International Workshop on
Publicly Owned Energy Companies

Thursday 10 May – Friday 11 May 2018

Edinburgh Centre for Carbon Innovation
Infirmary Street, Edinburgh. EH1 1LZ

THE UNIVERSITY of EDINBURGH

HEAT AND THE CITY

Research Councils UK Energy For a Low Carbon Future

UKERC UK Energy Research Centre

energy technologies institute

Workshop Organisers

The workshop is being organised and hosted by Professor Janette Webb, Dr Ronan Bolton, Dr Dave Hawkey, Ms Mags Tingey and Dr Mark Winskel who comprise the EPSRC *Reframing Energy Demand*[1] and UKERC/ETI *Local Engagement in UK Energy Systems*[2] teams based in the School of Social and Political Science[3] at the University of Edinburgh.

Workshop Rationale

The roles of public and private sectors in European economies are once more becoming the focus of political debate, not least in the UK. Energy systems, and envisaged transitions to clean energy, are fundamental to economy and society, and there are questions about whether ownership is materially consequential to development of a low carbon energy system and its efficient operation. In the UK surveys of public opinion find majority support for public ownership in the energy sector, and the UK Labour party, Scottish National Party (and Scottish Government), and Plaid Cymru have all proposed different forms of publicly owned energy companies (POECs). In other European countries liberalisation and privatisation have followed different dynamics, with, for example, a wave of 'remunicipalisations' in Germany and continued public ownership of major district heating schemes in Denmark.

This workshop will examine existing and proposed models of public ownership of different aspects of energy systems, across different scales and in different contexts, drawing on examples from the UK and the rest of Europe. Academics from a range of disciplines, along with practitioners, will consider the evidence and debate the arguments for and against different ownership structures for energy networks, power generation, gas supply, energy retailing and energy services. Does public or private ownership make a significant difference to the economic performance, low carbon innovation capacities, reliability and public accountability of energy businesses? Do public authorities have the resources and capacity to set up (or purchase) and successfully manage energy companies? Can there be fixed answers to any of these questions, or do answers vary according to historical period, place, scale and institutions of political economy? If so, how do evolving markets, technical systems and policy objectives affect the cases for and against different ownership models now and in the foreseeable future? Are experiences and evidence from different European countries transferable?

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[1] https://heatandthecity.org.uk/project/reframing-energy-demand-innovation-for-sustainable-heat/

[2] https://heatandthecity.org.uk/project/local-engagement-with-uk-energy-systems/

[3] http://www.sps.ed.ac.uk/

Workshop Aims

- To contribute to empirically-informed debate about rationales for public or private ownership of energy at different scales in European societies.
- To share insights from research on public ownership models, core activities, pros and cons, and implications for regulation
- To review
    - the politics and political economy of public v private ownership
    - international comparative examples of municipal and national ownership of energy infrastructure and utilities
    - implications of evolving market, regulatory and policy environments for ownership models
- To facilitate dialogue between academics and practitioners, and across disciplinary and professional boundaries, about the different options for public and private ownership.

Workshop participants include academics whose empirical research has explored dimensions of public and private ownership, practitioners working in publicly owned energy companies, and policymakers considering what, if any, role public ownership of energy could play in the near term. A full list of participants will be circulated before the workshop. Speakers will have 15 minutes to give a presentation. Sessions will conclude with comments from an invited respondent followed by open discussion.

