



South West
**NET ZERO
HUB** 

COMPLEX SITES EXPLAINER

Complex Sites : How do they work?

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Complex Sites Explainer

Complex Sites: What's that all about?

When a wind turbine is proposed on a nearby hill, it's common for the local community to shout, "What difference does it make, we can't use that energy. It doesn't save us anything."

And that has generally been the case – without a cable physically connecting the energy generator with the nearby homes and businesses, the power generated by the local wind turbine is exported into the national grid, while the members of the nearby community get their energy from the grid, not knowing where it was generated.

Of course, to some extent physical connection of generation and consumption is commonplace – with building occupiers using the energy generated from solar PV on the roof, and also on a bigger scale with factories and other businesses able to connect to a nearby renewables generator through a private wire, or hyper-local 'micro-grid'.

These physical arrangements are known as 'behind the meter' – supplying the power directly without use of the grid. But this has generally not been possible at a community scale without prohibitive cost and complexity.

Or so we thought... until Energy Local CIC was set up on the realisation that it *could* be done by applying what is known in the electricity supply regulations as a 'Complex Site'....

So, what do we mean by a 'complex site'?

Think of a large industrial site, or airport, or university campus, with a single owner operator but spread across multiple buildings with multiple electricity meters connecting to the grid within the site boundary.

The operator might well have good opportunities to put some generation on the site to meet some of their electricity demand, for example on a nice big warehouse roof. That warehouse might well use very little electricity, and it seems pretty reasonable for the site owner to be able to 'use' the rest of the energy generated in its other buildings and operations across the site, without it all having to be physically connected 'behind the meter'.

In agreement with the electricity supplier this can be done through a complex site arrangement – where all the import and export to and from the grid across all the meters on site are aggregated under a single virtual meter, and the operator is billed on the net amount of energy used from the grid. Simple!

But hang on! If energy use can be accounted for in this way across a sprawling complex industrial site, why can't it be done across multiple site boundaries covering a similar area? Well apparently, it can...

Clubbing together...

You might have heard of Energy Local Clubs or Local Supply Clubs – and netting off generation and demand across club members is what they are doing. Joining together as a club, with all members signed up to the same supplier, a price is agreed directly between the generator and the club for the electricity being generated that can be used by the members as it is being locally generated – matching generation and demand on a half-hourly basis.

...for everyone's benefit!

This means the generator can sell power direct to local people and achieve a price higher than they would get by selling it into the grid in the normal way. And at the same time, that price is lower than the consumers normally pay on their grid supplied electricity. Energy Local clubs are achieving savings of over 25% on members total electricity bills. It's a win-win, incentivising delivery of local renewable generation, with local people getting the benefits.

Actually, it's a win-win-win! The supplier facilitating the complex site arrangement has a way of attracting new customers, with people wanting to join the Club switching to that supplier. Any of the members' electricity demand not met by the local generation is supplied through the grid by the supplier in the normal way.

Or, without wanting to get too carried away, is it a win-win-win-win? The priority of the grid operators is to keep the lights on – requiring a careful balancing of supply and demand to make sure there's enough supply without overloading the system. With the dramatic changes in our electricity network – from few very large power stations to a very distributed system involving thousands of small generators connecting into the distribution system - this has got a lot more complicated. Complex sites have the potential to provide some balancing of supply and demand at a very local level. The network operators recognise this potential benefit and are keen to understand its value.

But how does it lead to lower bills?

Let's get back to those savings for local people from using locally generated electricity. Where do those savings come from if the generator and consumer are not physically connecting but still connected through the grid? The simple explanation is that the

classification as a complex site is intended to enable the treatment of the local group of generator and consumer sites *as if* they were physically wired together behind the meter. Much of an electricity bill (currently ~ 60%) is made up of non-commodity costs, i.e. not for the electricity itself but other associated charges for the use of the grid system and its management and also including green levies resulting from government policy. When connecting directly 'behind the meter' all these charges are avoided on each kilowatt of power.

It's time to get nerdy...

To understand how this is dealt with in practice for complex sites we need to get a bit more into the detail of how this is all regulated.

