

Community-led heat projects: an introduction

Prepared by Regen SW
for the Department of Energy and Climate Change
March 2016



Photo courtesy of LOGSTOR

Introduction to Community-led heat projects

This guide aims to help community energy groups and local authorities understand some of the opportunities, and challenges associated with community-led heating projects. This introduction document covers some of the main types of heating project that are delivered by community-led groups.

There is increasing interest in the UK in developing more heat networks at a range of scales, from two or more buildings connected together up to whole towns and districts sharing heat. In recognition of this interest, DECC has commissioned a 'Community Heat Toolkit' to help communities and smaller local authorities identify and develop some of these schemes.

The toolkit was produced by Regen SW on behalf of the Department of Energy and Climate Change, and we would also like to thank our peer review group from industry for their expert input.¹

Each section contains information on each type of heating project, with links to more detailed information or further support.

[Introduction to Heat Networks](#)

[Introduction to projects for heating one building](#)

[Introduction to setting up group buying schemes](#)

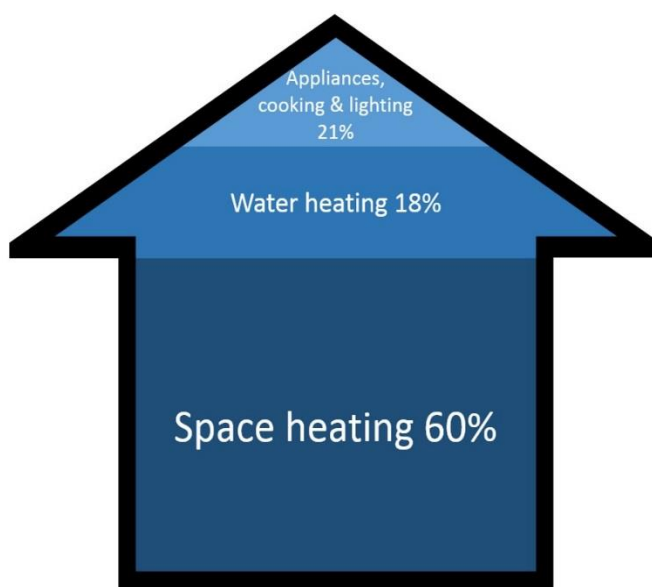
1.0 What are community heat projects?

Much of the energy needed by communities is used to heat spaces: homes, businesses, public buildings and every type of building in between. In fact, nearly half of the energy consumed in the UK is for space heating and hot water. For individual homes, this figure is even higher, with 60% of a household's energy being used for space heating.²

Increasingly, community groups and local authorities at all scales are looking at how their heat is generated and used and coming up with innovative projects to help address fuel poverty, reduce energy bills, increase sustainability and more.

Typically, community heat projects fall under one of three broad themes all of which are introduced in this document. They are (in order of decreasing complexity):

- providing heat to multiple properties using a heat network



¹ With thanks to: Dan Nicholls, Cornwall Council, Sue Ansell and Ken Brady, Energy Saving Trust, Mark Prior, Forestry Commission

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/190149/16_04-DECC-The_Future_of_Heating_Accessible-10.pdf

- replacing individual heating systems in key community buildings
- bulk buying of heating fuel

Community heat projects are different from conventional renewable electricity projects (such as solar PV or wind) in that heat is produced and consumed locally. There is no mechanism for transporting heat long distances in the same way that there is for electricity. This may well change in the future, but currently heat is essentially limited to a local market. Heating fuels of course, can be transported by road, rail and sea.

1.1 Who is doing community-led heat projects?

Although less common than renewable electricity, community heat projects are happening. Some of the more progressed projects are:

- [Greenfox Community Energy](#) in Leicester has replaced a local school's oil boiler with a woodchip heating system.
- [Woolhope Dome Community Woodfuel](#) has been installing biomass boilers in hard-to-heat buildings and producing woodchip from local forestry.
- [Springbok Sustainable Wood Heat Co-operative Ltd](#) has built a heat network for a large residential estate.



