

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

Summary case study report

Energy Local

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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 Energy Local, a novel model for the equitable sharing of renewable generation locally. Both were 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?

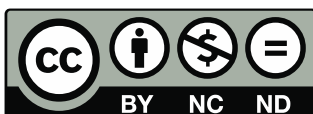
This summary document focuses on the emergence and operation of the Energy Local model, showing how it creates and delivers different types of value to citizens, consumers, and energy systems, as a business model. It concludes with a brief discussion of the potential for Energy Local model to be copied 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.

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Energy Local

Energy Local Clubs (ELCs) link local renewable energy generators to local consumers to create fairer prices for the local production and consumption of electricity. Each club is set up as a cooperative, consisting of local generators and consumers (principally households) and operates a 'complex site' in partnership with an established (licensed) supplier. The first club was set up in 2017 in Bethesda, North Wales enabling 100 households to access electricity from a local hydro generation plant. Since then, clubs have been set up in Corwen, Crickhowel, Machynlleth, and Llandysul in Wales and Bridport and Brixton in England. Further ELCs are in development. Energy Local Community Interest Company (CIC) acts as the development 'hub': coordinating between the stakeholders involved, and sharing knowledge, as well as developing, refining and helping replicate the model.

Emergence

The Energy Local (EL) model was developed by a group of energy professionals/ practitioners. Working on smart grids and renewable energy projects, one of the four founding directors realised that many of the issues they were trying to solve from a technical point of view were fundamentally regulatory. Importantly, generation and consumption of electricity from renewable sources was not being looked at in an integrated way. This led to inefficiencies where renewable energy is generated and sold but not used locally.

The EL model was developed to address this problem, make sharing energy fairer and achieve better outcomes for local communities and generators. In the EL model, generators get a better price than on the open market, and there is more effective local balancing. Key elements of the model were developed and trialled in a research project between 2015-17 that investigated the matching of local demand with local solar generation. Funded by the UK Engineering and Physical Sciences Research Council and Innovate UK, the CEGADS project (Community Energy Generation, Aggregation and Demand Shaping) was a collaboration between Energy Local CIC and academic, commercial and NGO partners including Exergy Devices, Moixa, Weset, Energise Sussex Coast, Cooperative Energy, and Oxford University and De Montfort University.

The project enabled Energy Local to test their model in a trial of 48 households in the Oxfordshire villages of Shrivenham, Watchfield and Longcot. It allowed the team to estimate savings participants would be able to make on an EL tariff. This learning was then implemented in a full-scale trial of the model in Bethesda, Wales, where the first Energy Local Club was established in 2017.

Energy Local CIC was founded in 2016 as a hub for ongoing work on the model. It employs a core team of practitioners who coordinate and manage continuous development of the model and new clubs. Establishing each club typically involves local organisations, mostly from the community energy sector. These act as initiators of ELCs, using their connections to identify local generators and consumers, set up the cooperative and manage its operation in the first year, at all points supported by Energy Local CIC. Energy Local advisors, usually one per club, help to set up each club and act as primary contact points between ELCs and the hub. All advisors receive training from the EL hub.

Operation

A group of local generators and domestic consumers come together in a new organisation – an Energy Local Club – and partner with a (licensed) supplier to manage a 'complex site' (a particular type of contract under UK electricity regulations). Under the arrangement, locally generated renewable electricity is shared equally across the club's demand members/consumers and paid for on a 'match tariff' agreed by club members annually. This results in a higher income for generators and lower bills for households.

ELCs are established as bona fide cooperatives comprised of local generators and consumers (principally households). The cooperative's board is elected by members and contains at least one generation owner and one consumer. The board's principal functions are to agree 'match tariffs' annually, balance the amount of generation and demand within the club and maintain the cooperative in terms of management and accounts.

