Energy Systems Catapult Response to the Competition and Markets Authority Statement of Scope on District Heating

Introduction

1. This response is submitted on behalf of the Energy Systems Catapult (ESC). The ESC supports innovators in unleashing opportunities from the transition to a clean, intelligent energy system. We are part of a network of world-leading centres set up by the government to transform the UK's capability for innovation in specific sectors and to help drive future economic growth.

2. By taking an independent, whole energy systems view, we work with stakeholders across the energy sector (consumers, industry, academia and government) to identify innovation priorities, gaps in the market and overcome barriers to accelerating the decarbonisation of the energy system at least cost. In doing so, we seek to open up routes to market for innovators, as well as supporting them to understand how their products, services and value propositions fit into the transforming energy system.

3. The ESC is working with the UK government and local authorities to deliver the SSH Programme**,** determining the most effective means of decarbonising the UK's 27 million homes and contributing to the target of an 80% reduction in the UK's Greenhouse Gas emissions by 2050. A key element of this work is the development of Local Area Energy Strategies using the EnergyPath Networks modelling tool, jointly developed by the ETI and Baringa. These local area energy strategies seek to determine the most appropriate forms of heating in specific areas.

4. If you wish to discuss the contents of this submission, please contact Tony Dicicco at: tony.dicicco@es.catapult.org.uk

Key points

- **We welcome the CMA's initiative to conduct a market study** on the market for heat networks because of its importance to the future of low carbon heat supply in the UK.

- **Creation of a coherent market and regulatory framework for the heat network market is highly valuable to long-term consumer interests.** A range of evidence, including that based on whole energy system modelling, points to the high value of heat networks as a key option for the future decarbonisation of heat supply, in line with legally binding carbon targets. Therefore, the creation of a coherent market and regulatory framework for heat networks which can deliver fair and efficient outcomes is of fundamental importance to consumers.

- **A coherent economic and governance framework is needed to shape choices around heat network development in ways that are socially optimal and serve consumers' broad long-term interests.** The *Statement of Scope* understandably focuses on issues of immediate concern in current heat markets, and it is right that focus is given to addressing these. However, the market is currently immature and lacks a coherent regulatory framework, which is key to unlocking its potential to deliver future consumer benefits as the UK moves to decarbonise its heat markets in the decades ahead.

- **Markets on their own are unlikely to be able to deliver an efficient outcome for consumers because heat supply has some monopolistic characteristics as well as a range of social and environmental externalities** (e.g. enabling reductions in carbon emissions). Future decisions about heat network investments are likely to be collective in character, affecting entire localities, so there is a need for clear governance arrangements which command legitimacy and properly reflect consumers' views.

- **As a general principle, consumer rights and protections for heat network customers should be equivalent to those for other utility services.** Once collective choices around local heat supply arrangements for a local market have been made, the networks themselves exhibit natural monopoly characteristics similar to other utilities. In these circumstances consumers should clearly have similar rights and protections in relation to an essential service.

Comments on the scope and themes identified for the market study

5. We agree with the themes identified in the statement of scope. In addition, however, we think further attention should be given to the issues below.

The governance framework for 'collective decisions' about local heat supply zoning and infrastructure

6. Managing the transition to heat networks raises a number of difficult challenges for market and regulatory arrangements. Efficiently decarbonising the UK's heat supply over the coming decades is likely to entail a series of 'collective decisions' about how best to deliver low carbon heat to homes and buildings across an entire local area or zone. The right choice of heat supply infrastructures will reflect local conditions (e.g. building density and local energy supply options). Local heat infrastructure may also have monopolistic characteristics that will need to be managed so that consumers connected to a heat network are not disadvantaged compared to those using other heating options.

7. These collective decisions have strategic, social and environmental externalities which cannot be managed only (or mainly) through competitive markets and/or the aggregation of individual consumer choices. In Denmark, for example, municipalities are responsible for preparing and updating municipal heat plans and approving heat

projects, which must also be subject to a social cost/benefit analysis undertaken in line with guidance provide by the Danish Energy Agency.

