

Mr M Geen
Curry Rivel

28th July 2022

Curry Rivel Heating Study

Dear Matt,

Firstly, thank you once again for inviting us to assist you with this important project,

Contents:

- The Brief
- Executive Summary
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The Brief

To undertake a study to consider how the Parish of Curry Rivel can become more sustainable through reducing its reliance on fossil fuels for heating and thereby reducing its carbon footprint.

The objectives for the study are as follows.

- To examine short- and long-term options for increasing the ability of the Parish to meet its heating requirements through more sustainable methods.
- Recommend a program of implementation which incorporates community engagement and facilitates take up of initiatives.
- To identify future funding opportunities to assist the Parish in pursuing sustainable heating projects.

The study should identify any immediate measures which may be taken to reduce CO2 emissions from heating within the parish.

The study should contemplate the following.

- Reducing the carbon footprint of the community by exploring possibilities of installing renewable energy schemes on the school buildings and village hall.
- Opt-in community scheme to purchase and install heat pumps to a significant proportion of dwellings, reducing the reliance of the community on fossil fuels.
- Energy generating schemes which could be implemented on PC land to off-set CO2 emissions from heating. For example, solar panels or ground source heating. Whilst seeking to reduce its carbon footprint the Parish also recognizes the importance of all contributing factors to climate change, including maintaining and enhancing biodiversity. Any such scheme would need to minimize and mitigate any adverse impacts upon the environment.
- Development of a retrofit heat network. A small-scale heat network connected to an energy centre could deliver heat to multiple properties from a central source. Whilst this could potentially be initially connected to mains gas to deliver a low carbon alternative to oil, it would enable renewable technologies to be connected in, such as biomass sourced from local farming activities, ground source, wind or future technologies such as hydrogen, delivering low carbon heat to multiple properties.

- Other potential schemes for sustainable heating and renewable energy which could be pursued by the PC either in the short or long term.

It is expected that the study will entail desktop research, using both local (where possible) and national data as required. A site visit to gain understanding of issues such as location, landscape, house types, community infrastructure may be beneficial.

The study may advise on examples of similar projects undertaken elsewhere.

The study will consider the options available for the PC to be a pilot scheme and/or apply for funding to pursue any of the projects identified in the study, either on its own or working with the South Somerset District Council or Somerset County Council, including HNIP (The Heat Networks Investment Project) funding.

Indicative costings and timescales should be provided for the projects which are recommended.

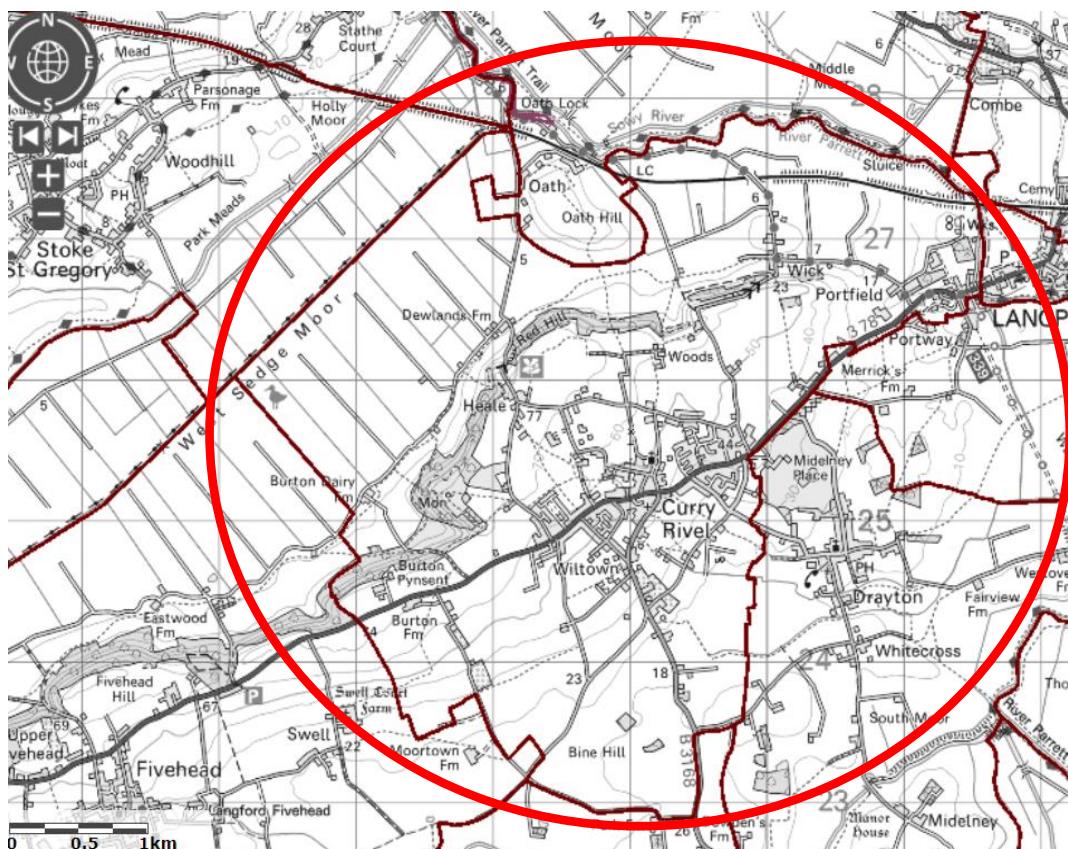
Key Milestones & outcomes

The following table sets out the key milestones and outcomes to be delivered.

	Description
Key Milestones	Inception Meeting & site visit around parish Midpoint meeting to discuss progress of study Issue draft report setting out findings of study Final review meeting to discuss recommendations Issue final report (Present findings at Parish Council meeting if required)
Outcomes	Identify opportunities to address climate change through sustainable heating. Recommend immediate measures that may be taken by the PC to promote sustainable heating.

	Recommend feasible projects (including funding opportunities) for sustainable heating to be further investigated by the PC.
	Identify future funding opportunities to facilitate the recommended projects

Curry Rivel Parish Boundary (Marked in dark red, within the red circle)



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Executive Summary

Overall Findings

- There are over 500 properties locally who would benefit from working together to get off expensive fossil fuels.
- There is a large heating demand locally, over 8GWh. This is substantial and attractive for heat network funding should those models be taken forward and have sufficient community support.
- There is a substantial number of promising property types of an age and ability to be modified for use of lower temperature renewable heating solutions
- There are three models to consider with varying levels of risk including a buying scheme model, a centralised heat network model and a shared ground array model. All these can be facilitated or owned by the community.
- The community survey has identified a gap in knowledge of what community energy companies are and also how community heat solutions can benefit them.
- To address this, we recommend proactive focused engagement to drive up numbers of the survey participation as a high priority, to help educate and obtain more firm interest in the options to enable further funding of work to make these models happen.
- There are potential savings from the buying scheme (we estimate max 10% but not easy to give a headline figure), but due to the complexity of buildings the discounts will be limited and other benefits such as simplifying the quoting process and vetting may become more valued benefits. The buying scheme will only likely benefit the able to pay residents.
- Supply chain will be a big issue for all models, but in particular the buying scheme which relies on a number of players and is a time commitment from residents to manage installer relationships and manage community expectations.
- Of the heat network solutions, the shared ground loop model offers a more manageable and less complex solution to community ownership which has the benefits of scale, less operational complexity and ability to raise grant funding
- Funding exists for heating schemes via national and regional grants.
- All three schemes will require follow up work to develop them which will require funding which may be available locally.

Desktop Review Findings

In order to assess the potential for heating solutions including heating networks within Curry Rivel we examined the map data available in the public domain as well as publicly available demographic and property data. This helps us understand the area from a geographical layout point of view as well as understanding population density and types of residences.

Once we have a clear picture of these elements, we can then begin to understand the constraints and opportunities for different renewable heating models for the area.

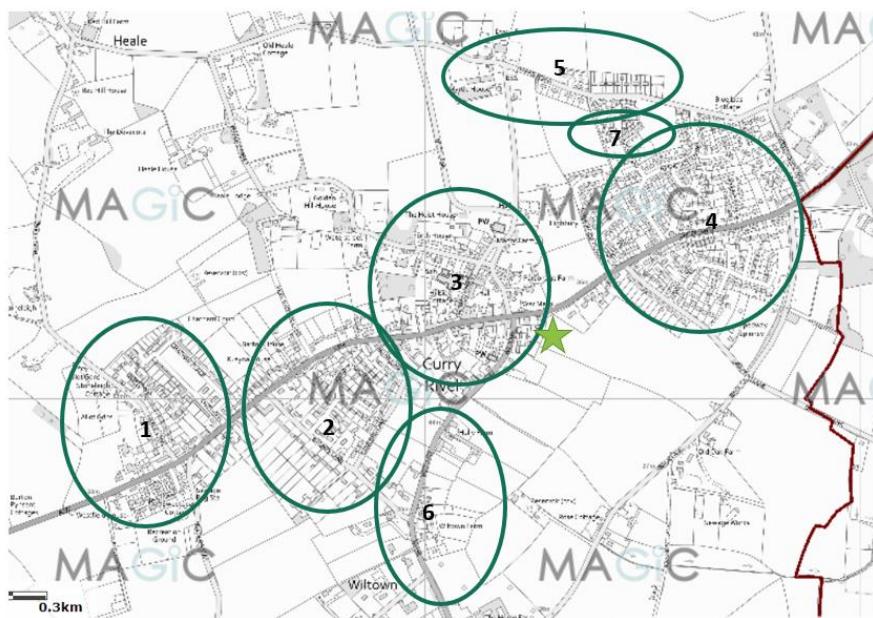
Population Zones

Firstly, we created arbitrary zones from reviewing the Ordnance Survey and planning maps available online and there appears to be 7 areas of population with different needs. We have broken down the findings for each of these in the next sections and also used the postcode data available to breakdown the population and property data within these zones as well.

Each zone has its own specific needs. For example, Zone 7 is the cluster of new building properties built around an LPG network, which effectively rules them out of any immediate net network solution unless they wish to opt out of their current model.

Conversely Zone 4, which is the largest cluster of properties across the Stanchester Estate, is made up of a mix of properties but of largely similar age and condition, with potential for cavity wall insulation and good glazing in many. This could be seen as a clear opportunity zone for lower temperature heating networks as the properties can be upgraded to run efficiently with a low temperature heat pump network or individual heat pump.

Curry Rivel Population Zones



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2011 Census Data

We have identified the general population figures from the Census and other documents which roughly correspond to the local area. These can be updated with the recent 2021 census.

- 2148 residents
- 975 dwellings

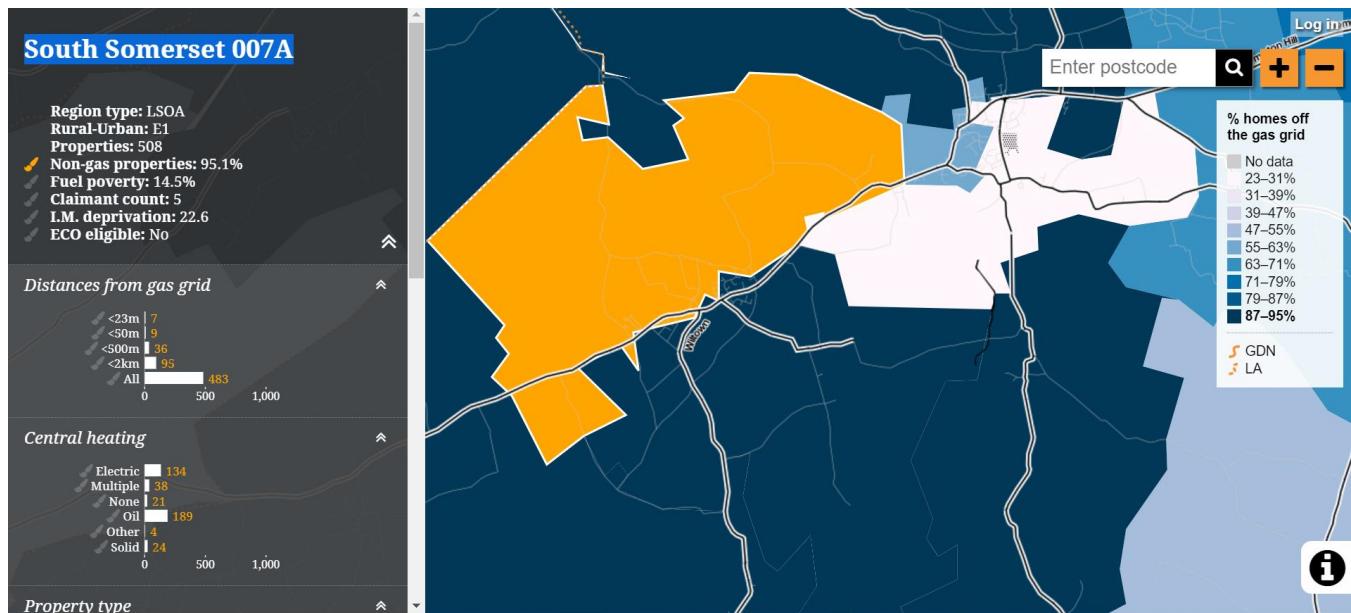
Other sources

- 2,229 residents
- 949 households
- 91 postcodes

High Proportion of Off Grid Properties Indicates Clear Renewable Heat Opportunity

The below charts indicate the data available publicly which shows the proportions of properties connected to the gas grid, in this area it is less than 5%. This means the area residents are exposed to high and volatile oil or LPG fuel prices, but conversely could see a great opportunity to create a non-fossil fuel grid to serve the local opportunity.