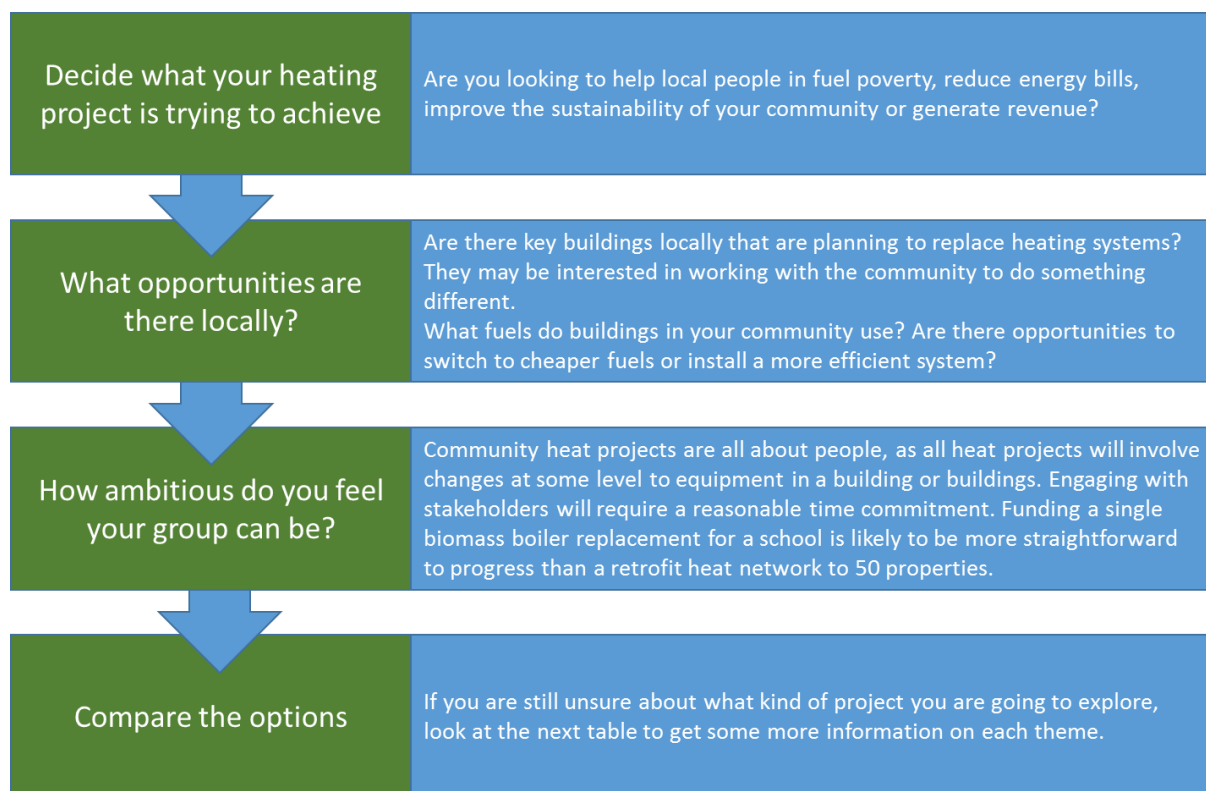
**Chris from Woolhope WoodHeat
comparing potential pipes for their
project**

All of these organisations are co-operatives run by volunteers for the benefit of their community.

Depending on the scale of the project, the community group may or may not need a formal legal structure. For example, if a community group wanted to collectively replace their old oil boilers with new biomass stoves or boilers, this could be done together informally, without forming a legal entity. If, however, a community group wanted to own and operate a heat network including selling heat, this would require appropriate legal and financial structures.

1.2 Choosing a project type

Supplying, selling and consuming heat does not currently have formal regulations applied to it in the UK, unlike electricity projects. This means community energy groups and local authorities can be innovative in choosing a project and perhaps more flexible in the sorts of outcomes they would like to see. The first step to building a heat project is to be clear about what you want to achieve, and what you can realistically deliver.



If you are still unsure as to what type of project you may be looking to develop, it may help to look at what factors influence the viability of a project:

	When the project may work well	When the project may not work well	Objectives that may fit:
Heat networks	<ul style="list-style-type: none"> The community buildings are using expensive fuels There's a new build development planned Houses are fairly close together or you are confident about a reasonable non-domestic heat demand There's space for a central boiler (and fuel store if biomass) There's strong interest in the project aims from the local community 	<ul style="list-style-type: none"> Buildings are spread out, rather than being clustered together Local area is congested, with lots of roads and infrastructure that would be in the way of heat network pipes Not much new development happening (any heat network would be 'retrofit' only) 	<ul style="list-style-type: none"> Generating a revenue (through sales and possibly incentive schemes) Lowering carbon emissions Potentially lowering bills Build community cohesion Address fuel poverty through cheaper or subsidised heating
Heating one building	<ul style="list-style-type: none"> A building that is important to the community (school, health care centre, village hall etc) has an old boiler that needs to be upgraded or replaced There's interest from the community in an investment opportunity 	<ul style="list-style-type: none"> A building is tied into existing long-term fuel or energy supply contract The local community would like a heating project to address energy bills in the local area – Bulk buying or a heat network would be more suited to achieving this 	<ul style="list-style-type: none"> Lowering carbon emissions Potentially lowering bills Help protect a community asset
Bulk Buying	<ul style="list-style-type: none"> A number of local people are interested in either changing their heat generator to a new technology, or are looking to replace older equipment This could be for new condensing gas boilers, heat pumps or biomass pellet boilers The more interested parties in the chosen technology, the better Several customers have the same fuel and make savings with a combined purchase 	<ul style="list-style-type: none"> The local community has recently taken advantage of schemes like ECO or Green deal to upgrade heating systems Existing heating systems are still relatively new (although bulk fuel purchasing may still be a project) The community wants to generate a revenue, or tackle fuel poverty in addition to lowering bills Insufficient numbers of customers interest to achieve any economy of scale 	<ul style="list-style-type: none"> Obtain savings on existing fuel or equipment costs Build community cohesion Address fuel poverty through an energy efficiency scheme

1.3 Sources of support

You can find out more about each type of community heat project through individual resources on the community energy hub:

- [Heat Networks Toolkit](#)
- [Projects that provide heat to a single building](#)
- [Bulk Buying Projects](#)

2.0 What is a Heat Network

Heat networks enable one or more sources of heat energy to provide hot water and space heating to many users. Any scheme generating heat and providing it to two or more buildings can be classed as a heat network, regardless of what type of building is being heated. A heat network can also involve a single block of flats with multiple dwellings (this is usually termed communal heating). In fact, heat networks work best with a variety of building types, (i.e. residential, retail, industrial) as this helps to balance the daily and seasonal demands for heat on the system.



