Title:
Chapter 19: How non-energy policies shape demand for energy

Authors:
Sarah Royston
Research Fellow
Global Sustainability Institute, Anglia Ruskin University, East Rd, Cambridge CB1 1PT
Sarah.royston@anglia.ac.uk
https://orcid.org/0000-0002-6624-0037

Jan Selby
Professor
Department of Politics and International Relations, University of Sheffield, Northumberland Rd, Sheffield S10 2TU
j.e.selby@sheffield.ac.uk

Abstract:
This chapter introduces an important challenge to the conventional idea of 'energy policy'. It explains how energy demand is not only affected by energy policy, but also by policies relating to other sectors, such as industry, transport, farming, health and education. We begin by showing how 'non-energy policies' shape energy demand through the impact they have on what people do, and explain how these policies shape the timing, location and amount of energy demand. We then delve deeper into the mechanisms through which an illustrative non-energy policy (marketization) affects energy demand in one case study sector: UK Higher Education. We reflect on the 'invisibility' of these policy effects, and then discuss the implications of a recognition of these effects for policy and practice. We conclude by reflecting on how social scientists working on energy issues can contribute to greater understanding of this important but neglected aspect of energy governance.

Key words:
policy; integration; governance; mainstreaming; Higher Education; consumption

List of tables

Author bios

Sarah Royston is a Research Fellow at the Global Sustainability Institute, Anglia Ruskin University, and has previously worked within the DEMAND centre at the University of Sussex and the Association for the Conservation of Energy. An interdisciplinary social scientist, her work explores issues of energy governance, demand and everyday life. She studied Geography at the University of Cambridge and holds a PhD in Social Policy from the University of York.

Jan Selby is Professor of Politics and International Relations at the University of Sheffield. His work focuses on the international political ecology of water, climate and energy. Recent papers include 'The Trump presidency, climate change and the prospect of a disorderly energy transition', Review of International Studies (2019) and 'On blaming climate change for the Syrian civil war', Middle East Report (2020).

<a> Introduction

As the contributions to this Handbook show, energy is fundamentally a social issue. Energy is not consumed (and supplied) for its own sake, but rather because it is embedded in practices that people perform: for example, moving around; working; or keeping warm. Taking this idea seriously has many implications for researchers and policy-makers attempting to understand, and intervene in, the energy demanding activities of individuals and other actors (see, for example, Shin & Chappells, Chapter 4 and Morley, Chapter 5). One implication of this social understanding of energy that has received relatively little attention to date concerns the role of policies in contributing to the constitution of energy demand. If energy demand arises through practices, then the policies that play a part in steering those practices are also steering energy demand. Policies are by no means the only influence on practices, but they do play a role in shaping them, and crucially, they are an area where some form of deliberate intervention in social life is already occurring, and thus can provide opportunities for change.

The practices that demand energy are affected by many forms of policy, developed across many sectors: including policies that are not conventionally seen as 'energy policies'. For example, when, where and how people travel is strongly shaped by policies on urban planning; school choice and employment. A focus on these so-called non-energy policies inevitably follows from an understanding of energy as social. If we are to move towards a more sustainable energy system, we need to understand the full range of policies that steer energy use.

This chapter presents an overview of, and arguments for, a research agenda around non-energy policies. In using the term 'policies' here, we take a deliberately broad view, including standards, regulations, planning procedures and oversight processes, which may be implemented by diverse organizations, from international agencies to local institutions such as hospitals, councils and businesses. The chapter first reviews what is typically meant by the term 'energy policy' (section 19.2) and shows how a commonly-adopted narrow view misses many important forms of energy governance (see Kerr, Chapter 9 for more on how different rationales shape *energy* policy). Section 19.3 then asks: How do other policies matter for energy demand? It explores a range of dimensions, including direct and indirect effects; temporal and spatial effects; and upward and downward trajectories of energy demand. The case study (section 19.4) provides a more detailed picture of how the processes outlined in section 19.3 play out in practice. It draws on multiple strands of data to show how a powerful policy agenda (marketization in UK Higher Education (HE)) is playing out through institutional strategies, and reconfiguring practices.

Section 19.5 reflects on the 'invisibility' of the policy effects that have been discussed, and some of the underlying reasons for this, before considering implications of these arguments for policy and practice. It uses examples from fields where some progress has been made, to draw out proposals for greater recognition of non-energy policy effects. Section 19.6 concludes by reflecting on what these arguments mean for social science researchers. This discussion also speaks to cross-cutting themes in this Handbook, arguing that the policy effects discussed here serve as further evidence of the need for a nuanced and trans-disciplinary understanding of energy in society.

<a> What do we mean by energy policy?

First, it is worth considering what is meant by policy in general, and energy policy in particular. While we often think of policy as the province of states, policies are also made at the international level by governmental and non-governmental bodies and corporations, as well as at devolved and regional levels. They are also made at the local level by councils and institutions such as universities and hospitals. A look at the website of most institutions will reveal an array of formalized 'policies', on anything from Health and Safety procedures through to ethical, financial and strategic policies. Policies across these scales are often connected; for example, national policies on discrimination, or on counter-terrorism, or on climate change will inform sectoral and institutional policies. We take a deliberately broad understanding of policy, that includes plans, protocols, performance indicators, rules, standards and guidelines, that are used to establish, encode and enact an organization's goals (see Royston et al., 2018 for further discussion of policies).

