Swaffham Prior Community Heat Scheme- Questions of Interest

Please note: We are currently at the Techno-economic feasibility stage of work. Greater detail on questions and answers will also be provided at a later stage

Technical questions

Question	answer
1. Will there be a loss of heat as the pipes circulate around the village? 2. Is the temperature of water at the end user site guaranteed? 3. Does it matter how far from the energy centre the house is to receive heat?	It is expected that there could be up to a 5^{o}DegC temperature difference across the system. Bouygues are looking into ways of minimising the heat loss. The temperature of water for the end user will be guaranteed. No, the system is designed so that house distance from the energy centre will not be an issue.
4. What is the expected heat temperature of the system?	Currently expected to be 60-70^{o}DegC
5. How has the energy centre site been chosen? 6. Why will there be one energy centre and not multiple energy centres around the village?	A preferred site for the energy centre has been identified on the land that County Council own which is currently allocated for commercial development. This land does not impact any home directly and secures the commercial land for positive development for the village. If the community can identify better parcels of land to host energy centres that are acceptable to the community this can be reviewed.
7. How big is the energy centre going to be?	Approximately 25 metres X 30 metres and 5 metres high. To visualise the size, imagine a modern barn building.
8. What is the design capacity of the energy centre? 9. 10. How does this compare with estimated energy use in the village at the moment?	The system is being designed to supply approximately 2MW but is expandable. Whilst we do not have the actual capacity installed in every home we have designed the system based on pro-rated capacity from the information that residents have provided and by using Energy Performance Certificates where available.

11. LPG-what is it?	Liquefied Petroleum Gas. LPG is a stored fuel similar to Oil but it has a lower carbon content than Oil and is much like natural gas but has more energy content per litre.
12. What is the estimated maximum usage of LPG?	LPG usage is estimated at 196,000 kWh unless the use of mains gas can be developed as advised by residents (see question above).
13. How has this value been calculated?	This has been calculated using 10 years of local historic weather data and the need to raise the temperature from 65 to 75degC.
14. How does this affect the cost, both to the supplier and the end user?	Assuming the cost per kWh as below, the cost of LPG is more expensive but much cleaner. The additional cost of the LPG will be offset by lower maintenance costs against an Oil system. The current information depicting the location of the gas main would mean an additional £350 – 400k cost to install the gas main.
15. If LPG usage is higher than expected who bears this cost?	If the usage is higher than expected then this would fall to the operator.

Fuel	kWh	ppkWh	Cost pa
Oil	196,080	4.9	9,608
LPG	196,080	9.3	18,235
Natural Gas	196,080	2	3,922

16. Can the energy centre cope with peak demand or will LPG be used to top it up?	The Energy Centre can cope with the peak demand due to the 2 x 50m^3 (100,000 litres) thermal storage vessels. Heat will be supplied by the LPG boilers to top up the temperature when needed, such as during very cold weather, planned or unplanned maintenance of the system.
17. Has any allowance been made for increases in energy use, either due to general household usage going up, or new builds in the village requiring hook up to the system?	The system is being designed to cope with increases in demand and is expected to be installed in phases. This means the system is designed to be expanded over time to cope with increased connections. If a household increases their demand significantly, such as by adding a large extension, it may be necessary to increase the size of the Heat Interface Unit (HIU) in much the same way that a larger boiler would have been required to meet the new increased demand.
18. Will the heat pump and energy centre be noisy?	As with all heating systems there will be some noise. The noise created should not be disruptive as there is background noise from the A14 and it is expected that the system will be quieter than current oil boiler systems within homes. There are currently eight air source heat pumps on Rodgers Road which do not create noticeable amounts of noise. Ground source heating systems will also be quieter than air source.

