

Challenges of designing and delivering effective SME energy policy

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Keywords

SME, policies and measures, energy demand

Abstract

SMEs (small and medium enterprises) are widely acknowledged as a difficult target for energy policy. This is in part due to their diversity: they operate in every sector, in all property types and vary from one person operations with no business premises, to manufacturers with up to 250 employees. Their energy use is poorly understood: evidence on where, why and how much energy they use is incomplete. This paper uses theory, literature review and examples from the UK and France to investigate where the major difficulties arise in designing effective, economic and equitable policy for SMEs, and suggests how this might be improved. Firstly, the policy context is described with reference to the scale and characteristics of SMEs. Available data on their energy use and potential for savings are presented from literature, followed by a discussion of different models of understanding SME decision-making. Three categories of options available to policy makers are described: (1) designing 'universal' policy (2) developing organisational policy designed with minimum obligation thresholds, and (3) deploying measures specifically targeted at SMEs. We argue that the focal unit of policy design is the crucial factor influencing whether SMEs are likely to be included in scope. Where the organisation is the primary focus, SMEs are more likely to be exempted, whereas universal policy such as those focused on products, buildings or technologies may hold potential for extending the benefits of energy efficiency to SMEs. Targeted SME policies largely consist of incentives and information provision, and are typically delivered by business support organisations with primary aims

to support economic growth. We argue that while there are benefits from utilising existing support networks for delivering energy efficiency programmes, SMEs with stable business plans are deprioritised, and contradictory effects may arise.

Introduction

With the Paris Agreement (UNFCCC, 2015) now ratified by the majority of nations in Europe, the emphasis shifts to developing energy and climate policy fit for meeting the ambitious target of limiting global average temperatures to 2 °C of warming. Emissions reductions from all sectors of the economy will be required for this feat, including the commercial and industrial sectors, of which small and medium-sized enterprises (SMEs) represent a significant proportion. A recent study estimates that SMEs collectively consume more than 13 % of energy globally, and that significant opportunities exist to implement energy efficiency measures with potential for savings of up to 30 % (IEA, 2015). However, in many priority areas such as energy efficiency and low-carbon heat, 'SMEs are poorly addressed by existing policies' (Committee on Climate Change, 2016).

Whereas a range of policies have been developed in the UK and France to ensure that corporations take steps to mitigate climate change according to the 'polluter pays' principle, SMEs are often exempted from regulation, taxes and market-based mechanisms. The rationale for these exclusions is expressed by a narrative of protecting SMEs from the burden of bureaucracy and paper-work, which are perceived as barriers to growth and productivity (Cabinet Office, 2016). SMEs are considered to have limited capacity for economies of scale, to suffer from lack of information, time or expertise to deal with regulations or

administrative rules, and to find it more difficult or expensive to access capital than larger organisations. Thus regulation has a disproportionate effect in terms of cost and administration on SMEs (Nyman, 2016). The term 'red tape' (excessive bureaucracy or adherence to official rules) dates back to the 16th century, being used to bind the eighty petitions issued to the Pope by King Henry VIII when seeking a divorce from Catherine of Aragon (Dickson, 2014). Its negative connotations still pervade European political discourse today. The European Commission has held a conference and competition for 'Red Tape Reduction' (High Level Group on Administrative Burdens, 2014), while the UK regularly surveys businesses' perceptions of regulation (BEIS, 2016) and has created a programme called 'Cutting Red Tape' which reviews policy in different sectors on a rolling basis (Cabinet Office, 2016).