Workshop Agenda: Thursday 10 May

12:00 Arrival, registration and buffet lunch

13:00 **Welcome and introduction**

Professor Jan Webb, School of Social and Political Science, University of Edinburgh

13:30 **Session 1 Political dynamics of decision making about public and private ownership of energy**

Chaired by Professor Jan Webb, University of Edinburgh

Professor Andrew Cumbers, Adam Smith Business School, University of Glasgow, *Public Ownership, Economic Democracy and Energy*

Mika Minio-Paluello, Platform London, *Public ownership of large-scale energy infrastructure - can we build energy democracy from the top-down?*

Dr Sören Becker, Department of Geography, University of Bonn, *Public ownership as a tool for participation and technical change: insights from German cities*

Respondent: Dr Caroline Kuzemko, Faculty of Social Sciences, University of Warwick

Open discussion

15:00 Tea and coffee break

15:30 **Session 2 Large scale infrastructure and utilities**

Chaired by Ragne Low, Centre for Energy Policy, University of Strathclyde

Alan Sutherland, Chief Executive, Water Industry Commission for Scotland

Emeritus Professor Steve Thomas, Public Services International Research Unit, University of Greenwich, *Is there a future for the European mega-utilities?*

Professor Stefano Clò, Department of Economics, Management, and Quantitative Methods, University of Milan, *Ownership and environmental regulation: Evidence from the European electricity industry*

Visiting Professor David Hall, Public Services International Research Unit, University of Greenwich, *Public-private comparative economic realities in energy and beyond*

Respondent: Dr Ronan Bolton, School of Social and Political Science, University of Edinburgh

Open discussion

17:15 Free time to check into accommodation etc.

19:00 Workshop dinner at Blonde Restaurant, 71-75 St. Leonard's St, Edinburgh EH8 9QR

https://blonderestaurant.co.uk/ Approx. 15 minute walk from ECCI and hotel
https://goo.gl/maps/g5bCQU8WkRT2

Friday 11 May

08:50 **Day 2 introduction**

Professor Jan Webb, School of Social and Political Science, University of Edinburgh

09:00 **Session 3 European municipal energy companies in practice**

Chaired by Dr Emily Creamer, University of Edinburgh

Rune Nielsen, Advisor, Danish Energy Agency, *Danish experiences with public and local ownership of district heating companies*

Christian Maaß, Co-founder and Partner, Hamburg Institute, *Ownership of Energy infrastructure – lessons learned in Hamburg*

Dr François-Mathieu Poupeau, CNRS, LATTS, Université Paris Est, *Local authorities and the regulation of distribution networks: concession contracts or local (semi) public operators?*

Open discussion

10:30 Tea and coffee break

10:45 **Session 4 UK Local authorities engagement with energy**

Chaired by Professor Jan Webb, University of Edinburgh

Tony Norton, Centre for Energy and the Environment, University of Exeter, *The UK energy market context*

Gail Scholes, Chief Executive, Robin Hood Energy

Dr Katy Roelich, Sustainability Research Institute, University of Leeds, *How do policy and market contexts affect the potential for municipal energy companies in the UK?*

Mags Tingey, School of Social and Political Science, University of Edinburgh, *Ownership models and business structures in UK Local Authority energy initiatives*

Open discussion

12:15 Lunch

13:00 **Session 5 Municipal energy companies and low carbon heat**

Chaired by Dr Faye Wade, University of Edinburgh

Ian Booth, Chief Executive, Aberdeen Heat and Power Ltd, *Aberdeen Heat & Power: A Growing Not-for-Profit Model*

Jess Britton, Energy Policy Group, University of Exeter, *Enabling to ensuring: heat networks as a tool for local re-engagement in energy*

Dr Dave Hawkey, School of Social and Political Science, University of Edinburgh, *Explicit and implicit roles for the public sector in district heating: what can the UK learn from other countries to future-proof ownership and governance arrangements?*

Open discussion

14:15 Tea and coffee break

14:30 **Session 6 Roundtable discussions on contemporary proposals for new POECs**

Led by Dr Dave Hawkey, University of Edinburgh

We will hold a facilitated discussion in small groups to discuss the implications from the presentation sessions for live proposals for POECs in the UK. The University of Edinburgh team will introduce these proposals and specific questions to debate. Group discussion will be followed by plenary feedback.