8. The governance and regulatory framework for future choices around heat infrastructure, including heat networks, needs to be given further consideration. Importantly this must be transparent and ensure that consumers' interests are properly safeguarded in decision-making by local authorities, developers and utilities. It must also address the relative roles of planning, incentives and consumer choice, given that the viability of heat networks may depend on achieving sufficient density of uptake, particularly if they are to play a role in decarbonising heat supply to existing building stock. In Denmark a framework of obligatory connection and ban on electric heating has delivered efficient utilisation and sufficient revenue security for energy companies.

Creating a market framework to deliver maximum benefits to consumers from heat networks

9. As the UK moves to decarbonise heat, consumers' interests will be best served if decisions about future heat supply and infrastructure are based on prices and economic criteria that reflect broader societal value. A number of externalities and price distortions currently affect the broader market context for decisions about heat networks:

    - Carbon externalities associated with heat supply are not fully reflected in prices.
    - Domestic gas consumption benefits from a lower VAT rating which means that the heat market is not a level playing field.
    - Some forms of heating benefit from specific subsidies through the renewable heat incentive.

10. Further consideration needs to be given to the process for removing price and policy distortions, incentive provision while creating a coherent market and/or economic framework for choices about heat supply across the country. Investors in networks will need a regulatory framework that gives them assurance about future cost recovery, enabling them to invest at a lower cost of capital, with lower financing costs flowing through to consumers in the form of lower prices.

Maximising the scope for innovation and competition in home energy service provision

11. New smart technology, new platforms and rising consumer aspirations are opening up the scope for innovative new approaches to delivering home energy services. The future shape of home energy services is likely to change considerably, potentially with consumers moving to purchasing bundles of services and outcomes with improved control and functionality, rather than kWh or therms. In this context, consumers may be more concerned about the outcomes and functionality that service providers can deliver, levels of service and control, rather than the underlying infrastructure or delivery vectors.

12. We think the market study needs to review how the market and regulatory framework for heat networks can be shaped in a way that enables maximum scope for open access and the construction of innovative new service offerings to meet consumers' varied needs. Evidence from the ESC's Smart Systems and Heat (SSH) programme shows how consumers' needs and aspirations are varied, so heat network platforms need to be capable of meeting a range of needs.

13. It may be possible to open up elements of district heating provision to competition, including heat supply to consumers. Heat production and network operation could also be separate functions. Some form of regulation may be required as evidence from countries with unregulated district heat networks (e.g. Sweden and Germany) shows that competition issues can occur in the absence of ex-ante regulation. This suggests that **regulation may be needed to provide sufficient consumer protection both in terms of price and quality of service**.

14. However, consumer protection and regulatory arrangements need to be designed in ways that do not constrain consumer choice and competition in home energy service provision. A lack of standard contractual arrangements is a key barrier for both private and public sector-led development of district heating networks in the UK. The energy market is designed around selling units of gas and electricity - there are no similar arrangements for selling heat.

15. It would be helpful if a heat market were developed with standard contractual terms for heat provision. The ESC is developing a number of business models which look to offer a level of comfort to consumers rather than selling them energy on a kWh-basis.

Enabling heat networks to realise value as providers of flexibility in energy service demand

16. Energy system modelling suggests that the future of low carbon energy will take on an increasingly 'multi-vector' character. Electricity systems will need to adapt accommodating increasing proportions of variable renewable generation and meeting new demands in heat, transport and industry. A range of evidence points to the importance and high potential value of 'flexibility' in electricity and energy systems. Heat networks can potentially operate as short-term providers of energy storage and flexibility, unlocking value for the broader energy system.

17. Further consideration should be given to the market and regulatory arrangements that will best enable this value to be realised, including the reward mechanisms for heat network owners/ operators. This could enable more efficient use of assets, with benefits to consumers in the form of lower prices, differentiated service offerings etc.

