

Rural Housing Scotland Conference 2023

Power Circle Projects Ltd

Kenneth Easson – Project Development Manager



Power Circle

- Power Circle is a Scottish social enterprise in the process of registering as a charity, we work on projects across the United Kingdom.
- We develop, support, manage, and arrange funding for low carbon energy projects. With a focus on smart local energy systems (SLES).
- Power Circle Projects Ltd has been selected as a provider of its innovative Smart Local Energy Systems (SLES) service offering under the Procurement for Housing, Social Housing Emerging Disruptors (SHED) framework.
- Recent success in securing LCITP and Social Housing Net Zero Heat Fund support for rural social housing projects.



Smart Local Energy Systems (SLES)

What do we mean by a SLES?

- Any set of energy assets within a building or local area which are managed together, using smart technology, to optimise their operation. At a wider level we will optimise further by managing a portfolio of these systems across the UK.
- **Smart Local Energy Systems (SLES) are central to our service offering.**
- We have developed a number of SLES project types which are illustrated later on.



Our Mission

- Our mission is to enable local energy users to access low carbon energy at scale in a way that is affordable, fair and breaks down social barriers.
- Looking ahead to 2045, we see that the key challenge for housing providers will be achieving net zero whilst avoiding the “unjust transition”.
- Recent research by National Energy Action suggested that, based on reasonable assumptions at the time, achieving net zero in social housing would add £200 to £800/year to household bills...

...before the cost-of-living crisis.



Project Types and Case Studies

Solar Circle, SAPPHIRE, and Climate Positive Homes



Solar Circle

Aim:

To reduce energy costs to householders (owners or tenants) and reduce carbon emissions from existing housing stock while generating income.

How:

By installing solar PV and batteries in existing housing stock.



Solar Circle: Aberdeenshire Case Study



- Aberdeenshire Smart Solar and Storage
- 500 property PV and battery project.
- Grid consents had been refused for solar PV systems.
- Solved by smart energy management via domestic batteries.
- PV and battery systems aggregated into a **virtual power plant (VPP)** for export of excess energy and grid services provision.



Solar Circle: Aberdeenshire Case Study



- First social housing project on this scale to incorporate grid services. This also provides a revenue stream for the local authority.
- **Energy Services Company (ESCo)** sells energy to tenants at an affordable tariff, helping to address fuel poverty which affects 35% of Aberdeenshire social households.
- Solar and battery storage systems helping to achieve social housing energy standards.



SAPPHIRE

Smart Affordable Provision of Power and Heat with Integrated Renewable Energy

Aim:

Provide electric heating which is comparable to mains gas in terms of cost and with user friendly operation for tenants and homeowners.

How:

By integrating electric heating solutions into smart local energy systems which include solar PV and batteries.



SAPPHIRE – Solution

- Provision of smart solar and storage package and then replacement of gas boiler when it is due to be replaced by (probably) a heat pump.
- Integration of the heat pump as part of the overall smart energy system.
- In some cases, this could alternatively involve integration of storage heaters, a district heating system, or perhaps in future a hydrogen network.
- Current SAPPHIRE projects include social housing in Glasgow and a BEIS funded project targeting owner occupiers in Blairgowrie.



Climate Positive Homes

Aim:

To design, develop, and operate climate-positive new build homes with net negative operational carbon emissions.

How:

By integrating microgeneration systems within the design that generate more than each building in the development requires plus provision of grid services.



Climate Positive Homes – Solution

- Electric heating system; the type will depend on the energy efficiency standard to which the properties are built.
- Whole roof building integrated solar PV across every property as an energy source.
- Each property linked by private wire to a central battery which stores the electricity and can export and import to the grid.
- EScO manages the local energy network and sells energy to the tenants at a low tariff helping reduce fuel poverty.
- Excess energy also traded through the grid providing revenue to the EScO.



Lochalsh and Skye Housing Association

Neil Clapperton – Chief Executive



Island Life

- Being off-gas
- Being green
- Being fuel poor
- Dodgy supply chain
- A technical legacy

Price Tag

- Is the sector paying £2Bn or £18Bn?
- A modest investment = £80pm more
- Competing for capital and covenants
- Retrofit and new build

What is needed?