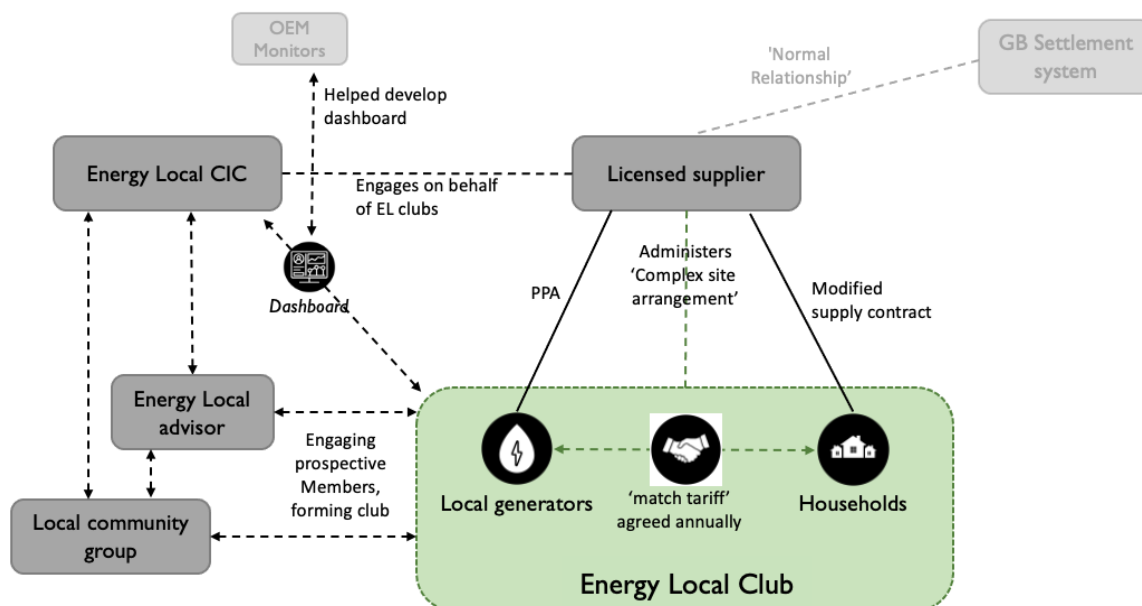


Figure 1: Central actors and relationships within Energy Local

Smart meters are used to record half-hourly generation and demand data. The supplier handles billing and supplies additional power required through a time of use tariff. It also covers all regulatory compliance issues and delivers a range of back-office services that are required for selling energy, including wholesale trading, metering and customer services. To allocate the distribution of electricity under the 'match tariff' to each demand member, the supplier runs a 'fair share' algorithm. A virtual meter point measures imports of power not generated locally, or exports of local generation not used locally. This virtual meter point reading is then taken to settlement as the collective outcome of the complex site.

To incentivise use of locally generated electricity, a portal allows demand members to see times of predicted local generation and track their consumption and expenditure. Central actors and relationships are depicted in Figure 1. Primary electricity and financial flows within each club are depicted in Figure 2.

Business model

EL Clubs utilise pre-existing, renewable electricity generation technologies such as hydro, wind and solar, and link generation and demand at local scales, through a partnership with a licensed supplier. The EL business model is a negotiated settlement between local generators and domestic consumers (who group together in ELCs) and a supplier. Each party – local generator, domestic consumer and supplier – receives benefits from the arrangement. Members, both generators and consumers, are consulted on at key points in each club's creation and play an active role in its management. The business model relies on the active participation of members, actively shifting their demand to times of local generation to maximise value creation potential.

The overall objective of ELCs is to create value for the parties involved and the energy system it is embedded within, above and beyond what they could achieve acting individually. Each ELC can consequently be viewed as a benevolent enterprise: none of the value created by the business model is captured by the focal cooperative, the ELC. The business model might also be described as spanning the boundaries of multiple actors: to create and deliver value multiple actors are involved (generators, consumers, and the license supplier for instance).