Image credit: Regen SW

The heat network moves heat to each building via hot water (or sometimes steam) in a system of pipes insulated to reduce heat loss and normally buried much like any other utility supply infrastructure. The heat is normally generated in one location, typically called the energy centre. (This can be a new building built to house the plant, or housed in a convenient existing building).

Water in the heat network is at a high temperature, often between 70 and 100 degrees Celsius, and customers usually access this heat through a Heat Interface Unit (HIU), which takes the place of an individual boiler (they are in fact much the same size as a small gas boiler).

The HIU contains a heat exchanger, which lets the customer extract heat from the main network into their own central heating system to supply radiators and hot water taps. Each customer has a heating control system and meter installed with the HIU so they can be billed for the amount used and control their usage.



Bristol City Council heat network being installed. In this picture, sections of pipe are being welded together before they are positioned in their trench.

Photo credit: Bristol City Council

The heat is generated in a centralised energy centre. Hot water is usually stored in large, insulated (thermal) stores so the system can deal with times of high and low usage, whilst running the energy centre at maximum efficiency. Most of the heat networks in the UK use gas or biomass boilers to create heat, but you can harvest waste heat from industry, or collect low temperature heat from water or the air through large heat pumps (for more information on heat generating technologies, check the Heat networks toolkit or the [Community Energy Hub section on renewable heat technologies](#)). Heat networks are also good at managing heat from multiple sources, even from different sites.

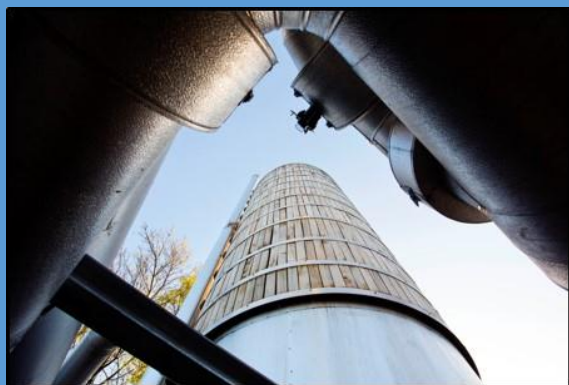
Increasing numbers of projects are exploring the generation of both heat and electricity with the same plant, known as Combined Heat and Power or CHP, as this can provide additional revenue for the owner, as well as help to de-risk fluctuations in the electrical energy market.

Heat networks have been employed for a long time to heat multiple properties from a single source. Indeed, there is evidence that hot water distribution to multiple buildings was in use as early as fourteenth Century France³.

One of the UK's first community-led district heating schemes was for St Bride's Community Centre in South Lanarkshire. You can read a case study about the project on the [website of the Association for Decentralised Energy](#).

2.1 Heat networks in the UK

Heat networks (or district heating as it is often called) first started being used after World War II in the UK, to heat large residential areas that sprung up in areas destroyed by the Blitz. Many of these early schemes are still in use today, such as the Pimlico District Heating Undertaking (PDHU), which first became operational in 1950.



Some large networks require large components, such as this accumulator tower, part of the Bunhill Heat network. It is used to help keep constant pressure in the system.

Photo Credit: Islington Borough Council

One of the oldest and largest schemes still in operation is in Westminster and run by City West Homes, supplying over 3,000 properties with hot water, space heating and electricity. It is estimated

³ Advanced District Heating and Cooling (DHC) Systems, Woodhead Publishing series in Energy 2015

that there are 1765 individual heat networks in the UK, but that they are predominantly small⁴. Three quarters of all networks identified by DECC in 2013 are classified as small, with an average of 35 residential dwellings.⁵

Some of the UK's oldest heat networks are expanding even now. Sheffield's heat network was established in 1988 and serves 140 non-domestic buildings, as well as 2800 homes.

2.2 What drives interest in Heat Networks?

There are a number of practical factors that drive interest in heat network projects:

Practical drivers for developing a heat network	<ul style="list-style-type: none"> • The provision of heat by heat networks is usually more efficient than many individual boilers or plant • Heat networks can usually use a range of heat supply sources, so it can be easier to transition the whole system to a different source of heat generation, i.e. renewables • They remove the burden of boiler maintenance and checks from the householder or bill payer
Political, environmental and social drivers for developing a heat network	<ul style="list-style-type: none"> • There is long-term political support for developing heat networks in the UK • Natural gas boilers at an individual building level are likely to be phased out completely by 2050 as part of meeting UK 2050 Carbon emission reduction targets • Heat networks can often contribute to lower energy bills than individual heating systems and help lift some households out of fuel poverty • Community energy projects can help improve community cohesion • Heat networks can help lower carbon emissions associated with existing heating regimes
Economic drivers for developing a heat network	<ul style="list-style-type: none"> • Heat can be sold to customers connected to the network, generating a revenue for the network owner/operator • If the fuel source for the network is low carbon, there may be government incentives or tax benefits for the owner/operator i.e. the RHI • The system should be more efficient than the heating systems that the customers had previously. Customers should therefore expect some financial benefit to connecting, unless the main aim of the network is not to reduce bills (i.e. raise money for the community, socialise heat to protect the fuel poor etc)

⁴https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212565/summary_evidence_district_heating_networks_uk.pdf