15:45 **Closing remarks**

Heat and the City team, University of Edinburgh

16:00 Workshop close

Delegate List

Name	Role	Organisation
Syed Ahmed	Director	Energy for London
Sören Becker	Lecturer / Researcher	Bonn University / Humboldt University Berlin
Ronan Bolton	Lecturer	University of Edinburgh
Ian Booth	Chief Executive Officer	Aberdeen Heat and Power Ltd
Jess Britton	Research Fellow	University of Exeter
Shea Buckland-Jones	Re-Energising Wales Project Coordinator	Institute of Welsh Affairs
Stefano Clò	Professor	University of Milan
Mike Colechin	Director	Cultivate Innovation Ltd
Emily Creamer	Postdoctoral Researcher	University of Edinburgh
Andrew Cumbers	Professor of Regional Political Economy	University of Glasgow
Hamish Davidson	Senior Executive	EY
Sam Ghibaldan	Head of Consumer Futures Unit	Citizens Advice Scotland
Rika Haga	PhD candidate	University of St Andrews
David Hall	Visiting Professor	PSIRU, University of Greenwich
David Hawkey	Research Fellow	University of Edinburgh
Michael King	Co-convenor	District Energy Vanguards Network
Caroline Kuzemko	Assistant Professor	University of Warwick
Ragne Low	Principal KE Fellow	Centre for Energy Policy
Christian Maaß	Partner	Hamburg Institute
Jamie Macleod	Policy Officer	Scottish Government
Donald MacRae	Chairman	Water Industry Commission for Scotland
Mika Minio-Paluello	Energy Economist	Platform London
Kate Morrison	Energy Policy Manager	Citizens Advice Scotland
Rune Nielsen	Advisor	Danish Energy Agency
Tony Norton	Head of the Centre for Energy and Environment	University of Exeter
François-Mathieu Poupeau	Researcher	CNRS-LATTS
Alasdair Reid	Senior Researcher	Scottish Parliament Information Centre
Neil Ritchie	Unit Head	Scottish Government
Katy Roelich	Associate Professor	University of Leeds
Gail Scholes	CEO	Robin Hood Energy
Francis Stuart	Policy Officer	Scottish Trades Union Congress
Alan Sutherland	Chief Executive	Water Industry Commission for Scotland
Stephen Thomas	Emeritus Professor	University of Greenwich
Mags Tingey	Researcher & PhD Student	University of Edinburgh
Faye Wade	CXC PDRF - Energy Efficiency Scotland	University of Edinburgh
Oliver Wagner	Researcher	Wuppertal Institut
Jan Webb	Professor	University of Edinburgh
Duncan Whitehead	EY Lead for Economic Advisory in Scotland	EY
Mark Winskel	Chancellor's Research Fellow and Senior Lecturer	University of Edinburgh

Abstracts

Session 1 Political dynamics of decision making about public and private ownership of energy

Public Ownership, Economic Democracy and Energy

Professor Andrew Cumbers, Adam Smith Business School, University of Glasgow

As public ownership returns to the forefront of public debate, it is critical that lessons are learnt from past experiences about linking policy to broader public goals and needs. In a time of deepening political and ecological crisis, I will argue for an agenda around economic democracy as central to this challenge. Most critical, in the energy sector, new forms of public ownership that engage citizens in the battle against climate change are required to forge a politics of the common good against vested established interests.

Public ownership of large-scale energy infrastructure - can we build energy democracy from the top-down?

Mika Minio-Paluello, Platform London

This paper will explore how an increase in public ownership of energy can help accelerate the climate transition and build energy democracy. It will explore the potential and importance of public ownership of energy infrastructure, including existing transmission and distribution networks and new large-scale renewable generation like offshore-wind and tidal. We will provide an overview and breakdown of current ownership patterns of UK energy infrastructure, and explore the political economy of different types of ownership.

Achieving a successful climate transition will rely on major investments and infrastructure upgrades over the coming 15 years. This paper argues that greater public ownership can smoothen this process, while unlocking value-added benefits including increased economic democracy, targeted industrial strategies and community development and regeneration. Publicly-owned energy companies can take on institutional roles in helping deliver a just transition, by actively redeploying workers formerly in high-carbon sectors into clean 21st century industries.

