

Central Lincolnshire
Policy S8
Decentralised Energy Networks and
Combined Heat and Power
Evidence Report

June 2021



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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 S8, 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.
- 2.2. Chapter 2 of the NPPF sets out national policy for achieving sustainable development, which 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. At 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 148 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 151 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 which 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 S8 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 building rather than thermally efficient new buildings. ... That said

¹ PPG Reference ID: 5-001-20140306

where renewable heat is already available in close proximity to new development then heat networks should be considered, examples of available 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 St 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 HN are expensive to install and so to make an economic case for the HN 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 building 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. Proposed Approach in Draft Local Plan

- 5.1. The proposed policy approach taken forward in the Draft Local Plan is a policy requiring that in the case of major development proposals, where an existing decentralised energy network exists in the locality, connection of the development to the network is considered, 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.

6. Reasonable Alternative Options

- 6.1. Two alternative policy approaches were 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.
- 6.2. Option 3, to have no local policy and instead rely on national policy and guidance.
- 6.3. The two alternative policy approaches 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 and it is anticipated that policy option 1 will deliver larger scale benefits from major development proposals.
- 6.4. While policy option 2 sets 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.

- 6.5. 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 151) 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. Conclusion

- 7.1. This Evidence Report demonstrates the rationale for the proposed policy as contained in the Draft Central Lincolnshire Local Plan January 2021. This report will be updated following responses received during the Regulation 18 consultation prior to finalising the Local Plan for submission. 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.