The term 'energy policies' generally means policies directly relating to the production, distribution and consumption of energy. In theory, definitions of energy policy generally give equal weight to issues of supply and issues of demand; however, this is not always the case in reality. To give one (somewhat extreme) example, a textbook entitled 'Understanding energy and energy policy' (Braun and Glidden, 2014) includes seven chapters focused on energy supply, but none on energy demand. The same trend can be observed in the policy sphere, and the demand side has been called 'the Cinderella of energy policy, receiving scant policy attention and limited financial support when compared to energy supply' (Smith, 2009, p. 64-65). In 2018 the UK Government's *Cost of Energy Review* was described as 'highly skewed towards considering supply-side issues and away from demand side policy' (End Use Energy Demand Centres, 2018), while the Committee on Climate Change (2018) highlighted some significant policy gaps regarding the demand side in their evaluation of the UK's 2017 Clean Growth Strategy.

Furthermore, when energy policies do tackle issues of demand, they often adopt a narrow framing of demand. 'Demand-side' policy tends to translate largely into *efficiency* policy. This is apparent in the framing used by the UK Committee on Climate Change, which splits measures for reducing emissions into two groups: 'Using energy more efficiently' and 'Switching to low-carbon fuels' (Committee on Climate Change, undated). Technical efficiency policies can play a part in reducing energy use; for example, Rosenow and Galvin (2013) have estimated that a German loan scheme for domestic energy efficiency improvements produced an average saving of 27 per cent of pre-refurbishment energy consumption. However, if policies focus solely on technical efficiency measures, any gains they make may easily be wiped out by escalating consumption norms. Work drawing on theories of social practice (see Morley, Chapter 5 for a description of Social Practice Theory) suggests that rather than pursuing technical efficiency alone, we need to understand *what energy is for* (Rinkinen et al., 2020; Shove, 2018). Work within this field emphasizes that energy is not used for its own sake, but rather as part of fulfilling socially-constructed needs and performing largely-routinized daily activities (practices). In this sense, all energy use is 'derived demand'.

In summary, when researchers and policy-makers speak of energy policies, they generally mean policies that are: 1) explicitly focused on energy as a distinct topic; 2) mostly centred on the supply side; and 3) when they consider demand, then largely focusing on technical efficiency measures. This represents a very narrow subset of the policies that actually steer demand for energy.

<a> How do 'non-energy policies' matter for energy demand?

This section explains some of the ways in which so-called 'non-energy policies' actually matter for energy demand (drawing on Royston et al., 2018). This is inevitably a partial account, since there are myriad effects of these policies on energy demand: in fact, it is difficult to imagine any policy which has no implication at all for how energy is used. A scoping literature review carried out by Cox et al. (2016) found that energy demand (and indeed supply) may be impacted by policies within virtually every policy sector.

A first point to note is that, as highlighted above, policies affecting energy occur across multiple spatial scales and policy actors, including states, transnational institutions, devolved and regional bodies, and local institutions such as universities and hospitals. All of these play a part in steering demand for energy, to a greater or lesser extent. There are also agendas that span many different policy sectors, which have especially wide-ranging effects. One of the most important is the dominant commitment to economic growth, along with related strategies (among many policy actors) of liberalization and marketization. Liberalization here refers to a shift away from governmental provision, funding, management and control of services, and towards increasing roles and freedoms for private service-providers. Within this, marketization specifically refers to the development of markets in sectors that previously did not operate as markets. These agendas recur through many of the examples discussed below.

Secondly, the effect of policies on energy demand may be fairly direct or immediate; for example, if a business decides to cut operating costs by turning off all lights at night, this will affect energy use as soon as it is implemented. More typically, though, the impact of policy decisions may be less direct, delayed, or occur over a longer time-scale or at a distance. Policy change usually represents just one moment in ongoing processes of social and technical transition, and impacts on energy demand generally materialize when, where and insofar as policies become embodied within infrastructures and social practices. For example, the growth of out-of-town shopping centres has been driven by land use policy decisions (both locally and nationally) and has contributed to significant growth in transport-related energy use over several decades (Banister, 1999). Equally, if they do become embedded in infrastructures and conventions, policy decisions can trigger path-dependent trajectories in energy demand, which may not be easy to reverse.

A third feature of non-energy policies is that they can contribute either to increasing or decreasing energy demand. Many non-energy policies unintentionally contribute to rising demand: for example, the recent preference within some UK health authorities for hospital patients to have individual rooms (driven by agendas around infection and privacy) is leading to greater use of power-demanding equipment to facilitate monitoring when patients are less easily visible, as well as managing loneliness (Bradford, 2015; Department of Health, 2013; Pennington and Isles, 2013; Reid et al., 2015). Policies can also create or reproduce barriers to energy efficiency investment; for example, building heritage and conservation policies can obstruct insulation plans (Vera, 2014).