Acknowledging the strength of resistance to SME regulation, this paper identifies the challenges faced by policy makers tasked with reducing energy consumption and carbon emissions from the commercial and industrial sectors, and presents some alternative options. The authors' research on SMEs is focused on the UK. However, including perspectives from another country adds both interesting case study material, and the opportunity for comparisons to enrich the analysis of policy design and implementation. France was chosen as it was thought likely to be reasonably similar to the UK - and that therefore the intersection between energy policy and SMEs could be understood without a full comparative analysis. The next section provides context to the policy challenge. It describes the scale and characteristics of the SME population and provides a summary of the available evidence relating to their energy use. The third section describes three categories of energy policy (1) 'universal' approaches (2) organisational policy designed with minimum obligation thresholds, and (3) targeted SME policy. Because SMEs are largely excluded from the second category, a policy gap is identified, and the discussion proposes options for filling this gap by designing policy, which is not focused on the organisational unit. A variety of alternative focal units for policy are identified from academic literature, including legal status, data availability and business practices. Given the prevalence of targeted SME policy taking the form of 'business support', the discussion describes the pitfalls of delivering energy efficiency policy through organisations with a primary remit to deliver economic growth. The conclusion summarises the challenges faced by policy makers, and suggests areas for further research.

Context setting: SMEs as energy consumers

SMEs are defined by only one parameter: size. The European Union defines SMEs as independent organisations with fewer than 250 staff and a turnover or balance sheet of up to €50 m or €43 m respectively. There are an estimated 23 million SMEs in the EU, providing between 53 % and 70 % of employment in different member states (Eurostat, 2015).

SMEs operate in every sector of the economy, varying by sector, management structure, legal status and premises type. SMEs are influential in the energy system as a whole, beyond their role as consumers. For example, representing 86 % of employment in the UK construction sector (1.8 million) and employing 46 % of workers (2.3 million) in the motor vehicles

trade and repair industry. As such they influence the ways in which energy is consumed in the built environment and by the transportation system. In this paper however they are primarily addressed as energy consumers, for which data is imperfect. Whereas the USA measures energy used for manufacturing by business size, and figures are available for SME energy consumption by fuel in Australia, in Europe, figures are largely unavailable at the national scale. For example, while the IEA quotes estimates that 70 % of energy used in the Italian industrial sector comes from SME manufacturers (2015), its cited source (Trianni and Cagno, 2011) includes only an estimate of 'over 60 %', with no further reference provided.

The UK government estimates that SMEs in the UK spend £49.6 bn (€58.6 bn) annually on all forms of energy consumption (DECC, 2016). Of all energy use in non-domestic buildings, SMEs are estimated to represent 57 % of electricity and 50 % of gas demand (DECC, 2015). However, these national figures are approximations, subject to a range of assumptions and currently being revised as part of efforts to improve data on non-domestic buildings and energy consumed by their inhabitants (Nicholls, 2014). Energy consumption in non-domestic buildings does not represent the totality of SME greenhouse gas (GHG) emissions however. 59.4 % of SMEs operate from domestic premises in the UK (BIS, 2015a, 2015b) meaning that when designing policy, simple segmentation based on building type is insufficient to capture the breadth of SME energy demand. Transport also represents a major source of energy consumption by SMEs. It has been suggested that travel demand management may represent the largest opportunity for savings, however disaggregating national travel data to identify SME behaviours is a complex and error-prone task (DECC, 2016).

Context setting: Energy saving potential and decision making

Collecting reliable, representative data on energy used by SMEs at a national scale is a difficult task. This paucity of data poses a challenge to policy makers aiming to quantify and evaluate the impact of existing energy policy on SMEs, and to design new instruments on the basis of evidence. Nonetheless, there is evidence to suggest that energy efficiency opportunities are significant amongst SMEs (IEA, 2015). UK government research estimates that SMEs could reduce energy costs by 18–24 % by maximising on energy efficiency opportunities (DECC, 2014). A report identifies the scale of the 'missed opportunity' for UK SMEs to save between £1.26 bn (€1.49 bn) and £2.63 bn (€3.11 bn) in buildings, with 37 % of the savings requiring zero capital investment (ibid.). Despite the availability low-cost opportunities such as behavioural change and improved operation of energy using equipment to SMEs (ibid.), a recent survey found that more than 60 % of SME owners do not regard energy efficiency as a key priority, and only 1 in 10 had made energy savings in the previous 12 months (Scottish Power, 2016).