⁵https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/212565/summary_evidence_district_heating_networks_uk.pdf

There are many reports outlining the benefits of heat networks including [a report by the Low Carbon Infrastructure Fund](#) and the [District Heating Manual for London](#). Recently, interest in heat networks has been growing again, as their benefits have been demonstrated at home and abroad. The creation of the Renewable Heat Incentive (RHI) has also helped to generate interest in heating solutions by providing financial support for buildings heated from one renewable energy source, provided the energy source was classed as renewable (biomass, heat pumps, energy from waste etc). You can find out more about how the RHI works [here](#). Another government initiative, the Heat Networks Delivery Unit (HNDU) has supported local authorities in England & Wales in exploring over 180 large-scale, heat network projects at varying stages of development⁶. You can read more about the work done by the HNDU on the DECC website [here](#).

Local authorities often have an interest in encouraging heat network projects. Other than the reasons outlined above, key interests for local authorities can be⁷:

- tackling fuel poverty, which requires keeping consumer bills down
- regeneration, by providing a competitive advantage to an area
- being seen to be actively engaging with low carbon transition and sustainability
- contributing directly to local authority greenhouse gas reduction targets
- income generation

2.3 What does a heat network project look like?

Every building, home and business needs heat. Unlike electricity or gas, heat (or the medium used to transport it such as hot water or steam) currently cannot be transmitted or moved great distances efficiently in the UK. This means there is no national market for heat as a commodity, and heat must be produced, supplied and consumed on a local basis.

This means that for any heat network, the customers must be local and must make a decision to connect to that local system. This is different to other types of energy project such as wind farms or solar arrays, as the electricity generated by these schemes enters a national market and doesn't necessarily need local residents to buy it.

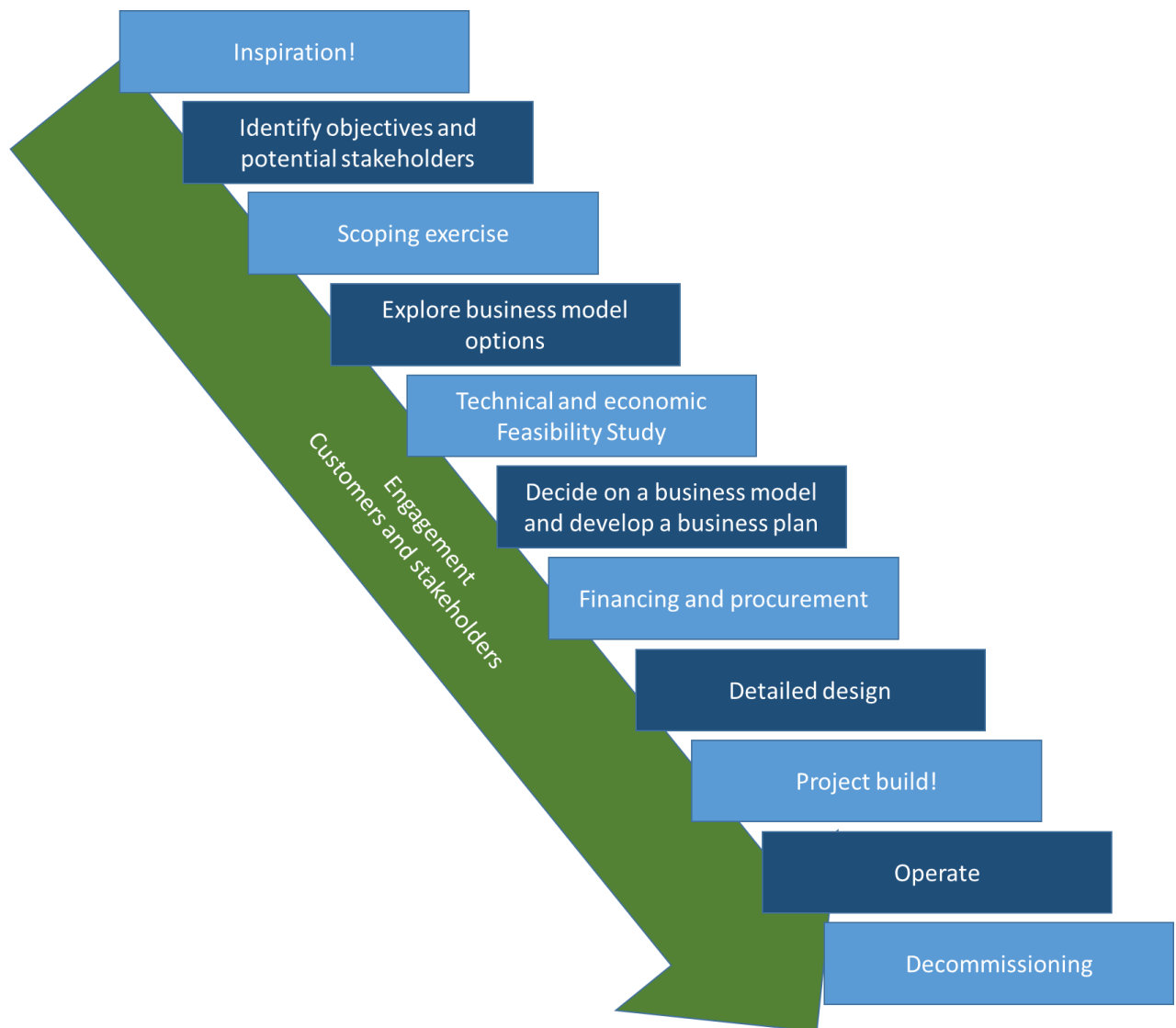
So heat projects start and finish with local communities – this has a significant impact on how heat networks projects are developed.