But can regional and national public energy companies also play a role in giving enabling decentralisation and giving smaller-scale communities control over their local infrastructure? What political processes and accountability structures need to be baked in to make this possible?

Public ownership as a tool for participation and technical change: insights from German cities

Dr Sören Becker, Department of Geography, University of Bonn

In the early 2000s more than 200 German municipalities introduced public ownership in energy grids or plants, sometimes even for the first time ever. Cases for remunicipalisation can be found in small communities of just over 1,000 inhabitants and in metropolises like Hamburg. Whereas social movements pushed for the triad of social, ecological and democratically governed energy systems, city councils were convinced by prospects for regaining local control of infrastructures, for a technological change towards renewable energy, and good chances for amortisation. For both sides, visions of altered energy systems could crystallise in the promise of public ownership.

Today this “wave of remunicipalisation” is celebrated internationally (and especially in current debates in the United Kingdom), while discussions became more silent at home. After the big political splash of ownership change, now would be the time for assessing the outcome of the remunicipalisation for understanding in how far these new enterprises produce different outcomes than their private predecessors. Looking at Hamburg and other cities, this presentation will discuss first insights, on how remunicipalisations have resulted in more participation and renewable energy, and will seek to identify conditions and practical approaches that could render public ownership a tool for social and technical change.

Session 2 Large scale infrastructure and utilities

Water Industry Commission for Scotland

Alan Sutherland, Chief Executive, Water Industry Commission for Scotland

Alan Sutherland has been Chief Executive of the Water Industry Commission since its establishment in 2005, where he presided over the first successful liberalisation of a retail water market in the world, a model which has now been substantially replicated in England. Prior to WICS' establishment, he was the Water Industry Commissioner, a role he took up in 1999. Under Alan's supervision, the water industry in Scotland has become much more efficient – both operating and capital costs are down by some 40% on a like for like basis – and performance standards have improved markedly. The introduction of competition to the Scottish market has further facilitated new and improved services, reduced costs and increased emphasis on efficient water use.

Alan has extensive experience in management consultancy and in the investment banking industry. He was formerly a management consultant with Bain and Company and before that a Manager with Robert Fleming and Co. More recently he was Managing Director of Wolverine CIS Ltd. Alan has an MBA and MA from the Wharton School and the School of Arts and Sciences at the University of Pennsylvania and an MA (Hons) from the University of St Andrews.

Is there a future for the European mega-utilities?

Emeritus Professor Steve Thomas, Public Services International Research Unit, University of Greenwich

15 years ago, it seemed that the liberalisation of energy markets would lead to the domination of the sector by a handful of internationally-based, mostly privatised utilities, the Seven Brothers. The opening of markets to competition seemed to restrict the scope for governments to use their ownership of utilities as policy tools and reduced the attractions of public ownership. By 2010, the market had concentrated further leaving just five large companies. However, in 2018, these companies are in difficulty with unsustainable debts, a loss of market share and public distrust. They are beginning to take radical measures to try to transform themselves into sustainable businesses. In this presentation we examine the factors that have led to this crisis. These include: a history of poor strategy decisions going back more than 20 years; the failure of most of the large-scale technologies that insulated them from challenge by new entrants; the remarkable cost reductions in small-scale renewable technologies that make entry easy for newcomers; and their scale, which makes them slow to respond to rapidly changing market conditions. Nevertheless, efficient energy markets remain elusive and if there is a return to a more planned sector, public ownership could re-emerge.