19. What will be the height of the water tank in the design?	There will be two tanks and each will be 2 meter radius by 4 meter height equalling 50m^3
20. The Energy Centre will be sited on top of a hill surrounded by archaeological interest. Is there a way the Energy Centre and water tank be designed partly below ground to reduce the impact? 21. When will detailed plans and designs be available?	The landscaping of the Energy Centre will need to be sensitive to its settings. Archaeology discussions will be held with Cambridgeshire County Council and landscape management and mitigation discussions will be required with East Cambridgeshire District Council to ensure compliance with landscape policies in the local plan. Outline designs will be available in November but detailed designs are part of the next phase following the next round of Heat Network Delivery Unit (HNDU) funding.
22. Why is the back-up system planned as LPG when the gas main runs past the village? 23. Why are you tapping into a gas main?	Transco maps of the available gas mains do not show an appropriate pipe to access that is close enough. If a gas main can be identified close to the village then this will be considered and incorporated into the design. Please send through your knowledge of the local gas mains and where it runs in relation to the village to mlei@cambridgeshire.gov.uk. We believe that 32 and 34 Mill Hill have gas from the comments made at the presentation but the current Transco data shows a suitable main on Heath Road, approx. 1.5 miles East of Pulpit Corner.
24. Is the heat circuit isolated from what is in your home?	Yes via a heat interface unit
25. In severe cold weather heating systems often fail- how can we rely on this heating system? How will you mitigate this risk?	We are working with an advisor from Denmark who has extensive expertise on community scale ground source heat pumps. Denmark faces more severe winters than England and heating networks cover 80% of their community. Bouygues also have technical engineering expertise in mitigating these risks.
26. Will you be having a generator? Swaffham Prior has a lot of power cuts.	This is very helpful to understand. A generator is not currently being considered. Phase 2 of the project will be to look at securing local renewable energy supplies directly from solar farms.
27. How long would it take to get heating back after a power cut?	This will depend on the length of the power outage. The heat network proposed has two 50,000 litre storage vessels which will store the hot water and will begin circulating again as soon as the power returns. If the outage is over a few days the heat in the vessels may have been depleted to a point that the LPG boilers are run alongside the heat pumps to bring the system back up to temperature more quickly.
28. In the construction phase will the pipe be in the footpath or the road?	This is yet to be determined. Soft digs are preferable in terms of costs and disruption so where possible grass paths or verges.
29. What is the expected life cycle of the system/ equipment? 30. When the equipment needs to be replaced how will these costs be met?	40-60 years For the heat network, ground source heat pump, gas boilers, HIU which are owned by the potential joint venture, a sinking fund will be set up via the standing charge to allow for life cycle replacements. For assets owned by the homeowner this will be up to the residents just alike all the other assets owned by the homeowner.

31. Will you do energy efficiency tests of every home participating in the scheme?	The next stage of the project will require home assessments for interested homeowners. This will provide data on current heating systems in the home and efficiency. An application for HNDU Round 8 funding is under preparation for submission by end of November 2018.
32. Can we find performance data for similar schemes?	We will ask our external advisor from Denmark if he can provide us with relevant information.
33. As the roads will be dug up will there be other benefits that we can add in?	There is the possible option of adding in fibre optic broadband at the same time.
34. Is low density layout an issue? Can we reach all of the village via the pipes?	Low density layout is a challenge and it will be hard to provide coverage for the whole village.
35. On a cost and technology front is there a penalty for being one of the first villages to do this type of a scheme? 36. Will we be stuck with first generation/ high cost equipment when later adopters are benefiting from reduced costs/ higher efficiencies?	It is possible that higher efficiency HIU's will be available over time but this is not new technology. Currently the Renewable Heat Incentive is a mechanism to support early adopters of heat schemes. Once the market is established these subsidies will reduce to reflect potential lower technology costs. Overall the costs could be balanced.

Financial questions

Please note: The project has to stack up financially or it will not go ahead. Just as it is currently being funded, wherever possible, we will look into grants to fund this scheme.

Question	**Answer**
1. We want figures, where are they and when can we see them?	The purpose of the techno-economic study funded by BEIS (Government department for Business, Energy and Industrial Strategy) and its Heat Network Delivery Unit (HNDU), is to identify the financial viability of the scheme. The initial costs of the schemes are expected in November 2018. If the outline business case stacks up or can be supported to work, a further application will be submitted to BEIS for grant to take it to an investment grade proposal.
2. How many houses need to sign up to the scheme to make it economically viable?	We currently estimate that around 170 houses will need to sign up. Also proposed to be included will be the: primary school, swimming pool, two churches, pub, and former youth club and village hall. The more homes or buildings that sign up, the better the economic case for the scheme.
3. What if the cost of electricity/ oil falls?	While we make every effort to predict what will happen to energy costs it is not always possible to get it right. We calculate the cost benefit on best available information at the time of completing the assessment. If the cost of electricity falls the cost of operating the system would also fall. If the cost of oil falls it impacts the return on investment but does not affect the reason for the project which is to reduce carbon emissions of which oil has a large content.