Sadly over 14% of the population are in fuel poverty as a result, this represents an urgent issue which needs tackling.

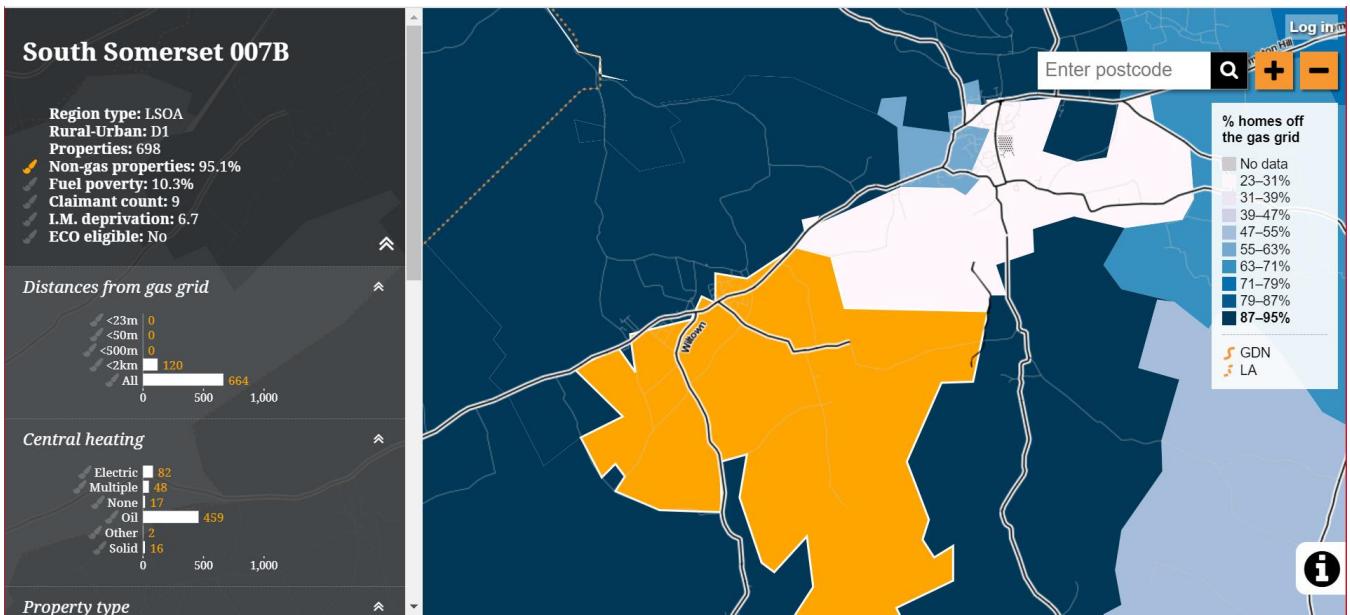


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Source: Nongasmapp.org.uk

Local EPC Certificate Data

On the next pages you can see charts which indicate an analysis of the local EPC certificates for the area. Please note EPC certificates are completed at different times in a property's life, usually when the property is sold. In some cases where a renewable energy subsidy has been applied for an EPC certificate could have been created for that purpose.

This means that the data can be slightly out of date and over time houses can make improvements.

In addition to this it also gives us an insight into the heating end energy solutions in a large sample of the properties, it can indicate whether they already have energy solutions in place (including renewables like heat pumps) and also an indication on whether there are improvements that could further enhance the carbon footprint of the buildings.

From a heat network perspective this also allows us to crudely model the local heat demand of the residences.

Key highlights from the figures that follow include:

- 83% are Detached or semi detached
- 19% have heat pumps already (we are aware of clusters within the Yarlington Sheltered housing properties)
- **77% are on either oil, LPG or electric heaters, which are the most expensive forms of heating fuels. This figure is made up of 595 properties in the area, a substantial opportunity for a heat network or heating scheme of some kind.**
- **In total there is a load of 8.94GWh of heat demand**

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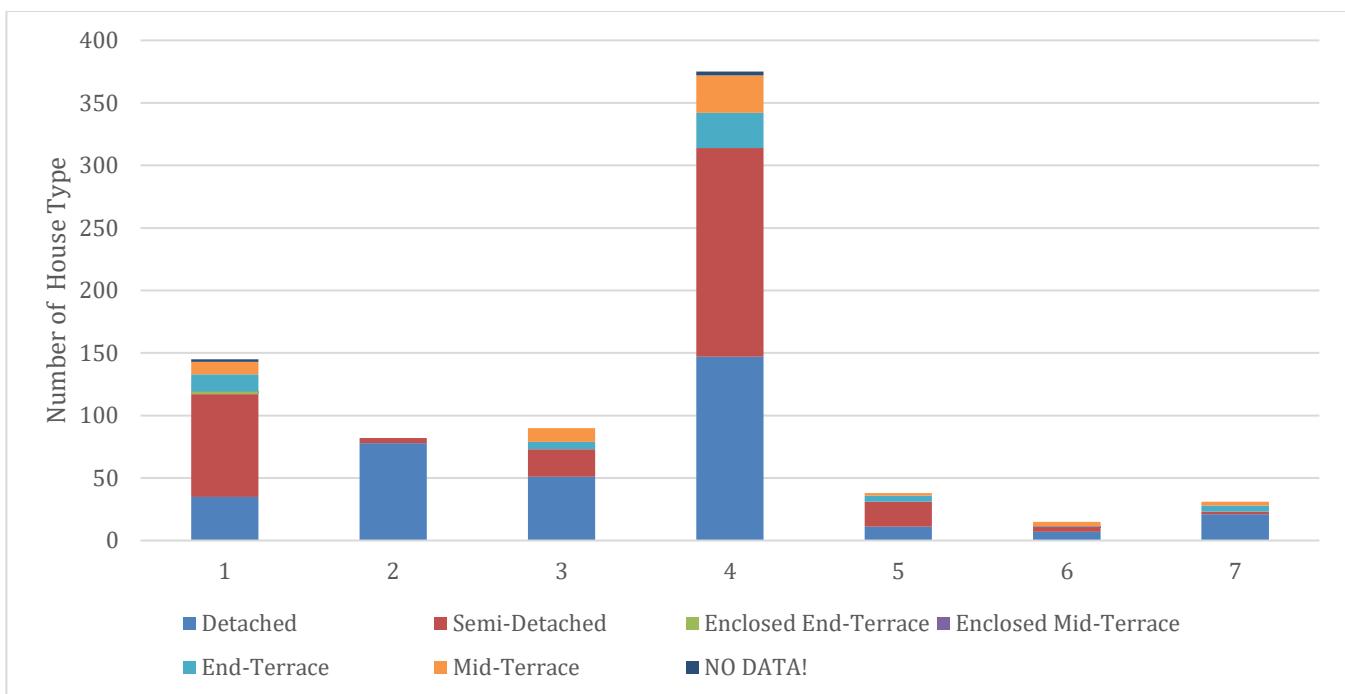


Figure 1: Building form types for each area in Curry Rivel.

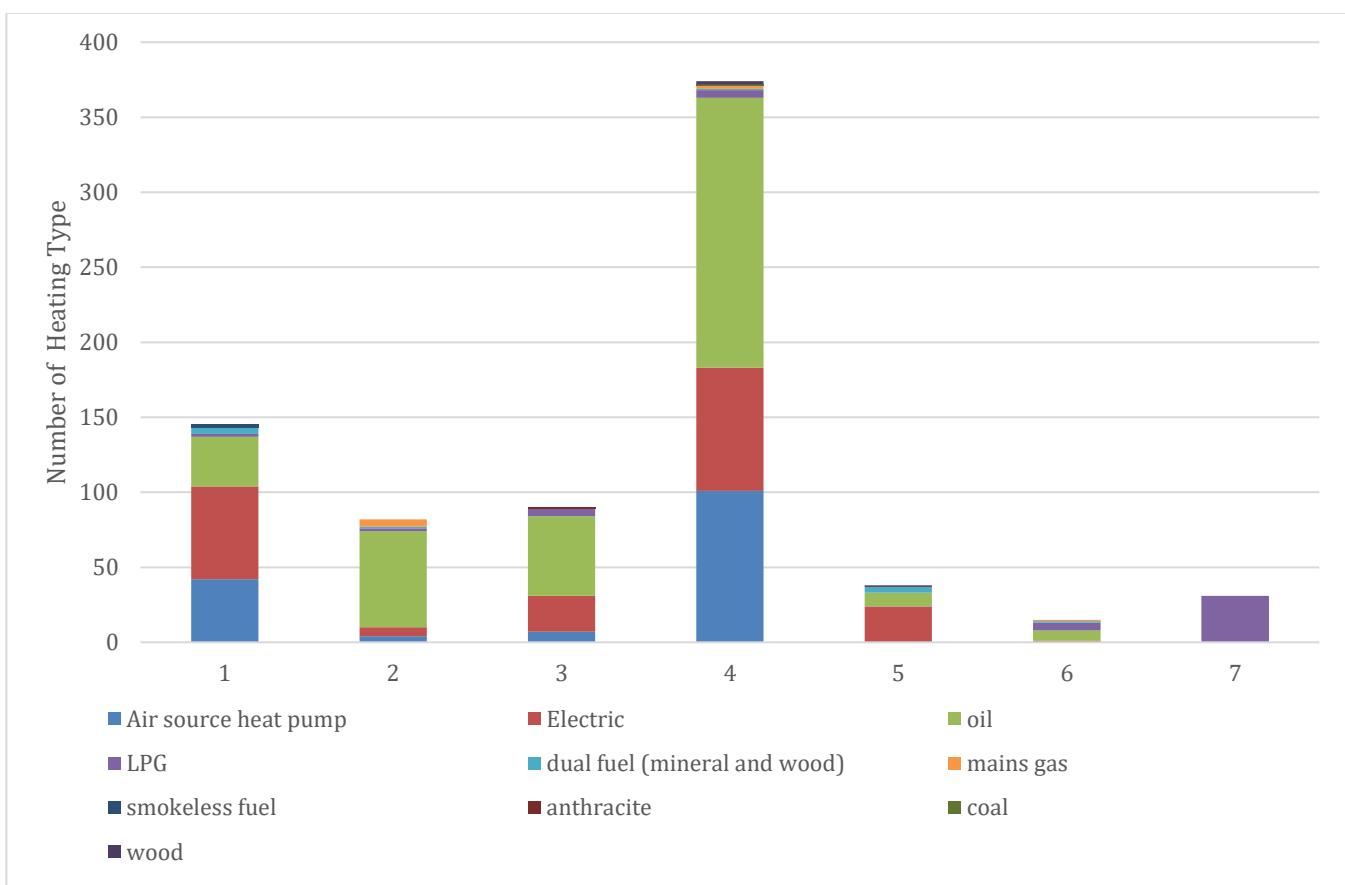


Figure 2: Heating types for each area in Curry Rivel.

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In order to be eligible for grant schemes, houses must not have recommendations for loft or cavity wall insulation¹. This is shown in Figure 3 and Figure 4 with (BUS) which stands for boiler upgrade scheme compliant.