Understanding the decision making processes of SMEs is essential for policy-makers encouraging the take up of energy efficiency measures. A considerable literature has focused on the barriers to uptake of energy efficiency measures by SMEs (Brown, 2001; Crocker, 2012; Sorrell et al., 2011; Trianni and Cagno, 2012, 2011). Barriers analysis is based on an economically rational model of decision making, and typically com-

prises studies using interview and self-reported survey data by owners and managers. There are critiques of both the methods used and the underlying theoretical assumptions from researchers in that tradition, and from those outside (Sorrell et al., 2011; Banks et al., 2012). To highlight one methodological problem, in their sample of Italian SMEs for example, Trianni and Cagno (2012) *unsurprisingly* find that their interviewees reported that 'lack of managerial awareness' was their least significant barrier, compared to access to capital or information on investment payback times relating to energy efficient technologies. It seems unlikely that owners and managers would identify their own lack of awareness as a significant barrier, as it is difficult to have insight into personal unawareness. The validity of self-reported barriers is open to question, particularly as an isolated form of evidence. More significantly, if policy makers share the 'rational economic actor' model of SMEs, then policies will be designed to overcome barriers found by research. If this framing only gives a partial account of decision making, removal of the barriers identified is unlikely to deliver the anticipated improvement in energy efficiency.

There is evidence showing that non-economic factors can be important in SME decisions on energy. For example, environmental values can be a significant factor for motivating action on energy efficiency, and the attitudes of individuals can have greater significance for SMEs than for larger organisations (Williams and Schaefer, 2013). However, one of the problems for all empirical research on SMEs is that given their breadth and diversity, it tends to be limited in scale and geography, focusing on individual sectors. What is true for one SME sector, may not be true for others. Whereas pro-environmental values were found to be significant in a small sample of SME owner managers (*ibid.*), a survey of IT professionals found that environmental issues were factored into investment decisions less frequently for SMEs compared to larger organisations where decision making is comparatively more structured and procedural (Quocirca, 2016).

A UK government commissioned report adds depth to a literature focused on drivers and barriers. Building on the energy efficiency 'paradox' (DeCanio, 1998) which uncovers ways in which enterprises do not behave according to rational economic principles, Banks et al. (2012) develop a more complex model for energy behaviours and decision making processes in non-domestic organisations (of all sizes, not just SMEs). They argue that energy behaviours and efficiency investments are embedded in the 'socio-technical landscapes' of organisations, which in turn are framed by broader social, material, market and regulatory domains. This model can help explain empirical evidence of economically 'irrational' behaviours, such as that from a recent study of SME tourism businesses in the south west of England, where energy management was largely absent as a practice, despite energy representing a significant cost base for many surveyed businesses (Coles et al., 2016). While Banks et al's model helps to build a more complete picture of the multiple factors contributing to decision-making by SMEs, it does not easily lead to simple policy solutions. However, the report did make a number of suggestions for policy, including: making energy use more visible and salient; highlighting the strategic importance of efficiency investments; focusing policy on the earlier stages of decision-making - noticing opportunities and assembling options.

It is beyond the scope of this paper to more fully debate the different implications of these decision-making models to policy design. The barriers model is probably still most influential in policy-making, albeit with increasing interest in more complex explanations of organisational behaviours around energy. For the remainder of the paper, policies, which are based on different models of decision-making, are explored equally.

Energy policy approaches

When compiling a list of national and European level policies aimed at reducing GHG emissions from organisations, three categories emerged. Firstly, 'universal' policies include promoting smart technology, innovation or raising efficiency standards for all organisations including SMEs. The second is focused on the organisation as unit, usually taking the form of taxes and regulation, with a minimum size threshold excluding most or all SMEs. A third category of policy includes instruments for SMEs directly, usually in the form of information or incentives such as funding and advice. This section expands on these categories with reference to energy policy in the UK and France.