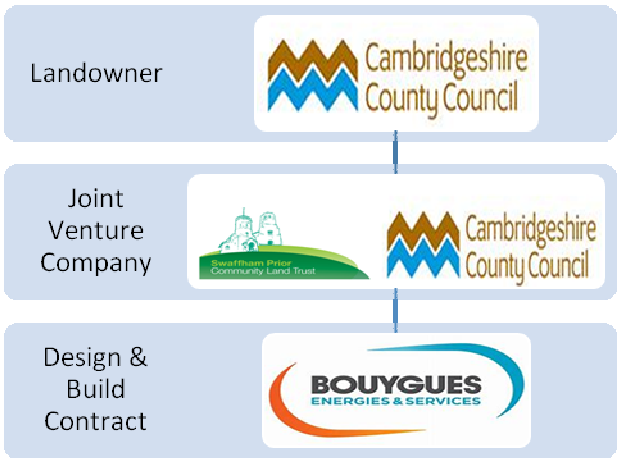
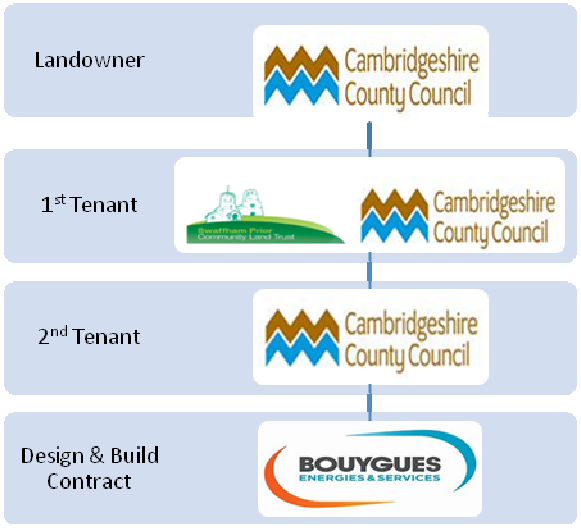
4. Will there be a standing charge alongside the heat bill? 5. If so, 6. How will this be calculated? 7. How does it compare with current oil costs? 8. Will this be dependent on the house size?	Yes, a standing charge will apply. The exact formula for calculating this charge is still to be determined. But it will need to be different according to the size of your house and predicted heat demand. The intention is that the new heating scheme will match or cost less than your current oil based scheme accounting for fuel, maintenance and servicing costs too.
9. What would we have to pay upfront? Would there be an initial larger fee?	The aim is not to have a big upfront charge but to spread this charge out across the contract term. This means you do pay for the heating scheme but not upfront and allows you to plan for the costs.
10. Do the radiators and pipework upgrades get rolled into the costs?	If significant costs are required for new radiators and pipework upgrades this is seen as a barrier to a homeowner signing up. Discussions are underway to identify how the works and costs could be managed upfront as part of the scheme but paid off over time.
11. Will the costs for removing and disposing of the oil tanks and oil boilers get covered?	Yes, it certainly can be included.
12. Will the grants from government cover all of the costs?	So far all of the desk based analysis and design of the scheme has been funded via grant money. Once the scheme is investment ready and the community shows sufficient support, investment funding will need to be secured. This can come from a number of sources and work is underway to identify investment options. For example, Cambridgeshire County Council may consider borrowing from public works loan board to help finance the project; crowd funding or green bonds could be considered alongside more traditional investments. .
13. Will the scheme financially stack up?	We do not know if the scheme will break even. If there is a financial gap we will need to have discussions with BEIS and others on how this finance gap could be reduced. A key criteria for the project is that the new scheme cannot cost more that the individual oil boiler costs otherwise it is unlikely that the community will sign up to the scheme at the scale that is needed to make this project work.
14. At the meeting it was mentioned that Bouygues' mark-up was a percentage of costs. Could you explain further? 15. Was this just the build costs or the ongoing supply costs too?	Bouygues have been procured under an OJEU tendered Framework on a design, build and operate contract. This means the performance risk of the system sits with the private sector. Bouygues were awarded the contract on best quality and value for money. The mark-up applies to the design and build of the system and would apply to the ongoing operational costs of the scheme. Bouygues are not an energy supply company – they will maintain and operate the scheme under an energy performance contract. The energy supply will likely come from a Joint Venture, not for profit company with the Swaffham Prior Community land Trust and Cambridgeshire County Council. The details of this Joint Venture are still to be worked through in detail.

Other

1. How can we get more information? We would like an updated project plan and timeline.	A project timeline is under development and this can be placed on the CLT page of the parish website. In addition we will provide the slides from this workshop, the earlier feasibility studies and the techno-economic study once it's complete.

