

Research brief

Smart and Fair Local Energy

Introducing Energy Local

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Introduction

To reach the UK's decarbonisation targets requires radical changes in energy markets as well as the development of new business models and tariffs. The UK has been successful in deploying renewable generation mostly from sun, wind and biomass. Yet, a five-fold increase in deployed renewable generation technologies over the last decade is now concentrating attention on a new challenge: how to make best use of them and keep local distribution networks functioning well. Much innovation effort is being directed towards developing smarter, locally based energy systems. High profile innovation projects grab much of the attention, but below the radar is a range of community-orientated initiatives that are quietly developing alternatives.

Energy Local is one such approach, seeking to transform the electricity market for local communities and small-scale generators. By facilitating local sharing of energy, it increases export prices for local generators, reduces electricity costs and fuel poverty for households and keeps money circulating locally. It is pioneering the development and uptake of new tariffs and services that work for consumers, changing people's thinking on energy and ability to act. Below, we explain how this is done and what the Energy Local approach can contribute to local and national policy goals.



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Environmental Change Institute



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The challenge: current GB energy system

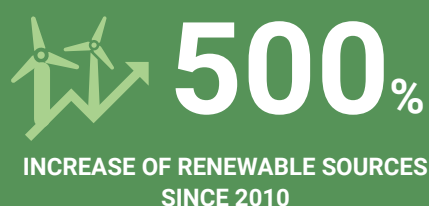
The GB energy market is undergoing a rapid transformation. Change can be attributed to national net zero policy targets, the emergence of new technologies and increasing digital connectivity. Licensed suppliers continue to play a central role in the system, acting as intermediaries between customers and wider energy systems. This arrangement, which has evolved over the last 30 years since privatisation, is known as the ‘supplier hub’ model. To many, including the national regulator, Ofgem, this model is no longer fit for purposeⁱ. It requires fundamental reform.

Amongst the many issues associated with the supplier hub model, two are frequently raised by communities.

1. Only those who own and operate small-scale renewable generation at their homes or business premises can benefit from clean energy and lower bills. There is no way to share the benefits with friends or neighbours who are not directly connected to the generation asset.
2. Any surplus generation that is not used onsite, can only be sold to licensed suppliers at low wholesale market prices. At the same time, members of a community living on the same street must pay national market prices (typically more than three times wholesale market prices). To many

small-scale generators the inability to sell electricity directly to consumers, and thereby receive higher prices for surplus generation, limiting their capacity to develop new projects. Moreover, there is little incentive for households who do not own their own renewable generation assets to engage in where, how and when electricity is generated.

The 2020 Energy White Paperⁱⁱ – *Powering our Future* – recognises these issues and seeks to drive forward change. It makes clear that achieving net zero targets requires making sure that market rules and regulations are fit for purpose. It commits the UK to a smarter, more flexible decentralised electricity system. It also recognises how wind and solar installations will provide the majority of future power supply and it argues for increased innovation and competition. In practice this means finding ways to engage people in energy markets and the energy transition. It means incentivising the use of cleaner energy solutions and encouraging the flexible consumption of energy. As the Committee on Climate Change points out, reliance upon approaches that only focus on supply-side changes will not work. Finding ways to engage people in change will be criticalⁱⁱⁱ.



Most prominent issues with the ‘supplier hub’ model:



Only **users co-located with generation** can benefit from clean energy and lower bills.



Surplus generation can only be bought by **licensed suppliers** at low wholesale market prices before being sold on.



A solution: Introducing Energy Local

Energy Local is a new approach to managing local electricity generation and use at a community level. Developed through a trial in South Oxfordshire villages, Energy Local won an Ashden Award for this pioneering early work and has now extended its reach substantially throughout England and Wales.

Energy Local clubs

Energy Local clubs (ELCs) sit at the heart of the approach, facilitating access to local renewable electricity generation whilst lowering members' energy bills and increasing export payments for local generation. ELCs are formed by a group of local generators and consumers. The resultant new organisation – an Energy Local club (ELC) – then partners with a licensed supplier. Within the club, locally generated renewable electricity is shared equally among the club's members, and paid for on a 'match tariff' agreed annually by the club's management board.