Are the right potential remedies being considered/should other remedies be considered?

18. We agree with the potential remedies identified as of interest in the Statement of Scope. In addition, we think a number of potential remedies should be considered, particularly in relation to the longer-term development of the market and regulatory framework for effective heat network investment. These include:

    - **The potential use of heat zoning and regulation** in achieving sufficient density of uptake and certainty over demand is likely to be crucial to the business case for heat network investments, particularly those seeking to serve existing housing stock. Other jurisdictions have used zoning and regulatory measures to require and/or incentivise consumers to connect. Zoning may also form an important part of a clear and transparent approach to governance and decision making, and the achievement of social acceptability. Evidence from other jurisdictions would be particularly relevant to consider.
    - **Alternative approaches to enabling consumer choice and switching** – consumer choice and switching are currently made available to gas and electricity consumers without the ability to choose to connect to a different physical supply or network. Similar approaches may be possible in the heat network market, particularly in the context of emerging 'value-added' approaches to home energy service provision. This merits further specific consideration in the market study.
    - **Economic regulatory approaches** – given the natural monopoly characteristics there is a need to consider explicitly the options around economic regulation of price and service standards.

Comments on the proposed approach to evidence and analysis

19. **The creation of a Local Area Energy Strategy (LAES) can identify the least cost heating solutions in particular areas.** The ESC has been working with Newcastle City Council, Bridgend County Borough Council and Bury Metropolitan Borough Council to develop Local Area Energy Strategies, using a modelling framework, "EnergyPath™ Networks" (EPN) [1], developed by the ETI, to transition to a lower carbon future.

20. An analysis framework such as EPN provides an understanding of the strategic choices in local areas for future heat and energy service provision/infrastructure design etc, including the most suitable locations for district heating. The ESC would be happy to arrange a demonstration for the CMA of the local area energy strategy process using EPN, and facilitate discussion with local stakeholders.

21. The intended evidence-gathering and analysis as laid out in paragraphs 56-58, 68 and 73-74 of the *Statement of Scope* seems a sensible approach. We support your intention to conduct original research, potentially involving case studies, focus groups and/or interviews as well as drawing on evidence gathered by others. A wide range of stakeholders should be interviewed including consumers, heat network operators, energy suppliers, local authorities, Ofgem, BEIS, energy network operators, the Association of Decentralised Energy, CIBSE, Which?.

[1] "EnergyPath™ Networks" has been developed by the Energy Technologies Institute (ETI).

22. It would also be very useful to consider evidence from other jurisdictions, especially Denmark given its long experience and mature regulatory and market framework for heat networks, and potentially Sweden and Germany where slightly different approaches have been followed.

23. It will also be important to gather evidence on the social acceptability of different options and approaches to collective decision making. Two field trials by Dolan and Metcalf[2] looked into the impact of social norms on energy consumption by sending households information on the average gas consumption of their neighbours ("social norm information"). They found that providing social norm information is enough to motivate people to change their behaviour and seek to reduce their energy consumption.

24. The views of consumers who are already connected to a heat network, and those who may have the opportunity to do so in future, obviously will be key to understanding what changes need to be made to the provision of district heating. Another important group will be the producers of "waste" heat that may be suitable for district heating: what are their requirements to participate in such schemes? There are potentially significant opportunities to incorporate industrial heat. However, businesses are inevitably driven by their own commercial imperatives, and so the opportunities to create mutually attractive commercial arrangements that provide heat when required are often very limited.

25. District Heating is an important low carbon option for consumers and it should be for investors and innovators to find ways of making the creation, operation and decommissioning as economically viable, and the customer proposition as attractive, as possible.

[2] Dolan and Metcalf (2013); *Neighbours, Knowledge, and Nuggets: Two Natural Field Experiments on the Role of Incentives on Energy Conservation*