CHAPTER 6

UK Responses to the Energy Challenge: Dominant Framings and New Imaginaries

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Abstract The chapter identifies dominant framings of contemporary energy challenges and possible responses in relation to developments in the UK. It summarises national trends in energy consumption and the material, societal and policy factors that influence them. Examples are provided of energy campaigns and sustainable energy consumption initiatives that illustrate different problem framings of energy challenges. A 'good practice' example of a UK initiative that involves changes in complex interactions demonstrates the value of the complex approach that targets energy use along with other aspects of sustainable living. The chapter concludes by pointing to an alternative framing and imaginary that could tackle climate change more effectively.

Keywords 'BedZED' · Energy policy · Good practice · Imaginaries · Problem framings

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Introduction

This chapter outlines developments in UK national energy policies and Sustainable Energy Consumption Initiatives (SECIs), exploring dominant framings for current energy challenges and possible solutions. The chapter identifies approaches that rely on alternative problem framings (or 'imaginaries' c.f. Genus and Iskandarova 2018; Jasanoff and Kim 2009) that may be better adapted to addressing these challenges.

The chapter consists of six sections. The section "Socio-Material Dynamics of Domestic Energy Use" introduces socio-material aspects of energy use in households. The next section, "Energy Policy in the UK", provides a brief summary of nationally specific trends and their manifestation in energy policy in the UK with implication for energy consumption. The section "Trends in Energy Campaigns and Types of Sustainable Energy Consumption Initiatives in the UK" gives examples of energy campaigns and SECIs that illustrate the different problem framings of energy discussed in Chapter 2 (see also Jensen et al. 2017). The section "BedZED: A 'Good Practice' Example" provides a *good practice* example of a national SECI that corresponds to the 'changes in complex interactions' category in the problem framing typology. Finally, the section "Concluding Remarks" summarises how the energy challenge is currently typically framed in the UK, while pointing to an alternative imaginary or framing which could tackle the challenge more effectively.

Socio-Material Dynamics of Domestic Energy Use

According to the Department for Business, Energy & Industrial Strategy, the domestic sector accounts for more than a quarter of total energy consumption in the UK (28% in 2017). The fuel mix has changed significantly since 1970, when 49% of final energy consumption was provided by solid fuels and 24% by gas; these days the balance looks very different—1.6 and 66% respectively (BEIS 2018). In the UK, space and water heating accounts for 80% of final domestic energy consumption, which is also susceptive to temperature fluctuations. In addition to weather-related factors, energy consumption is affected by household characteristics including the age of housing, efficiency measures (e.g. level of insulation) and the usage of appliances (BEIS 2018). Air conditioning is not a common feature in British houses; fireplaces as well as outdoor heaters and power showers are more popular. An additional factor to be considered

is the level of comfort required, i.e. a reasonable level of warmth, which varies over time. The average room temperature in the UK is around 18 degrees (compared with 12 degrees in 1970), and, on average, UK homes are heated for 8 hours per day in winter. About 70% of UK homes with central heating heat their homes twice per day and occasionally boost the heating when required (OVO Energy 2018). Energy prices and relative incomes also impact consumption levels. In the period since 2005, gas and electricity prices have more than doubled. This significant increase in fuel prices, combined with an economic downturn, is likely to reduce consumption as consumers became more conscious of their household budgets (BEIS 2018).

The UK housing stock is old compared with most European countries. As a result, many houses have poor insulation, resulting in additional consumption to maintain a given level of comfort. Nonetheless, older housing stock is being gradually replaced with newer, more energy efficient homes. Therefore, there have been some key changes to household characteristics, as well as energy efficiency measures (e.g. more efficient boilers; installation of double glazing; cavity wall insulation), which have put downward pressure on energy use (BEIS 2018).