In addition, heat network projects need different levels of technical expertise according to their scale and complexity, in much the same way that a domestic rooftop PV installation will have a different development pathway to a 6 MW solar ground array.

In general though, every heat network project will need to follow these steps:

⁶https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477898/Heat_Networks_Invest_Guide_Nov2015.pdf

⁷https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457240/HNDU_Report_Final_28_08.pdf



The important thing to note with this 'project journey' is the presence of customers and stakeholders throughout the entire process, along with a mechanism for them to be included in each stage.

Depending on the nature of the project, initial stakeholders could include (before getting in to technical requirements):

- community groups/Local authorities
- housing associations
- local businesses
- landowners
- developers (if major regenerations or new build developments feature in the project)
- residents' associations/parish councils
- potential customers directly, if the project is a retrofit

This holds for both local authority and community-led projects.

For both community energy groups and local authorities, a heat network project will only ever be viable if:

- heat customers can be convinced to connect, OR
- there is sufficient demand under the control of the network owner, OR
- new-build developers can be encouraged to incorporate connection to a heat network in their plans.

In addition, due to the length of time heat network projects can take to develop (which can be several months for small privately owned networks up to many years for larger schemes), customers and stakeholders may change. It is crucial that potential network customers are kept involved with the progress of the project and are able to maintain support for it long-term.

You can find out more about community engagement, what it is and how it works in the heat networks toolkit, here or on the [community energy hub website](#).

For more detail on the project stages, see the Heat Networks Toolkit.

2.4 What constitutes a good heat network opportunity?

Heat networks are, from a technical point of view, fairly straightforward to implement (see the [CIBSE Heat Networks code of practice](#) for more information). They require a heat source, some pipework to transport the heat, a control system and some customers wanting heat. Financing and operating this project must of course at least cover its costs. The challenge, however, is for a community heat network project to also **meet the objectives of the community-led group**. These objectives may be quite varied, depending on why the project is being developed. Whether that test is satisfied or not will depend on a number of factors, and no two opportunities in the country will be exactly the same.

Broadly, the more boxes that can be ticked below, the more likely it is that a heat network project may be viable in that location:

Heat network 'opportunity' factor	✓ or ✗	More information
Is there a 'local plan' for your area that includes support for heat networks?		Each local authority should have written (or be in the process of writing) a local plan. These may contain planning policies that encourage the development of heat networks
Is there a ' Neighbourhood plan ' for your area that includes support for heat networks?		Many communities are writing neighbourhood plans that can specifically encourage certain improvements to local areas. This may include policies on heat networks. Some of these can be linked to specific sites or geographical areas of the community. Visit the RTPI website to find out more about neighbourhood planning.
Is the area to be served by the heat network off the gas grid?		Natural gas is currently one of the cheapest ways to heat homes and businesses. Buildings already heated by gas may not see much (or any) in the way of energy savings by switching to a heat network supply, but this is not always the case. At the very least, understanding what your customers currently use for fuel and you're your heat network might use for fuel is important. You can find on the CSE website a list of

		postcodes that were off the gas grid as of 2011.
Are there any buildings with a large heat demand that may be able to connect?		Buildings using heat regularly, and throughout the year are useful as they can help balance the load. The more buildings with high heat demands (i.e., schools, leisure centres, care homes) that can connect, the better the opportunity. Some heat may be being produced locally as a by-product of an industrial/commercial process. This could potentially be used in a heat network.
Are many of the houses that might connect built reasonably close together?		Typically, a hamlet with 5 or 6 detached homes with lots of space in between them would not be a good opportunity due to the need for long pipes and low demand. The closer the 'potential connections' are to each other, the lower the cost of connecting pipework will be, and the system efficiency will be higher.
Assuming a heat network project goes ahead, could you join up customers without the pipes being laid in the road?		Roads are expensive to dig up and put pipes into. Some heat network projects become cheaper to implement because they lay the pipes in grass verges or private land instead. (this is known as 'soft dig' rather than 'hard dig')
Is there somewhere convenient for the 'Energy Centre'; central in the network and with good access to roads big enough for construction/fuel deliveries?		The energy centre is the 'boiler house'. This is where the heat is generated and the pipework terminates. Its size will depend on how big your network is and how many customers it is serving. Thinking about future expansion of the network is important when looking at energy centre sites.
If your heat network is biomass fuelled, is there a suitable location onsite for storage of fuel?		Fuel is often forgotten about. For gas or heat pump driven networks, the fuel is delivered 'on-demand' so there is no need for fuel storage. Biomass powered heat networks, however, require large volumes of fuel. You can find out more about fuels in the Heat Networks Toolkit.



Energy Centres will come in all shapes and sizes, depending on the scale of the network

Photo Credit clockwise from top left: E.on, Dunster Biomass Heating, British Gas

2.5 Using the National Heat Map

The [National Heat Map](#) is a high-resolution web-based map of estimated heat demand for every address in England. It was published in 2012 and is accessible to all. It provides modelled estimates of total heat demand for every address in England.

