THE NETWORK APPROACH TO ANALYSING ENERGY DECISION-MAKING IN THE UK

1. INTRODUCTION

This report discusses the network approach and its outcomes arising from the work conducted for the ASCEND scoping study (Task 2). The results based on the preliminary insights are introduced as hypotheses worthy of further investigation within the frames of a more detailed analysis.

In the last decades, a large body of literature developed in public policy making and administration research which focuses on the impact of interaction processes (or the lack of these) among affected actors on outcomes (policy decisions, strategies, agendas, investment plans, etc.) in various policy domains (see for example Agranoff and McGuire, 2003; Klijn and Koppenjan, 2015; Koppenjan and Klijn, 2004; Skelcher et al., 2013). This research acknowledges that contemporary decision-making processes in a variety of fields are characterised by organisational fragmentation, uncertainty arising from the diverging perceptions of affected actors, and the complexity of interactions between them resulting from the lack of established rules and norms. In turn, complex interaction patterns have an impact on fragmentation and uncertainties, closing the feedback loop (See Figure 1).

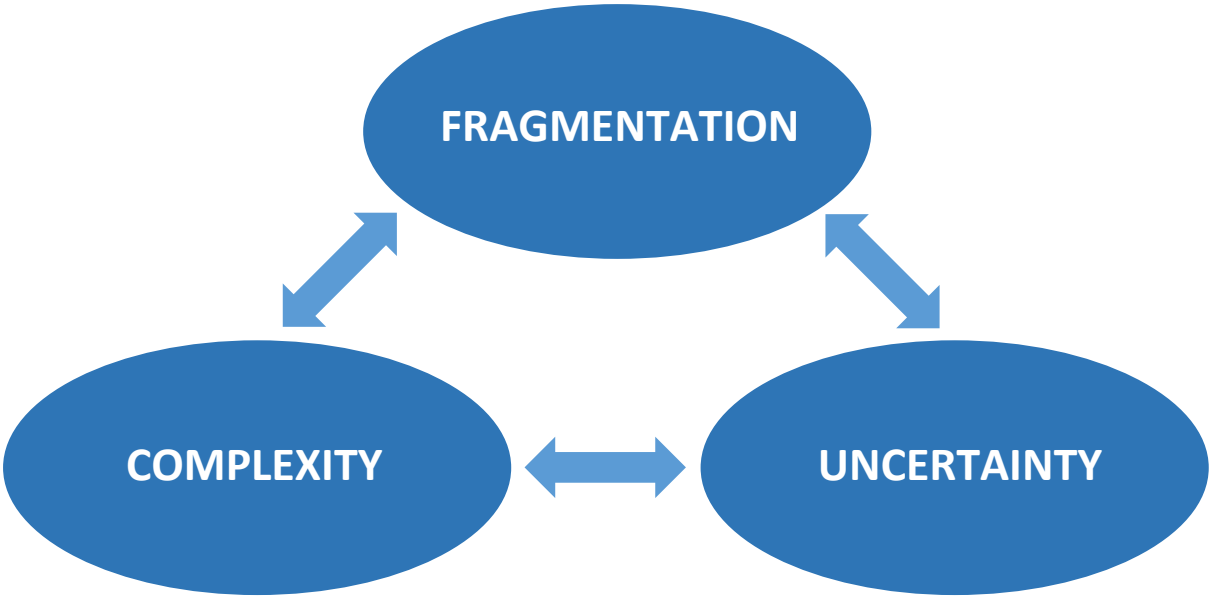

Figure 1 Contemporary decision-making process in the context of wicked problems

Policy issues resulting in such situations have been termed ‘wicked problems’ (Head, 2008; Rittel and Webber, 1973). Wicked problems are characterised by uncertainty around the problem definition, the objectives to be achieved and, consequently, the actions to be taken. They emerge from multiple

interdependent causes which often result in internally conflicting goals. Cause-effects mechanisms are non-linear and may lead to unpredictable outcomes and unintended consequences. As the problem definition is not stable and evolves over time, there is no clear 'objective' solution to such problems and any action towards formulating solutions requires the co-ordinated action of multiple stakeholders with diverging interests (Rittel and Webber, 1973).

