Frequently asked questions

Why are we doing this?

Our electricity industry and market is in the middle of a major **transition** as we respond to the unfolding climate crisis.

- It has become more **decentralised** with many small renewable energy generators, rather than fewer large fossil fuel powered ones.
- Growing electricity **demand** from appliances will be further increased by electric heating and electric vehicle charging.
- Installation of renewable energy needs to accelerate to **meet carbon reduction** targets.
- To meet peak demand, power generation has traditionally been ramped up by using the most carbon intensive and expensive fuels.
- It is getting harder to **balance energy supply and demand**, especially at peak times, as decentralised renewable generation is a lot harder to control.
- Intermittency concerns with renewables can be **overcome with electricity storage facilities**, such as domestic and commercial batteries.
- However, costly upgrades to the electricity network will be required with greater environmental and resource impact, as well as financial consequences for consumers, if demand is not managed effectively.
- We need to consider when we use electricity, as well as how much we use, to minimise carbon emissions and expensive and resource intensive manufacture and installation of new technology.
- Ultimately, a big factor will be how far we, as households and organisations, can **change the way we use energy** and what the best ways of achieving this are (e.g. smart technology, pricing mechanisms, promotional campaigns).

What is Flex Community?

Flex Community is a cloud based, smart software platform that manages energy at a building and inter-building level. It has been developed in Spain by Stemy Energy with initial funding coming from COMILLAS university in Spain and MIT in the USA. It has been widely tested with involvement from the Spanish Government and a number of key Spanish utilities.

Stemy Energy is currently working with community groups like Bath & West Community Energy to adapt the platform for the UK market and deliver services through a strong community model that **empowers local people to get involved in the energy transition**.

In partnership with Bath & West Community Energy, the Flex Community project started testing the control of water heating. Now, aside from water heating, we are also controlling more aspects such as space heating, photovoltaic panels, batteries, electric vehicles charging points, etc. in more households. Flexibility is provided (see **'What are flexibility markets?'** below) through controlling when water is re-heated to the temperature set by the hot water tank thermostat, controlling space heating in an intelligent manner, making the most out of photovoltaic installations and managing of other resources. In addition, householders will have the ability to override any automatic control as required.

- Flex Community monitors and learns about customer energy behaviour and building energy performance.
- Flex Community predicts weather patterns and provides home automation and temperature control to ensure customer comfort levels whilst also maximising the potential of renewables to reduce CO_2 emissions.
- Householders have freedom to let the system operate without their input, within the pre-set conditions, or to take control of their energy use through a mobile app.
- Flex Community will facilitate participation in flexibility markets to provide demand response services when required.
- Flex Community will provide feedback to householders with information on how participation in flexibility markets has reduced carbon emissions.

The software platform maximises the home's energy efficiency whilst streamlining the energy flexibility of the grid. It is, in effect, a private energy broker for householders and a collective control and management tool for utilities. It is a win-win for consumers and energy utilities alike.

What are flexibility markets?

Flexibility markets are created by electricity network operators prepared to pay for the ability to turn up or down electricity generation or consumption in order to balance **supply and demand.**

To date the energy industry has typically provided flexibility around **supply** e.g. through power stations changing how much they produce or installing enough cables to make sure electricity can always be transported to consumers.

The industry has also worked with large industrial and commercial consumers to manage **demand** but this will need to be expanded. In our changing energy system with far more small-scale generation that cannot be easily controlled centrally, we will increasingly need to see **demand** flexibility at a much smaller scale, down to individual households.

If we can bring together multiple households, each able to provide small amounts of flexibility, it is possible to offer flexibility across the whole community

at a level that can be provided to electricity network operators in return for income.

Domestic flexibility can be provided by installing smart technology that makes it easier for households to be flexible in the times that they use electricity during the day.

Energy demand management is the quickest, most effective tool to balance demand and supply in the grid today. Its relevance to the sustainability of the energy system will therefore only increase over time.

Why would I get involved?

As well as reducing your climate impact, involvement in this project will mean that you will be helping us shape approaches to carbon reduction that will become the norm over the next 5 years.

- As we continue to electrify our energy use we will see **Time of Use Tariffs** become the norm, charging different rates for electricity use at different times of day. We will pay more for our electricity during peak times, so by shifting electricity use away from times of high demand, we can reduce fuel bills. Involvement in this project will prepare you for a way of using electricity that will soon become standard for all. Involvement in this project will certainly not increase your fuel bills in any way.
- As trading within **flexibility markets** develops, you will be able to earn income from changing when you use electricity, depending on how much, how quickly and how long you can shift your electricity use. See **'What are flexibility markets?'** above.
- As a user, after completing the first phase of the project (only Domestic Hot Water control as a starting point) you will be able to solar panels, heat pumps and car charging, providing a service that will users to identify what new technology they might need to install , how much it cost, what they will save and what impact it would have on energy demand.
- We are also keen to test **peer to peer trading**, where one solar panel owner can sell electricity they don't need directly to neighbours. This has been done successfully in Spain through the Flex Community platform but is not yet possible in the UK due to market regulations. However, we are in discussions with Ofgem around how we can adapt the approach to make it work here too within 12-18 months.

So, your input could be crucial to the next phase of the energy transition, as we look to accommodate the massive increase in renewable electricity that we must have to decarbonise our electricity system. Getting involved now will help us shape the future.

What would I have to do?

The Flex Community software platform will respond to flexibility requests from the operator of the local electricity network, in our case Western Power Distribution, when they need electricity demand turned up or down to help balance grid operation.

To be part of Flex Community you should have or be interested in having an electric immersion heater, radiators, a heat pump or an electric vehicle charging post.

Who are we?

Bath & West Community Energy

Bath & West Community Energy (BWCE) develops community owned renewable energy projects, offering local people the opportunity to invest in local projects, earn a reasonable return and as members have a say in the running of the organisation. BWCE is set up for the benefit of the community and to support local action to reduce the impact of climate change. www.bwce.coop.

BWCE has delivered a wide range of community renewable energy projects as well as running innovative pilots, including Solar Streets and EmPower projects, that have involved us in working with householders around electricity use, as well as installing solar PV, batteries and monitoring and control hardware in people's homes.

Who are we?

Stemy Energy

Stemy Energy was created with the mission to reduce the energy bill of end-users, reduce their carbon footprint, and promote a more sustainable energy system, using learning tools to participate in the ancillary services market in real time whilst managing the demand simultaneously.

Stemy Energy was founded by Alvaro, Jaime, Francisco, Miguel, Antonio and Carlos, experts with 20 years of experience working in high performance intelligence in the electricity sector. It was born from a project called SPLODER, which evolved into a commercial product as it proved successful. Stemy has worked with Spanish utilities, and has a working platform with homes all over Spain. Now, Stemy is creating new products adapted to the UK electric market and user experience, in collaboration with Bath & West Community Energy.

Álvaro Sánchez Miralles
Chief Executive Officer

Jaime Boal Martín-Larrauri
Chief Technology Officer

Francisco Martín Martínez
Chief Operations Officer