Ownership and environmental regulation: Evidence from the European electricity industry

Professor Stefano Clò, Department of Economics, Management, and Quantitative Methods, University of Milan

The paper investigates how ownership affects the environmental performance in developed countries where environmental regulation is introduced in the form of market-based instrument. By looking at a cross-country panel dataset of 29 power markets around Europe over the period 1990–2012, we find empirical evidence that an increase of public ownership, as measured by the OECD ETCR index, is associated with a reduction of both greenhouse gas emissions and carbon intensity. We also find that the implementation of the European Emissions Trading Scheme (ETS) had a limited impact on emissions' reduction due to lax allocation of allowances. The positive effect of public ownership on environmental performance has been significant even after the introduction of the ETS, giving additional incentives to mitigate emissions when the ETS cap was not stringent enough. This evidence suggests that government control over power companies in Europe can has created idiosyncratic incentives to improve environmental quality, complementing environmental regulation in the achievement of environmental goals when the latter was absent or sub-optimal.

Public-private comparative economic realities in energy and beyond

Visiting Professor David Hall, Public Services International Research Unit, University of Greenwich

In electricity, as in other sectors, the belief in superior private sector efficiency is not supported by empirical evidence: “the theory is ambiguous and the empirical evidence is mixed” (IMF). The cost of capital is higher for the private sector, so without efficiency savings public sector operations can be expected to be more cost-efficient. Insofar as efficiency is reflected in prices, most international studies have found that private ownership of electrical utilities is linked to *higher* prices for consumers than public ownership. At system level, liberalised and deregulated systems are more costly through losing the efficiency of vertical integration. Energy systems should develop as public service systems enabling actors, including public authorities and the public, to continuously contribute to optimise the public goods of decarbonisation, price, and access.

Session 3 European municipal energy companies in practice

Danish experiences with public and local ownership of district heating companies

Rune Nielsen, Advisor, Danish Energy Agency

Rune Nielsen is advisor at the Danish Energy Agency (DEA), an independent unit under the Danish Ministry Climate, Energy and Utilities, concerned with legislation and policies regarding the energy sector. Rune has a master in Energy planning and prior to joining DEA has experience with most aspects of district heating regulation and implementation from two municipalities and from Greater Copenhagen Utility Company (Hofor).

Ownership of Energy infrastructure – lessons learned in Hamburg

Christian Maaß, Co-founder and Partner, Hamburg Institut

This input will focus on the developments in the ownership of the energy infrastructure in Hamburg (Germany) and on what can be learned from this case study from a broader perspective. For more than 100 years, the City State of Hamburg owned municipal companies that were running the energy grids and producing power and heat. In the 1990s, these companies were privatized. One generation later, the city decided to found a new public utility. In addition, a referendum obliged the State government to buy back the grids for power, gas and district heating. What has triggered the city's moves to first sell and now to reestablish public energy ownership? What were the consequences and results of losing and regaining public ownership from the city's perspective?

Christian Maaß is today an advisor of the City of Hamburg and other cities. He was member of the Hamburg City council from 2001 to 2008. From 2008 to 2010 he was the State secretary for Environment and Energy in the City's Government where he initiated the foundation of Hamburg Energie and chaired its supervisory board.

Local authorities and the regulation of distribution networks: concession contracts or local (semi) public operators?

Dr François-Mathieu Poupeau, CNRS, LATTS, Université Paris Est

In France, as in many European countries, local authorities are coming back to power in the field of electricity. This emerging implication raises many debates about their role in the regulatory frame and the tools they may mobilize to foster energy transition processes. This contribution deals with one of these discussions, about electricity distribution networks, which are under municipal responsibility since 1906. Local authorities can use two tools to fulfill this competence, which involves major stakes (financial, public policies). The first one is concession contracts (95% of the territory), signed with Enedis, the national operator (a subsidiary of EDF). The second tool is local (semi) public operators, which have resisted to the creation of EDF and are now less than 200 (in cities such as Strasbourg, Grenoble or Metz namely). In this contribution, we will first compare these two tools, by studying their pros and cons on a local point of view (the control of distribution networks). We will then explain that, despite its assets, the local (semi) public operators tool encounters many difficulties to spread, facing a national strong coalition of powerful actors (the State, EDF, rural politicians) which have a common interest to keep concession contracts.