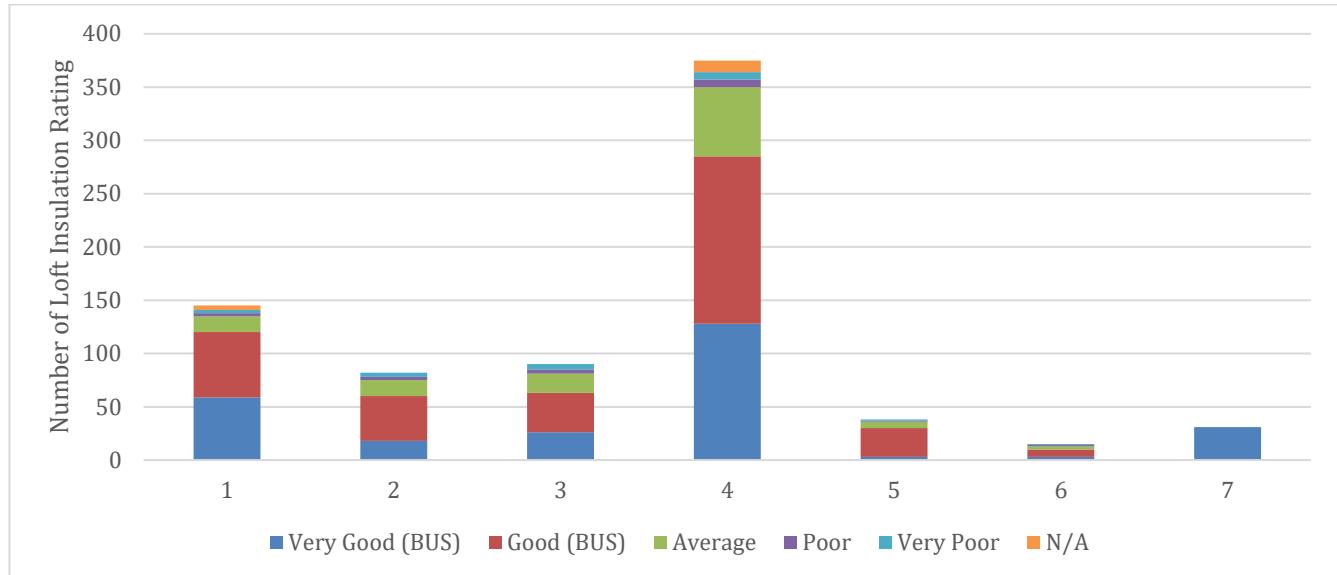


Figure 3: Type of loft insulation from EPC certificates in each area.

23% of properties in Curry Rivel need to improve their loft insulation to be heat pump viable.

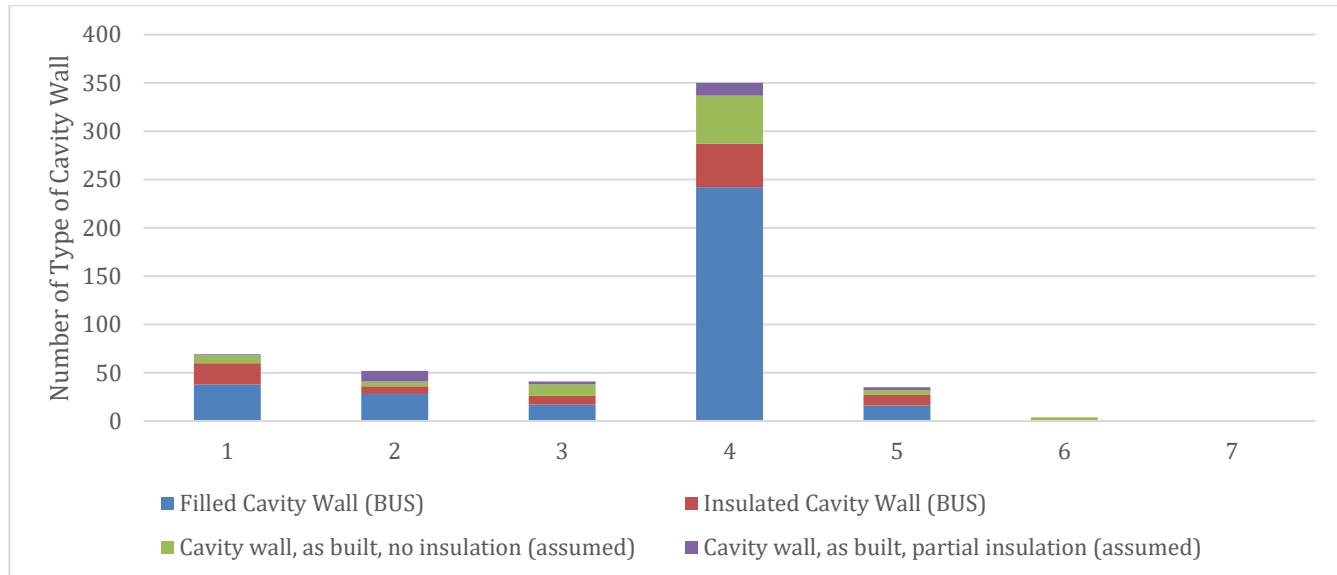


Figure 4: Cavity wall insulation grades for the different areas.

21% of properties in Curry Rivel need to improve their cavity wall insulation to be heat pump viable. This is based off of EPC data which can be unreliable and insulation upgrade recommendations will need to be completed on a case by case basis for the detailed design stage.

¹ <https://www.gov.uk/guidance/check-if-you-may-be-eligible-for-the-boiler-upgrade-scheme-from-april-2022>

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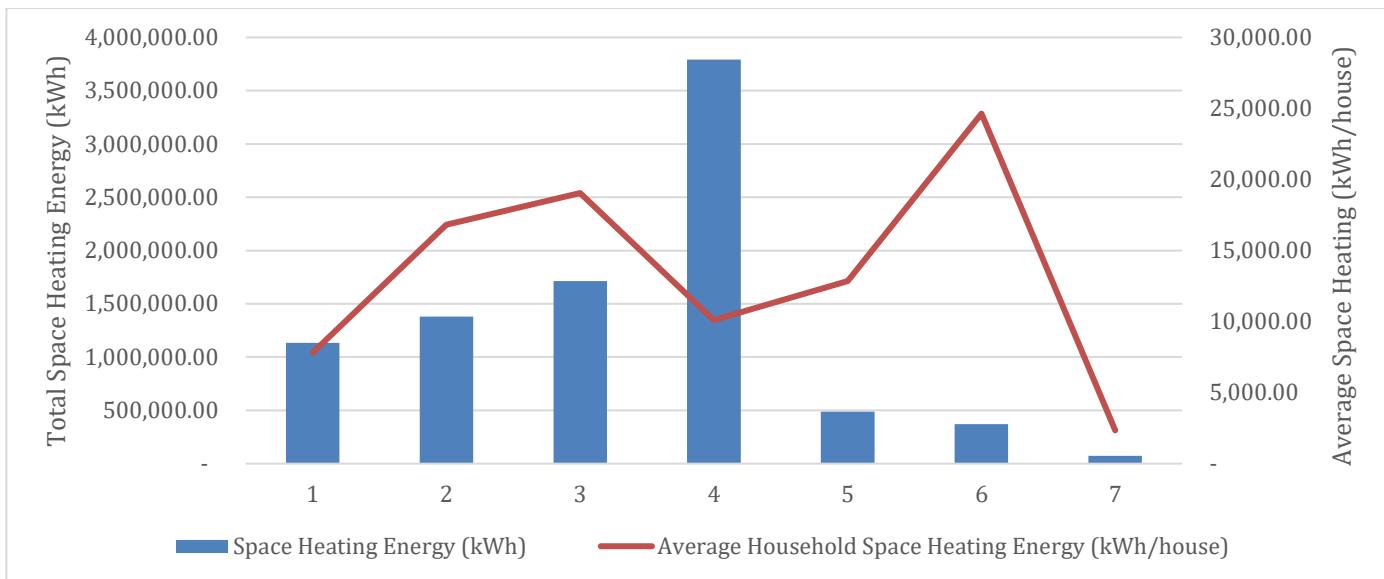


Figure 5: Total space heating energy for each area and the average space heating energy per household for each area.

The difference in housing types can be seen in Figure 5 from the average space heating. For example, the new build LPG estate in area 7 has the lowest average space heating per household which would be excellent for a heat pump upgrades. However, the rural detached houses in area 6 have the highest heat consumption and would need to be insulated to be heat pump compatible. As a rough guide a house needs to have an annual heat consumption of less than 70 kWh/m²/year to be heat pump compatible, but EPC's don't provide enough data for us to calculate this.

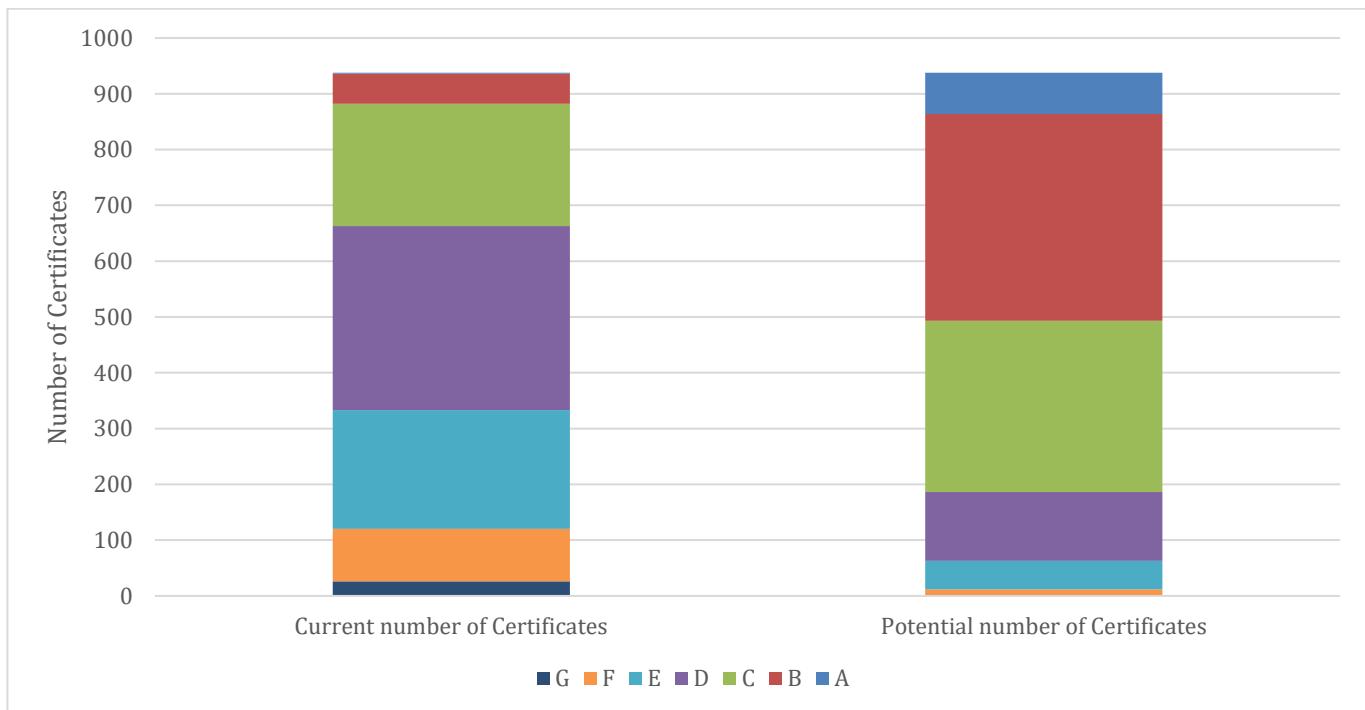


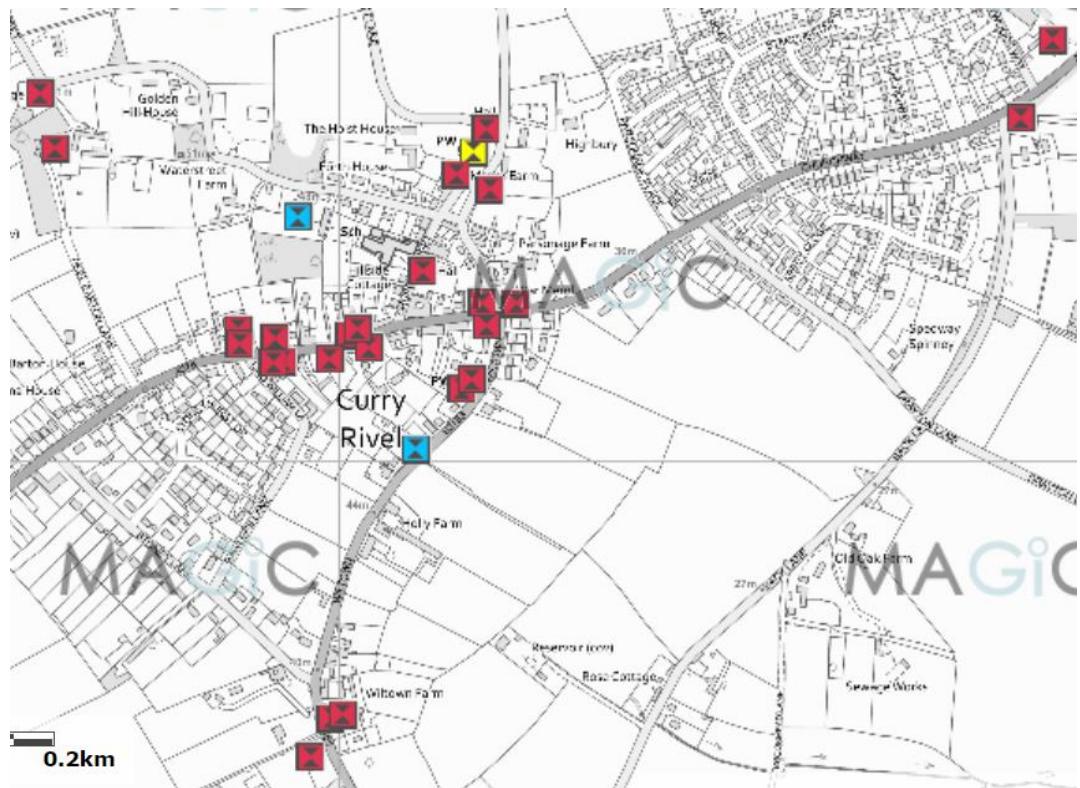
Figure 6: EPC certificates for Curry Rivel.