The map can be used as a first point of enquiry to assess the local geography and heat demand of the area, and to assist in high level planning. It can inform enquirers about the presence of high heat load generators, e.g. industries and hospitals who often tend to be intensive heat users and tend to have on-site heat generation for their purposes. As a result, they may have surplus heat for sharing with high heat sink areas, possibly with public libraries/offices, residential blocks, schools, community centres etc. It should be noted that high heat load generators and high heat sink areas may vary from one area to another. It may be that, in some areas, public buildings would be the ones who would have large heat loads, and could configure their systems to supply heat to buildings beyond their estates.

Users can also identify other local low carbon sources in the area, such as local forestry locations or water bodies. Through the use of the Water Source Heat Map (found as a separate layer on the National Heat Map), one can ascertain an approximate thermal potential for the water bodies in their local area, such as rivers, canals, estuaries and coastal areas. With a good understanding of the local heat resources and heat demands, work on a future heat plan for the area can then commence.

2.6 Summary of typical challenges

Heat network projects are different to many energy projects, in that they require a direct connection to each customer, which in many cases is a connection into people's homes and businesses. This can cause concern for prospective customers who are not used to the concept of heat interface units, both in retrofit and new build scenarios. However, this feature can also be considered a strength as it means there is an opportunity to engage each and every customer on an individual basis, helping to build support for a project overall, as well of course meaning that customers will not have to repair or maintain their individual boilers again.

Community scale heat networks are not normally complicated systems from an engineering point of view. While they must be designed carefully and installed by experienced or suitably trained installers, many of the typical challenges are to do with scale and risk, rather than their technical complexity.

Engagement

Encouraging home owners and businesses to change how they think about their heating needs is challenging and may take a long time. Things like particularly cold winters, boiler failures or replacements and expensive fuel prices may help trigger interest in a heat network. Bundling heat network installation with improving broadband provision can help.

Also, heat networks can take a long time to come to fruition and customers can change their mind, move or may have replaced a boiler recently. Constant engagement is time consuming, but necessary.

Location

If local customers are interested in a heat network, then the next challenge is to explore whether the location itself is suitable. Even if lots of householders are keen to connect, if they live on opposite sides of a mainline railway, are not of sufficient density, or have access to cheap fuel a heat network may struggle to be financially viable. If starting a project from scratch, checking that the location is viable for a heat network *before* engaging potential customers is likely to be worthwhile.

Finances

Heat networks are very long-term prospects, and as they directly impact on customers' quality of life there is huge onus on the operation to be well designed, well installed and to operate as efficiently as or more affordably than the previous heating system. This has an impact on the business model and how the project is financed. Creating a heat network is one thing, but running one is quite another. You can find out more about financing community-led projects on the [community energy hub website](#).

2.7 Next Steps

Understand what the key steps are in starting a heat network project

- Download the Heat Networks Toolkit to find out more information specific to heat network projects. This includes signposting and advice on each stage of a heat network project.

Gather local knowledge

- Heat networks need local customers, and local support. Other groups may have already looked at heat projects in your area, so engaging with your local transition or energy group and local authority are good places to start and see what work may already have been done. You can find any existing local transition group on the [transition network website](#), and on community energy groups at [Community Energy England](#) and [Community Energy Wales](#), although none of these lists are exhaustive. You can also contact other regional/local organisations such as [Regen SW](#) who can help highlight activity in your area.
- It can often be your own local knowledge that unlocks projects, for example knowing that a local school is looking to replace its heating system, or that a new build development is planned. This knowledge is often the catalyst for starting conversations about exploring a heat network, or other energy project.

Check that your area constitutes a good opportunity

- The table introduced in the 'What constitutes a good heat network opportunity' section in this document (Section 2.4) is a good place to start. This highlights the main elements that will be important to the viability of a network project. Once you have considered some of these questions in relation to your own project, the Heat Network Toolkit contains links to guidance on undertaking your own technical assessment of a potential heat network. Performing a scoping exercise can be done at an early stage and may quickly highlight whether your community has a viable project or not, based on some broad assumptions (things like whether your community is likely to be interested in a decentralised system, housing density, etc.) Much information already exists for free to help you do this, such as the [National Heat Map](#). In addition, your local authority may already have investigated a heat network project in your area.

3.0 Heating one building – Community led projects

3.1 How does it work

Systems that heat just one building each are the most common way space heating is delivered in the UK. Much like a heat network, heat is moved around a building through pipes, sometimes insulated, but often not. Many heating systems are controlled by thermostats, but some systems will have controls to vary supply during the day and, if there are radiators, they may have valves that reduce flow when a desired temperature is achieved. There are two main types of single heat systems: wet and dry.

Wet systems

Hot water is generated from a central energy centre, transported to buildings via pipes and then distributed around a building through smaller pipes. Heat is emitted via radiators and the cooler water is transported back to the boiler to be re-heated up to the desired temperature.

Where space is limited an oil or gas powered combination or ‘combi’ boiler can be used, producing hot water for taps and radiators on demand and at the same time, with no storage tank. Other systems will have a boiler producing hot water for radiators and also supplying an insulated tank. This tank may also include an electrical heating element to provide a quick boost of heat and will supply taps and appliances. These systems can be powered by fossil or renewable energy systems.

Oil or gas powered systems are moving over to condensing boilers, which can have much higher efficiencies, c. 90 per cent, than old types of boiler. For this to be achieved, the temperature of the water returning back to the boiler needs to be no higher than 50°C, something that is often not the case.

