

Next Generation end of project case study: Community energy in new developments Burneside Community Energy

About Burneside Community Energy:

The community-led vision for the Cumbrian village of Burneside aspired to create a “world-class village” by tackling a variety of issues. It identified opportunities to harness renewable energy for local benefit. Burneside Community Energy (BCE) was established to deliver this aspect of the vision.

About this innovation project and its impact:

Having already funded and installed solar PV via community share offers, plans for new housing gave an opportunity for BCE to:

- 1) Set up the systems needed to supply energy to these homes.
- 2) Demonstrate that a community energy supply model can work for new homes.
- 3) Investigate how to offer the same opportunity to existing homes.

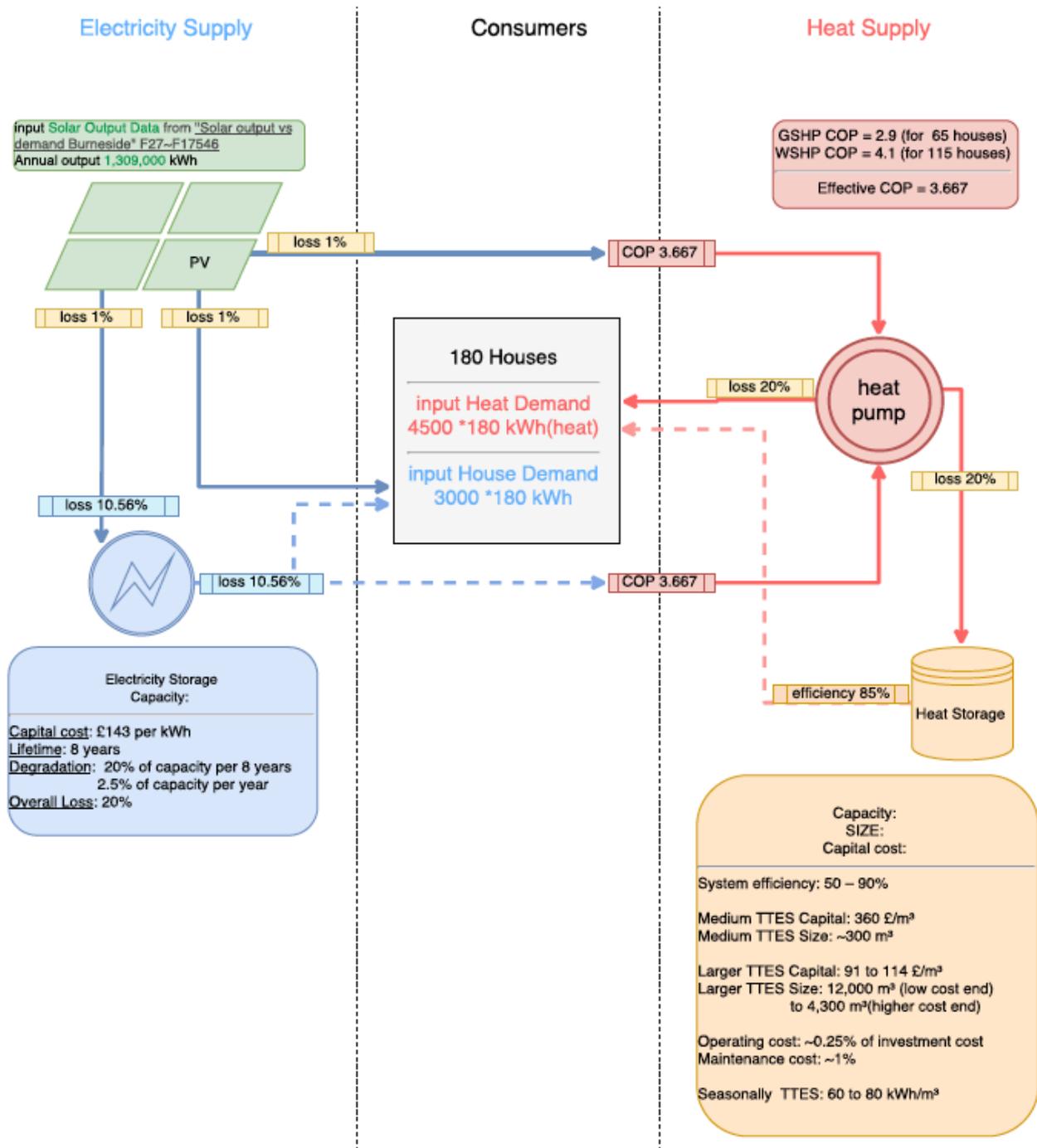
The plan was to have a self-sustaining local supply business using a combination of local generation and supply/demand balancing. Income was to be generated through sales of electricity and heat, ideally at or below market rates. Capital was to be raised through a combination of:

- Community shares
- Social investment loans
- Grant funding (heat networks)
- Developer contribution (offset against reduced costs for energy supply).

