Central Lincolnshire
Policy S9
Decentralised Energy Networks and Combined Heat and Power
Evidence Report

March 2022

Central Lincolnshire
LOCAL PLAN

Contents

1. Introduction

1.1. The Central Lincolnshire Local Plan is being updated since the first Local Plan for Central Lincolnshire, an area covering the districts of City of Lincoln, North Kesteven and West Lindsey, was adopted in April 2017.

1.2. This Evidence Report (which is one of a collection) provides background information and justification for Policy S9, which relates to decentralised energy networks and combined heat and power networks.

2. Policy Context

National Policy and Guidance

2.1. Since the Central Lincolnshire Plan was adopted the National Planning Policy Framework (NPPF) was updated in July 2018 with subsequent additional changes being published in February 2019 and again in July 2021.

2.2. Chapter 2 of the NPPF sets out national policy for achieving sustainable development, and separates it out into three objectives – economic, social and environmental. Within the environmental objective, "mitigating and adapting to climate change, including moving to a low carbon economy" forms a key part of achieving sustainable development – a key goal of the planning system.

2.3. Paragraph 20 of the NPPF sets out the strategic matters that should be addressed through strategic policies, including "planning measures to address climate change mitigation and adaptation."

2.4. Chapter 14 of the NPPF provides national planning policy relating to climate change. It provides some clarity for the expectations of how Local Plans should address the challenges of climate change in paragraph 152 where it says:

> *"The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure."*

2.5. Paragraph 155 of the NPPF goes onto state that to increase the use and supply of renewable energy, plans should:

> *"a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);*
>
> *b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and*
>
> *c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers."*

2.6. This all makes it clear that there is a duty for Local Plans to proactively plan to deliver a renewable and low carbon energy future.

2.7. The Planning Practice Guidance (PPG) was first introduced in 2014 and offers 'live' government guidance. The PPG provides guidance to help in the implementation of policy in the NPPF.

2.8. The PPG includes a section of guidance titled Renewable and low carbon energy. In this section it provides guidance for how Local Planning Authorities should plan for renewable and low carbon energy including setting out its importance:

> *"Increasing the amount of energy from renewable and low carbon technologies will help to make sure the UK has a secure energy supply, reduce greenhouse gas emissions to slow down climate change and stimulate investment in new jobs and businesses. Planning has an important role in the delivery of new renewable and low carbon energy infrastructure in locations where the local environmental impact is acceptable."*[1]

Local Policy

2.9. The current Local Plan is very limited in its content in relation to decentralised energy networks: policy LP18 (Climate Change and Low Carbon Living) states that development proposals will be considered more favourably if the scheme would make a positive and significant contribution towards several factors, including energy production through site based decentralised energy infrastructure.

2.10. The current Local Plan makes no provisions in relation to combined heat and power networks.

3. Context and Evidence

Climate Change Evidence 2021

3.1. Consultants were appointed in July 2020 to investigate the scale of Central Lincolnshire's contribution to greenhouse gas emissions and climate change, and the opportunities that exist to tackle these problems locally, including through the Local Plan.

3.2. This work set out the overarching context for Central Lincolnshire identifying what would need to be done in order to achieve a carbon neutral Central Lincolnshire by 2050 (and 2041 to align to the science-based approach) to accord with the Paris Agreement. This research painted a very challenging picture to achieve these goals.

3.3. This work was broken down into a number of distinct tasks which combine together to provide a holistic picture for the area. Of particular relevance for Policy S9 is Task J Decentralised Energy Networks.

3.4. One of the recommendations of Task J was:

> *"Heat networks will save more carbon and are likely to be more economical when supplying existing buildings rather than thermally efficient new buildings. …That said where renewable heat is already available in close proximity to new development then heat networks should be considered, examples of available*

[1] PPG Reference ID: 5-001-20140306

renewable heat are the energy from waste plant in Lincoln and the biomass power station at Sleaford."

3.5. The Task J Report highlighted that heat networks are not that common in the UK, but they do exist. For example, 10 Downing Street is heated from a heat network as are all buildings on the 2012 Olympic Park in East London.

