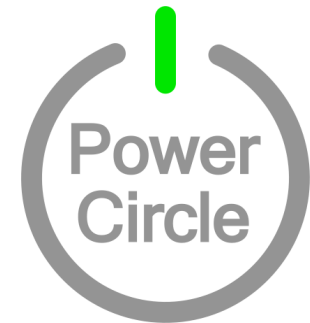


Presentation to Thornhill Development Trust
and residents

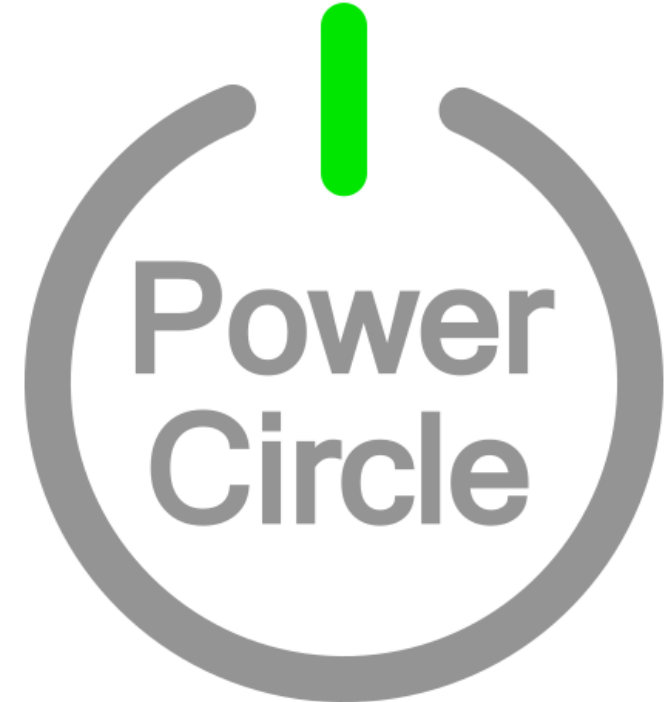
Innovative Energy Solutions for Thornhill

23rd March 2026



Who we are

- Power Circle Projects Ltd is a social enterprise that develops, manages and, where required, arranges funding for low carbon energy projects. With a focus on smart local energy systems.
- 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.
- We also provide consultancy services linked to our Mission



Context for the Study

- Thornhill household survey. 51 responses
- Desire to look at new solutions to cut energy costs and carbon
- Options we have looked at
 - Octopus Zero Bills
 - Thermify HeatHub
 - Biaco electric boiler
 - Solar PV and battery

Survey Responses

- Thornhill household survey. 51 responses
- 49 owner occupiers, 1 social tenant & 1 private tenant
- Property types
 - 41 houses (one mid terrace)
 - 8 bungalows
 - 1 cottage
 - 1 flat

Survey Responses continued

- Age of Property
 - 28 Before 1919
 - 2 1919-29
 - 1 1930-49
 - 3 1950-64
 - 4 1965-75
 - 1 1984-91
 - 3 1992-98
 - 1 2003-07
 - 1 2008-11
 - 6 2012-23
 - 1 2024 onwards

Survey Responses continued

- Type of heating
 - 30 Oil
 - 12 Air source heat pump
 - 5 Electric Storage heater
 - 2 Back boiler
 - 1 Biomass boiler
 - 1 Direct Electric

Survey Responses continued

- Low carbon tech installed
 - 14 Solar PV
 - 11 Electric vehicle charger
 - 4 Electric battery

NB Many of the above will represent homes with more than one of these technologies

Octopus Zero Bills

- Offers a zero energy bill for at least 5 years – subject to fair use limit: c20% above ‘the expected consumption for a home of a similar size’ use above this will be charged at the Flexible Octopus tariff rate. Homes with very large consumption may be excluded
- Requires home to be assessed as suitable and solar PV, battery and heat pump to be installed
- Octopus manages the system and retains all export and grid services income – this is what makes the zero bill possible
- Only for houses and bungalows at present
- Can be attractive but many Thornhill homes may not be suitable