People in the UK prefer living in houses to flats. This is partially explained by assumptions about respect for privacy and independence, and pride in ownership. Additionally, houses are typically 'freehold', i.e. includes the ownership of both the building and the land, in contrast with flats or apartments, which in England and Wales are most commonly owned on a leasehold basis. The UK is also the only EU country not to have minimum-space standards for homes; as a result, it has the smallest new homes in Europe, significantly smaller than 100 years ago (Henley 2012).

Energy Policy in the UK[1]

UK energy policy today seeks to deliver solutions to the so-called energy 'trilemma'—the perceived need for secure, affordable and clean energy supplies for the UK's economic success. Although the UK has pursued a centralised approach to energy for many decades, the government and other interest groups intend to develop decentralised energy and storage systems

[1]This chapter was written at the time when the UK was in the process of Brexit negotiations. There may be changes to energy and climate areas when the UK leaves the EU.

and replace significant volumes of large, transmission-connected fossil-fuel power stations with smaller, often distribution-network-connected, renewable generation technologies such as wind and solar. This fundamental shift will have implications for how the energy system is operated.

A catalyst for the growth of renewables is the legal requirement that the UK provide at least 15% of its energy from renewable energy sources by 2020, with the Department of Energy and Climate Change (DECC) being established in 2008 to deliver this target. The Climate Change Act 2008 is part of the UK government's plan to reduce greenhouse gas emissions. The UK Renewable Energy strategy 2009 was instituted as an action plan for delivering the UK's renewable energy objectives, and the Feed in Tariff (FiT) scheme was launched in 2010 as a policy mechanism to accelerate investment in renewable energy.

Through its Microgeneration Strategy, launched in 2011, and the Renewable Heat Incentive, the coalition government put in place a range of financial incentives to encourage the deployment of small-scale, on-site, renewable energy. This was followed by the announcement of the Green Deal Scheme, a programme for building refurbishment i.e. energy-saving improvements (the government scheme was closed in 2015 and relaunched in 2017 as the Green Deal Finance company backed by private investors). The energy efficiency agenda was underpinned by the Energy Efficiency Strategy of 2012, which set the direction for energy efficiency policy, and identified steps to stimulate the energy efficiency market.

The UK government's first ever Community Energy Strategy was launched in 2014. It aimed to encourage communities to play a greater role in achieving energy and climate change goals, e.g. community involvement in generating electricity. Recent years have seen a growth in small-scale installations of renewable energy aided by the UK FiT, but since the UK general election in 2015, there have been substantial, negative changes to support for key renewable energy technologies (e.g. significant reduction of FiT).

The electricity market reforms aimed to attract investment needed to replace and upgrade the UK's electricity infrastructure and enable it to meet the growing demand for electricity. One of the key mechanisms of the reform is Contracts for Difference. It is designed to support investment in new low-carbon generation, with a technology-dependent fixed price (BEIS 2015/2017). The reform was underpinned by the Energy Act 2013, which aimed to maintain a stable electricity supply as coal-fired power stations are retired.

A recent development aimed to promote the deployment of innovative technologies in the design of an electricity system based on smart metering and supporting infrastructure. The government is committed to ensuring that smart meters are offered to every home and small business by the end of 2020, enabling smart tariffs and other benefits for consumers, arguably putting consumers in control of their energy use.

Given that fuel poverty affects over 4 million UK households (roughly 15% of all households), it is not surprising that fuel poverty and energy efficiency are the focal points of policy discourse and energy campaigns in the UK. There have been a number of government schemes in recent years aimed at reducing fuel poverty: the Warm Front Scheme ran until January 2013, its replacement the Energy Company Obligation (ECO) scheme (and a subsequent version known as the Affordable Warmth Obligation) began in early 2013; it offers grants for energy-saving improvements to people's homes, such as insulation works or heating system upgrades. The Social Fund Cold Weather Payments scheme runs from 1 November to 31 March each year for those receiving certain benefits payments in Great Britain (e.g. Pension Credit, Income Support, Universal Credit, Support for Mortgage Interest). The Warm Home Discount Scheme provides discounts on electricity or gas bills during the winter months for those receiving Pension Credit and those on a lower income. A Winter Fuel Payment also helps those who qualify for the scheme pay heating bills. The 2015 Fuel Poverty Strategy for England aims to improve the homes of the fuel poor by 2030 achieving where possible a minimum energy efficiency rating of Band C.