The match tariff

Electricity shared within the club is paid for on a 'match tariff'. This match tariff is agreed annually between those selling electricity (the generators) and those using energy (the consumers). To the authors' knowledge, ELCs are unique in this regard: prices are negotiated between members before the outcome is consolidated into a formal agreement (the match tariff). This approach contrasts strongly with efforts to develop competitive local energy marketplaces, such as the Cornwall Local

Energy Marketplace^{iv} or Project LEO^v - both of which are multi-million-pound research projects. Energy Local is already delivering many of the expected benefits of these pioneering projects – including, but not limited to, new investment models, innovative tariffs, and local skills and knowledge - but at a fraction of the cost.

Smart metering

Smart meters record half-hourly generation and demand. A 'fair share' algorithm then allocates the distribution of locally generated electricity to members under the 'match tariff'. Additional electricity required by members is provided by the licensed supplier through a static time-of-use tariff. Members can see forecast local generation and track their consumption and expenditure via online displays, building awareness and know-how.

Technical details

ELCs and licensed suppliers work together to manage a 'complex site arrangement', a particular situation under GB licensing rules designed for small industrial sites to benefit from renewable generation across meter points. Within such arrangements, generation and demand from club

members are combined under two meter points (one for import, one for export). The power that is not used locally (i.e., after local use is netted off) is recorded under these meter points. This reading is then taken to settlement – the national system for determining the amount of electricity generated and used – instead of individual readings. Thus, any local generation can be pooled for use among all members.

In practice this relationship results in power purchase agreements between generators and the licensed supplier, and modified supply contracts between households and the licensed supplier (figure 1). The licensed supplier handles billing, covers all regulatory compliance issues and delivers a range of required back-office services, including wholesale trading, metering, and customer services.

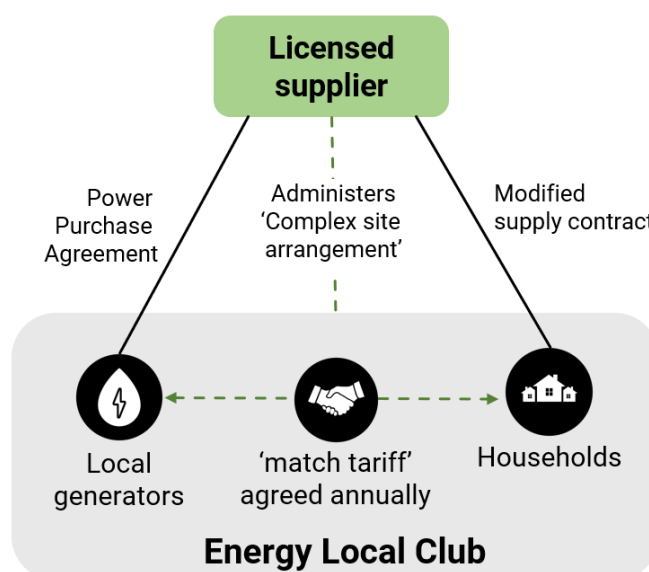


Figure 1: Central actors and their relationships in Energy Local Clubs.

Are Energy Local clubs a traditional for-profit business?

No. ELCs do not generate a profit. Instead, they generate value for generators, end-users, and wider energy systems by re-ordering relationships. Because they generate value for multiple actors, ELCs are self-sustaining.

Each ELC is set up as a bona fide cooperative. Each cooperative is 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 demand member (e.g. a household). The board's principal functions are to agree 'match tariffs' annually; to balance the amount of generation and demand within the club so that both generators and demand members benefit; and to manage the cooperative.

Energy Local clubs are currently being set up under a modified 'franchise' model. Unlike traditional franchising, the model isn't sold to prospective buyers. Instead, new clubs are set up by existing community organisations with the support and guidance from Energy Local CIC, who acts as the development hub and 'franchise owner'. The approach facilitates the transfer of knowledge and experience between clubs and ensures continuous learning.