The total number of EPC certificates in Figure 6 is 938 and the quoted number of households from the 2011 census is 1,097 so there is a shortfall in the number of EPC certificates.

Listed Buildings

Whilst there are a large number of potentially eligible buildings which are capable of being modified or are able to use a heat pump efficiently in the village, there are still a number of Listed Buildings and older properties which are less easy to heat.

- These buildings are located around the village centre and along the main road. These buildings are less easy to connect to renewable heat without major modification or additional forms of heat to supplement a low temperature solution.
- There are 26 Listed Buildings in total including the public buildings (The Church for example).
- These buildings may require an alternative solution using higher temperature solutions such as biomass OR substantial investment in wall, floor and loft insulation and glazing.



Electricity Network

In order to harness electrical heating solutions, we need to understand the capability of the electricity network. We are able to see the local network map. There are 11kW and 33kW lines running through the area which could provide potential to connect import or export capacity for heat demand or renewable power generation.

We are aware of significant constraints on the wider network for generation opportunities but there may be opportunities for demand headroom in the local area as shown by the latest information from the Langport substation.

We are awaiting more detailed feedback from WPD on the network lines that are local to Curry Rivel.

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Policy Documents Review

The overarching District Council and County Council policies are progressive and focusing on tackling climate emergency. The actual activity relating to heat is more in general terms OR focused on council only buildings at this stage.

It does indicate further opportunities to tap into local funding for further work on heating solutions as a number of the policies indicate a strong appetite for engagement and research into solutions.

The local Parish Plan was disappointingly thin on energy solutions. It was likely published prior to the major uptick in climate consciousness and only refers to investigation into a natural gas network. This document needs updating to represent the urgent climate and fuel crises better locally.

Parish Plan 2015 Document

- No reference to climate, pre-climate emergency declarations
- One reference to investigating connecting to the natural gas network, although a concern about considerable cost

South Somerset Policies

[Environment Strategy | Environment \(southsomersetenvironment.co.uk\)](#)

- Very little support for householders to tackle heating emissions other than pledges to encourage uptake and investigate retrofit.
- Plan to reduce council's emissions by 10% each year

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[Environment Action Plan 2022/23 | Environment \(southsomersetenvironment.co.uk\)](https://southsomersetenvironment.co.uk)

Targets and actions	
Retrofitting: gain an understanding of existing housing stock across district so that SSDC are ready to apply for funding opportunities	Prepare to apply for funding opportunities for retrofitting when they present themselves, engaging with Somerset County Council to provide a centralised, Somerset based source of high-quality information regarding measures that can be taken on properties and the types of support available to people to undertake them. Invest with other councils to set up a database of houses, EPCs, and condition survey details.
Retrofitting: Review the success of the Thermal Imaging Project and expand the pilot project in Winter 2022/23	Re-run thermal imaging camera lending scheme as part of engagement on retrofitting to improve energy efficiency within existing properties. Partnership with the Bruton Retrofit Scheme.
Engagement and case study visits of energy efficiency retrofits and eco-buildings in South Somerset	Organise tours of case study examples of homes and businesses having retrofitted and installed eco-solutions to encourage others to do likewise. Undertake a public workshop or webinar, alongside the Retrofit Bruton coordinator with Environment Champions and community groups.

- Also includes some additional references to enabling change through parish climate champions and dissemination of knowledge into communities

Somerset County Council Policy



Somerset CC are working towards Carbon neutrality by 2030 and they have a number of useful strategy documents below:

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[Climate Emergency \(somerset.gov.uk\)](https://www.somerset.gov.uk/climate-emergency)

[Somerset's Climate Emergency Strategy documents](#)

<https://docs.somerset.gov.uk/wl/?id=8VyMa0AcMI32UyW4VHREq5rTeRZqddPQ>

- Numerous references to workstreams investigating and engaging on the heat subject and importantly a local fund for projects as shown by the link below.
- It is worth staying in close touch with South Somerset and Somerset Councils' climate teams and funding opportunities.

[Somerset communities given share of £1 million to tackle Climate Change | Somerset County Council Newsroom \(somersetnewsroom.com\)](#)

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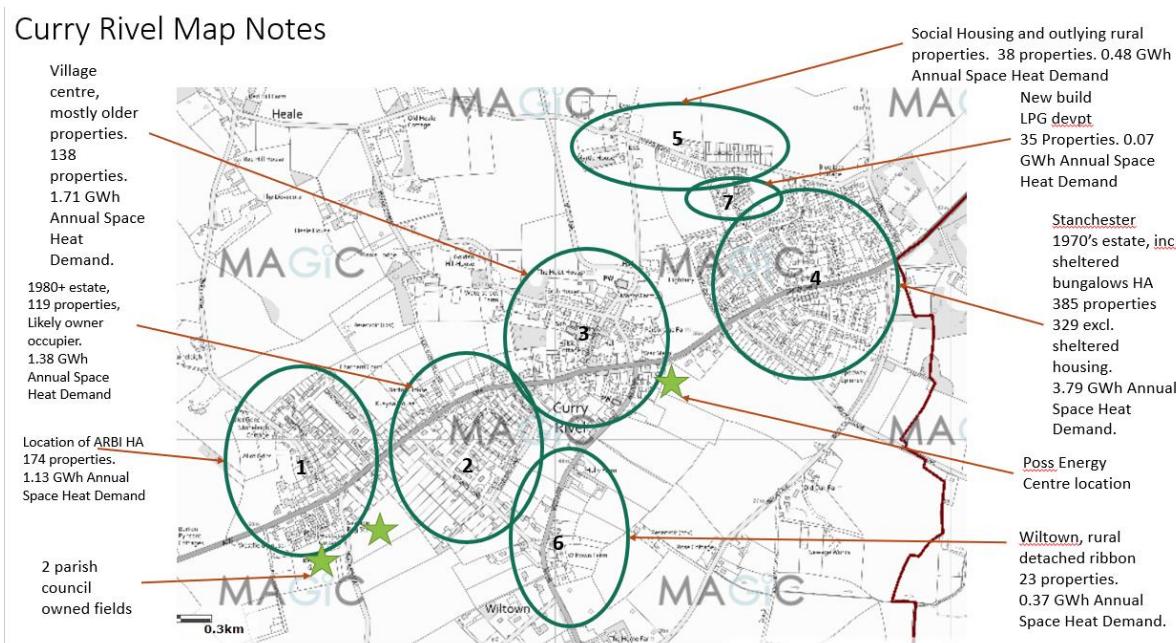
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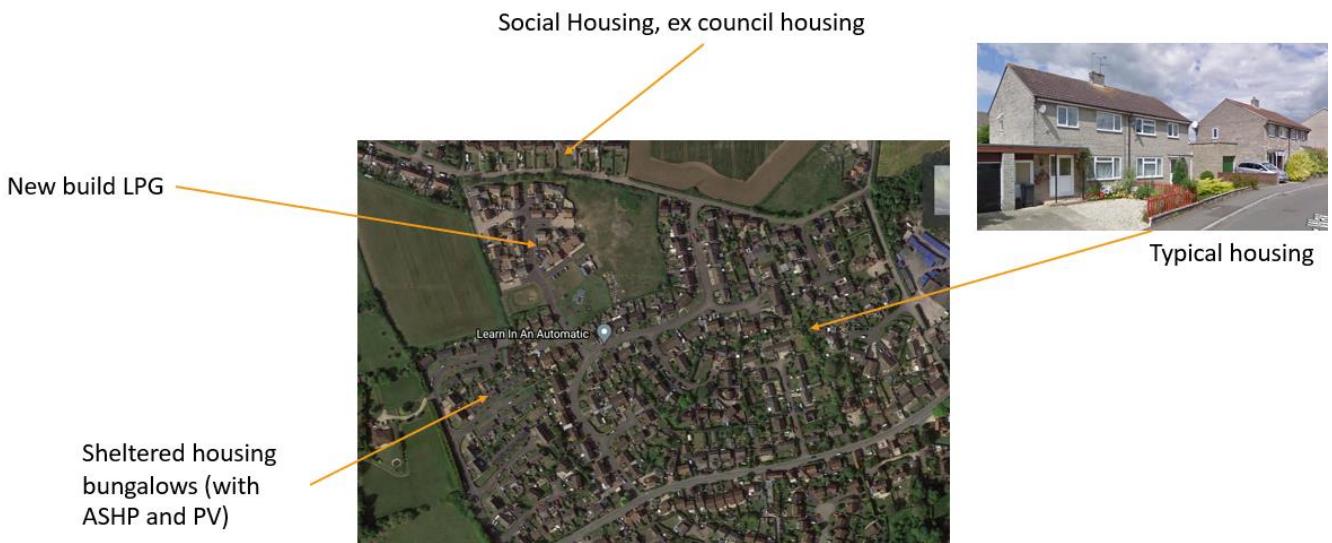
Site visit findings

In addition to our desktop work, we visited the local area along with members of the Curry Rivel community to get a closer feel of the property types, understand the locational constraints and also to look at some of the larger properties in the village such as the church, the local light industrial estate, the garage, shop school and local pub. On the day we were also shown fields which are owned by the Parish Council should they become useful for energy infrastructure locations.

The below map indicates describes our property profile findings as well as overlaying our desktop analysis of the heating loads within the 7 zones of interest in the village.



Stanchester Estate



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The Stanchester Estate represents the clearest opportunity of all areas of a large cluster of properties with potential for connecting to heat pumps or a heat network. They are often filled or unfilled cavity walls, have double glazing and in summary are able to be upgraded to suit a low temperature renewable heat solution. These properties are located in Zone 4 but there are similarly modern properties within Zone 2 also.

New Build Estate (All LPG network, Locked into Fossil Fuels), Adjacent to Stanchester Estate



Sadly, this neighbourhood of modern buildings with the latest efficient insulation under building regulations standards is connected to an LPG network. These properties could be modified to connect to another form of network, however there will be infrastructure costs in disconnecting and navigating the LPG pipework. We would not rule this estate out as over time the cost of LPG and cost of carbon may become too high for them to continue with this set up. Zone 7.

Sheltered Housing (Stanchester Estate)



Within the Stanchester Estate is a cluster of Sheltered accommodation bungalows. They are believed to be owned by ABRI Housing (previously Yarlington) and we believe most if not all have Mitsubishi Ecoden heat pumps in situ. Located in Zone 4.