- A pattern-book archetype approach
- Big Government
- Regional solutions
- ESCo – Power Circle Models

Working with Lochalsh and Skye Housing Association



Portree Biomass Site

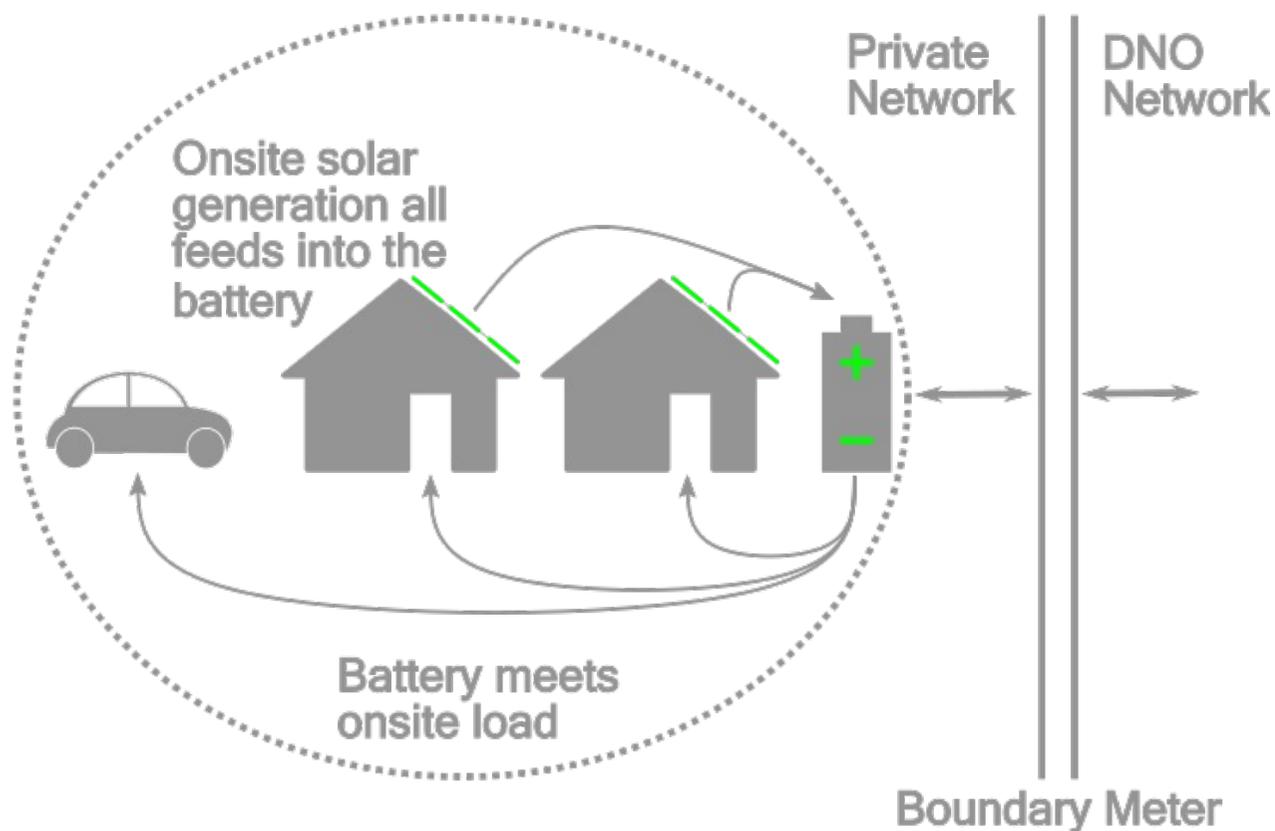


Portree Biomass Site