3.6. Task J found:

- The pipe infrastructure for heat networks is expensive to install and so to make an economic case for the heat network the heat demands need to be high in a small area.
- The economics of heat networks improve with scale and so opportunities to heat more than 200 houses are more likely to be economically viable.
- Air source and ground source heat pump are possible heat sources that are readily available everywhere.
- Biomass being transportable is similarly possible anywhere.
- In the more rural area, where land is available, solar thermal can be used to supply heat to heat networks.
- Water is a good source of heat as it is easier to extract large quantities of heat from water than it is from the air. Surface water in the environment typically is less cold than the air at the coldest times of the year when spacing heating demand is highest and this increases the efficiency of water source heat pumps over air source heat pumps. The report identifies 3 river locations with key opportunities for water source heat pumps.
- Waste heat sources are typically at higher than ambient temperatures and so allow higher efficiency heat pump operation. In rare instances, the waste heat is available at temperatures that are sufficient to use directly in a heat network.
- Lincoln Energy from Waste is located 5 km south-west from the centre of Lincoln. It generates 16.4MW of electricity and so will have over 30MW of heat available, this is sufficient heat for more than 20,000 houses which is around half the number of houses in Lincoln. From this, it is clear the limitation is economics and acceptability of the heat networks and not the availability of heat. The plant is listed as being 'CHP enabled' which means the plant has been designed with the possibility of extracting some heat. The design approach typically extracts steam which offers high-temperature heat but at the cost of a small reduction in electricity generation.
- Sleaford Renewable Energy Plant is 650m from the eastern edge of Sleaford. The plant burns straw and generates 40MW of electricity. This results over 50MW of heat being potentially available, far in excess of the heat demands of the 9,500 houses, and the non-domestic heat loads in Sleaford. The station supplies heat to several buildings in the town centre already making this an easier opportunity for increasing the number of buildings supplied by a heat network.
- Sewers are warmer than ambient temperatures and their flow provides a continuous stream of available heat. Both of these factors make sewage works good heat source for heat pumps, which can then supply a heat network. There are 22 sewage works where heat recovery may be possible.
- Anaerobic Digestion is the process by which organic matter such as animal or food waste is broken down to produce biogas and biofertilizer. Commonly the biogas generated is then used in an engine to generate electricity and heat. Some of the generated heat is needed for the AD process, but commonly there is surplus heat which could be directly used in a heat network. In the main the heat available is small and the locations quite distant from heat loads that could be served by a heat network.

3.7. A key conclusion of the Task was that the extension of an existing network is the lowest cost route to expanding the number of buildings served by a heat network, as the cost and risks of building an energy centre and operating an energy centre are avoided. Additionally, with a heat network already operating in the neighbourhood, the unfamiliarity and uncertainty of becoming a heat network customer is lessened. The Task estimated that there are 48 existing heat networks in Central Lincolnshire: 41 single building communal systems, and 7 multi building systems. The expansion of an existing network may also create an opportunity to decarbonise the currently operating heat network. New renewable heat plant can be installed to serve both the new and existing heat network and the older, most probably gas-fired plant, retained and top-up and back up heat sources from the enlarged network. Such a development could benefit both the new and the existing.

3.8. Another key conclusion was that new developments, especially as proposed in this plan, need little heat and so the high infrastructure cost of heat networks leads to a high cost for the carbon saved.

4. Issues and Options Consultation

4.1. The 2019 Issues and Options Consultation did not pose any specific questions in relation to decentralised energy or combined heat and power networks.

5. Regulation 18 Consultation

5.1. A Consultation Draft of the Local Plan was published for consultation between 30 June and 24 August 2021. During this eight week consultation comments were received on the plan, the policies within the plan, and supporting information and evidence.

5.2. A number of comments were received in relation to this policy. Points raised included:

- Support: decentralised approach offers potential for a more resilient network.
- Concern that the policy lacks flexibility.
- That the policy is too vague.
- That the policy should go further, in respect of associated infrastructure, as well as supporting the colocation heat consumers and heat suppliers.

5.3. Following the Regulation 18 consultation, in October 2021, Government consulted on proposals for heat network zoning[2].

5.4. The consultation set out proposals for how heat network zoning could operate. Central Government envisage central and local government working together with industry and local stakeholders, to identify and designate areas within which heat networks are the lowest cost solution for decarbonising heating. It is envisaged that this will help heat network developers to accelerate deployment of heat networks where they are most appropriate and help heat networks increase their contribution towards meeting net zero commitments.

