Abstract New Pathways

Title: **Grid governance; what new roles for the community energy movement?**

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In the Netherlands, local energy cooperatives are increasingly active in the production of renewable energy. The Local Energy Monitor 2020 (Schwencke 2021) counted 623 local energy cooperatives in the Netherlands, which are spread over all provinces, all regions and 85% of municipalities.

In the past years, energy communities and prosumers also have received growing recognition on the EU-level, as is demonstrated in the Clean Energy Package (Lavrijssen 2017; Verde and Rossetto 2021). Some authors take this as the future governance model for a renewable energy system (Lowitzsch, Hoicka, and van Tulder 2020).

Many cooperatives have concrete plans to invest in energy projects, such as solar fields and wind turbines. Unfortunately, because of growing problems of net congestion in the Netherlands, room for such projects is increasingly limited. In their quest to help solve this predicament, energy cooperatives are developing new and innovative energy services, for example delivering grid services to distribution system operators (DSOs). However, there are numerous legal, technical as well as economic obstacles for such innovative energy services (Royal Haskoning DHV 2021).

In the present energy system, the grid operators (DSOs) play a significant role. As Galeano Galvan et al. (2020) remark, they have a position from which they can influence the energy transition. However, as DSOs are traditional, centralized organizations, which are not used to communication with new entrants in the energy system, it is often difficult for RECs to engage with DSOs (Van der Waal, Das, and Van Der Schoor 2020).

What is missing in the literature so far is attention to the more developed energy communities that we see nowadays, which go much further than organizing individual prosumers. These RECs often own energy production units, such as solar parks or windmills. Furthermore, they often engage in experiments such as smart grids (Summeren et al. 2020; Kloppenburg, Smale, and Verkade 2019).
In fact, a whole landscape of different organisational constellations has emerged, where local cooperatives join forces with municipalities, housing associations, project developers, owners' associations, water boards, and others.

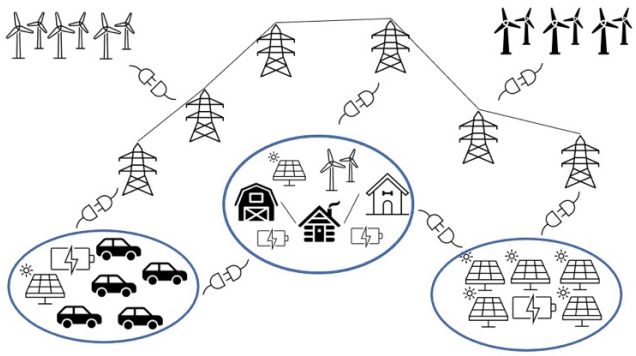
The variety of activities employed by these community energy organisations has also broadened considerably. Drawing on Social Movement Theory, we argue that these activities indicate that energy communities engage in 'prefigurative' activities; they create in their own environment the decentralized and democratic energy system that they strive for (Van Der Schoor et al. 2016). Such prefigurative practices are different from 'activist practices' in the climate movement because they take place as part of an envisaged new energy system. New organizational forms emerge, in which RECs cooperate with other societal partners to be able to develop large projects for wind and sun power. Inspired by the models of Parag & Sovacool (2016), we aim to identify sociotechnical modules for a system design that accounts for these expanded roles and new situations.

Empirically, our contribution draws on a current research project on innovative community energy services in the Netherlands. The aim of this project is to investigate new roles for cooperatives in delivering innovative energy services to their clients, such as demand response, cooperative aggregator, or peer-to-peer energy delivery. Furthermore, we ask if and in what way the provision of balance services might be feasible and profitable for RECs. For these roles, we enquire what technical

knowledge is needed, what the best scale and level is for such activities, and which business models are available.

In our view, community energy collectives are not restricted to representing prosumers which have an individual relation to the energy system. The community energy movement has evolved in such a way that RECs can provide services to all types of consumers, regardless of individual ownership of energy production units. Community energy cooperatives increasingly own and manage energy assets, such as solar roofs, solar parks, windmills. Furthermore, we see that RECs operate as a social enterprise. To guarantee continuity as an enterprise it is important to develop profitable business models and to engage paid employees in addition to volunteers.

We identified new types of actor constellations managed by RECs. These constellations can be interpreted as elements of a decentralised energy system with variable energy clusters, managed by RECs. In particular, we investigate combination of a solar park with energy storage, supply management of cooperative assets, developing the role of aggregator, demand management and balance services.



The emerging new energy services show that the community energy movement has come a long way from the early days of organising individual prosumer actions. The setup of collective production facilities has already become rather common. Energy communities now aim to take up roles in the full energy chain: as energy producer, distributor, energy trader and prosumer.

However, developing and managing these new functions takes a heavy toll in the form of knowledge acquisition, negotiation skills, organisation strength, and finally the capacity to take financial risks. The community energy movement is therefore considering new organisation and business models to be able to take up these challenges. Expanding to more segments of the energy system could lead to more profitable economic activities, that ensures continuity for the social enterprise of RECs. To that end, RECs need to scale up; for knowledge and time intensive jobs such as energy trade and management of energy facilities it is deemed essential to include a larger volume of energy assets. These activities bring substantial financial risks with them, so the economic buffer should be relative to that.