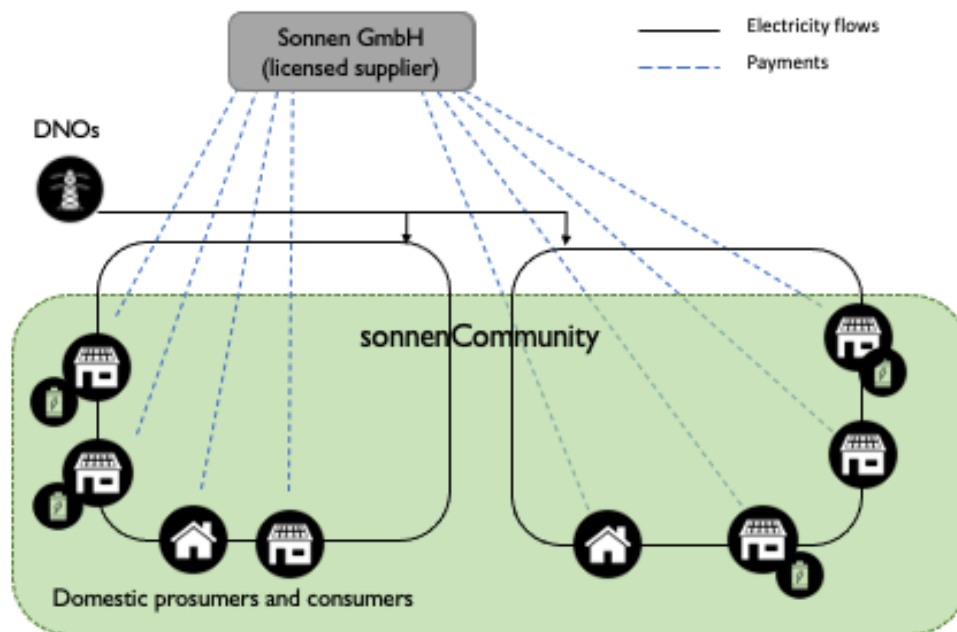


Figure 3: Primary electricity and financial flows in the sonnenCommunity

Business model

The sonnenCommunity does not operate as its own legal entity. It doesn't have a business model or undertake activities associated with a business. Instead, the sonnenCommunity can be described as an important component of sonnen GmbH's business model. The business model thus resides within a single, hierarchical institutional actor. It is thought to be attractive to potential customers because it can be interpreted flexibly and is inclusive.

The sonnenCommunity's principal value proposition to customers is summarised by sonnen as 'clean, reliable and affordable energy for everyone'. This narrative encapsulates ideas of greater energy independence, from existing energy systems and suppliers; participation in the energy transition through ownership and participation in a novel community that requires limited ongoing engagement or changes in energy practices; self-sufficiency or autarky, both individually and through reliance on the community; and realisation of a sharing economy. The use of flat service contracts helping foster a sense of equity between members and of a sharing economy. Where members relinquish control of their assets to sonnen GmbH to provide ancillary services to national energy systems, they are rewarded with small financial payments.

The sonnenCommunity also provides value to sonnen GmbH, principally the development of a new service offering to domestic households. The community is seen as a unique selling point, that attracts prospective customers and differentiates their offer to rival product or service providers. To deliver and capture value from the community sonnen GmbH offers a holistic, hassle-free service, employing customer assets to manage power flows between members and to offer a range of ancillary services to energy systems.

As a result, the community provides a range of values to energy systems. On an individual level, software to maximise onsite consumption through the use of battery storage reduces demand on the grid. More broadly, and through the active development of a range of flexibility services the community, via sonnen GmbH, has the potential to defer distribution and transmission capacity investment, reduce congestion cost, defer generation capacity investment, provide frequency response and optimise generator operation. The community's capacity to achieve this largely stems from direct load control by a commercial actor (sonnen GmbH) capable of responding quickly to market signals.

Prospects

The sonnenCommunity is already well developed, with a range of innovative new service offerings being produced over the last few years off the back of the original model. It is also clear that sonnen GmbH is growing rapidly within Germany and expanding operations in new countries. The more members the sonnenCommunity has (per energy market), the greater the utility its aggregator services can contribute to Distribution and Transmission Service Operators and energy markets.