UNIVERSAL POLICY APPROACHES

Universal policy rarely focuses on the organisation as the target for regulation, tax or incentives, but most often addresses products, markets, infrastructures and technologies. SMEs, like larger organisations and householders, are included in the scope of these policies. The EU's eco-design and energy labelling directive is one example, where minimum efficiency standards are applied to energy consuming products used by all sectors of the economy, such as air-conditioners, refrigerators and lighting appliances. Similarly, the Energy Performance of Buildings Directive (EPBD) sets standards for efficiency in new buildings - domestic and commercial - and requires the publication of energy performance certificates when premises are advertised for sale or rental.

The uptake of smart technologies has been identified by the UK government as holding potential for energy efficiency, representing a potential £8.6 bn (€10.2 bn) savings for SMEs in the UK (DECC, 2016). The report identifies seven significant smart technologies suitable for SMEs, including integrated building management systems (IBMS), remotely managed demand responsive equipment and fleet management software. It finds greatest potential in the accommodation and food service sectors, which consumes significant quantities of energy for space heating, food processing and transportation.

Despite not being identified as one of the technologies with greatest potential in the UK government report, smart meters are being rolled out as a major universal policy, affecting all domestic dwellings and non-domestic buildings. Most large organisations in the UK have already installed smart or advanced meters, so SMEs are at the heart of the UK roll-out, which aims to be complete by 2020. France has a similar smart meter deployment programme, and the approaches to these policies reflect the different traditions of the two countries. Whereas in France the regulated network operator is named as the responsible authority for implementing the roll-out of smart meters, UK electricity suppliers are mandated to install all smart meters. France has selected a single device called 'Linky', and plans to deploy 35 million before the end of 2022, while the UK

regulator has permitted competition amongst suppliers, each in the process of distributing their own branded devices.

Energy market design forms an important part of the national context within which SME policy is set. The key impact of energy markets on SMEs will be on energy prices. Comparisons of national statistics on prices paid by SMEs are not available. Using the prices faced by both households and industrial consumers as a proxy, the data show gas prices are similar in the UK and France, but electricity is significantly cheaper in France (approximately 50 % cheaper for industrial customers in 2015) (Eurostat, 2016)¹. Other market effects on SMEs could include: the incentives available for generating energy or engaging in demand response; the prevalence of ESCOs; and whether innovations in energy supply and service are encouraged.

ORGANISATIONAL ENERGY POLICY DESIGNED TO EXEMPT SMES

A number of policies set at the national and EU level are designed to target large organisations, and exempt smaller energy users. The EU Emissions Trading Scheme (EUETS) for example, seeks to limit emissions from the largest energy-using installations, such as power stations and industrial plants, while the UK's Carbon Reduction Commitment (CRC) – a mandatory carbon reporting and pricing scheme – requires only businesses consuming more than 6,000 MWh of electricity per year to participate. Article 8 of the Energy Efficiency Directive (EED), transposed into national law as France's Mandatory Energy Audit programme and the UK's Energy Savings Opportunity Scheme, requires only large enterprises to carry out regular energy audits. While the rationale of focusing on the largest energy consumers to deliver the greatest change at minimal administrative cost is reasonable, the scale of change required to meet the EU's 40 % GHG reduction target by 2030 (UNFCCC, 2015) means that excluding the collectively significant contribution from SMEs poses a risk to policy-makers.

While policies such as the EUETS and CRC exclude *all* SMEs, another major UK policy – an energy tax called the Climate Change Levy (CCL) – does affect many SMEs. The CCL exemption threshold is low meaning that a large number of SMEs therefore pay the CCL (Enerdata, 2014)². Very significant reductions in Levy rates are available for signatories to Climate Change Agreements (CCAs)³ (Environment Agency, 2014). However it is likely that the majority of SMEs do not benefit from these reductions, as industries which are dominated by SMEs such as construction, vehicle repair and maintenance and those offering professional services are not represented by CCAs. Thus, while the smallest SMEs are excluded from the scope of this policy, most have to pay tax at the full rate and cannot participate in a reduction scheme designed to benefit larger businesses.