The new homes were to be designed to be highly energy efficient. The project aimed to close the gap to make them at least zero carbon. The project also aimed to demonstrate how management of integrated energy supply and demand can minimise the impact on a capacity-constrained local electricity grid. This encompassed renewable generation from solar PV, battery storage, heat supply through heat pumps, daily and seasonal heat storage and EV charging, with a control system capable of optimising the use of locally generated electricity to meet as much local demand as possible.

The model concept is best described using the diagram below.

Figure 1: Energy system concept diagram



(Note the costs quoted in this diagram from 2018)

Key:

- GSHP – Ground Source Heat Pump
- WSHP – Water Source Heat Pump
- COP – Coefficient of Performance
- TTES – Tank Thermal Energy Storage

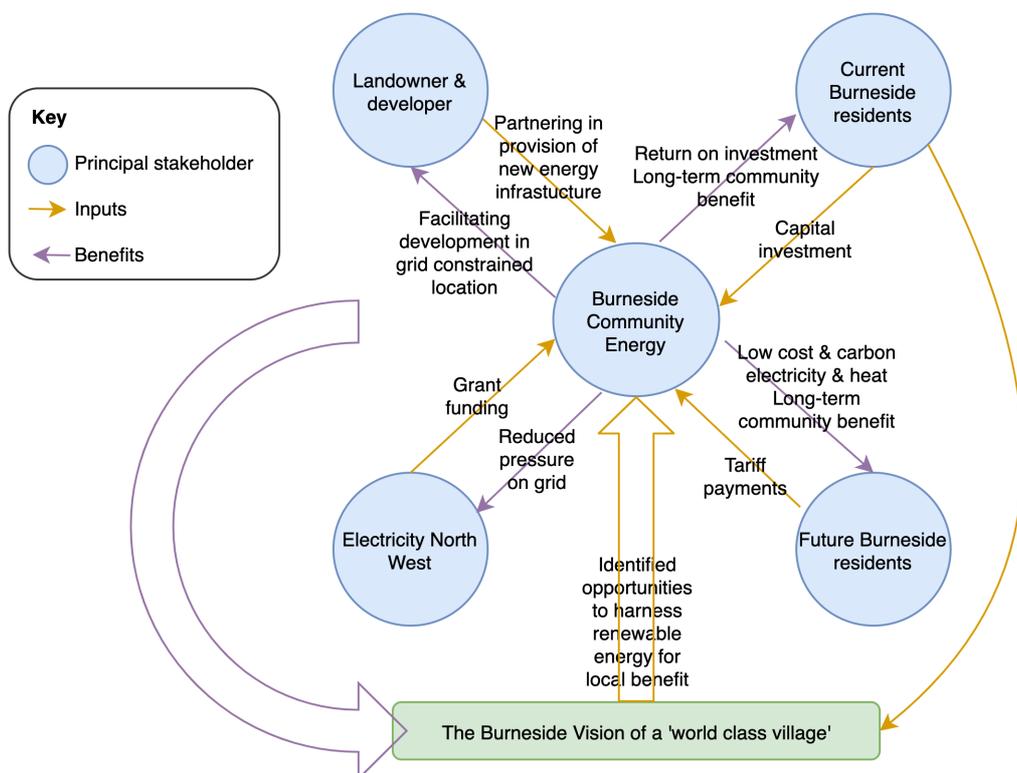
In practice, this community project did not go ahead because the developers and landowners were unable to commit to the project in the short to medium term. The modelling, budgeting and financial viability of the community element depended on technical specifications for the new homes (e.g. energy performance, heat and energy demand). The absence of this information was a 'show stopper' for the community energy element of the project.

It remains a possibility that BCE will invest in a single large ground mounted solar PV array and battery storage in order to supply electricity to a new residential development, but for now the complexities of establishing an entirely new energy services company to supply heat and power remain out of reach.

Advice for other groups considering this approach:

- Relying solely on volunteer board members is challenging for a project as complex as this. BCE appointed a part-time board administrator. In addition, having previously been heavily reliant on one director for technical inputs, BCE released that director to a paid part-time role in project development, with the remaining directors taking greater responsibility and ownership. This helped to clarify roles and responsibilities.
- As the diagram below illustrates, the project was a partnership with a number of key stakeholders. Changes and delays affecting one partner had knock-on effects on others. For such projects to succeed, building strong relationships and clear contractual relationships is vital and there is a need for flexibility, effective communication and cooperation.

Figure 2: Principal stakeholders, inputs and benefits



Key messages for policy-makers:

- The project sought to address a key issue for future development activity - how management of integrated energy supply and demand can minimise the impact of development on a capacity-constrained local electricity grid.
- The 'risk to return ratio' and return on investment for a community group is currently disproportionately low. To make such a model viable, work is needed to:
 - develop mechanisms for risk to be more equally shared with other stakeholders;
 - ensure appropriate grant funding is available to support the business case; and
 - address potential barriers to insuring community-owned energy installations on private homes.

If you want to know more:

Contact Tony Hill, Burnside Community Energy director. Email: toneoldbone@gmail.com
<https://www.next-generation.org.uk/resources>