2. Has anyone calculated the environmental impact of everything that will happen in the construction phase? Everything from the energy consumption of diggers and incoming traffic?	This will be looked into in great detail in the planning phase. Environmental impact forms a large part of the planning application.
3. Can people opt into the scheme at a later stage?	Yes but the scheme will be incentivised for early sign up as critical mass is required to make the scheme viable. If new homes or businesses are built in Swaffham Prior, the intention is to work with an East Cambs planner to require new premises to be connected to the heat scheme.
4. Is there a cut off period for households to take up the scheme in order to get the free installation?	If this is included in the scheme costs there will be a cut off point for the initial phase as the budgets will need to be agreed in advance for the business case to be approved. This will not stop anyone joining the scheme at a later date but it will cost more.
5. Is there a required take up rate in the years after needed in order to keep the scheme running?	The scheme will be designed based on initial take up. The scheme can be extended to accommodate new build connections to the heat network. Scheme extension will only happen if there is sufficient demand to justify the costs.
6. When do we have to sign up to the scheme?	Investment will be secured on the basis of the number of homes signed up the scheme. This will likely happen when the investment grade proposal and planning permission are in place and before the construction of the scheme starts. This will likely be during 2019
7. When can we expect construction to start?	We are provisionally aiming for 2020
8. What happens if there is a lightning strike that hits the energy centre?	The energy centre will have appropriate lightning protection. This is standard practice on most commercial buildings and will be assessed at the detailed design stage.
9. What happens if Bouygues were to go bankrupt? We don't want another Carillion.	The ownership of the scheme will be retained by the Joint Venture of the Community Land Trust and County Council and the risk sits here. The works can be insured to allow completion should this occur and Bouygues could provide a Performance Bond or Parent Company guarantee.
10. What happens if Bouygues decide to pull out at any time i.e before work has started/ before work is complete/ during the first years of operation?	If this were to happen CCC could appoint another party to deliver the scheme.

11. Competition: 12. This scheme will effectively be a monopoly supply. What incentive will the supplier have to maintain good service (bad service being the typical reason people switch suppliers)? 13. What incentive is there for the supplier to keep charges to customers low?	The operator would have key performance indicators to which their profit can be adjusted for poor performance. The heat supplier will be a joint venture, not for profit company comprising Swaffham Prior Community Land Trust and Cambridgeshire County Council. It is anticipated that the scheme will sign up to the terms set out by the Heat Trust which set a degree of price protection and performance to the customers.
14. When undertaking the construction will small businesses be supported?	All works to construct and operate the scheme will be tendered by Bouygues. Local businesses are encouraged to apply. Some external support may be required for small businesses in advance of this process to get the levels of indemnities needed, support to deliver high quality tender bids and the high standards expected as part of this process. A workshop will be set up for local businesses potentially interested in tendering for the work to explain what will be required.
15. What will the disruption look like in the installation phase? In house and on road?	We will most likely take a phased approach throughout the village to avoid total disruption.
16. What is the commercial relationship between the County Council and Bouygues?	Bouygues provide the engineering design skills and construction capabilities to the County Council for schemes. The County Council contracts projects on a design, construct and operation basis and in addition Bouygues provide a performance guarantee for the project for a minimum of 15 years. This shifts performance risk into the private sector and minimises finance risk for the Council,
17. What is the relationship between the County Council and the CLT?	If the energy centre is built on the Council's land, the intention is that the CLT and County Council set up a joint venture company. This is helpful for the CLT as County Council, as a large organisation can support the project in a number of ways including managing the finance and performance risk of the project. The CLT would not want to take on the risk.

18. Scheme ownership-the meeting briefly went through two possible scheme ownership models. Please describe these in more detail.	These are the two ownership models that we are currently reviewing and it is undecided which model will be progressed until the financial model is better understood. Model 1:  Model 2: 
19. Why have the County Council not gone out to tender to procure Bouygues?	Cambridgeshire County Council procured Bouygues Energies and Services Ltd under the Refit 3 Framework. The Refit 3 Framework is an OJEU compliant procurement run by the Crown Commercial Service, Greater London Authority and Local Partnerships. County Council ran a mini competition under this framework to secure a service provider for energy performance contracting and appointed Bouygues in November 2017.
20. Who is Per Diget and how is he a part of the scheme?	Per is an experienced Danish engineer with huge expertise in the delivery and design of ground source heat schemes. We have procured Per to act as a technical advisor.