But in certain circumstances, non-energy policies can also help reduce demand. One area where this is quite often true is in the field of environmental policies; integrating policies on climate change, air pollution and energy security can create 'win-wins' and improve outcomes across energy demand, carbon emissions and health, for example (Bollen et al., 2010). Thinking more widely, other policies that act to limit various kinds of consumption or

production can have unintended downward effects on energy demand. For example, China's one-child policy between 1979 and 2016 significantly reduced population growth and consequently slowed growth in energy demand (Eccleston and March, 2011; Zhuang, 2008). More recently, austerity policies implemented in European Union nations following the financial crisis of 2007–2008 contributed to major declines in energy use, while in the United States a more Keynesian approach to policy led to very different outcomes for the economy, and thus for energy consumption (Bel and Joseph, 2015; Weisbrot, 2014). This is not an argument that population control or austerity are appropriate methods for reducing demand. Rather, we wish to demonstrate the diversity of potential effects of non-energy policies on energy systems.

The fourth point to note about non-energy policies is that they do not only affect the overall amount of energy demand, but also its timing (which is relevant for provision infrastructures, especially in relation to peak times, as well as to pricing policies). Non-energy policies can affect temporal aspects of the practices that result in energy demand, including when they occur, how often, for how long, and in what order. For example, Blue (2017) describes the changing rhythms involved in English hospital life, and discusses how healthcare agendas and targets (such as promoting a 'one-stop shop' approach to cancer treatment) have shifted the timings of appointments and care pathways. These changes have had ramifications for the resources used for patient care, including space-heating and clinical equipment, as well as affecting when the associated forms of energy demand occur.

Fifth, non-energy policies can of course affect the spatial characteristics of practices, affecting where energy demands arise, and at what scale, as well as what kinds of mobility (of people and things) is demanded. For example, education policies that give parents more options regarding school choice have led to children travelling greater distances to school (He and Giuliano, 2017; Marshall et al., 2010). Globally, trade liberalization policies promoting the outsourcing of heavy industrial production to less developed countries have had major impacts on where energy is consumed in industrial production (Morgan, 2011). These policies also drive up the overall quantity of goods transported internationally, affecting fuel demand. Returning to the health sector, policies that aim to deliver care to patients in their homes (for example, in-home dialysis), rather than in hospital settings, transfer the location of the associated energy demand to these decentralized locations (see, for example, British Renal Society, 2015).

Lastly, it is worth noting that the effects of these policies on energy are often entangled and interacting, not least because there are multiple intersecting agendas in any policy sector, and indeed, within any policy actor. Fundamentally, since every policy interacts with social, technical and economic processes (which are themselves often connected to other policies) it is often extremely difficult to identify and describe, let alone to quantify, policies' effects on energy demand.

<a> Case study: marketization in UK Higher Education

This section serves to illustrate some of the points raised in section 19.3, by exploring energy demand impacts of marketization in English Higher Education (HE) since 2010. We draw on research conducted within the DEMAND centre, 2015-2019[i] on English universities. This involved semi-structured interviews with: sustainability managers; other senior and middle managers such as Directors of IT, of Services and of Finance; and with sustainability professionals in policy bodies. Interviews focused both on participants' direct engagement with energy issues, but also wider changes occurring in their work which might affect energy

use. We also analysed institutional, sectoral and national policy documents, and national datasets. This mixed methodology aimed to provide rich detail on institutional energy governance, complemented by a wider view of socio-technical changes steering UK energy demand. Please see Royston, Selby and Kesidou (2020) for further details.

The UK HE sector is a major energy consumer, using 714 ktoe in 2018 (BEIS, 2019). Until 2012, the main funder of English universities was the Higher Education Funding Council for England (HEFCE). In 2010 HEFCE published a carbon reduction strategy, which set the sector a 43 per cent carbon reduction target by 2020, against a 2005 baseline, in line with the 2008 Climate Change Act (with similar sectoral strategies adopted in other UK nations). HEFCE began to link its funding to universities' compliance with carbon policies. However, from 2012 HEFCE's funding role was significantly reduced, and in the ensuing policy vacuum some universities removed their absolute carbon targets, adopted lower targets, and/or stopped updating carbon plans. HEFCE was abolished in 2018, and at time of writing in 2020, sustainability strategies are still under development by the two new regulators (the Office for Students and UK Research and Innovation). Based on the latest UK data (for 2017/18), the sector has achieved a cut of only around 29 per cent[ii]. The progress reported so far has been largely through national grid decarbonization and changes in supply chains (Brite Green, 2017).

Many policies not conventionally seen as energy policies play a role in steering energy demand in universities. The most important 'non-energy' change currently occurring in UK HE concerns an agenda of marketization and liberalization, as summed up in a 2015 Green Paper which set out aims to '*empower students, strengthen competition, drive quality, eliminate unnecessary bureaucracy and save taxpayer money*' (BIS, 2015, p57). The trend towards liberalization in HE, both in the UK and internationally, has been extensively discussed (e.g. Deem & Brehony, 2005; Hemsley-Brown & Oplatka, 2006; Lynch, 2006; Molesworth et al., 2011). This broad agenda encompasses many dimensions, including changes in governance (the abolition of HEFCE, as noted above); professionalization and liberalization within HE institutions' internal services; marketization and competition across the sector; economic efficiency and austerity; growth; and internationalization. Here, we focus on one particularly important policy change to illustrate the diversity of its implications. This is the reduction in state grants to English universities, alongside the shift to higher (£9,000) tuition fees in 2012.