[2] www.gov.uk/government/consultations/proposals-for-heat-network-zoning

5.5. In this consultation the Government proposes that in a heat network zone all new buildings, large public sector and large non-domestic buildings – as well as larger domestic premises which are currently communally heated – would be required to connect to a heat network within a prescribed timeframe. Exemptions could be sought where it would not be cost-effective to connect, compared to an alternative low carbon solution. The consultation document expressed the intention to also introduce a low carbon requirement to ensure that new heat networks built within heat network zones are compatible with net zero commitments. The Government's response to the consultation is expected in early 2022.

5.6. In light of this national consultation, and in response to the comments raised at consultation, it is proposed that the draft policy wording is amended from 'development proposals the vicinity should consider connection to such as existing energy network...' to '...can consider...' (emphasis added).

5.7. The policy introductory text has also been amended, to note the recent Government consultation, and highlight that a national level project may be commenced in the future.

5.8. As a result of the Government intent to devise a nationwide project, and on balance with the wider Local Plan policy requirements, the policy has been amended from 'should' to 'can' so as not place undue burden on developers.

6. Proposed Approach in Proposed Submission Local Plan

6.1. The proposed policy approach taken forward in the Local Plan is a policy supporting connection of development proposals to an existing decentralised energy network in the locality, in circumstances where this would not result in increased fossil fuel consumption. The policy also expresses support for new and extended combined heat and power networks provided the power source of such a network is not fossil fuel based.

7. Reasonable Alternative Options

7.1. Three alternative policy approaches have been considered.

- Option 2, to have a policy requiring that all major and minor development proposals connect to an existing decentralised energy network where capacity exists or a new/ existing combined heat and power network.

- Option 3, to have no local policy and instead rely on national policy and guidance.

- Option 4, which was introduced after the Regulation 18 consultation, and thus not previously considered: to have a policy supporting connection of developments to an existing decentralised energy network in the locality, as long as this would not result in increased fossil fuel consumption. Policy also expresses support for new and extended combined heat and power networks provided the power source of such a network is not fossil fuel based.

7.2. At the previous draft stage, the then two alternative policy approaches (options 2 and 3) were discounted in preference of policy option 1, as presented in the Draft Local Plan. While options 1 and 2 scored the same against all objectives in the sustainability appraisal, option 2 was discounted because it offers no clear benefit over policy option 1.

7.3. While policy option 2 set a requirement for both minor and major development (compared to option 1 which applies to only major development) and so has potential to deliver wider benefits, the extent and scale of the benefits are uncertain, given that connection may not be viable technically and/ or financially, or there may not be capacity for connection. Furthermore, policy option 2 may delay the delivery of minor scale developments.

7.4. Policy option 3 was discounted following the sustainability appraisal as it was predicted to have no or negligible effects in relation to all policy objectives. Furthermore, the NPPF requires (para 155) that plans '*identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers'* so this policy option would not satisfy this NPPF requirement.

7.5. As discussed above, option 4 was added following the Regulation 18 consultation. All 4 options were appraised against the 15 sustainability appraisal objectives.

7.6. Policy option 4 does not score as favourably as options 1 and 2 in the sustainability appraisal: in relation to SA objectives SA2 Health and Wellbeing, SA8 Pollution, SA11 Climate Change Effects and Energy and SA12 Climate Change Adaptation and Flood Risk, option 4 scores '0/+/?' while options 1 and 2 score '+/++/?' in relation to SA2, SA8 and SA11, and '0/+' in relation to SA12. The reason for this is the added flexibility in the policy wording, which means that applicants are no longer *required* to consider connection to a decentralised energy network or combined heat and power network.

7.7. Despite the fact that option 4 does not have the potential for significant positive effects like options 1 and 2 do, option 4 is still taken forward as the preferred policy option, as major positive effects are not guaranteed to result from policy options 1 and 2. Furthermore, as a result of the Government intent to devise a nationwide project, and on balance with the wider Local Plan policy requirements, the policy has been amended from 'should' to 'can' so as not place undue burden on developers.

8. Conclusion

8.1. This Evidence Report demonstrates the rationale for the proposed policy as contained in the Proposed Submission Central Lincolnshire Local Plan. This helps bring together relevant evidence that has informed this policy and how we have responded to comments received during the plan making process, as well as how the latest evidence and national guidance has been taken into account.