Public policy tradition varies between France and the UK, with the former typically implementing policy from the 'top down', with central agencies responsible for administering

regulation; as opposed to publicly funded non-governmental organisations and market based mechanisms more common in the UK. This is typified by an example of resource efficiency policy (where energy is a key resource) – the Producer Responsibility regulations. In force since 1997, the UK's Packaging Regulations have helped to substantially increase recycling rates by placing obligations on manufacturers, processors, wholesalers and retailers of packaging products. A complex market structure was created to share the burden of responsibility, and a market established for trading recycling certificates for each of seven packaging materials (paper, plastic, glass etc), with 50 organisations registered with the Environment Agency as approved 'compliance schemes'. France on the other hand implemented the EU Directive from the 'top down', with only one government-run scheme administering compliance and collecting fees from producers to subsidise the recycling of packaging waste. Given the complexity of compliance in the UK model, small contributors – defined as handling less than 50 tonnes of packaging and with a turnover of less than £2 m (€2.4 m) – are excluded from the regulations. In France on the other hand, where compliance is administratively straightforward, companies of all sizes handling packaging are required to register and contribute towards its recycling subsidy. This example of resource efficiency regulation shows how the different traditions of policy design can influence SMEs; where compliance is considered administratively burdensome, smaller producers are excluded.

TARGETED SME ENERGY POLICY

SMEs are directly affected by universal policies which address technologies, appliances or markets as their focus, whereas when energy policy is designed to target the organisation as the obligated entity, SMEs are often excluded from scope. This leaves a policy gap relating to the significant consumption of energy by SMEs. Table 1⁴ describes energy policy measures designed specifically to target SMEs. Data is drawn from the ODYSSEE-MURE project, which produces a database of energy efficiency data and policies across the EU, including classifying SME measures (ODYSSEE-MURE, n.d.). Consistent with the narrative of cutting red tape for SMEs, energy policies for smaller organisations are largely designed as 'carrots', including incentive schemes and information provision. No 'sticks' such as taxes, regulations or standards exclusively designed for SMEs could be identified across the EU, although as discussed above in relation to the Climate Change Levy in the UK, exemptions may systematically exclude SMEs.

In the UK and France, SME policy is led by the idea of 'business support', with a focus on economic growth, job creation and skills development. In the UK, business support is characterised by continual reform, including the creation and dissolution of a plethora of publicly funded national and local organisations. Blackburn (2012) describes how the national 'Business Link' programme and the Regional Development Agencies were continually restructured throughout the

1. Market design is far from the only influence on price: underlying costs due to fuels, electricity generating technologies and infrastructure are clearly critical, as are government decisions on taxation and levies.

2. This tax is payable on gas (0.195 p/kWh, €0.22 c/kWh) and electricity (0.559 p/kWh, €0.64 c/kWh) consumption for all businesses using more than 4397 kWh/month and 1000 kWh/month respectively.

3. Signatories' CCL payments are reduced by 90 % for electricity and 65 % on other fuels based on commitments to energy and emissions reductions.

4. Non-domestic Smart Meter roll-out: Situation differs in France as gas meter roll-out not mandated. Regulated Network Operator (ERDF) is responsible for funding roll-out (as opposed to suppliers). Although this may be considered a universal policy approach, in practice SMEs are targeted as nearly all larger organisations have smart meters installed.

Table 1. Energy efficiency policies focused on SMEs in France and the UK.