Tuition fees and education contracts now make up 51 per cent of income for English HE providers, and 49 per cent for the UK as a whole[iii]. This national-scale policy change has a range of ramifications for institutional policy and practice, many of which may have unrecognized implications for energy demand. These include the increased prominence of a 'student experience' agenda, which emerged as a strong theme from interviews with a wide range of university professionals. Now that much of universities' income is from tuition fees, recruiting students is essential to their financial survival. This has made student experience a priority, guiding policy and planning across virtually all university functions, and creating new temporal patterns, such as the extension of opening hours for libraries, computer rooms, launderettes and help-desks. Interviewees also suggested that this agenda governs the provision of spaces, facilities and equipment; for example, accommodation is becoming larger, with more en-suite bathrooms, and internet connectivity is expected everywhere, all the time. One senior manager at a university said student expectations have; '*Hugely changed… If you're paying £9,000 fees…you have a higher demand on what the facilities at the university are. We see it all the time… People complain… The demand on good facilities is*

really high'. Another senior manager said, *'IT … they want it probably faster than we can conceivably deliver it... And completely on wireless, you can't have a dead spot anywhere.'*

Student experience is also closely related to a growth agenda. Some universities perceive that to maintain financial stability (both through tuition fees and research income) they need to grow in size. One staff member said, *'growth is a way of avoiding being swallowed up. It is a way of generating extra revenue. Our student numbers will go up because we need to generate more revenue'.* Inevitably, more staff and students require more energy, and growth often means constructing new buildings. New buildings may be more 'efficient' in terms of building fabric than older buildings, they may also reflect new expectations about spaces and services (e.g. with greater provision of power sockets). Wadud et al. (2019, p824) conducted econometric modelling of energy consumption in UK HE and found that if a university's floor area, income and number of students/staff are each increased by 10 per cent, there is an increase in energy consumption of 6.3 per cent. In other words, there are some 'economies of scale' associated with growth, but not nearly enough to offset the overall increase in energy use.

While it is extremely difficult to attribute causation, and many overlapping social and technical changes are implicated here, this brief overview highlights some of the likely implications of non-energy policy for energy demand within the HE sector, and illustrates several of the points made in section 19.3. First, this is a clear example of the ratcheting of norms of service provision. This phenomenon has been highlighted by, for example, Shove (2003), who explains that shared social expectations (such as those around comfort, cleanliness and convenience) have tended to increase over time, with serious environmental implications. Our analysis suggests that this ratcheting can be driven, unintentionally, by specific policies such as marketization. As Wadud et al. (2019) show, energy use is likely to increase in future unless there is significant change in the policies currently driving growth (of various kinds) in the UK HE sector. Secondly, it highlights policies' impacts on temporal dimensions of energy use, for example, through the escalating duration of opening hours[iv]. Thirdly, it illustrates the interconnected levels of governance that steer energy demand, including building level management, institutional strategy, national policy and transnational agendas. Specifically, the agenda underpinning all this change appears to be one of liberalization. Since this agenda, and associated policies of marketization, commodification and growth, are extremely pervasive, we might expect to see similar ratcheting effects on energy demand in other sectors.

<a> Why are these policies' effects 'invisible' and what can we do about them?

One reason why the effects of non-energy policies are poorly-understood is that truly interdisciplinary research on energy remains rare, with much work being dominated by technical and economistic agendas and frameworks (as described by Royston and Foulds, 2019). This dominance is also associated with the equation of consumption with demand (Shove, 2018); the assumption that people need energy, and that such needs should always be provided for. Such approaches fail to recognize that these 'needs' are constructed by, and mediated through, infrastructures, technologies, practices and policies. However, while social scientists are increasingly engaging with energy demand as an outcome of social practices (as mentioned above), relatively few of these have so far paid attention to the role of non-energy policies.

Another problem is that the issue of 'non-energy policy' is so wide-ranging and complex that it is difficult for researchers and policy-makers to find practical action points. This is

compounded by a paucity of data, as highlighted by Cox et al. (2016). Furthermore, recognising the impacts of non-energy policy might mean touching on sensitive priorities, breaking boundaries, and building new cross-organizational ways of working: these are not simple tasks. Professionals tasked with managing energy demand often encounter institutional obstacles in trying to bring about a more holistic approach to energy demand management (see Royston, Selby and Kesidou, 2020). Fundamentally, any institution will have its own core business or agenda, and other concerns such as energy demand will hold a more peripheral status. However, recognising such 'peripherality' does not imply that this status is inevitable, absolute, or permanent.

Obviously there are major challenges to any efforts to 'integrate' or 'mainstream' non-energy policies into energy agendas, and vice versa. However, we can learn from experiences in other sectors; for example, agendas around equality and diversity. In the not-too-distant past, these objectives were seen as relatively peripheral in relation to the priorities of many institutions. However, equality and diversity agendas have to a significant, albeit uneven, degree become 'mainstreamed' into institutional ways of working (Moser and Moser, 2005). They are becoming gradually embedded throughout institutions' employment and pay, workload management and the design and operation of buildings. Of course this mainstreaming is by no means finished, nor has it been uniformly successful (Rees, 2005). Nonetheless, it is widely accepted that institutions of all kinds can and should meet equalities objectives alongside their core goals. It is at least possible that energy demand agendas could be similarly mainstreamed.