Wet systems can have heat delivered by heat pump technology. Heat pumps are electrically powered and extract small amounts of heat out of the air, ground or water to enable higher temperatures to be generated. Less energy is used than produced and so heat pumps are an efficient way of generating lower temperature heat (c. 50°C) than might be found in a more conventional system (c. 70°C). For heat pump wet systems to work effectively, radiators will normally need to be large and the buildings themselves required good insulation and air-tightness. In an existing property, this may mean significant changes need to be made to the radiator and pipework circuit, or underfloor heating installed.



**The opening of Greenfox's plant and inside the boiler house.
Photo Credits: Greenfox Community Energy**

Dry systems

Some heating systems will use electric heaters and this is mainly in off-gas network areas. Heat may be generated centrally and distributed using fans, or each room will have their own generation and supply device. Often, due to the higher unit price for electrical heat, the heat is generated at night when electricity is cheaper, and then stored for use during more expensive times of the day. Electrical heating is often quoted as being 100% efficient at the point of use (as all the electricity is turned into heat – of course generating and transporting the electricity itself is less than 100% efficient), but the high price and difficulties with storing the heat effectively are important considerations. The use of renewable electricity sources may make these systems more attractive.

3.2 What constitutes a good opportunity

Off-gas

If your community has properties not connected to the mains gas network then they will tend to be using oil, LPG or electricity, which is often more expensive than gas and renewable sources of heat. Currently, (early 2016) oil prices are low, but the volatility of this market, and the rising cost of producing oil means that prices will inevitably start to rise again. This cost-burden is a good opportunity to engage building owners in discussing other sources of lower cost heat. There will often be an increased initial cost of these lower-unit cost options and so finance packages or an ability to engage people in attractive pay-back periods is important.

Older properties

Older buildings often have fewer options for improving their energy efficiency and lowering bills, especially if they are likely to be difficult to treat (i.e. they have 'listed' status or some other constraints on work that can be done to them), but older properties often have the most to gain from making improvements. Measures such as external wall insulation (EWI) increase in price if there are features that must be protected, or awkward shapes that must be accommodated. Also, if older properties have a history of damp they should not have EWI installed. If a property is listed, this can add further constraints on what energy efficiency measures may be cost-effective. In these cases, looking at improving the heating system can often be one of the most cost-effective ways to lowering energy bills.

Local fuel

It may well be that your local community has fuel resources and this could help to bring down the cost of fuel and support the local community. Woodfuel and biomethane are two fuels that can be produced locally, helping keep money in the local economy and improving the carbon emissions' savings of a system. Using woodfuel will also provide the benefits of sustainably managed woodlands. Where such fuels are being produced locally, this can add to the appeal of a single heat system project, helping the local community see the scheme in a positive light.

High heat load

Buildings such as schools, leisure centres, care homes and health care clinics typically have predictable and significant heat demands, and therefore high energy bills. It is customers such as these, that have a prominent role in the community, that are the most obvious target for a

community heat project, especially if their existing plant is nearing the end of its working life. The [national heat map](#) is a good place to start when looking for high heat demands in your area.

Boiler “up for replacement”

If you have a building with an existing heating system that is due for a replacement or has been found to be very inefficient compared to modern systems then this may be the perfect time for a project.

3.3 Summary of typical challenges

Cost of finance

In general, heat projects have low income potential and high capital costs, so finance needs to be long-term. This, and the fact that the financial sector has very little experience of heat projects, can mean that normal sources of finance can come with high interest rates. Crowdfunding can help to reduce this problem with investors tending to have a greater interest in the social benefits of a scheme, rather than the economic return. Many community-led groups have had success with raising money locally through a share issue⁸.

Other sources of funding are available, normally for certain aspects of a project, such as the Rural and Urban Community Energy Funds in England (RCEF and UCEF) and The Welsh Government Local Energy Service in Wales (WGLE).

RCEF/UCEF

These funds from DECC can be accessed by community energy groups to pay for early stage feasibility work, and potentially longer term loans. Find out more about the RCEF [here](#) and the UCEF [here](#). These funds must be applied to by a community energy group, but can be proposed in partnership with local authorities.

WGLE

The Welsh Government Local Energy service provides support to community and commercial developers in Wales to encourage and facilitate more local ownership of electricity and heat generation projects. Development Officers are available to provide advice, and feasibility and capital funding is available. Information is available on the Local Energy website:

<http://localenergy.gov.wales/en/>

Operation and maintenance of boilers

Customers will require good levels of heat supply and to be assured that any periods when equipment is not working are as brief as possible. This will require operation and maintenance contracts to be agreed with companies and legal contracts to be signed.

Building ownership

The owner of the building that is being supplied with heat will have a contractual relationship with the owner of the heating system. Sometimes this can be very complicated with a range of

⁸ Find out more about community share issues at <http://communityshares.org.uk/>

organisations having a role in the building. For example, a school may have governors and the local authority who need to be involved in development and in agreeing any contracts.

For more information specifically on community led biomass heating systems, see the [Community Biomass Heating Guide](#), developed by the Forestry Commission in partnership with DECC.