Decision-making over whole energy systems provides an example of a policy field characterised by a high degree of 'wickedness'. Here, decisions affecting system development are made in often unconnected decision-making arenas operating within and between various geographical and organisational levels (i.e. national and multiple supra- and sub-national levels), sectors (i.e. public, market, third sector) and domains (e.g. transport, housing, energy, industrial strategy, economic strategy, etc.). Moreover, arenas are populated by multiple actors motivated by dissimilar interests (e.g. government bodies on different levels and from different departments; private for-profit companies; community organisations and civil society).

So far, no studies have investigated the state and role of this fragmentation with regards to whole systems integration in the energy sector in the United Kingdom (UK). The assessment of the existing fragmentation between organisations, thus, may reveal fresh insights about the absence or importance of particular connections which counteract effective decision-making.

2. THE NETWORK APPROACH

The network approach applied in the ASCEND scoping study had a dual aim. First, to develop a methodology to visualise the state of fragmentation in energy decision-making related to heat in the UK. Second, to evaluate whether the approach has the ability to generate new knowledge about the functioning of the decision-making system providing the basis for system improvement. Thus, the central assumption on which the network approach rested was that learning about the degree and pattern of fragmentation in the energy decision-making system might highlight previously overlooked structural causes for uncertainty and complexity which characterise the decision-making process. By doing so, the work conducted was expected to contribute to the following ASCEND research objectives:

- identifying opportunities and making recommendations for improved exchange and collaboration between actors and the methods for such engagement, which will lead to better informed decision-making and

- bringing mutual awareness among key stakeholders of the challenges and opportunities for whole-system modelling to support decision-making across scales in the UK.

The network approach built on the emerging network governance literature in public policy making and administration; the research into the role of intermediation in the context of sustainable development and low-carbon transitions; and the literature on boundary management in knowledge systems (see ASCEND Literature Review). What these research strands have in common is the emphasis on structural requirements (and opportunities) to enhance collaboration among affected or influential actors. This is expected to contribute to building shared understandings of the problem, the possible solutions and the action needed to achieve these through negotiations, knowledge exchange and resource pooling.

Thus, the network approach combines two different components. First, a quantitative perspective, based on social network analysis, investigating the structure of the network, consisting of the actors involved the decision-making process and the connections which can be drawn between them. Second, a qualitative perspective, based on institutionalist theories, describing the governance processes developing in the network, and their influence over policies, strategies and agendas (cf. Klijn et al., 2013; Lewis, 2011; Torfing and Sørensen, 2014):

"[W]hile Social Network Analysis will make an effort to describe the direction, density and type of links between actors in a given network, institutional network theory will attempt to understand the meaning the network actors attach to the links between them." (Marcussen and Olsen, 2007:281)

3. DATA COLLECTION

The reconstruction of the energy decision-making network focused on heat in energy systems in the UK. It included actors advising (research, consultancy), developing (administration) and making (elected bodies) policies. The work started with the analysis of written documents (see Section 1.2.1 of the Literature Review) which had a relevance to the theme of heat either on the sub-national, national or supra-national level. Initially, the aim was to identify the affected and/or influential actors, the common reference points which can provide the basis of establishing connections between them, and the boundaries of the network.

Esmark and Triantafillou (2007) caution that documentary analysis can only provide an initial mapping of the official network topography which needs to be supplemented with other sources. They also contend that trying to identify actors and interaction patterns from written documents is usually

problematic as, in most cases, these only provide partial information on the network processes involved in their production. Nevertheless, documentary analysis has a strength in informing about the historical formation, change and continuity of the network and its norms (Esmark and Triantafillou, 2007).

Most network governance scholars suggest that the preliminary information collected from written sources can be complemented through the generation of primary data. Primary data collection is usually carried out through interviews with actors identified in the first round from documentary analysis (Zølner et al., 2007) and, later on, via snowball technique. Interviews can provide qualitative information on the network processes (content, frequency, type) and quantitative data on network structure and actors involved. Overall, seven semi-structured pilot interviews were conducted between September – December 2017 to support the information collected through documentary analysis in the ASCEND project. The interviews lasted between 30 and 50 minutes. Only open-ended questions were asked. Interview data was processed via producing summaries (partial transcripts) from the recordings. Interviewees were selected to include actors from policy making and administration on the supra-national (EU), national (UK) and local (Leeds and London) levels; academic research; as well as intermediary organisations. The ASCEND workshops held in Birmingham, Edinburgh and London also provided input to the network mapping and analysis.