Another field that suggests useful precedents is that of health. Increasingly it is understood that people's health is not just affected by policies directly on healthcare, but a wide range of areas of life. Over several decades, such thinking has led to the mainstreaming of health-related agendas into other fields, for example, by focusing on the safety of people at work (health and safety policies), supporting those with physical and mental conditions (occupational health policies), regulating food standards, and so on. These examples remind us that societies and institutions are pervaded by diverse governance agendas, and tensions between these agendas are not new. At the same time, it is notable that each attempt at mainstreaming has involved centralized legislation with judicial enforcement, alongside new cultures of best practice.

We can infer from this that mainstreaming a focus on energy demand across sectors and institutions is not impossible. The most obvious change needed is much stronger legislative action on energy demand and its consequences; for example, carbon emissions. In the UK, some sectors (e.g. UK central government; NHS England; Higher Education in England) and local institutions (e.g. local authorities; NHS Trusts; universities) have set carbon reduction targets (Sustainable Development Unit, 2014; Department for Environment, Food and Rural Affairs and Cabinet Office, 2016; Higher Education Funding Council for England, 2014). However, these targets are mostly voluntary or lack meaningful enforcement, and often exclude 'indirect' emissions from transport, procurement and so on. An emissions target for the public and HE sectors in England was introduced in the 2017 Clean Growth Strategy, but is also purely voluntary. This debate on mandatory versus voluntary standards is an international one; for example, de Melo et al. (2018) call for mandatory standards for vehicle efficiency in Brazil, arguing that voluntary standards have proved inadequate; while Takahashi (2019) suggests voluntary approaches have largely failed across a range of environmental and human rights issues in Japan. Compulsory emissions reduction targets, backed up by appropriate monitoring and enforcement mechanisms, would ensure that

energy and carbon shifted from a peripheral issue to a real concern for institutional and sectoral decision-makers.

Effective mainstreaming also means looking at the boundaries that separate energy and non-energy matters within institutions. We do not see 'joined-up policymaking' (Ling, 2002) or 'environmental' or 'climate policy integration' (Adelle and Russel, 2013; Jordan and Lenschow, 2010) as a panacea, and these things are notoriously hard to achieve in practice. However, some reconfiguring of institutional roles, responsibilities and remits is likely to be needed. For example, institutional energy managers need to play an active role in the development of all strategies that are likely to affect energy demand; such as growth or business development strategies.

Implementing these kinds of change would not suddenly remove conflicts and tensions between energy goals and other priorities. However, identifying these at an early stage, and assessing their impacts, is a prerequisite to informed decision-making. It may be that core business goals will still outweigh energy goals in most instances; we are not suggesting organizations should abandon their main priorities[v]. But at the very least, an early awareness of the conflict and likely outcomes will assist with organizations' planning; for example, additional effort may be required to cut demand in other areas. More positively, there may be ways to manage the way core policies are designed and implemented to mitigate unwanted energy effects. Within the higher education sector, for example, mainstreaming energy concerns might lead to the revision of academic promotion criteria to reduce pressures for international conference attendance; changes to academic calendars to limit international student travel; new targets on local procurement; or new guidance on opening hours of services.

Finally, pursuing these kinds of change could also help identify win-wins across different policy goals. The idea of co-benefits is increasingly discussed in energy studies, and an awareness of non-energy policies' intersections with energy demand can help researchers and policy-makers capitalize on opportunities for policy alignment. A good example comes from the English health sector, where a report by the NHS Sustainable Development Unit (2016) took a ground-breaking approach to energy and carbon reduction. It assessed the likely implications of a range of potential interventions in the health sector, including conventional energy efficiency and supply-side measures. However, it also included measures that intervene in how healthcare is actually delivered, or models of care. Five of the interventions assessed are shown in table 19.1.

Table 19.1: Selected energy-saving measures in the health sector (adapted from Sustainable Development Unit, 2016)

Proposed energy-saving measure	**Tonnes CO_2e saved in 2020 (estimate)**
Solar – thermal	2,350
Solar – photovoltaic	2,690
Lighting - high efficiency	18,800
Support patients to quit smoking	42,200
Provide better psychiatric care in Emergency departments	84,500

As the table shows, the conventional energy interventions were found to have relatively small impacts on emissions. In contrast, two interventions that apparently have no relation to energy (relating to smoking cessation and psychiatric care) have enormous impacts on

emissions. These are preventative interventions that protect people's mental and physical health, and so are predicted to reduce the number of medical appointments and treatments that patients actually need. Every use of a healthcare service involves extensive energy costs: heating, lighting, medications, equipment, transport etc (with one patient spending one day in hospital estimated to generate 91kg CO_2e (Sustainable Development Unit, 2012). The analysis found that most of the best ways to reduce energy and carbon in healthcare are measures that reduce patients' use of services; which simultaneously have massive benefits for people's health, and service costs. It is important to be very cautious about any claims of 'avoided' service demand, as highlighted by Shove (2018), and of course unintended effects may result from these changes. However, this example illustrates how an awareness of non-energy policies' impacts on energy opens up exciting new possibilities for demand reduction.