21. What are the drivers for the County Council to be involved in the scheme?	There are a number of drivers including: • Government policy is driving forward decarbonisation of heat for domestic properties. Supporting communities through this transition is important. • The Council has a corporate energy strategy including an objective to use its assets to support communities to decarbonise, develop energy projects and help communities to manage their future energy bills. This is the fuel poverty agenda. • The Council can use its assets and generate an income stream to support its services. • There are a number of villages across Cambridgeshire that are off gas and using oil. We are keen to identify a template for other villages to develop schemes like this. Swaffham Prior CLT approached County Council to support the project and demonstrated social capital and capabilities to make this happen.
22. Is this a Guinea Pig scheme for the Council?	Yes
23. Why isn't this scheme being done on a new house plot e.g in Burwell?	We can't comment on private development sites. The reason for the County Council to engage in this project is that the Swaffham Prior Community Land Trust approached us for discussions on using County land for an energy centre and to ask our help to secure grant for the development work. This project looked like a great opportunity for both parties.
24. Has this type of project been done on this scale in the U.K before?	No small scale retrofit schemes into village homes have been delivered that we know of in the UK. There have been new build, small scale schemes but these tend to be based on a commercial need and then the scheme extended to include housing. There are also city schemes which are built on high densities. Large City schemes include Southampton, Nottingham and Dagenham. But we know that village heat network retrofit schemes have been completed in Denmark and Germany.
25. Is this project Brexit proof?	Yes. The UK needs to move to greater energy self-sufficiency to manage global fuel demand and its costs.
26. Which Council will the planning application be approved by?	East Cambs DC will determine the application.

27. The majority of our homes are grade II listed buildings. How are you going to get around this?	We have started discussion with East Cambs planners on this issue. The idea is to agree a village wide consent rather than individual consents
28. It was mentioned that the supplier will be under a performance guarantee whereby they are penalised if they fall below some level of performance. 29. Who sets this level? 30. What KPI's will be included in the guarantee? 31. How easily can the management be moved to another company if the existing supplier does not perform well?	This is still to be explored and agreed.

Installation 1 .We have been told installation will be free in the home. What does this include?	The installation of the HIU and connecting to your radiators will be costed up as part of the overall scheme. If you need new radiators or pipework this will be the responsibility of the homeowner but the aim is to provide financial solutions to make this workable for you. Please also see the answer to question 8
2. Who decides where the heat exchanger will go? 3. Where is this most likely to be?	This will be agreed with the home owner. They can be on wall, within a cupboard, on the external wall. It is most likely to be installed near or in the current boiler location for ease of connection into the existing system.
4. Are there any properties which will, for any reason, not be able to take part in the scheme?	Some properties are too far from the Energy Centre to make connection viable at a reasonable cost. E.G Heath Road south and Lords Ground Drove
5. Will the customer's satisfaction be taken into consideration when digging up driveways/ gardens? What will the limitations be?	The installer will do their best to take an agreed route and make good to the home owners satisfaction and will be completed in discussion with the home owner
6. Who will own the box on the wall-supplier or customer? 7. Who will be responsible for costs and practicalities of maintaining it?	The HIU will be owned and maintained by the scheme / scheme operator. The scheme owner will maintain the HIU.
8. People who currently only have electric heating will need a full wet heating system installed. Will there be any help to get this done financial or otherwise?	An assessment of all homes interested in participating in the scheme will be required. This will be a key element of the next round of funding that is applied for from Government. We will need to understand the following: (i) What adaptations will be required to the home to take out the boiler and replace with the HIU (ii) What adaptations will be required to existing radiators and pipework to connect to the specification for the heating scheme and how much will it cost (iii) For homes without a wet system, what is the cost of installing radiators and pipes to the specification needed for connecting to the heat network (iv) What is the efficiency of the home and anticipated demand for heat The costs for (ii) and (iii) will fall on the homeowner BUT the intention is to find a solution to make these adaptions cost effective and spread the cost over the contract term to ensure this is not a barrier to participating in the project.

9. For ground source heating to get the same heating capacity as oil/ gas larger radiators may be needed. 10. If this is the case who pays for changing them out? 11.	See above.
12. The Energy saving trust states 'it is essential that your home is well insulated' for heat pumps to be effective. For many of the older houses in the village this may not be the case. How will this issue be overcome?	**A**ir source and ground source heat pumps work best when your home is well insulated and draught-proofed. This is because heat pumps produce lower temperature heat but over a longer time. If draughts are not managed this can make your home feel cooler than you may like. Many Swaffham Prior homes will need additional insulation. This just makes good financial sense and there are still a lot of government schemes available to help you insulate your home. Home insulation is a homeowner responsibility.
13. Will hot water tanks need adapting / replacing? 14. Will customers be able to keep immersion heaters if they have them?	The current design is for instantaneous hot water from the heat network like a combination boiler and hot water cylinders would be disconnected or removed. Yes, you can keep an immersion heart if you have one and still want to keep it.
15. Are hot water tanks required? 16. Customers with combi boilers will not have tanks? 17. Alternatively, could customers with tanks move to a combi style system?	The current design is for instantaneous hot water from the heat network like a combination boiler and hot water cylinders would be disconnected or removed. We will need to do some technical research to understand if moving to a combi style system is advisable. We will let you know.