Trends in Energy Campaigns and Types of Sustainable Energy Consumption Initiatives in the UK

Concerns about fuel poverty and energy efficiency are at the heart of energy campaigns and some initiatives in the UK. They often target energy users by providing information and advice regarding energy bills and choosing a supplier, particularly for low-income households. Between 2012 and 2015, the Energy Bill Revolution/Campaign for Warm Homes & Lower Bills movement aimed to raise public awareness about the UK's cold home crisis, and to gain support for making home energy efficiency an infrastructure investment priority that would also help end fuel poverty, reduce carbon emissions and create green jobs. Other campaigns, such as the Clean British Energy

campaign (run by Friends of the Earth) are more concerned with moving away from reliance on fossil fuels and cutting carbon from the energy system. The campaigns sponsored by energy companies such as British Gas, EDF Energy, E.ON, npower, ScottishPower and SSE aim to cut the number of deaths and injuries caused by carbon monoxide poisoning.

The most prevalent type of SECIs in the UK are those directed at changing individual behaviour or involving energy efficiency-related technical change—a tendency that accords with findings across the countries investigated as part of the ENERGISE project. Energy efficiency and reduction of energy use and carbon emissions (resulting in carbon-neutral or low-carbon living) are declared as the main objectives pursued by SECIs. The issue of fuel poverty is still addressed directly only by a handful of the SECIs. This can be partly explained by the fact that SECIs are usually carried out by communities with sufficient resources for investing in those initiatives. Smart metering and use of technology for monitoring energy consumption and emissions are among priorities for the UK SECIs. A community engagement element and an inclusive approach are important for many UK energy initiatives, e.g. in community renewable energy projects, which often represent active involvement of citizens who participate in local electricity generation.

Although citizens in the UK are often portrayed as passive energy consumers for whom policy-makers attempt to deliver 'affordable' energy and competitive markets, the overview of SECIs in the UK illustrates the potential to address issues of domestic energy consumption somewhat differently. The example presented in the following section demonstrates how the energy challenge is framed and addressed as an essential part of a contemporary sustainable living concept.

BedZED: A 'Good Practice' Example

The good practice example discussed here, the 'BedZED' development in a suburb of London, is among initiatives that aim to change 'complex interactions' in relation to energy. BedZED is a short name for Beddington Zero (Fossil) Energy Development. There are several such eco-developments in the UK, developed by Bioregional Development Group, which was founded as a registered charity in 1994 by environmental activists concerned about the effects of unsustainable consumption on the environment.

BedZED, a purpose-built eco-village, is located in the borough of Sutton, in south London. The developer's website describes it as the 'UK's first large-scale, mixed use sustainable community with 100 homes, office space, a college and community facilities'. Completed in 2002, it has dwellings of various sizes and tenures, which include 82 houses, 17 apartments and 1405 m^2 of workspace. The aims of the development are stated to be: to show what a 'truly sustainable community looks like'; to reduce ecological footprint of contemporary living and reduce carbon emissions related to consumption of heating and lighting, water, food, transport and waste. In addition to the sustainability of the finished BedZED product, every aspect of construction was considered in terms of its environmental impact. Materials used in construction were selected for low environmental impact, sourced locally where possible and from reclaimed and recycled materials where feasible.