However, integrating new agendas is not just a question of rewriting impact assessments or spotting win-wins. It is also a deeply political process that requires new forms of problem definition, and the application of new types of knowledge. We conclude this chapter by reflecting on this challenge, and the role that social scientists can play in addressing it.

<a> Concluding discussion: an emerging field of inquiry

In this chapter we have outlined a novel way of looking at energy demand and its governance, that is grounded in an understanding of energy as a societal phenomenon. We have explained how 'non-energy' policies have important, though largely unrecognized impacts on energy. What does this mean for social science researchers: how can we help address the energy impacts of non-energy policies?

Fundamentally, research has a key role to play in describing the interactions of non-energy and energy systems, so as to pinpoint the diverse routes and mechanisms through which non-energy policies steer energy demand. We also need new means of assessing which connections are more/less important, and which are more/less amenable to change; and methods for evaluating the effects of demand reduction efforts. In this, researchers can draw on data that is already available, for example, on transport patterns, but use it in new ways. For example, researchers might analyse the mobility demand effects of commitments such as providing 'superfast broadband coverage to 95% of UK premises by the end of 2017' (Priestley et al., 2017, p. 4). Social scientists (and others) from many disciplines can contribute to such analysis, for example, exploring the different types and modes of journey that are 'replaced' or adapted, and how these effects influence other aspects of everyday life, with ramifications for energy demand.

A key challenge for researchers is to break down complex webs of relationships into parts that can be analysed, while retaining an awareness of wider systemic processes. Researchers will need to be open to diverse forms of cross-sectoral influence, and to all kinds of 'rebound' and 'spillover' effects, far beyond those conventionally addressed by energy studies. They will need to creatively integrate data, draw on diverse techniques to explore causal relationships, and forge new relationships across disciplinary boundaries. One example of exciting work in this direction is that of Blue (2017) on the temporal rhythms of healthcare. Another excellent example of how non-energy policies can be researched in practice is provided by Green and Fahy (2020), who connect policy agendas of growth, modernization and neoliberal development, as well as specific policies on work, education and health, with shifts in energy-demanding practices in everyday life.

Energy researchers can also draw on theoretical concepts from other fields, for example, in the health field there is a concept of 'obesogenic environments' (Egger and Swinburn, 1997), referring to environments which contribute to obesity. We might ask what kinds of spaces and places would contribute to a less-energy demanding way of life (Kirk et al., 2010). Within transport studies it is generally accepted that mobility demand is 'derived' and affected by 'non-transport' policies, such as land-use planning, economic and employment policies, or those on education or leisure (Brown, 2017; Hallsworth et al., 1998; Santos et al., 2010). In these two examples, we are not suggesting that research has fully taken on board the implications of cross-sectoral thinking. But there is a degree of understanding that consumers' 'needs' are not fixed: rather, they have trajectories, and are subject to many forms of intervention.

Recognising the implications of non-energy policies for energy demand opens up new questions for research and policy, as well as revealing new opportunities for intervention and change. Ultimately, the processes of cross-sectoral governance discussed here serve as further evidence of the need for a nuanced and trans-disciplinary understanding of energy in society.

<a> Acknowledgements

This work was supported by the DEMAND: Dynamics of Energy, Mobility and Demand Research Centre funded by the Engineering and Physical Sciences Research Council [grant number EP/K011723/1] as part of the Research Councils UK Energy Programme and by EDF as part of the R&D ECLEER Programme. This chapter draws on the authors' work in collaboration with Elizabeth Shove.

<a> Endnotes

[1] The Centre for the Dynamics of Energy, Mobility and Demand; see: www.demand.ac.uk

[1] We analysed Estates data provided by the Higher Education Statistics Agency (HESA), accessed 28 January 2020 at www.hesa.ac.uk/data-and-analysis/estates/environmental.

[1] Analysis of Finances data from HESA, accessed 28 January 2020 at www.hesa.ac.uk/data-and-analysis/finances/table-7#.

[1] The importance of building opening hours has also been highlighted by work on 24-hour labs at Oxford University; see: www.sustainabilityexchange.ac.uk/files/midnight_oil_case_study_aug_2012.pdf

[1] An emerging field focuses on quantifying and communicating how energy efficiency can support organizations' core goals, e.g. the M-Benefits project (see www.mbenefits.eu).

<a> References

Adelle, C., and Russel, D. (2013), 'Climate Policy Integration: a case of Déjà Vu?', *Environmental Policy and Governance*, **23** (1), 1–12.

Banister, D. (1999), 'Planning more to travel less: land use and transport', *Town Planning Review*, **70** (3), 313–338.

Bel, G. and Joseph, S. (2015), 'Emission abatement: untangling the impacts of the EU ETS and the economic crisis', *Energy Economics*, **49,** 531–539.

Blue, S. (2017), 'Reducing demand for energy in hospitals: Opportunities for and limits to temporal coordination', in A. Hui, R. Day and G. Walker (eds), *Demanding Energy: Space, Time and Change*, New York: Palgrave Macmillan, pp. 313–338.

Bollen, J., Hers, S. and van der Zwaan, B. (2010), 'An integrated assessment of climate change, air pollution, and energy security policy', *Energy Policy***, 38,** 4021–4030.

Bradford E. (2015), 'Single hospital rooms - a good idea?', accessed 14 January 2018 at www.bbc.co.uk/news/uk-scotland-34043427.