Benefits of the approach

ELCs enable an energy system that is more flexible, more efficient in use of local resources, more resilient and less carbon intensive than existing systems as well as being fairer and more affordable for consumers. Each club entails benefits to participants, energy systems (including network operators) and decarbonisation goals.

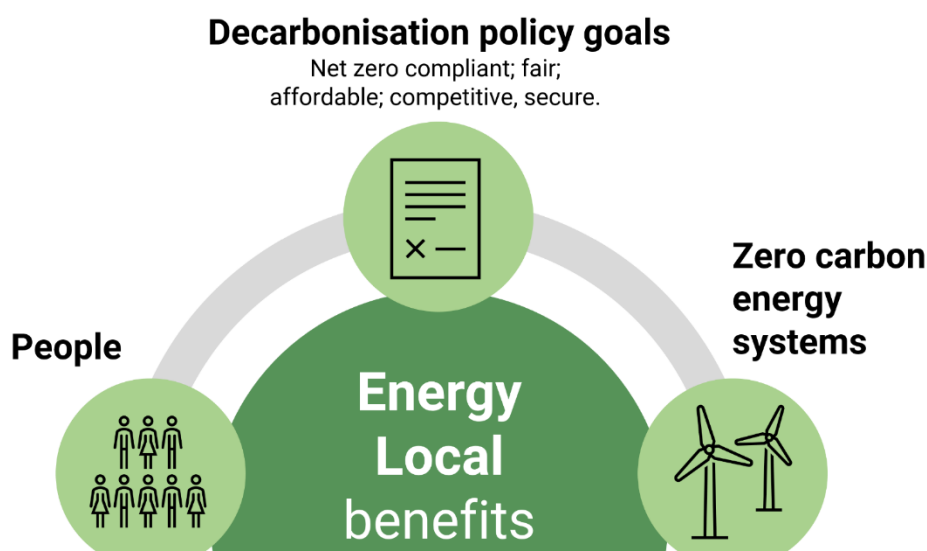


Figure 2: Benefits of Energy Local to people, energy systems and decarbonisation policy goals

Benefits to people

ELCs provide a range of values to members. For example, a new club in Bridport, Dorset is expected to save members £70 a year in electricity bills. Clubs also increase export prices for local generators. The same club in Bridport is expected to increase generator sales revenue by 90% per year. In doing so, clubs keep money in their local economies. Clubs achieve these benefits without any upfront investment by members. This opens the model to those who cannot afford renewable generation or do not have a suitable space to locate equipment.

In addition to financial value, people are also guided by a set of more subjective values, including perceived efficiency, environmental protection, security, fairness, inclusivity, and autonomy^{vi}.

£70

**savings on electricity
bills in a year**



From interviews and surveys with existing members, our research suggests ELCs create new ways for people to engage with energy system transformation by tapping into these values. Members recounted a **greater sense of agency** in energy systems and decarbonisation activities. They valued their direct control of the organisation, the Clubs' ability to provide them with a **voice** and a say in the prices they pay via the match tariff. Clubs are perceived as **strengthening community relationships** and fostering **social cohesion**. They are also perceived as reducing unfairness by

allowing all to participate and benefit, and by providing a means of selling excess renewable generation to community members rather than having export prices dictated by licensed suppliers. Collectively, this points to the ability of ELCs to **empower** people within the energy system and strengthen local economies.



*"Being part of Energy Local
makes me feel like
I am part of the solution."*

Benefits to energy systems

- ELCs contribute to system management, by reducing line losses and by potentially reducing network constraints, and reducing the need for curtailment (turn down) of renewable assets, depending on prior conditions.
- ELCs are encouraging the take up of innovative variable tariffs (viewed as essential in the creation of smarter energy systems) and the deployment of smart meters (another prerequisite of smart systems) whilst promoting more engaged 'energy citizens'.
- ELCs create a route to market for small-scale distributed generation via increased export prices – an important benefit, following the closure of the Feed-in Tariff scheme and limited access to remaining support schemes for renewables designed for large generators.