ZERO BILLS

*No energy bills
for 5 years
with our
Zero bills homes*

Thermify Heat Hub

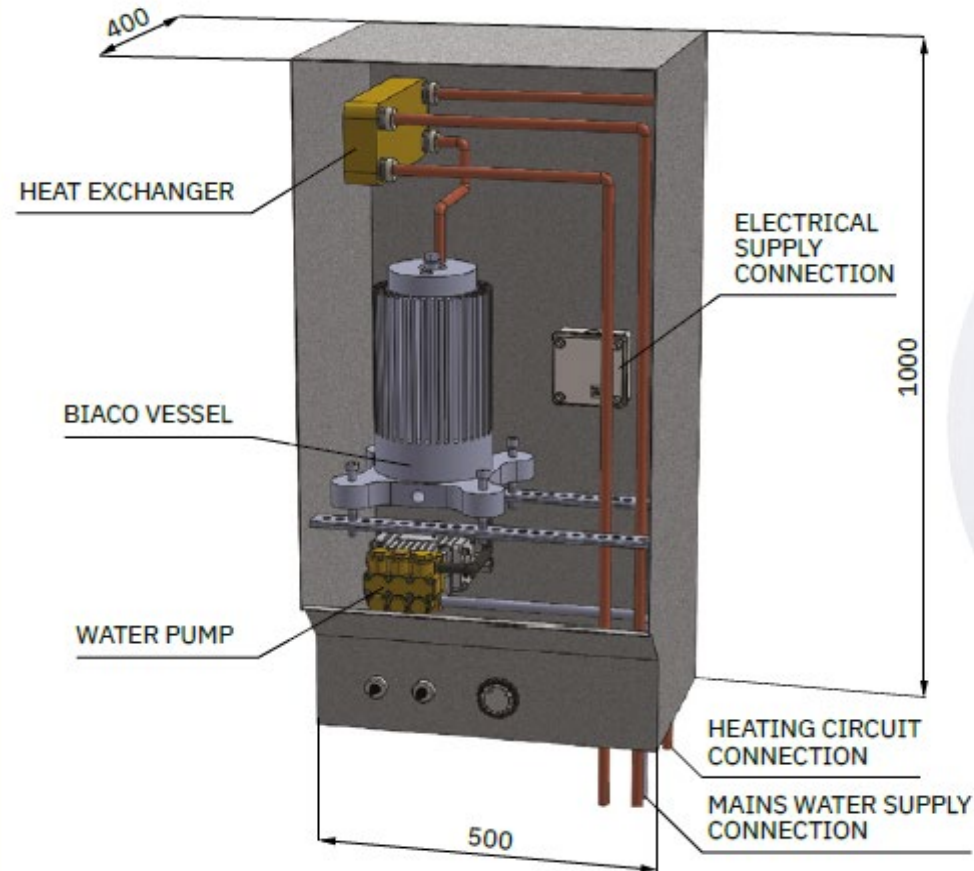
- New heating solution providing heat from mini data centre at each home. Thermify sells data services to its customers
- Thermify pays for its own electricity and broadband
- Most income for Thermify comes from its data sales
- Low cost low carbon heat, with a zero volumetric charge – you can use as much heat as you need, subject to system capacity
- Provides high temperature heat. Reduced or no need to change radiators.
- Recommended energy efficiency level – typical EPC C or better
- Suitable for houses - can have two units for large houses
- 100 installs under SHIELD programme now, Rollout 2028/29



Biaco electric boiler

- New technology producing high temperature heat. Reduced or no need to change radiators.
- Needs water and wastewater connection as well as electricity
- Suitable for both flats and houses, small or large
- Current efficiency COP4, aiming for 5 – this means 4 or 5 units of heat produced for each unit of electricity consumed
- Efficiency similar to best ground source heat pumps, better than air source
- 25kWth and 50kWth modular units are in development
- Trials in larger buildings now. Rollout planned for 2028/29

25 kW boiler concept design



Solar PV and battery

- These can provide very useful benefits on their own and can complement the heating options we are discussing. They are a requirement in the case of the Octopus Zero Bills option
- For other options, there is scope for the householder to earn revenue from both export and provision of grid services as well as making better use of solar PV and low overnight tariffs
- Battery can be installed inside or outside the house
- HES guidance to avoid solar panels on the principal elevation



Costs and benefits – broad indications

- Octopus Zero Bills. Property A upfront cost net of grant for ASHP: c£13000. Year 1 benefit estimate: £4412 - if consumption is within Fair Use limit
- Thermify Heat Hub. Property B (one Heat Hub). Upfront cost c£3500. There also may be a need for new heat storage or ancillary equipment. Annual cost £600. Year 1 benefit estimate: £1090.
- Biaco Electric Boiler. Property D. Upfront cost £5-6000. Year 1 benefit £230 at COP5 and roughly neutral at COP4
- PV and Battery. Property E. Upfront cost c£17,100. Year 1 benefit £1854

CO2 Savings

- Octopus Zero Bills. 'aims for zero carbon emissions'
- Thermify Heat Hub. 'assessed as providing a 90%+ reduction'
- Biaco Electric Boiler. 'When powered by green electricity, the system is zero carbon'
- PV and Battery. Property E. Installer estimate: 2 tonnes of carbon emission reduction per year

Grid impact

- SSEN has identified the need for significant infrastructure investment to meet widespread heat pump adoption
- SSEN emphasizes the use of flexible technologies manage higher peak demands and avoid extensive physical reinforcement costs
- All solutions reviewed involve use of flexible technologies – for Thermify and Biaco this depends on smart heat and/or electrical storage
- Thermify at scale may have a lower grid impact than the equivalent data processing capacity in centralised conventional data centres
- All of the options would reduce the grid impact of the transition to net zero compared with simply switching for a gas boiler to a heat pump.

Applicability of solutions in Thornhill

- Octopus Zero Bills. Limited to houses and by need for PV.
- Thermify Heat Hub. All houses could be suitable – subject to sufficient insulation. Possible scope in some flats.
- Biaco Electric Boiler. All houses and flats could be suitable
- PV and Battery. PV could be suitable, avoiding front elevation on any listed buildings. Battery could still add value with no PV.

Applicability of solutions in Thornhill

- The applicability of Thermify and Biaco has been checked as part of this study
 - 41 Homes could be suitable
 - 10 Homes are probably not suitable without installation of a new radiator system.
- Further work would be needed to look into the applicability of PV, Zero bills or air source heat pump

Scope for follow up

- Scope for PV, battery and heat pump options now. Octopus Zero Bills suitable in some cases. Funded options may be available from our social esco. and others
- Thermify Heat Hub. Scope to register interest now
- Biaco Electric Boiler. Scope to register interest now

Contact

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