Criteria for measuring performance include monitoring electricity, heat and water consumption; car ownership and miles travelled, air miles travelled, bicycle ownership; number of households who grow their own food; organic vs non-organic food consumption; recycling rates; proportion of the foregoing in, and the total carbon footprint of BedZED. Though it is prudent to exercise caution in interpreting any ongoing, and as yet relatively short-lived phenomenon, the BedZED initiative can be considered to be a success. A survey in 2007 showed that BedZED's total energy consumption was 82.4 kWh/m^2/year, compared with a UK residential total of 275.3 kWh/m^2/year; monitoring showed that BedZED households used 2579 kWh of electricity per year, which is 45% lower than the average in Sutton (Hodge and Haltrecht 2009). BedZED (2007) related carbon emissions were 19.9 CO_2/m^2/year, compared with the UK average of 63.3 CO_2/m^2/year (based on dwellings built in 2002). Between 2012 and 2015, BedZED's annual gas consumption was 36% lower than a typical conventional development in Sutton of the same size and mix, and the annual electricity consumption was 27% less. An on-site car club, ample secure cycle parking, good public transport links and only 0.6 car parking spaces per home resulted in reduction in travel-related greenhouse gas emissions, which was 53% less CO_2 eq than the UK average (Schoon 2016). An earlier 2007 survey found that 17% of BedZED residents travelled to work by car, compared with the then Sutton average of 49%.

BedZED residents share an understanding of the initiative as a template for more sustainable living based on the unique design of the homes (e.g. allows using more of daylight, passive ventilation, passive solar gain),

sense of community, the garden and conservatory-like 'sunspaces', the 'green' features of homes, the pioneering car club and reduced energy bills. Monitoring shows that sustainable lifestyles account for around half the eco-savings at BedZED, and energy demand is dramatically reduced compared with an equivalent conventional development. Small-scale, on-site energy generation included a biomass CHP plant (this hadn't reached the agreed outputs and was replaced in 2005 by three conventional natural gas-fired boilers) and photovoltaic panels (Schoon 2016). Homes are fitted with energy efficient and water-saving appliances, visible meters and 'super' insulation. Critics of the initiative would, however, point to the high cost of completing the development, and problems with the originally envisaged on-site energy plant and water treatment facilities. Although the energy consumption in the homes is much lower than average, residents living in BedZED are unable to get to a 'one planet living level'; residents had an average ecological footprint of about 2.5 planets' worth (with a potential to reduce it down to 1.9–1.7 planets) (Hodge and Haltrecht 2009).

Nonetheless, BedZED demonstrates the value of a complex approach that targets energy use along with other aspects of sustainable living (e.g. water use, transport, waste). Professional design (though not by citizens) combined with financial contribution from households provided a winning combination of expertise and involvement of residents. In the BedZED example, energy use is treated as an outcome of material and social organisation; an environment that is susceptible to more sustainable practices is created, and community building is seen as a crucial element of a sustainable living initiative. The BedZED example suggests that a more holistic approach to sustainable energy could be effective if adopted by policy-makers. Supporting sustainable/eco developments, where energy is addressed and understood in the context of related sustainable practices, could make sustainable living (including energy consumption) more attractive and easier to achieve.

Concluding Remarks

It is recognised by the UK government that the participation of a diverse range of actors can facilitate the development of a more efficient smart and flexible energy system. In a recent consultation, BEIS announced the aim of the reform as maximising the ability of consumers to play an active role in managing their energy needs (BEIS/Ofgem 2016). However, the emphasis is on communicating effectively the benefits of

smart meters and intelligent devices to manage energy use. This will not necessarily mean greater consumer engagement, and the focus of policy is still on reducing energy demand rather than citizens becoming 'prosumers'.

Overall, UK policy and other actors tend to frame the energy challenge and responses to it as requiring individual behaviour change or the diffusion of energy efficiency-related technology. The examples of UK initiatives featuring in the ENERGISE database support this viewpoint. However, there are cases that frame the challenge differently. For example, at BedZED unsustainable energy use is framed as a fundamental problem concerned with our way of life. Thus, energy use, practices and change are bound up with material and social organisation and the ways in which a community of people can live their everyday lives, rather than the outcome of individual actions or technology deployment.

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