Benefits to decarbonisation policy goals

The Energy Local approach also produces benefits in line with ambitions to transform the energy system as set out in the government White paper^{vii}.

- It engages people and SMEs in the energy transition. For example, the launch of a new club in Bridport in January 2020 resulted in 80 domestic sign-ups for 50 places within four weeks.
- The approach contributes to the Government's aim of Net Zero emissions by 2050, by promoting efficiency and flexibility using existing generation and demand-side assets.
- By offering a fairer deal for consumers and renewable energy generators without significant upfront costs, the approach addresses key commitments made in the Government's White Paper on: affordability and fairness, opportunities to save on energy bills and reduce fuel poverty.
- The approach enhances the capacity of consumers to take charge of their energy use through the use of smart meters and digital infrastructure enabling increased choice and control of energy consumption. This is in line with commitments made in the 2020 Energy White Paper on protecting consumer interests and reducing barriers to consumer engagement, so that more customers make informed choices about the products and services they use.
- Finally, by stimulating demand for smart meters, the approach supports the move to half-hourly settlement, which is seen by Ofgem^{viii} as a 'major milestone' in the transition to a smart and flexible energy system.

Outlook

A variety of **issues** have the potential to limit Energy Local's impact, including:



Limited access to at-risk funding for club development costs severely limits take-up of the model nationwide.

Digitalisation of the energy industry is still in its infancy. The Energy Local model is in many aspects (such as half-hourly balancing) very advanced for the domestic and small business sectors. Teething issues that are beyond the control of Energy Local, such as connectivity and transfer of data between industry actors, threaten to derail the effective operation of Clubs.

Reliance on a licensed supplier to provide all back-end services involved in selling electricity means local clubs face the risk of being the face of new trading relationships but without any power to resolve issues that might arise. Such partnership present reputational risks despite licensed suppliers performing vital roles in each clubs operation.

Despite these issues, we find the Energy Local model continues to be **promising**, because:



There is no reliance on the deployment of new distributed generation capacity. Clubs utilise existing generation capacity and make better use of it, resulting in a wide range of benefits to people, the energy system and policy goals.

Clubs can support the deployment of further distributed generation capacity by increasing export prices of local generators.

Clubs have the potential to vary the distribution of benefits depending on local circumstances, community values and preferences and at different stages of club development.

Creating new clubs will require limited upfront financial and human capital once the model is refined and relationships with licensed suppliers are established. Their ongoing running costs are also expected to be minimal.

ⁱ <https://www.ofgem.gov.uk/publications-and-updates/future-supply-market-arrangements-response-our-call-evidence>

ⁱⁱ BEIS. (2020). Powering our Net Zero

Future. http://www.ret.gov.au/energy/facts/white_paper/Pages/energy_white_paper.aspx

ⁱⁱⁱ Committee on Climate Change, C. (2019). *Net Zero: The UK's contribution to stopping global warming*, https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/?utm_source=hs_email&utm_medium=email&utm_content=72305980&hsenc=p2ANqtz-932kEYWIj2zWsyBO53mnlytI57cnjTzoVSb1RPtAmUcFB9C6WI5X_9HVirz7n8aaDTrUOeDK3BJ0MUoVvV-UK9

^{iv} <https://www.centrica.com/innovation/cornwall-local-energy-market>

^v <https://project-leo.co.uk/>

^{vi} Demski, C., Butler, C., Parkhill, K. A., Spence, A., & Pidgeon, N. F. (2015). Public values for energy system change. *Global Environmental Change*, 34, 59–69. <https://doi.org/10.1016/j.gloenvcha.2015.06.014>

^{vii} BEIS. (2020). Powering our Net Zero

Future. http://www.ret.gov.au/energy/facts/white_paper/Pages/energy_white_paper.aspx page 25

^{viii} Rossington (April 2021) **Major system upgrade to hit net zero and help cut energy bills**, https://www.ofgem.gov.uk/news-blog/our-blog/major-system-upgrade-hit-net-zero-and-help-cut-energy-bills?dm_i=1QCB,7C5QB,RJNC5X,TRSHR,1