Portree Biomass Site

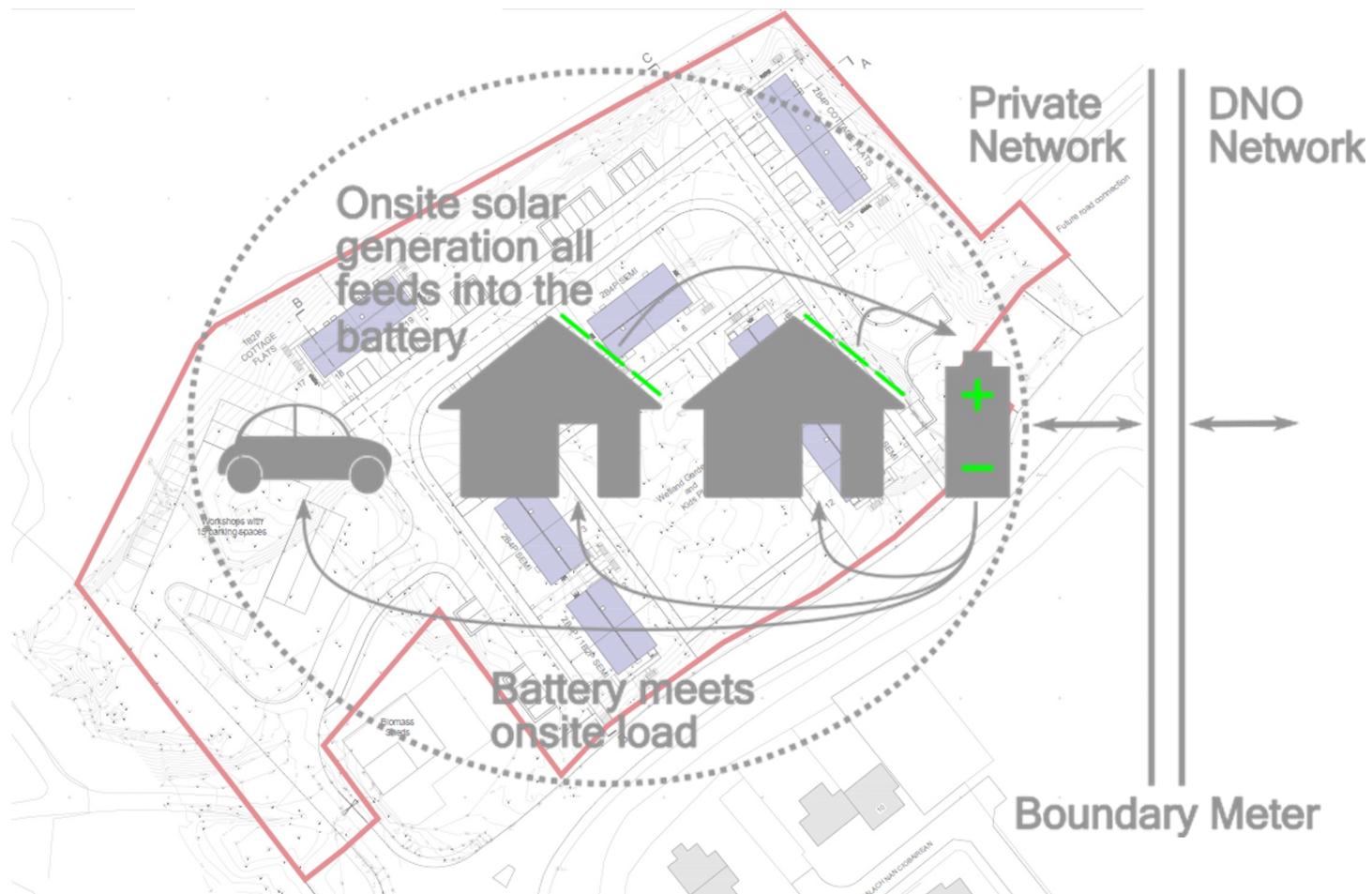
In the Project



- An example of the “climate positive homes” project model.
- New properties will be connected to a private wire microgrid.
- Provision to add communal EV chargers at a later date.