4. DATA ANALYSIS

The initial stakeholder mapping indicated that multiple actors are involved in decision-making processes around energy on the various organisational scales including the UK national, devolved administration (Scotland) and local (Birmingham, Leeds and London) levels. The quality and detail of the data collected depended heavily on the availability of interviewees, i.e. more detailed network representation was possible around organisations where interviews were conducted.

It was found that actors interact with each other in various ways, including via (1) the use of various analytical tools and systems models (e.g. heat mapping; UKTM; ESME; Scottish TIMES; Energy Paths; etc.); (2) intermediation processes facilitated by particular organisations tasked with this activity (e.g. Committee on Climate Change; UKERC; ETI / ESC; ClimateXChange; Sustainability West Midlands; Leeds Climate Commission); and project-based collaborations (e.g wholeSEM; CESI; Centre for Low Carbon Futures). The network mapping for the scoping study focused on the first option, i.e. the connections (and the lack of these) between organisations via the use of analytical tools and energy systems models. This means that in order to gain a more complete understanding of organisational

fragmentation and its impact on energy decision-making, the other two networks will have to be reconstructed in a second phase of the project.

Network boundaries were determined in a bottom-up way, including the actors and connections highlighted by the documents analysed, the interviews, and the workshops. Documents to be analysed were chosen on the basis of their relevance for heat policy and implementation. Similarly, interviewees were asked to talk about their experiences in relation to energy-decision making with a focus on heat. Thus, the network reconstructed through the scoping study is not an attempt to provide a complete representation of the energy/heat decision-making system. Rather, it is better understood as testing a new methodology which has the potential to uncover existing structural issues counteracting effective cross-scale decision-making in the energy domain.

Figure 2 shows the network visualisation generated through the analysis of written documents and primary data generated from interviews and workshops, as described above. Thus, the network presents the organisational landscape around the various analytical tools and energy systems models identified from documents, interviews, and workshops.

On the basis of the network mapping exercise, the following insights were generated which were discussed with stakeholders on one of the sessions of the ASCEND Workshop in London in December 2017:

1. Most modelling activity is conducted on the national level, resulting in an interconnected group which, however, is seemingly disconnected from decision-making on other scales.
2. Few connections exist between the national and local levels. Moreover, the key brokerage positions are occupied by private (consultancies) and semi-private (partnerships) organisations.
3. There is an apparent intra-scale fragmentation on the local level, as different cities appear not to co-operate for local-level modelling or systems analysis.

DRAFT NETWORK MAP

Please note that this is an **illustrative, work-in-progress representation** focusing on of where energy system models are used for decision making in heat across scales in the UK. The 'Local' scale is considered in relation to the cities of Birmingham and Leeds.