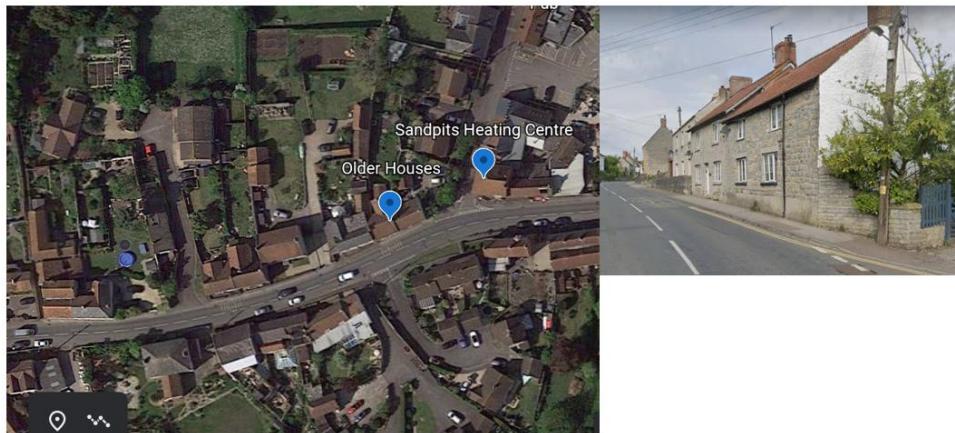
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Village Centre Along Main Road



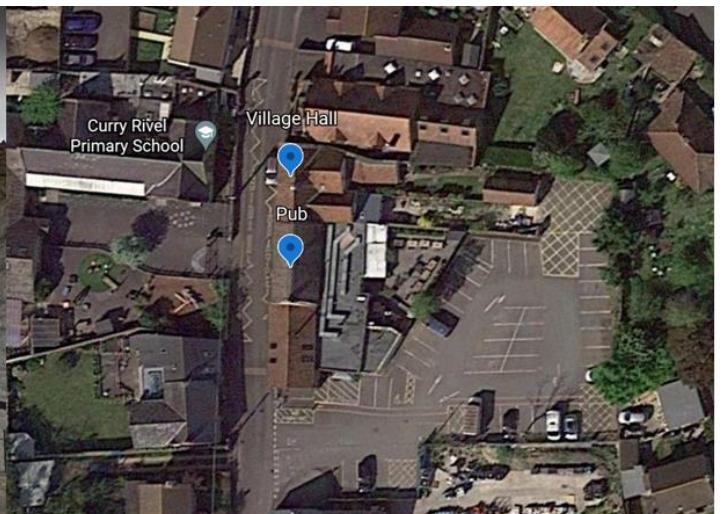
This area is a wide mix of mostly older buildings, solid walls, thatch, slate, solid brick and stone construction. Some contain flats within larger houses, mostly residential with a few shops.

Oil and LPG properties. Some may have electric heating (flats).

Possibly a mix of income lower middle and upper middle incomes

Mainly homeowners and some tenants (estimated). Located in Zone 3.

Village Hall



The Village Hall, The School and the Pub are all older properties in the centre of the village. The village hall has received grant money to insulate the loft, replace boilers and add solar. Individually

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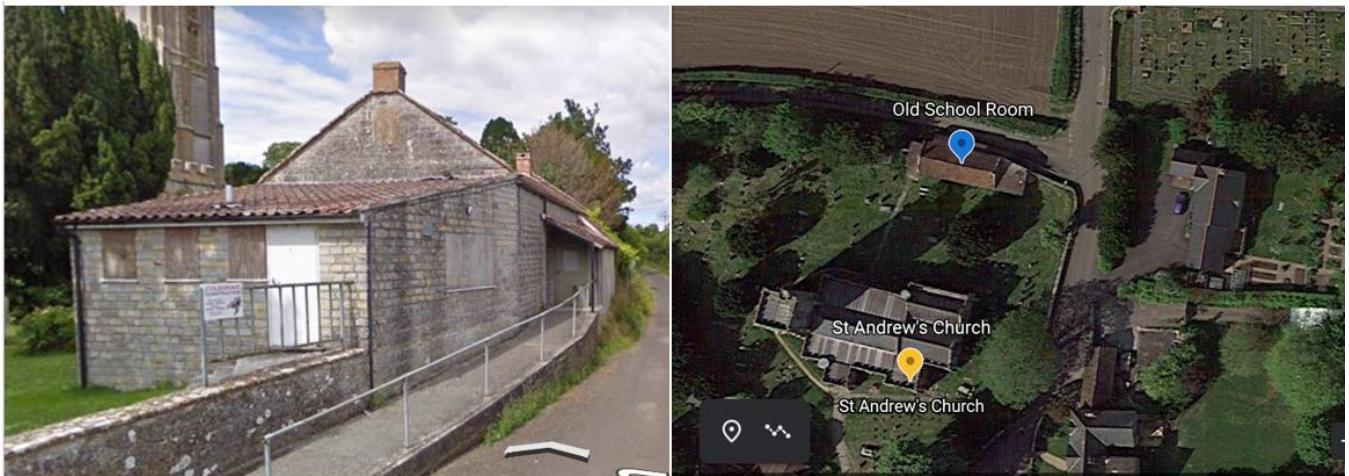
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they would be classed as hard to heat properties, but collectively they could become a core or anchor load on a heat network which could be supplemented by low temperature heating topped up with higher temperature heat pumps or other renewable heating. Located in Zone 3.

The Old School Room



This has been renovated and is in close proximity to The Church. The Old School Room and The Church share the same boiler. They could act as anchor loads on a wider network but have similar harder to heat characteristics as the Village Hall for example. Located in Zone 3.

St Andrews Church



Churches are notoriously hard to heat, they have infrequent demand and face a difficult dilemma due to their character and design. There is potential for them benefitting from being part of a low

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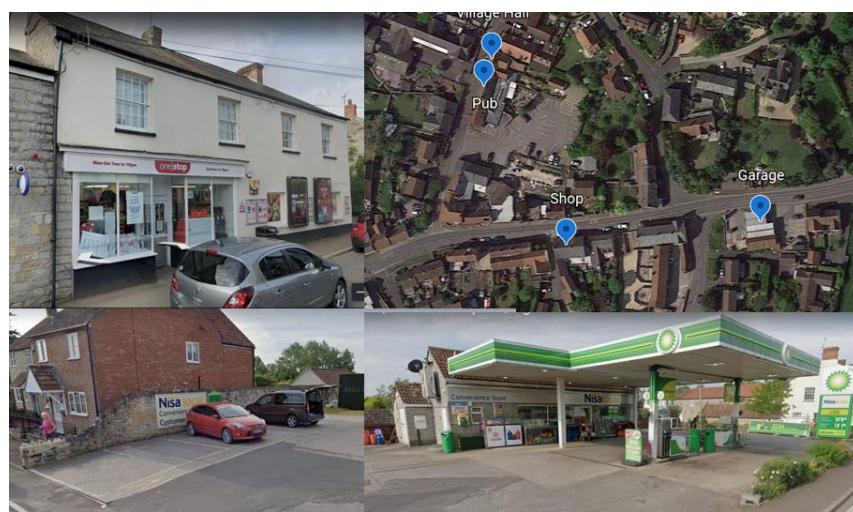
temperature heat network as an anchor load as this could maintain a conservation heating background heat for the property. Located in Zone 3.

The Pub



The pub is a well-supported venue locally and located centrally. Located in Zone 3.

Village Shop and Garage



It is unlikely these properties would want to connect to a heat network given their ownership structure. They are well used facilities and could present useful opportunities to connect to local

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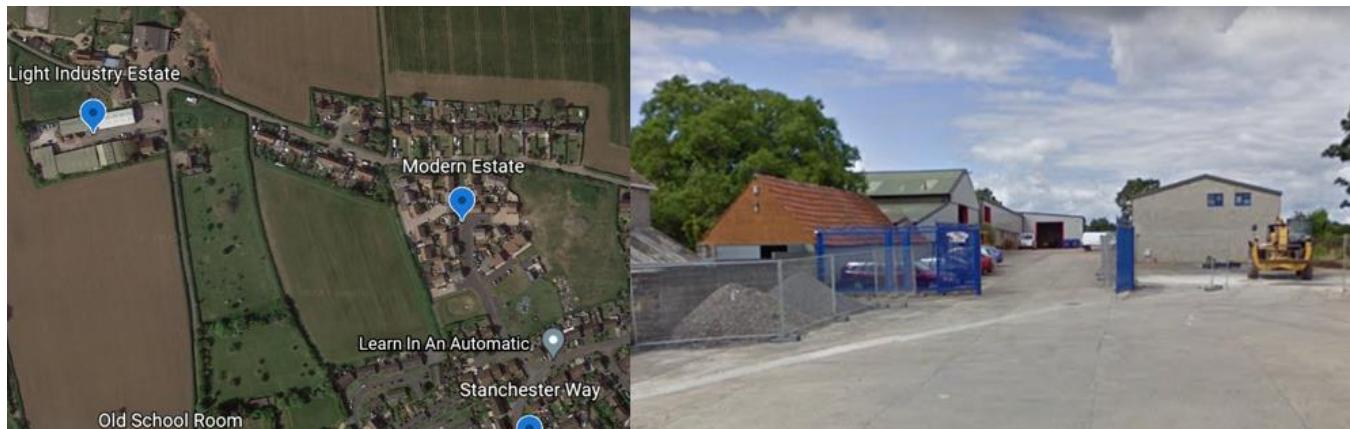
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residents with surveys and general dissemination of news relating to the project. Located in Zone 3 and 4 respectively.

Light Industrial Estate



There may be potential for some local solar generation on the rooftops, subject to their demand on site being of a sufficient size. As far as heat network requirements go, it would require more detailed investigation. Their buildings are predominantly relatively energy inefficient warehouse or workshops. Located in Zone 5.

Plant Nursery



If the nursery requires heat in colder months, it might be an opportunity to be another anchor load.

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Registered Social Landlord Properties



These properties are in zone 1 on the map. We believe a large number of these are currently owned by ABRI Housing Association. Some may be owned through "Right to Buy".

These properties may be made up of families on lower income and may be a mix of oil and electric heating. We suggest arranging to meet Yarlington HA to discuss the areas and status and their plans for renovations

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Heat Model Options

Buying Group Model

A more commonly used model by communities, often with residents buying oil in bulk for example, is where residents agree to buy a fuel in volume together. In a similar way this can be applied to acquiring heat pumps for properties.

There are other communities running their own solar buying schemes such as Zero Chippenham, who offer cheaper solar through locally sourced and vetted reputable contractors [Chippenham Community Solar PV Buying Scheme – Zero Chippenham](#)

Some local authorities have also taken on the role of facilitator and developed schemes for residents to purchase solar and other technologies such as through the scheme Solar Together, run by private company iChoosr [Group-buying for Solar | iChoosr](#).

Advantages	Challenges
Discounts from installers for buying in bulk	Hard to give an easy-to-understand headline discount percentage as pricing is very variable. Discounts can only really be on the materials and where economies of scale are possible such as the heat pumps and hot water tanks themselves or conducting works back-to-back in close proximity Only really supports the able to pay market unless it can be done in conjunction with a local Housing Association
Ability to create a local specification to simplify buying choices for residents	Simplification can be things like brands and rough size guides, but actual installations of heating are very variable between properties due to size and building construction
Creates some local focal point for educational briefings for residents thinking about this. Installers can talk to groups of residents at one time.	Doesn't solve the issue of additional modifications such as replacement of radiators, upgrading insulation etc. to make houses heat pump ready. These may require grants and other third-party

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	expertise and another buying scheme in parallel.
Creates case studies for residents planning for medium to long term to copy	Requires a local resident team to coordinate the enquiries process and provide a link to the supply chain.
Can provide small contribution from installers towards marketing of the scheme to generate more local interest and enquiries	Residents will still need advice on interpreting their quotes which may need to come from residents' group or a friendly expert to support them.
Enables a pre-vetting of installers to ensure quality, accreditation, insurances, case study experience and safety are all in place before residents speak to them	

We have approached local installers to obtain their feedback to key questions to see if there is an appetite from the supply chain to support Curry Rivel with such a scheme. Of those who responded we have identified them below.

All installers are registered on the Microgeneration Certification Database which is a source of reliable installers who have retained their accreditation and can offer grant support to residents through the Boiler Upgrade Scheme grant scheme.

