

## Living with Renewables: Transforming Energy Demand





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Bath & West Community Energy



Established 2010 to deliver ...

# "Clean Local Energy, Community Owned for the Common Good"

A Community Benefit Society One member one vote Asset lock Not for profit

# Since 2010 BWCE has raised £20 million to build 12.35 MW of Community Renewables

#### **Ground mount solar**

• 5 ground mount systems ranging from 250kW to 5MW

## Roof top solar & hydro

- 15 roof top systems on schools and community buildings ranging from 10 to 50kW
- 1 small modern water wheel

### Wind turbines

• Currently seeking sites





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## Reasonable return paid to members & over £220k to community fund











# Climate Change is Happening Now ...

### David Attenborough – UN Security Council, Feb 2021

"There is no going back - no matter what we do now, it's too late to avoid climate change and the poorest, the most vulnerable, those with the least security, are now certain to suffer."

"If we bring emissions down with sufficient vigour we may yet avoid the tipping points that will make runaway climate change unstoppable."

#### **IMPACT**

## EQUITY

#### URGENCY



# **Energy Transition – System Change**







Must do something about heat and transport

## PRESSURE FOR NEW RENEWABLES WILL ONLY INCREASE

"Zero carbon operation of the electricity system by 2025 means a fundamental change to how our system was designed to operate."
"However we believe this transformation is achievable and, if we are to make progress in addressing climate change, essential." National Grid







## Click Here to Watch National Grid ESO YouTube Video - 1:43 minutes

# So how do we deal with....





# **Matching Supply and Demand**







It's not just about **how much** energy we use

It's also about when we use it.

Meeting energy demand during the **evening peak** is more **carbon intensive** (relying more on fossil fuel power generation).

Shifting when you use electricity from 8pm in the evening to 2pm in the afternoon can cut carbon emissions by up to 50% in the SW, by maximising use of renewables

Balancing supply and demand can also reduce the need to turn off renewables during times of low demand and ease grid connection for new renewables

# We can better manage demand...





Behaviour change



Battery storage

# FLEXIBILITY

The ability to modify consumption patterns in response to an external signal (such as a change in price, or a message)



#### **Pricing mechanisms**



Smart technology

# **Evolution of Flexibility**



Historically, balancing driven by control of generation through large scale, centralised power stations

Local Flexibility Markets





#### Solar Streets – up to 20% demand shifted away from peak times



#### Challenging to sustain with behaviour change alone

# Flex Community – automating demand shifting



Community Approach

Heat Pumps & Electric Water Heating



Solar PV

In partnership with **Stemy Energy** (Spain) Funding from Power to Change and part of the EU funded ReDREAM project



## **Early results - just for hot water heating**

From 16 participating households – will grow up to over 100 inc, heat pumps & electric vehicle charge points

Two operating modes:

- 1. Optimisation shifting demand to maximise use of on site solar generated electricity and minimise standing losses
  - 2. Flexibility shifting demand in response to grid demands

Up to 20-25% reduction in electricity bill for hot water heating

Flex payments compensate for where flexibility reduces optimisation

But not yet known what the balance of carbon impacts is between the two approaches



### Flex Community is trialling flexibility

We are looking for 'pioneers'

Who already have a heat pump, EV charger or main source immersion heater OR Are planning to install either of these in the next three months

Willing to have electricity consumption remotely controlled via digital technology, within constraints set by you and changed over time if your needs change

To test if we can develop a workable, community owned solution to energy demand management

Will receive 'Flex Payments' for participating

## Can you help us? Do you live in ...



#### **BWCE's Area**

#### **The Mendip Area**



# **Flex Community Portal**









## **Support Local Renewables – Be More Flexible**

Climate change is here now, and it affects us all and the most vulnerable the greatest

Carbon intensity of electricity is rapidly falling but the amount of electricity we are and will be using is increasing - increasing the pressure for new renewables

Preventing curtailment of energy renewable energy systems and increasing new capacity – needed to fully decarbonize the grid - will require new approaches to both how we supply and use energy

The higher our energy use, the more flexible we need to be

The Flex Community pilot is recruiting – do you live in the right area, are you interested?

Can you promote to friends, colleagues, local networks?

See website for more info and contact Nick for details of follow up sessions





#### **Contact Details**

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WPD Carbon Tracer. - <u>https://carbontracer.westernpower.co.uk/</u>

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