The EL model creates multiple types of value for multiple stakeholders. For domestic consumers it offers potentially lower electricity bills, dependent on the extent to which members change their consumption patterns to make use of 'matched' generation or the variable time of use tariff. It offers knowledge that a proportion of their household consumption can be linked to locally generated renewable power, with a portion of their electricity bill going to local renewable energy generators. It increases transparency of

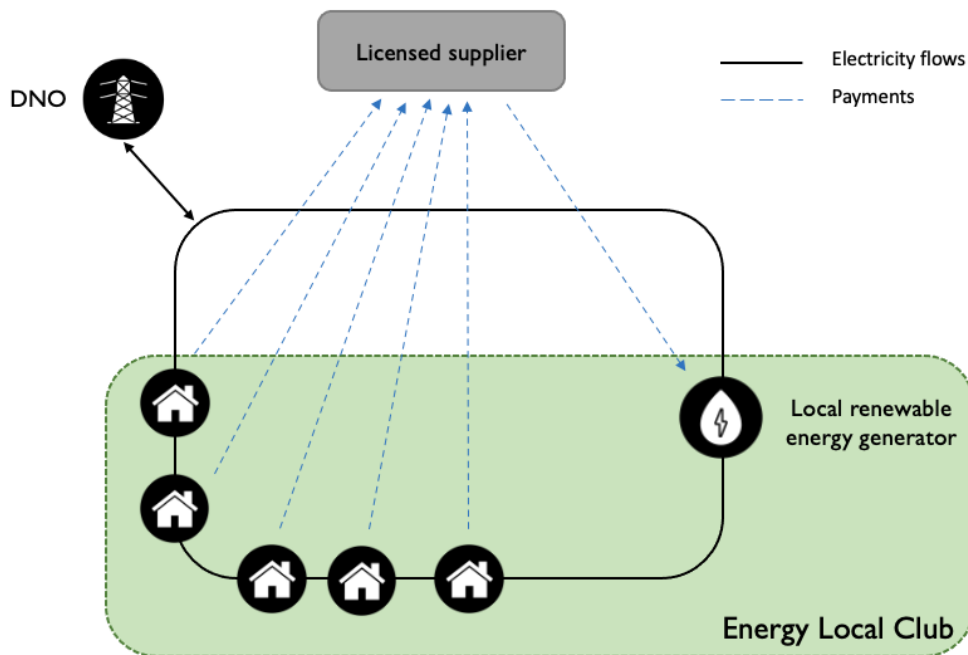


Figure 2: Primary electricity and financial flows in Energy Local clubs

energy systems and billing, helps to keep money circulating in local economies (c.f. energy bills being paid to a non-local licensed supplier) and increases energy literacy and control.

For local generators it offers higher export prices. For the supplier it offers customer acquisition and, potentially, retention as well as a reduced risk of incurring imbalance penalties or high spot prices for power in settlement. For licensed suppliers these aspects might be combined in a new service proposition. For energy systems it increases energy literacy of consumers, has the potential to reduce grid constraints as well as demand on transmission grids through fostering demand side flexibility. It also delivers value to the wider energy system through collective self-consumption of renewable electricity via the grid (*in front of the meter*) and potentially incentivises increased local renewable deployment (by providing higher export prices to member generators).

Prospects

Having successfully developed the model within Bethesda and with ELCs being replicated in a variety of new locations, EL's prospects look bright. Work is underway to refine the model through for instance, advances in the portal communication infrastructure. Replication of the model is, however, restricted by limited access to at-risk funding. It is also constrained by the extent to which digitalisation of the energy industry is still in its infancy. Teething issues concerning connectivity and transfer of data between industry partners, have the potential to derail the effective operation of clubs. The reliance of ELCs upon a license supplier also poses reputational risks, where clubs have limited power to resolve operational issues whilst being the 'face' of the arrangement.

Despite these issues, the model holds significant potential for impact, not least because:

- it can utilise existing generation capacity and make better use of it,
- it can support the further deployment of renewable generation capacity by offering higher export prices for generators,
- It has the potential to vary the distribution of benefits depending on local circumstances, community values and at different times of generation.
- The model is expected to require limited upfront financial and human capital once it has been refined and relationships with suppliers are established.