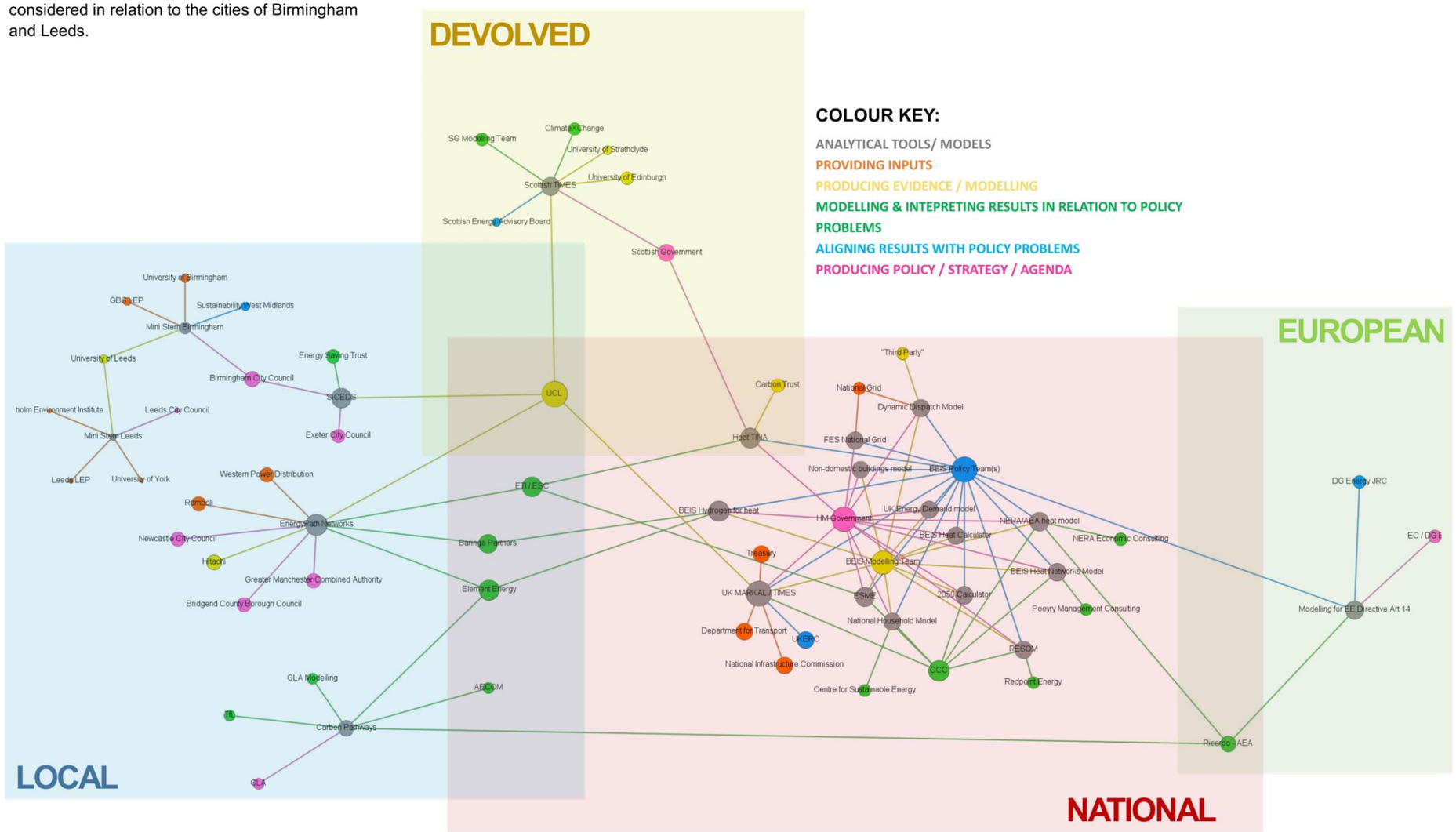

Figure 2 Illustrative network map of the organisational landscape around systems analysis and modelling with a focus on heat

5. CONCLUSIONS AND FUTURE RESEARCH OPTIONS

These insights suggest that decision-making processes, informed by analysis and modelling, take place in multi-actor settings on the different (geographical and organisational/political) scales. These, however, are potentially scarcely connected. This results in a situation where actor groups operating on different levels of government (geographical/political scale) produce dissimilar interpretations of policy problems and priorities in the energy/heat domain (uncertainty) which further complicates the potential and options for (cross-scale) collective action (complexity), reinforcing organisational fragmentation. These diverging perceptions are likely to influence decisions related to (1) the problems and priorities to be modelled; (2) the appropriateness of model inputs and assumptions within the model; (3) the interpretations of modelling results: (4) their meaning in the particular (place-specific) governing processes; and (5) the possibilities considered for acting upon them (Interview 06, 2017; Interview 07, 2017). In turn, these differences potentially have a negative effect on linking modelling and systems analyses across scales. Results of workshops and interviews (Interview 06, 2017; Interview 07, 2017) indicated that, so far, these factors have not been given sufficient attention in relation to the role of modelling and analysis in energy policy making and agenda setting. Thus, further research is needed to

1. Refine the network map produced in the scoping study representing connections among stakeholders through systems analysis and modelling on various scales.
2. Expand the knowledge base on interaction patterns through the production of organisational network maps related to options 2 and 3 discussed in Section 4 (intermediary organisations' connections; and project-based collaborations).
3. Investigate and evaluate the impact of organisational fragmentation for decision-making across scales in terms of uncertainty and complexity.

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