Braun, T. and Glidden, L. (2014), *Understanding Energy and Energy Policy*, London: Zed Books Ltd.

BriteGreen (2017), 'University of Sussex 2020 Carbon Target: Progress Report for the Academic Year 2015/16', London: BriteGreen.

British Renal Society (2015), National Home Adaptation and Reimbursement Guidance for People Undertaking Dialysis at Home, accessed 17 January 2020 at www.kidneycareuk.org/documents/54/Home_dialysis_reimbursement_guidance.pdf.

Brown D. (2017), 'The enormous potential of cities to reduce GHG emissions: 571 strategies adopted by 44 cities around the world', accessed 15 February 2018 at www.ethicsandclimate.org/2017/09/01/the-enormous-potential-of-local-governments-to-reduce-ghg-emissionsa-paper-that-identifies-571-strategies-adopted-by-44-cities-around-the-world.

Committee on Climate Change (undated), What can be done, accessed 2 August 2018 at www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/what-can-be-done.

Committee on Climate Change (2018), 'An independent assessment of the UK's Clean Growth Strategy: From ambition to action', accessed 5 October 2020 at www.theccc.org.uk/wp-content/uploads/2018/01/CCC-Independent-Assessment-of-UKs-Clean-Growth-Strategy-2018.pdf.

Cox, E., Royston, S. and Selby, J. (2016), 'The impacts of non-energy policies on energy systems: A scoping paper', London: UKERC.

Deem, R., and Brehony, K. J. (2005), 'Management as ideology: the case of 'new managerialism' in higher education', *Oxford Review of Education*, **31** (2), 217–235.

De Melo, C. A., De Martino Jannuzzi, G., and De Mello Santana, P.H. (2018), 'Why should Brazil to implement mandatory fuel economy standards for the light vehicle fleet?', *Renewable and Sustainable Energy Reviews*, **81** (1), 1166-1174.

Department for Business, Energy, Innovation and Skills (2019), Energy Consumption in the UK (ECUK); End Use Tables, accessed 28 January 2020 at www.gov.uk/government/statistics/energy-consumption-in-the-uk.

Department for Business, Energy and Industrial Strategy (2018), The Clean Growth Strategy: Leading the way to a low carbon future, accessed 18 March 2020 at www.gov.uk/government/publications/clean-growth-strategy.

Department of Business, Innovation and Skills (2015), 'Fulfilling our potential: teaching excellence, social mobility and student choice', London: TSO.

Department for Environment, Food and Rural Affairs and Cabinet Office (2016), 'Greening Government Commitments: Overview of Reporting Requirements 2016–2020', London: Department for Environment, Food and Rural Affairs and Cabinet Office.

Department of Health (2013), 'Adult in-Patient Facilities: Planning and Design', London: Department of Health.

Eccleston, C.H. and March, F. (2011), *Global Environmental Policy: Concepts, Principles and Practice*, Boca Raton, FL: CRC Press.

Egger, G. and Swinburn, B. (1997), 'An 'ecological' approach to the obesity pandemic', *BMJ*, **315,** 477–480.

End Use Energy Demand Centres (2018), Energy efficiency: the missing piece in the Energy Cost Review jigsaw, accessed 2 August 2018 at www.eueduk.com/energy-efficiency.

Greene, M. and Fahy, F. (2020), 'Steering demand? Exploring the intersection of policy, practice and lives in energy systems change in Ireland', *Energy Research & Social Science*, **61,** 101331.

Hallsworth, A., Tolley, R., and Black, C. (1998), 'Transport policy-making: the curse of the uncomfortable consequence', *Journal of Transport Geography*, **6** (2), 159–166.

He, S.Y. and Giuliano, G. (2017), 'School choice: understanding the trade-off between travel distance and school quality', *Transportation,* **44,** 1-24.

Hemsley-Brown, J., and Oplatka, I. (2006), 'Universities in a competitive global marketplace: A systematic review of the literature on higher education marketing', *International Journal of Public Sector Management,* **19** (4), 316–338.

Higher Education Funding Council for England (2014), 'Sustainable Development in Higher Education: HEFCE's Role to Date and a Framework for its Future Actions', Bristol: Higher Education Funding Council for England.

Jordan, A. and Lenschow, A. (2010), 'Environmental policy integration: a state of the art review', *Environmental Policy and Governance*, **20** (3), 147–158.

Ling, T. (2002), 'Delivering joined-up government in the UK: dimensions issues and problems', *Public Administration*, **80** (4), 615–642.

Lynch, K. (2006), 'Neo-Liberalism and Marketisation: The Implications for Higher Education', *European Educational Research Journal*, **5** (1), 1–17.

Marshall, J.D., Wilson, R.D., Meyer, K.L., Rajangam, S.K., McDonald, N.C. and Wilson, E.J. (2010), 'Vehicle Emissions during Children's School Commuting: Impacts of Education Policy', *Environmental Science and Technology,* **44** (5), 1537–1543.

Molesworth, M., Scullion, R., and Nixon, E. (eds) (2011), *The Marketisation of Higher Education and the Student as Consumer*, Abingdon and New York, NY: Routledge.