3.4 Next steps

Community energy assessment

Find out if there are any active community energy groups in your area and whether local plans and neighbourhood plans have statements relating to heat. You can search the [Plan Local website](#) developed by the Centre for Sustainable Energy to find out more about any local plans that might affect your area, or to get involved. You can contact [Community Energy England](#), [Community Energy Wales](#) or other regional/local organisations such as [Regen SW](#) to find out more about community energy in your area, and your council should know about any local plans being developed.

Check that your area constitutes a good opportunity

A single heating system can often be simpler to assess than a network of connected customers, but many of the key hallmarks that signify a viable heat network opportunity apply for a project that heats just one building. In particular, factors such as high heat demand and not having access to cheaper fuels such as natural gas are important for both types of project.

Gather local knowledge

You will need to find information on the potential market and stakeholders. This is easiest if some work has already started on energy projects in your area, but you can start from scratch by contacting:

- local energy groups
- local authorities and their planners
- owners/operators of buildings with larger heat demands

4.0 Bulk Buying Groups

4.1 How does it work

Bulk-buying groups are a great way to reduce the unit price of heating fuel, reduce fuel poverty, reduce transportation impact from deliveries and bring people together. In the heating sector, bulk buying started with heating oil and there are a number of groups across the country. The idea has now spread into the biomass sector and local authorities are starting to develop schemes for communities.

Bulk-buying organisations are typically not-for-profits and normally based on a co-operative business structure with all members having a say in the governance of the organisation. Orders are taken from members and then fuel purchased in bulk, enabling a lower unit price to be achieved. For biomass schemes, the organisation might also purchase machinery for the production of fuel, i.e. chippers to produce wood chip.

Some examples of bulk buying schemes in the UK:

- Scarborough Borough Council in partnership with Ryedale District Council has set up an oil buying cooperative through their Choices4Energy cooperative⁹
- In Suffolk, Community Action Suffolk have been running an oil buying scheme for three years and now have 1,000 members across Suffolk and Essex¹⁰
- The Dartmoor Woodfuel Co-operative was set up in 2009 to offer owners of woodland access to machinery, trailer hire, a chipping service and storage facilities and has 30 active members¹¹
- In Dumfries, the Wood Fuel Co-operative is offering members wood briquettes, kiln dried logs and wood pellets¹²

⁹ <http://www.scarborough.gov.uk/home/environment/oil-buying-cooperatives>

¹⁰ <http://www.communitybuying.org.uk/>

¹¹ <http://www.dartmoorwoodfuel.co.uk/>

¹² <http://www.woodfuel.coop/>



Dartmoor Woodfuel Co-operative's wood chip store. Due to its relatively low energy content when compared to gas or oil, wood chip fired systems need substantial space to store fuel. This can be a benefit to the project, however, if you have space available and can supply other installations. Photo Credit: Regen SW

4.2 What constitutes a good opportunity

Off-gas, older properties

If your community has properties not connected to the mains gas network then they may well be using oil, LPG, kerosene or wood and most likely interested in reducing their heating bills. Even more so for older properties, which, in general, have poorer levels of insulation and so greater potential for savings on their bills. This type of property is a great place to start when looking for support for a bulk buying project.

Local fuel

It may well be that your local community has fuel resources. There may be woodland that is either currently or could be brought into wood fuel production or even a supply of waste material that could be processed and turned into a useable fuel product. These situations are more common in rural areas, but urban schemes are possible too by using arboricultural and processing residue (e.g. trimmings and wood residue from construction and manufacturing).

Several communities have already had experience of using their local biomass resources. Click [here](#) for the Community Biomass tool developed by the Forestry Commission in partnership with DECC.

4.3 Summary of typical challenges

Skills and standards

IF you are considering producing biomass as a community-led project, the harvesting, processing, storing and supplying of wood fuel needs skills and experience. Additionally, there will be regulations to comply with from health and safety to the Biomass Suppliers List. Training local people or using third-party contractors are options and it's good to review the skill sets at hand.

Storage

For certain types of fuel, storage space will be important. Finding space for fuel storage, and any associated structures/access can sometimes be difficult and then there may be costs attached, so working with the public sector and land owners is often key to finding a practical solution.

4.4 Next steps

Community energy assessment

Find out if there are any active community energy groups in your area and whether local plans and neighbourhood plans have statements relating to heat, as this may impact residents' willingness to embark on a bulk-buying scheme. There is no one-stop-shop currently to find out if there is an active community energy group in your area, or whether energy projects are featuring in the development of a local plan. You can, however, contact [Community Energy England](#), [Community Energy Wales](#) or other regional/local organisations such as [Regen SW](#) to find out more about community energy in your area, and your council should know about any local plans being developed.

Check that your area constitutes a good opportunity

Bulk buying needs a substantial amount of organisational time and energy, but requires only limited resources from the customers themselves. A good opportunity may be one where an existing group or network can be approached with the concept. This may be anything from a social group that is made up of residents in an off-gas village, or a sign-up sheet for interested parties in the local pub - anything that can be used to help gather customers with a similar need for fuel. This can potentially then be expanded out to include equipment at a later stage.

Gather local knowledge

Bulk buying schemes rely on a well-coordinated group of customers, with similar needs. Essentially everyone participating will be buying in to a benefit, so being clear on what the offer is will be important. This offer can then be advertised in local magazines, papers at community gatherings and potentially in partnership with your local authority or community energy group. Engaging with local housing associations or existing local authority initiatives can be a good way of establishing a large customer base quickly.