The rules of how electricity is traded, and the purchase of energy by suppliers from generators is set out in the Balancing and Settlement Code (BSC), and there has been a proposed modification to the code going through the rigorous assessment, approval and implementation process in recent years.

Code modification P441, which after a four-year process is recommended for approval with a final decision by Ofgem timetabled for June 2026, specifically seeks to create six clear classes of complex site. The first four define four types which are already common – e.g. an industrial site with multiple users, or a factory with its own generation. Class 6 is to allow for new arrangements that do not fit into any of the other five classes. It is **Class 5** that we are interested in – clearly defining a class of complex sites for the netting of imports and export across multiple sites. And it comes with certain restrictions:

- The boundary of a Class 5 complex site is limited to being served by a single primary substation (over 500 in the Hub's South West region) on the electricity distribution network – ensuring local use and benefit of the generation, and to give the local distribution network balancing advantages.
- All participants must be supplied by the same licenced supplier.
- The generation must be renewable (or qualifying as 'Good Quality' CHP).
- And the generators in the complex site arrangement need to qualify for a supply licence exemption.

This last one limits the size of exempt supply from a generator supplying the complex site to five megawatts per hour to non-domestic consumers, or two and a half megawatts per hour to domestic consumers. And it's this licence exempt supply (LES) that provides most of the savings off the electricity bill through the avoidance of green levies. A Class 5 complex site will also avoid paying the costs associated with balancing the grid that are usually passed onto customers.

So, while not treated exactly like a behind the meter connection, significant charges are avoided, approximately 6 or 7p on every kilowatt hour and 30% of total unit costs.

It's all sorted then?

It's still very early days for complex sites and local supply clubs and there's plenty more to do. There is currently one supplier, 100Green, supporting Energy Local clubs. Other suppliers, such as Octopus (through its community joint venture Younity, with its new Community Power Clubs) are utilising Licence Exempt Supply benefits at a community scale. But the potential is huge and we are seeing a rapid growth in interest from community energy organisations.

But the opportunity doesn't stop there. The Hub works closely with Local Authorities across the region and we think there's significant potential for them to benefit from complex sites – in terms of energy cost savings but also from increasing the amount of viable renewables generation – as both the generator and consumer.

How does that work?

Rooftop solar generally makes sense where generation can be used in the building because the savings from reducing the amount of energy imported from the grid pays back the cost of installing the panels fairly quickly, and then those savings continue for the lifetime of the panels. But that means solar arrays are often sized to match the demand from the building, not the size of the roof. If they were made bigger the extra energy generated would need to be sold into the grid at a much lower price, not enough to justify the cost of installing the panels.

So, the opportunities for local authorities to install large solar roofs are limited because suitable sites can't use much of the electricity produced. Much of the suitable rooftop space is left empty.

Using a 'Complex site' local electricity supply arrangement, the exported electricity can be used to supply other buildings owned by the local authority in the same way as an Energy Local Club, with the Council getting the savings. By doing this, putting more solar on the suitable roofs makes financial sense.

How the Hub is helping make it happen

The potential for this was shown in a Hub funded project looking at complex site opportunities for Southampton City Council across three primary substation areas. This showed a significant increase in financial benefit to the council (~33%), a reduction in payback period and therefore a stronger business case for increased solar deployment. That's just a few areas for one Council.

We have since done a project with Energy System Catapult to map all local authority buildings and make a first assessment of the primary substation areas with the best complex site opportunities. And we are doing some detailed modelling on some priority areas and developing a shareable methodology so that local authorities will be able to assess their own opportunities. We are also engaging with local authority electricity suppliers on the implementation of complex site arrangements, so local authorities can start realising the benefits of this exciting innovation.

[And there's more to come...](#)

We don't yet know how this will develop. But with the recent publication of the Department for Energy Security and Net Zero and Great British Energy's Local Power Plan, which includes making it easier to share generated power locally, we can see there is support for this right from government, network operators to local community groups. For our energy system, in part at least, the future is local!

Find out more about how the Hub supported Southampton Council to understand the feasibility of Complex Sites for their estate- [Complex sites and local electricity supply - South West Net Zero Hub](#).

[Contact the Hub for more information](#)