Morgan, N. (2011), 'Carbon Emission Accounting – Balancing the books for the UK, Energy Insight briefing paper', London: UKERC.

Moser, C. and Moser, A. (2005), 'Gender mainstreaming since Beijing: a review of success and limitations in international institutions', *Gender and Development,* **13** (2), 11–22.

Pennington, H., and Isles, C. (2013), 'Should hospitals provide all patients with single rooms?', *BMJ,* **347**, 24.

Priestley, S., Baker, C. and Adcock, A. (2017), 'Superfast Broadband Coverage in the UK, House of Commons Briefing Paper CBP06643', London: House of Commons Library.

Rees, T., (2005), 'Reflections on the uneven development of gender mainstreaming in Europe', *International Feminist Journal of Politics*, **7** (4), 555–574.

Reid, J., Wilson, K., Anderson, K.E., and Maguire, C.P.J. (2015), 'Older inpatients' room preference: single versus shared accommodation', *Age and Ageing,* **44** (2), 331–333.

Rinkinen, J., Shove, E., and Marsden, G. (2020), *Conceptualising Demand: Distinctive approaches to consumption and practice*, London: Routledge.

Rosenow, J. and Galvin, R. (2013), 'Evaluating the evaluations: Evidence from energy efficiency programmes in Germany and the UK', *Energy and Buildings,* **62,** 450–458.

Royston, S. (2016), 'Invisible energy policy in Higher Education', in DEMAND conference proceedings, Lancaster: DEMAND, accessed 1 August 2018 at www.demand.ac.uk/wp-content/uploads/2016/05/Royston-Invisible-energy-policy-in-HE.pdf.

Royston, S. and Foulds, C. (2019), 'Use of evidence in energy policy: the roles, capacities and expectations of Social Sciences and Humanities: Scoping workshop report', Cambridge: Energy-SHIFTS.

Royston, S., Selby, J. and Shove, E. (2018), 'Invisible energy policies: A new agenda for energy demand reduction', *Energy Policy,* **123,** 127-135.

Royston, S., Selby, J. and Kesidou, S. (2020), 'Governing energy in organisations: Energy management professionals, marginalised practices, and the limits to change', *Environmental Policy and Governance*, 1– 16, published online before publication at https://doi.org/10.1002/eet.1914.

Santos, G., Behrendt, H., and Teytelboym, A. (2010), 'Part II: policy instruments for sustainable road transport', *Research in Transportation Economics*, **28** (1), 46–91.

Shove, E. (2003), 'Converging Conventions of Comfort, Cleanliness and Convenience', *Journal of Consumer Policy,* **26,** 395–418.

Shove, E. (2018), 'What is wrong with energy efficiency?', *Building Research and Information*, **46** (7), 779-789.

Smith, A. (2009), 'Energy governance: the challenges of sustainability', in I. Scrase and G. MacKerron (eds), *Energy for the Future: A New Agenda*, Basingstoke: Palgrave Macmillan, pp. 54–76.

Sustainable Development Unit (2012), 'Goods and services carbon hotspots', Cambridge: Sustainable Development Unit.

Sustainable Development Unit (2014), 'Sustainable, Resilient, Healthy People & Places: a Sustainable Development Strategy for the NHS, Public Health and Social Care System', Cambridge: Sustainable Development Unit.

Sustainable Development Unit (2016), 'Securing Healthy Returns: Realising the financial value of sustainable development', Cambridge: Sustainable Development Unit.

Takahashi, S.J., (2019), 'Seizen-setsu and the inadequacy of voluntary frameworks', in M. Mullen, D. Polomski, T. Soares, J. Cassinerio, M. D'Cruz, and V. Hongsathavij (eds), *Navigating a New Era in Business and Human Rights*, Lincoln, Nebraska: Article 30, pp. 57-62.

Vera, M. (2014), 'Features of energy efficient upgrade of historic buildings: Illustrated with the example of Saint-Petersburg', *Journal of Applied Engineering Science*, **12** (1), 1-10.

Wadud, Z., Royston, S. and Selby, J. (2019), 'Modelling energy demand from higher education institutions: A case study of the UK', *Applied Energy*, **233-234**, 816-826.

Weisbrot, M. (2014), 'Why has Europe's Economy Done Worse Than the US?', accessed 13 March 2018 at www.theguardian.com/commentisfree/2014/jan/16/why-the-european-economy-is-worse.

Zhuang, G., (2008), 'How will China move towards becoming a low carbon economy?', *China and World Economy*, **16** (3), 93–105.

[i] The Centre for the Dynamics of Energy, Mobility and Demand; see: www.demand.ac.uk
[ii] We analysed Estates data provided by the Higher Education Statistics Agency (HESA), accessed 28 January 2020 at www.hesa.ac.uk/data-and-analysis/estates/environmental.
[iii] Analysis of Finances data from HESA, accessed 28 January 2020 at www.hesa.ac.uk/data-and-analysis/finances/table-7#.
[iv] The importance of building opening hours has also been highlighted by work on 24-hour labs at Oxford University; see: www.sustainabilityexchange.ac.uk/files/midnight_oil_case_study_aug_2012.pdf
[v] An emerging field focuses on quantifying and communicating how energy efficiency can support organizations' core goals, e.g. the M-Benefits project (see www.mbenefits.eu).