Installer	Do you install air source heat pumps on residential properties	Do you install ground source heat pumps for residential properties	Which Brands of Air source do you install	Which brands of Ground source do you install	How long have you been installing heat pumps	What area do you cover?
Res Distribution	yes	yes	Daikin, Vaillant	kensa	4th year	South west, but an umbrella scheme so they will sub contract installers around the country, they review half way through the project.
Commercial Biomass LTD	yes	yes	From Austria and Germany		15-20 years	Cover, curry rivel
Renewables Inc Ltd	yes	yes	Vaillant	Vaillant, got the best service in the country with a 7 year parts warranty	Building 40 years, Solar PV 14 years, 10 years heat pumps	Depends, 30-50 miles away
Total Renewable solutions, SW Ltd	Yes	Yes a little	Samsung, LG, Vaillant, Mitsubishi when stock available		10years+	South West
Evergreen Renewable Energy Ltd	yes	yes	Mitsubishi, Ecodan, a few Samsung	Kensa	6 years	30-40 miles

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Installer	Do you offer grants to homeowners	Typical 3 bed house Ground source heat pump price	Typical 3 bed air source heat pump price	Would you offer a discount for volume?
Res Distribution	Yes- Boiler Upgrade Scheme	£20,000 £7000-10000, renovation also £10000		No structure - multi plot are looked at more favourably but if they
Commercial Biomass LTD	no			
Renewables Inc Ltd	Yes- air source £5000, ground source £6000 from the government	8kw £24,000, £30,000 - £35,000	Assuming there is adequate room and and all adjustments made, 7kw £10,000- £12,000	Vaillant do not do discount, do not currently but could potentially look into it.
Total Renewable solutions, SW Ltd	Yes		£10-12k depending on radiators and upgrades	Depends on volume
Evergreen Renewable Energy Ltd	Whatever the government grants schemes are			This is a conversation with the directors. not the person to answer these questions

Key Findings from Installer Engagement

- There are reliable installers locally, however they are all incredibly busy with unprecedented demand. Managing resident expectations for quote timelines and process and agreeing a customer process up front with the installer will be hard to do but is essential to ensure the scheme is able to function.
- No installers gave a commitment to offering a discount, however we believe if we can demonstrate sufficient community interest then a conversation can be brokered with the directors of the installers to offer a form of discount and process to suit the area. In terms of levels of discount, this will depend on whether the installer is able to either:
 - Agree a discounted price for volume with their suppliers which they can pass through (likely 10% max and will come with a volume commitment and rules about timing of installation) or
 - Work out a price within their current volumes and work pattern to offer a discount for a minimum number of installations grouped together ordering at the same time and capable of being installed at the same time
- The closure of the Renewable Heat Incentive Scheme created huge delays in getting responses from installers as they were too busy to entertain new business. Since that has passed there is a little more responsiveness however relationships must be nurtured

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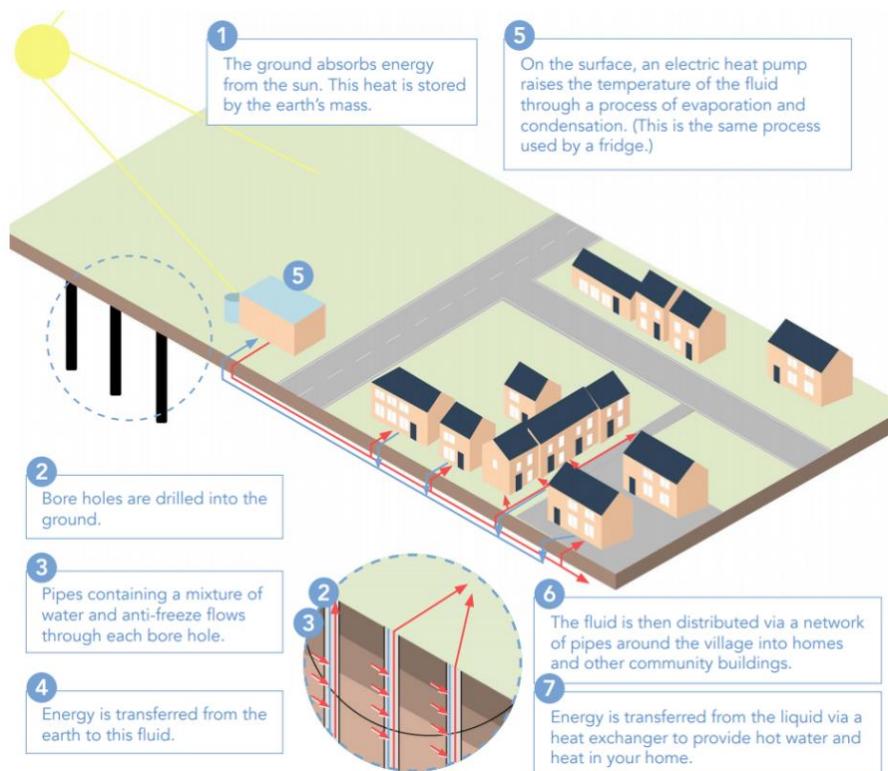
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because should the BUS scheme run into timing issues there is every chance the delays could happen again. There are simply not enough engineers in the marketplace to keep up with growth of demand.

- Product availability from the major manufacturers has been incredibly patchy. Installers who would have traditionally relied on Mitsubishi (the market leader until last year) have shifted brands to others such as Vaillant, Samsung and LG, in an attempt to find a reliable manufacturer who can supply product. The issue is caused by a number of factors:
 - Renewable Heat Incentive demand due to scheme ending in March 22.
 - General growth in heat pump demand in the UK driven by climate emergency and volatile energy costs driving retrofits and shift in building regulations rules for new builds
 - Global and European demand for heat pumps exploding at the same time as the UK
 - Pandemic supply chain issues affecting electronics parts manufacturing and global shipping crises

Large Heat Networks

This concept involves a central heating source such as a large ground or air source heat pump feeding a pipe network around a community. A current UK example would be Swaffham in Lincolnshire, image below illustrates how their planned heat network works.



This type of installation is far more invasive on a community, involving major pipework around a local area and is best suited to projects which are:

- Densely located properties
- Mixed with larger anchor loads for efficient heat distribution
- Preferably providing a low temperature heat flow to reduce losses
- Good grid connection and a plot of land for the heating energy centre and any associated power generation if that is supplementing the system.
- Property owners willing to connect to the network and pass on the rights and costs to new owners if they sell their property if they wish to stay connected.
- A community which is open to an ESCO (Energy Service Company) model which requires significant capital raise, a special asset management company setting up to own and operate the heat pump and manage all of the transactions.

Swaffham includes 300 buildings of which 40 are listed, a school and a pub. 70% were on oil and they are targeting 66% reduction in carbon. The energy load is 5GWh, planned to be fed by a large borehole fed ground source array, supplemented by Air Source in the summer, sited on a local farm. The network is 7km and has a network of 300 customers. The project relied heavily on subsidies and grants. [How the Swaffham Prior Heat Network works - Cambridgeshire County Council](#)

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Where could we see this working locally?

- Zones 1,2,3 and 4 combined, linking in the modern properties and anchor loads but involving a mix of heat pump types to accommodate the different diverse property demands for some of the older buildings.
- As a minimum a cluster of 100 homes or 2GWh of heat demand are required to attract the governments national heat network funding.

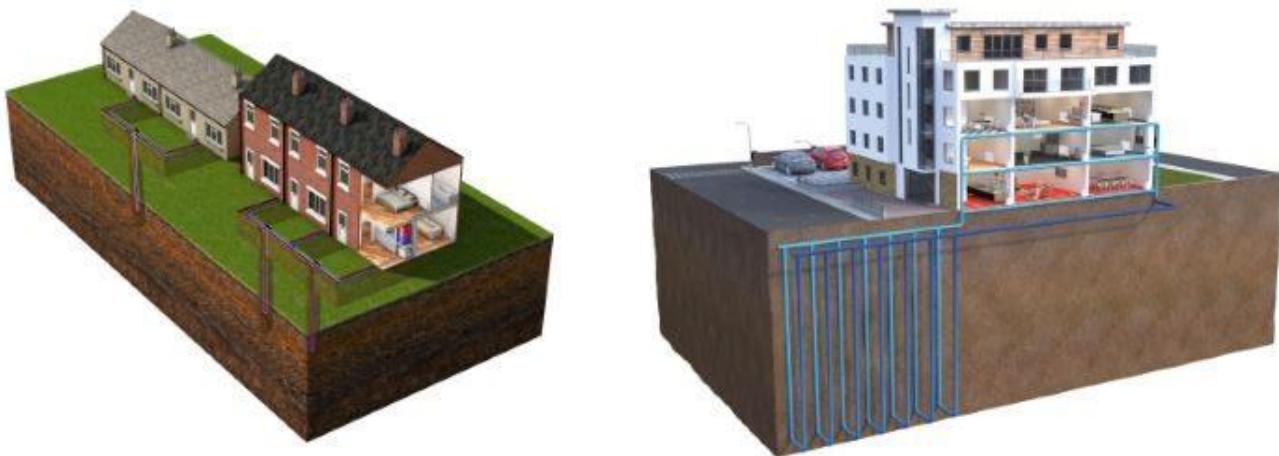
Scale and cost outline

- Cost estimates vary as materials and labour for this specialist type of infrastructure are volatile currently. Contractors and suppliers include names such as Mitsubishi, Kensa, Daikin, Vattenfall and Star Refrigeration. Large utilities such as EON and Engie are involved in larger city-based heat networks.
- The pipe network can cost £1000/m, reduced slightly if you can use fields rather than roads for pipework routes.
- For the major central heat sources, you are talking around £1200 for Air Source, or £1800-2000/kW for Ground Source (depending on geology).
- Grid capacity and Energy Centre location will be a significant capital cost, possibly in high 6 figures or more.
- Scale is everything, so the larger the cluster of properties and the more densely located they are the better the cost model.

Shared Ground Source Arrays

In speaking to contractors and manufacturers we have also been able to identify an alternative model for heat networks which uses an alternative source of grant funding more widely available to local people and could be a simpler model for a community energy company to facilitate.

The model has been developed by Kensa heat Pumps and more details are available on their website here [Shared Ground Loop Arrays with Kensa Contracting](#). We have engaged with Kensa, and they are open to assisting with project development if we can obtain sufficient householder interest (100properties ideally).



The model offers a ground source heating solution which connects multiple neighbouring properties to a shared ground loop. Kensa claim it mimics the gas network by offering a shared pipe network (i.e., owned by the community) which properties connect onto and the have their own heat pumps (like you would a gas boiler). This could be best suited to communities which:

- Have clusters of properties with neighbours willing to work together to share a ground loop and where the ground loops can be sited on their property or nearby
- Where the density of participants is slightly more spread out into smaller clusters of properties as opposed to a large network
- Where land for a large energy centre is harder to acquire and the potential for a large grid connection may be unaffordable
- Where a community may require a simpler operational model without major ongoing asset management and maintenance costs
- There is still an opportunity to involve larger buildings as anchor loads which may also attract local council or national grant funding (such as the school).

Of the many advantages this model has over its more capital intensive cousins is that it can be in part funded by the Boiler Upgrade Scheme grants ([Boiler Upgrade Scheme - GOV.UK \(www.gov.uk\)](#)) which offers £6000 for homes to connect ground source heat pumps. In essence the homeowner can fund their element (the heat pump) through this method and the community array can be funded by the community who can recoup their capital investment in this via a long-term standing charge each year.

Where could we see this working locally?

- Most Zones, linking many property types and anchor loads but involving a mix of heat pump types to accommodate the different diverse property demands for some of the older buildings.
- As a minimum a number of 50 homes in smaller clusters of groups of 4-6 properties minimum would be required to get the support of Kensa to construct the project.