Session 4 UK Local authorities engagement with energy

The UK energy market context

Tony Norton, Centre for Energy and the Environment, University of Exeter

The evolution of the UK's energy market from a fragmented patchwork of private and municipal provision in the 19th Century to centralised state ownership in the mid 20th Century and then structured privatisation in the 1980's and 1990's effectively disengaged local authorities from energy. The emergence of the "big 6" companies (some vertically integrated with interests in North Sea gas fields, power generation and millions of retail customers), the potential for the exercise of market power and complex and shifting gas and electricity market operation and regulation have led to a challenging environment for the operation of any UK energy undertaking; particularly new entrants. There are three main business areas for local authority engagement in the UK energy market; generation, retail supply and heat networks. Each of these businesses has significantly different features. An early understanding of these, together with the potential benefits and risks, is a must for those contemplating publicly owned energy companies in the UK. Only when this understanding is in place can sensible investment decisions be made.

Tony Norton is Director of the Centre for Energy and the Environment at the University of Exeter. Founded in 1978 by local authorities and the University, the Centre is a multi-disciplinary team which undertakes a broad range of research and consultancy in energy and the built environment primarily for the public sector. Tony is a Chemical Engineer and prior to joining the Centre in 2004 he spent 25 years in the energy industry in the UK and overseas covering a range of technical, commercial and managerial roles including energy trading in continental Europe. Over the past 10 years he has been deeply involved in public sector engagement with energy in the south west of England including the establishment of a publicly owned energy company.

How do policy and market contexts affect the potential for municipal energy companies in the UK?

Dr Katy Roelich, Sustainability Research Institute, University of Leeds

The relationship between policy and markets on the one hand and municipal energy companies (MECs) on the other is complex and potentially problematic. In order to understand the dynamics of this relationship more fully we must engage with the ideological context of policies and markets and the diverse goals and models that drive MECs. This paper draws on a critical approach developed in support of researching climate change and community (Taylor Aiken et al., 2017) that recognises the diversity in meaning and function of [community] activity, the implications of the neoliberal context in which [community] plays out, and that is alert to social difference and the importance of democracy. I will introduce the diversity of meanings and functions that municipalities are seeking when trying to establish a MEC, along with the very different forms that MECs can take. This diversity can increase tensions between MECs and a policy and market context that favours centralisation and standardisation, which goes some way to explaining the challenges faced by MECs. I will explore the neoliberal context underpinning energy policy and markets in more detail to examine challenges created by the desire to co-opt municipal energy to deliver on national policy goals and to capture its outcomes. Finally I will consider the role of municipal energy companies

in enabling democratic renewal and the challenges this poses to its nascent relationship with policy and markets.

Ref: Taylor Aiken, GT et al (2017) Researching climate change and community in neoliberal contexts: an emerging critical approach. Wiley Interdisciplinary Reviews: Climate Change, 8 (4).

Ownership models and business structures in UK Local Authority energy initiatives

Mags Tingey, School of Social and Political Science, University of Edinburgh

In this paper, I discuss ownership models and business structures of 40 UK local authority (LA) energy initiatives. Projects directly managed by the LA are compared with projects established as independent businesses.

Decision-making about business structures is found to be multi-dimensional although a common feature of directly managed projects was their potential for relatively easy integration into existing council structures and management processes. The diversity of structures used to serve similar goals however, indicates that council decisions about direct management of energy investments, contracting with commercial and community partners, or establishment of an independent business are not simply the outcome of technical-economic characteristics of projects. Some councils are testing out different commercial structures, using independent municipal enterprises or partnerships with commercial energy utilities and community groups. In general, structures are customised to local circumstances and priorities, including political strategies, financial opportunities and the composition of council skills, resources and procedures. This can be variously interpreted as local flexibility and as a reflection of the challenges of embedding energy provisions in council structures governed largely by statutory duties and central government financial control.