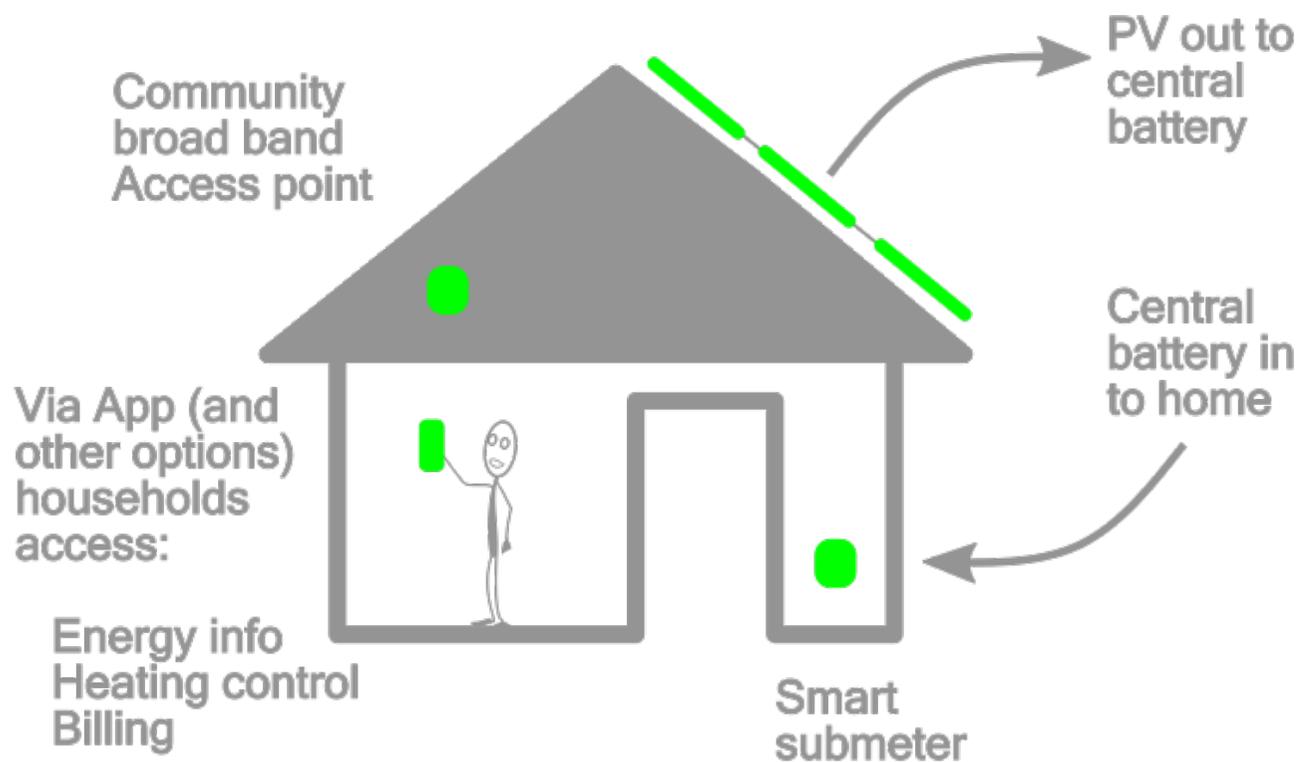


Portree Biomass Site



Portree Biomass Site

In the Home



- Includes community broadband, energy storage, and BIPV.
- Tenants billed for electricity by LSHA Energy Services Company (ESCo) via smart submeter in each property.



Solar Circle Retrofit and Net Zero Strategy

Solar Circle for Flats:

- Project exploring the feasibility of retrofitting a solution similar to our Solar Circle model in flatted properties.

LSHA Net Zero Strategy and Project Feasibility Studies:

- Project will principally develop a strategy to achieve net zero across the LSHA estate; this will balance landlord and tenant affordability with regulatory and zero-carbon compliance.
- Will include consideration of fabric, heating, microgeneration, SLES, and business model options. Plus detailed analysis of case study properties representative of the wider LSHA estate.



Summary



The Energy Challenge in 2022:

- A national energy system under pressure.
- A retail energy landscape characterised by market volatility, an expanding range of technology options, and uncertainty about the future.
- A need to understand the value of grid services opportunities, complex tariff structures, and smart energy options which didn't exist a decade ago.
- Limited capital budgets available to invest, pressure to get decisions right.
- Lack of in-house staff with the time, knowledge, and expertise to develop business case and deliver optimal solutions.
- Lack of trust in commercially sponsored solutions.



Power Circle can help:

- Reduce energy costs for tenants and consequently also rates of fuel poverty.
- Meet energy efficiency, carbon reduction, and other regulatory targets.
- Derive benefit from adoption of onsite renewable energy and smart technologies.
- As a social enterprise, our focus is on the benefits we're able to deliver for customers and stakeholders.



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Thanks for listening, any questions?



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