Scale and cost outline

- Cost estimates vary as materials and labour for this specialist type of infrastructure are volatile currently. The main protagonist in the UK is Kensa who offer the heat pumps and the construction. The figures below require a lot more work but need a critical mass of interested householders to firm up pricing and feasibility:
 - A £9k-10k 250m deep bore hole would supply a couple of 2-3-bedroom houses, therefore circa @ £5k each house, funded by the community and then paid for by an annual standing charge
 - The house might need to find minimum of £5-6k for a shoebox heat pump and wet system which could be funded by the BUS grant. Insulation and radiator changes may be required on top.
 - Typical price range for social housing retro fit including additional upgrades (this normally includes insulation measures as well) is £18-22k per property.
- Ground source heat pumps replacement is in year 20 as opposed to air source which is in year 12-15.
- Ground array payback (if funded by the community) can be year 15 or moved later depending on cashflows and community benefits needed

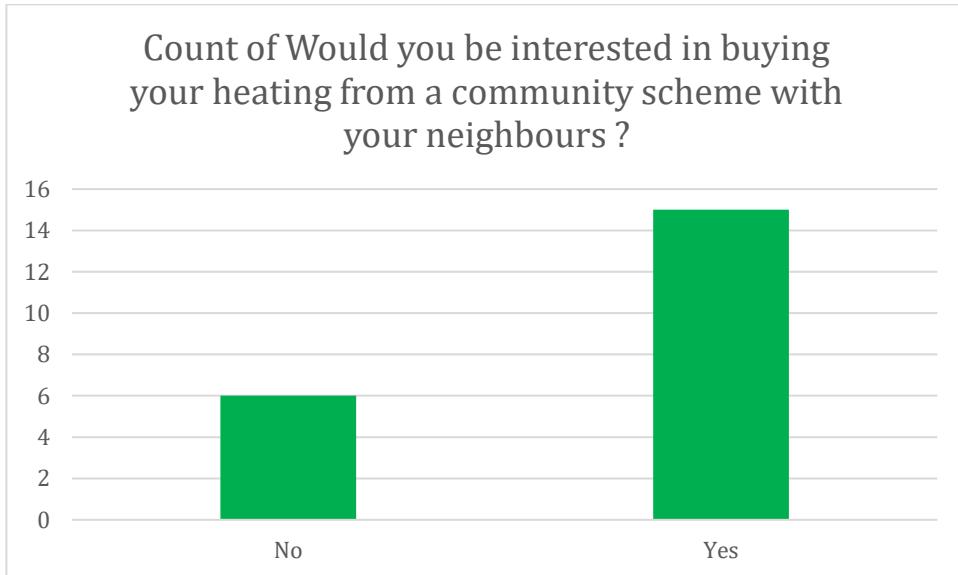
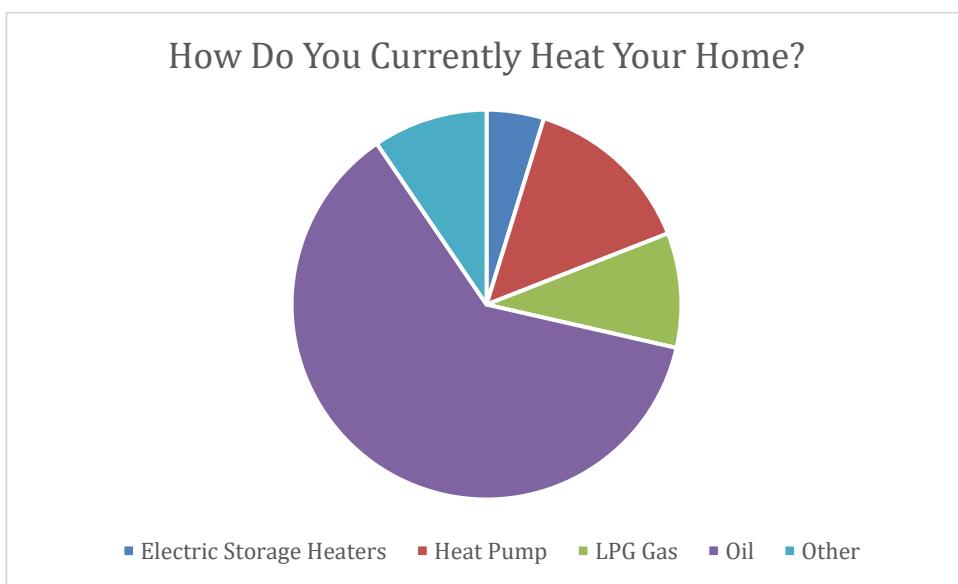
This would still require a feasibility study to follow up this model, subject to getting sufficient properties involved in the scheme.

Community Engagement

Members of the local Currey Rivel community launched a residents survey which commenced in April and May 2022. Details of the survey are still live and can be found online here:

[Curry Rivel Heating Initiatives Project](#) link on Parish website [Curry Rivel Online - Above the Levels Energy saving Tips and Actions | Environment \(southsomersetenvironment.co.uk\)](#)

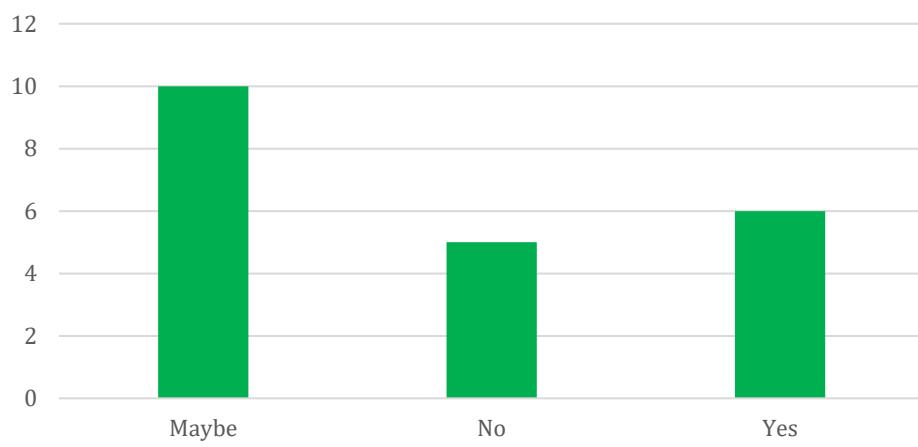
Within one month 21 respondents filled in the survey and the results are below. Further engagement planned throughout the summer.



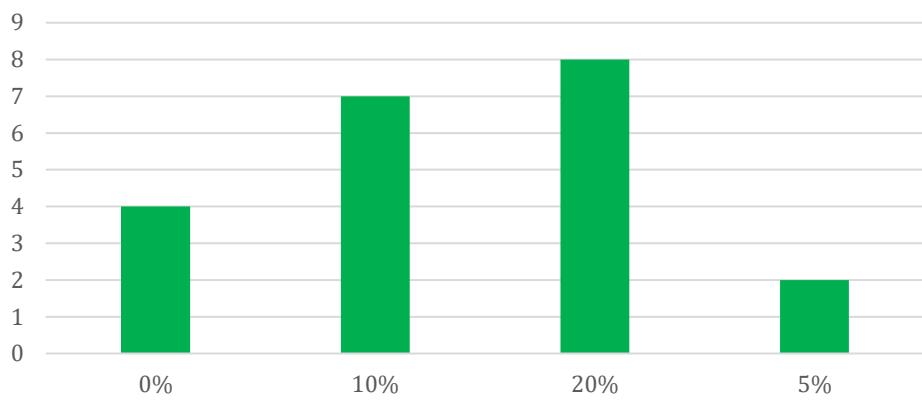
Count of Would you be interested in your house connecting to a community heat network?



Count of Would you be interested in a bulk buying scheme for heat pumps?

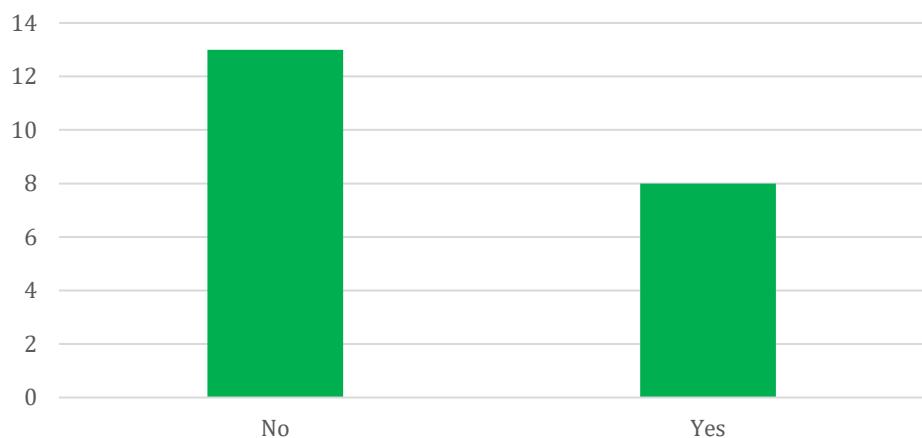


Count of How much money discount would motivate you to join a scheme like this? (tick all that apply)

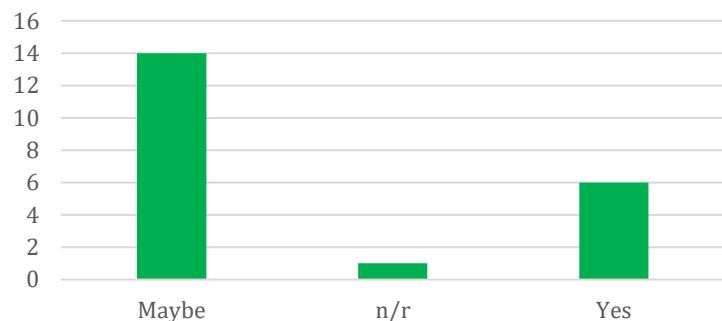


AMEND ABOVE

Count of Have you heard of not-for-profit community energy companies?



Count of Would you be interested in this idea for your community?



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Other key findings

- Key motivation for working together = Cost saving, followed by Carbon saving
- 10 out of 22 have cavity walls, 9 are filled cavity walls
- 10 have considered heat pumps already, 2 considered biomass

Analysis

The key motivator for residents is cost saving, which is not surprising given the volatile energy prices and available fuels to residents currently.

There is a clearer interest in a buying scheme amongst the current sample of 21 residents (fewer maybes for that question compared to others marginally) which may reflect a combination of:

- Their own ability access to funds to buy a heat pump, whereas a wider sample may find other residents feel this is out of their reach
- Their knowledge of the community model and how heat network models work.

There is a high % of respondents expressing maybe for a community project and/or a heat network model. Given the awareness of the community of the concept of community energy being relatively low it points towards more engagement and education for the community to explain how these concepts could work and then reassess their interest when they are presented with clearer explanations of both.

Recommendations

- Continue to obtain more survey responses. A minimum of 100 interested parties is required to apply for a heat network grant or 50 for the Shared loop array concept
- We would suggest this would also be a suitable minimum number of interested people to acquire further capital funding
- We advise sharing some of this information on heat and community models with the community in a series of events and online resources to help educate and engage residents around these new alternative models.

Community Model Options

For Curry Rivel you have three main options on the table which we summarise below. Please note we have not repeated all of the comments and strengths and weakness from earlier sections and have just focused on key risks and benefits below to simplify review:

1. Buying scheme model

- a. Lowest risk but limited communitywide integration benefit
- b. Simpler structure, requires mainly time commitment to facilitate

2. Centralized heat network

- a. Highest risk in terms of capital and ongoing performance risk
- b. Able to develop methods to incorporate less able to pay residents through bulk connectivity
- c. Requires a Community Energy Services Company model to own and operate and substantial capital fundraising and expertise to set up.

3. Shared Loop array concept

- a. Medium risk compared to the alternatives with a cleaner community model available and easier to acquire grants.
- b. Able to incorporate less able to pay residents if residents can acquire grant funding to fund any upgrades which may have required personal capital
- c. Still requires a community Energy Services Company to own and operate the ground array and ongoing connections and transactions to pay down capital and distribute community benefit

What is a Community Energy Services Company?

Energy Services Companies (ESCO's) have existed for a number of years, coming originally from commercial models by large corporates such as Honeywell, EON and Centrica who have developed schemes to implement and fund self-funding energy efficiency schemes for large commercial and public sector businesses (like hospitals etc). They are essentially a business set up to fund, build and operate the new energy assets, which deliver savings to the organisations in carbon and cash, and the savings pay for the capital and also provide profit to the entity providing it.



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Source: IEA

In the case of a Community ESCO the same principles can apply however the key difference is that the organisation is typically not for profit and driven by altruistic aims and aims to recycle any profits back into the local community in form of grants from any surplus savings.

An example is given below from BHESCO, who are a local community energy company, based in Sussex. In the example below they are funding collective funding and ownership heat pumps, but their aim is also to provide ground loop shared arrays.

[Firle Village - A Beacon for Renewable Energy in Sussex \(bhesco.co.uk\)](#)

[Chipping-Community-Energy-FAQs.pdf \(chippingcommunityenergy.co.uk\)](#)

To find out more about the type of organisation you need to be to set up a community energy company it is worth looking at Community Energy England's website [The Voice of the Community Energy Sector | Community Energy England](#) and also the Cooperatives UK website [Co-operatives UK](#). These organisations are home to a large number of communities owned not for profit organisations, often formed on a cooperative model or Community interest company model. Typically projects like this will require a feasibility study to help clarify the right model with legal, financial and practical advice.