Findings from the 40 case studies demonstrate that much greater LA capacity and resources will be needed if municipal energy is to be a significant component of a clean energy system. Using these cases, I sketch out the key changes needed to create more reliable routes to institutionalising forms of municipal energy provision in the UK.

Session 5 Municipal energy companies and low carbon heat

Aberdeen Heat & Power: A Growing Not-for-Profit Model

Ian Booth, Chief Executive, Aberdeen Heat and Power Ltd

Aberdeen Heat & Power (AH&P) was set up in 2002 by Aberdeen City Council, as an independent not-for-profit company, limited by guarantee, to deliver affordable heat through district heating. The principal aims of the Company were, and still are, to alleviate fuel poverty and reduce the carbon footprint within the city "for the benefit of the citizens of Aberdeen". Starting off at a small scale in 2002 with a gas-fired CHP plant to feed a cluster of hi-rise blocks of flats, the company has grown to a position whereby over 3000 domestic connections have been made, from CHP and communal heating schemes, along with 19 public buildings from four energy centres across the City. Further connections are underway, with plans to extend the network across the city centre. The operating model has been successful with benefits provided for tenants within local hard to treat properties, carbon savings made for public buildings and all round improvements to hi-rise blocks. Surpluses made from operations are retained within the company to help sustain affordable heat price, build cash reserve for future plant replacement and assist with further infrastructure investment.

Enabling to ensuring: heat networks as a tool for local re-engagement in energy

Jess Britton, Energy Policy Group, University of Exeter

Amidst increasing policy focus in the UK, and elsewhere, on the role of heat networks in decarbonisation a large number of English local authorities are pursuing heat network projects. Although historic and locational contexts are significant, analysis of heat network actors in England reveals that there are important differences in ownership discourses adopted by local and national actors. Central government and industry actors largely frame heat networks as apolitical undertakings with decisions based on techno-economic feasibility and the risk appetite of partners. In contrast, local authorities are increasingly connecting heat networks to wider discussions of the role of local public ownership and remunicipalisation. Local governments also frame public ownership in the energy sector, and heat networks in particular, as addressing public distrust in incumbent companies and facilitating the delivery of complex social, economic and environmental objectives.

Heat networks are therefore acting as one forum for local authorities to re-evaluate their role in the energy system with a combination of interdependent political, economic and technological decentralisation trends prompting a degree of (re)engagement in the shaping of local energy systems. In particular there is evidence that a reimagining of local governance, together with constrained local public finances, is leading to more local authorities adopting an 'ensuring' form of governance which often (but not always) frames public ownership of energy infrastructure as central to the delivery of multiple objectives. These findings demonstrates how broader governance and decentralisation trends are interlinked with the progress of the energy transition but highlights how national contexts can constrain debate of more diverse forms of local energy governance.

Explicit and implicit roles for the public sector in district heating: what can the UK learn from other countries to future-proof ownership and governance arrangements?

Dr Dave Hawkey, School of Social and Political Science, University of Edinburgh

District heating has been embedded in policy scenarios for decarbonised heat which envisage significant growth in use of the technology from its current servicing of around 2% of UK heat demand. While there is much uncertainty around these scenarios it is likely a cost effective configuration of future district heating would comprise large scale networks in city centres, contrasting with the organisationally-bound small networks that characterise current practice. This would imply multiple forms of rescaling beyond the material extension of heat pipes through cities: large heat networks would play a more significant role in individual cities' metabolic relationships and environmental impacts, and they would mediate a wider variety and greater complexity of socioeconomic relationships between actors within and beyond cities. This raises questions as to whether governance and organisational forms used in the UK to deliver incremental heat networks are 'future-proofed' against the sociotechnical and political dynamics that larger systems can create. I examine this question by presenting recent episodes in two European cities' large district heating systems where public ownership and vertical integration have been central to debates about securing collective environmental and distributional objectives, and comparing these with the organisation and business models used in UK cases. From this comparison I recommend a number of challenges that public authorities should consider when sponsoring new heat networks and designing regulatory models.