The main principles of community energy companies generally are:

- Deliver carbon and fuel poverty solutions to their local area
- Community ownership, raising funds from the local area collectively and collectively owning and operating het assets for the local area
- Distributing any benefits locally via the savings, carbon or cash and also any surplus recycled back into the local community
- Democratic ownership, owned by its members. Ongoing engagement with community.
- Built on a sound corporate footing to enable fundraising of capital and fair distribution of benefits
- Built on its people, requiring committed people who will stick with this for the long term and bring in skills to complement the projects

Energy Efficiency Solutions

We discussed the potential for grant and advice around energy efficiency measures such as loft, or wall insulation. These measures and may others for reducing energy would be ideal measures to investigate in the immediate near term as they are comparatively cheaper than installing new heating systems and will offer big savings quickly. They will also reduce the heating load of the property and therefore reduce the size of heat pump solution required.

Measures include things such as:

- Loft insulation
- Internal or external wall insulation
- Draught proofing
- Chimney balloons
- Double or secondary glazing (not cheap but may be essential for some properties)
- Energy efficient lighting
- New heating controls and thermostats
- Pipe lagging
- Hot water tank lagging
- Flushing your heating system

Advice can be found by approaching organisations such as these below:

[Resources | Centre for Sustainable Energy \(cse.org.uk\)](#), with really useful factsheets

Safe and Warm Somerset will be able to offer advice and grants for families on low incomes here
<https://www.cse.org.uk/projects/view/1367>

Another idea might be to work together and buy measures as a group in bulk. Approaching companies such as <https://www.am-energy.com/contact/> may give you bulk discounts on loft and cavity wall insulation.

Next steps

- Please read this report and organise a meeting with members of your group to discuss the findings together
- A model needs to be selected to progress further for the heat network if that is your preference. Please note the minimum number of households thresholds and risk profiles. Both will require forms of further engagement and feasibility work to develop the concepts further.
- You are likely to require some form of grant funding to support ongoing work on these models, some less than others. You should not be deterred from doing the larger schemes as the expertise and funding is available to help create a substantial community asset if you have the appetite for it.

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Appendices

1. Specification

- 2.1 Proposals are invited for an analysis of opportunities for sustainable heating to serve the community of Curry Rivel. The scoping exercise will identify realistic and feasible projects that the Parish Council (PC) can pursue in its aim to provide sustainable and low carbon heating alternatives for the community, in respect to both individual dwellings and community facilities.
- 2.2 The residents and businesses of Curry Rivel are largely reliant on domestic oil for heating and hot water due to there not being a connection to mains gas in the village. With awareness of the environmental impacts of using fossil fuels growing, combined with the likely rise in oil prices the PC is aware that at some point alternative solutions for heating must be sought.

Background

- 2.3 Curry Rivel comprises approximately 1100 dwellings with a population circa. 2500.
- 2.4 Mitigating climate change is a priority for all levels of Government from national to local level. At a local level the PC would like to promote and support initiatives to reduce greenhouse gas emissions. The PC has been successful in obtaining a grant under the Somerset County Council Climate Fund to investigate initiatives for sustainable heating and power generation in the parish.
- 2.5 The PC would like to explore the opportunities available to assist parishioners improve the energy efficiency of heating their homes and encourage the uptake of renewable heating methods.
- 2.6 Though the implementation of technical measures such as roof, wall and floor insulation and draught-proofing the energy efficiency of buildings can be significantly improved, reducing the heat demand of a building. The PC would like to explore ways to assist homeowners reduce their heat demand. The purchase of a Thermal Imaging Camera by the PC would enable residents to survey their buildings and identify areas which are leaking heat. Low cost and larger scale improvements can then be undertaken, for example installation of thermal blinds, draft proofing around doors, replacing/adding double glazing, adding or improving insulation and undertaking repairs to masonry work.
- 2.7 Bringing together local homeowners and businesses to install renewable technologies in bulk can significantly reduce costs to homeowners. The PC could work with installers to agree discounted rates for installation of equipment as well as other benefits such as

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exporting unused energy back to the grid or battery storage of electricity. Solar Streets is a popular example of such a scheme, providing Solar PV arrays to residents. Similar schemes can be investigated for heat pumps.

- 2.8 Whilst we understand that greater energy efficiency in buildings is required, and discounts could be achieved in organizing the purchasing of which could be explored a need we lack the expertise in drawing together a viable set of options with which to move forward.
- 2.9 As well as domestic installations there is opportunity to explore community initiatives such small-scale retrofit heat networks for groups of dwellings or ground source heat pumps on community owned land. As technological solutions are brought forward for energy storage what are the opportunities for the Parish to generate renewable power, e.g., wind, PV, anaerobic digestion? Should the Parish consider opportunities to off-set the consumption of energy for heat?
- 2.10 The funds available to the Parish are very limited and uptake in participation in any scheme is heavily reliant on the community. Community engagement and understanding local needs are therefore fundamental.
- 2.11 Climate change is high on the national agenda and the PC would like to be in a position to apply for any funding that is available to fulfil its sustainability objectives.

Brief

- 2.12 To undertake a study to consider how the Parish of Curry Rivel can become more sustainable through reducing its reliance on fossil fuels for heating and thereby reducing its carbon footprint.
- 2.13 The objectives for the study are as follows.
 - To examine short- and long-term options for increasing the ability of the Parish to meet its heating requirements through more sustainable methods.
 - Recommend a program of implementation which incorporates community engagement and facilitates take up of initiatives.
 - To identify future funding opportunities to assist the Parish in pursuing sustainable heating projects.
- 2.14 The study should identify any immediate measures which may be taken to reduce CO2 emissions from heating within the parish.
- 2.15 The study should contemplate the following.

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- Reducing the carbon footprint of the community by exploring possibilities of installing renewable energy schemes on the school buildings and village hall.
- Opt-in community scheme to purchase and install heat pumps to a significant proportion of dwellings, reducing the reliance of the community on fossil fuels.
- Energy generating schemes which could be implemented on PC land to off-set CO₂ emissions from heating. For example, solar panels or ground source heating. Whilst seeking to reduce its carbon footprint the Parish also recognizes the importance of all contributing factors to climate change, including maintaining and enhancing biodiversity. Any such scheme would need to minimise and mitigate any adverse impacts upon the environment.
- Development of a retrofit heat network. A small-scale heat network connected to an energy centre could deliver heat to multiple properties from a central source. Whilst this could potentially be initially connected to mains gas to deliver a low carbon alternative to oil, it would enable renewable technologies to be connected in, such as biomass sourced from local farming activities, ground source, wind or future technologies such as hydrogen, delivering low carbon heat to multiple properties.
- Other potential schemes for sustainable heating and renewable energy which could be pursued by the PC either in the short or long term.

- 2.16 It is expected that the study will entail desktop research, using both local (where possible) and national data as required. A site visit to gain understanding of issues such as location, landscape, house types, community infrastructure may be beneficial.
- 2.17 The study may advise on examples of similar projects undertaken elsewhere.
- 2.18 The study will consider the options available for the PC to be a pilot scheme and/or apply for funding to pursue any of the projects identified in the study, either on its own or working with the South Somerset District Council or Somerset County Council, including HNIP (The Heat Networks Investment Project) funding.
- 2.19 Indicative costings and timescales should be provided for the projects which are recommended.

Key Milestones & outcomes

- 2.8 The following table sets out the key milestones and outcomes to be delivered.

	Description
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Key Milestones	Inception Meeting & site visit around parish
	Midpoint meeting to discuss progress of study
	Issue draft report setting out findings of study
	Final review meeting to discuss recommendations
	Issue final report
	(Present findings at Parish Council meeting if required)
Outcomes	Identify opportunities to address climate change through sustainable heating.
	Recommend immediate measures that may be taken by the PC to promote sustainable heating.
	Recommend feasible projects (including funding opportunities) for sustainable heating to be further investigated by the PC.
	Identify future funding opportunities to facilitate the recommended projects

Kick off meeting to be held on-line to confirm the brief, confirm key contacts during the project, timings and capture contact details of specific opportunities that the Parish Council representatives may have already identified where the community may have a pressing need. This is also an opportunity to confirm the sources of the most up to date data on the local area such as the occupancy, blend of occupants, the carbon footprint (if available) and the known energy consumption of any buildings under consideration at an early stage.

We would also welcome any information on the main landowners in the Parish and identify them on a map including the Parish Council itself and others including but not limited to Diocesan, schools, other council authorities, social landlords, colleges, community organisations, commercial and agricultural premises and key private landowners.

We would then undertake a desktop review of the area using online data resources and maps to identify a long list of heating opportunities and review any local planning or technical constraints at high level. We would like to be able to consult Parish council representatives on their knowledge and contacts to make sure we are able to obtain contact details and property information if it is available. This desktop survey and review will focus our time on an agenda for a site visit. The long list may become a slightly shorter list depending on the context of each building.

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We anticipate we need at least one day for a site visit at this stage, this does depend on the number of opportunities found and the accessibility of the properties on the day. If we have to make a second visit, we will aim to work within the budget as much as possible.

On the site visit we would pay a visit to as many of the key properties on the priority long list and undertake a brief survey to assess the current heating systems, energy cost and fabric of the building. Due to the time involved we will not be able to produce detailed room by room heat loss calculations, however we will aim to estimate the overall dimensions and heat loss to give a useful guide for our assessment at the next stage.

We will also aim to visit a selection of the residential areas to try and capture the context and locality, this helps with understanding the heat loss characteristics of the properties locally (for profiling individual heating solutions) as well as their relative proximity and ability to connect to a heat network.

Following the visit, we will produce a report which summarises the findings from each of the long-listed opportunities and focuses as a priority the most feasible opportunities for renewable heating.

The report will capture the estimated load, likely technical options for heating, estimated costs and benefits, grant funding opportunities and any specific technical, regulatory or legal constraints which are material to the opportunities and their respective business cases.

We do not know for certain if there are cases for community energy projects at this stage, but we will always consider community energy solutions wherever possible as this is a particular area of expertise and passion we have as a business.

We noted there is a requirement to outline how to develop a community buying scheme for renewable energy and energy efficiency for the area. This is an area we have some experience of and having had a history of installing and procuring installers for many years. We feel well placed to set out how the community could undertake this. A scheme such as this may have access to funding such as grants (local or national if available) but one of the core aims will be to create a reliable, skilled supply chain, who can offer sensible prices for homes. If there is additional funding to support those not able to pay, we will also try and capture something there as well.

The short list of opportunities will also be given some degree of prioritisation relative to each other to help the community identify which order to undertake the next steps and also outline some of the key next steps for the community to pursue them.

If there is work that has been undertaken to identify a carbon footprint already or failing that a way of utilising existing tools such as the CSE carbon footprint tool as an initial baseline, we can describe the impact the work will have on the local carbon footprint for the community when it is delivered.

We have assumed the majority of meetings require online presence, we find this is time efficient for studies like this and also significantly reduces our carbon footprint.

The time we have allocated for this project is 12.4 days of effort across three people for a duration of six weeks. This approximately two-thirds of one day, per person, for 6 weeks. As a result, we are comfortable that we can absorb this workload and deliver to the timings requested.

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MCS Registered Residential Heat Pump Installers Approached

Installer	Contact	Located	Certification Body	Suitable for
Otter South West Ltd	01823 338292, accounts@ottersouthwest.co.uk	Holt Barn, Taunton	NAPIT	Air & Ground source Heat pumps.
Res Distribution	01935 316232, O.smith@res-distribution.com	2a Kingfisher close, Lynx trading estate, Yeovil	NICIEC	Air & Ground source Heat pumps. Solar.
Commercial Biomass LTD	01935 476927, admin@commercialbiomassuk.com	Unit 12 venture 20, Yeovil	APHC	Air & Ground source Heat pumps. Biomass.
Renewables Inc Ltd	07973 406795, bob@greenstart-dbr.com	Unit B, Allerton road, Bridgewater	NAPIT	Air & Ground source Heat pumps. Biomass & Solar.
M & R Drayton Ltd	01460 220380, drayton449@btinternet.com;	Knights house, Axminster	OFTEC	Air & Ground source Heat pumps.
Total Renewable solutions, SW Ltd	01749 340490, accounts@totalrenewablesolutions.com	2 Whitty Court, Axminster	NAPIT	Air & Ground source Heat pumps. Solar.
Evergreen Renewable Energy Ltd	01297 443209, info@evergreendeal.co.uk	Unit 3 Lyme Regis industrial estate, Lyme Regis	NICIEC	Air & Ground Source Heat Pumps, Solar.

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