Policy type	Policy sub-type	Policy Detail
Incentives	Business Support initiatives: e.g. Grants, loans, advice	FR&UK: The European Regional Development Fund specifically targets SMEs, with a focus on sustainable growth and job creation. Regional projects focus on local needs, for instance reducing reliance on vehicles, saving time, money and emissions (Hampton, 2016a).
		UK: Local Enterprise Partnerships are handling increasingly significant funds, with a focus on delivering local growth. Many offer direct support to SMEs (e.g. through EU funding), including energy efficiency advice, grants and loans.
		UK: The Energy Saving Trust is funded by government to provide advice, including to SMEs. Loans are available to Scottish SMEs.
		UK: The Carbon Trust hosts an SME network and offers finance and training for energy efficiency.
		FR: ADEME's 'Investment for the Future programme' ("Investissements d'Avenir"): Includes various schemes: 'SME Initiatives' funds innovative SMEs are funded (up to €200,000 granted over 3 years). Ecotechnologies Fund is an SME equity investment fund worth €150m.
		FR: Energy saving certificates (Energy Efficiency Obligation Scheme): A list of energy efficiency products may be paid for with a low interest loan.
		FR: Green Loans: Loans (up to €5m) have low interest rates, and require no guarantee. Used to finance energy efficient or less polluting process or manufacturing eco-products.
Information provision	Energy efficiency advice and publications	UK: DECC's 'SME guide to energy efficiency' provides simple advice on low-cost measures in non-domestic buildings.
		FR: ADEME provides information targeted at businesses on energy efficiency, reducing pollution, transport management and renewable generation.
		UK: Energy utilities are increasingly offering energy savings advice to SMEs (as required by their licence to operate).
Technology adoption	Non-domestic Smart Meter roll-out	UK: Energy suppliers are mandated to install smart meters in all non-domestic properties by 2020. Anticipated benefits include 2.8% energy reduction from improved energy management.

1990s and 2000s, leading to a complex marketplace 'crowded with initiatives'. The Business Link service was closed in 2011 and Local Enterprise Partnerships (LEPs) have since become increasingly influential, supported with significant resources by central government and administering European Structural and Investment Funds, worth €10.8 bn (£9.1 bn) from 2014–2020. Economic growth remains at the heart of business support strategy, with the 39 LEPs mandated to produce 'strategic economic plans' which include transport, skills and inward investment strategy. Energy and environment feature sporadically in LEP strategies, but is sometimes attached to funds they are responsible for handling, such as the European Regional Development Fund (ERDF), which has a funding

stream for supporting SMEs in 'the shift towards a low carbon economy'. With its priorities set at the EU level, ERDF represents the single largest source of funding for SME energy efficiency in both the UK and France, with over €769 m (£650 m) awarded to date for sustainable development and risk prevention projects in France alone (L'Europe s'engage en France, n.d.).

As illustrated in Table 1 the majority of policy designed with SMEs at the centre takes an incentive based approach, with a large proportion of 'business support' taking the form of grants, loans or face-to-face advice. In the UK, business support policy has had varied success. The Richard Report (2008) heavily criticised business support programmes op-

erating under the Labour government (1997–2010), finding that only 34 % of local schemes had been evaluated in any way, and that only 0.5 % of small businesses both used and were satisfied with government funded support services. Despite its national scope and branding, Business Link services achieved between 1 and 20 % market penetration between 2005/6 and 2010/11 (Blackburn, 2012). Such figures appear to illustrate the failure of business support approaches to SME policy, but may in fact be a reflection of targeted approaches. With economic growth and job creation at the heart of business support policy, many programmes are specifically targeted at businesses with employees (32 % of all businesses), and some further focusing on those with the greatest growth potential (*ibid.*). Business Link identified ‘Growth’ and ‘Corporate Growth’ businesses, defining these as ‘critical to the productivity agenda [requiring] pro-active and intensive relationship management by Business Link’. In contrast, more than 2.5m ‘Lifestyle’ businesses were identified, characterised as providing the ‘lowest opportunity for value uplift in terms of each individual business and the UK’ (Business Link Segmentation Model 2005–06, cited by Blackburn, 2012). These approaches to targeting growth-oriented businesses continue to dominate the strategic plans of business support organisations such as LEPs, influencing the ways that energy efficiency incentive programmes are implemented.

Despite the significant provision of incentive-based policy for SMEs, little effort is made to quantify and aggregate emissions and energy savings brought about by business support initiatives at the national scale, and neither the UK or French Article 7 submissions – setting out how national energy savings targets will be met under the EED – include any reference to SME business support policies (European Commission, 2016). In the ex-post evaluation of the 2007–2013 ERDF programme which included an estimate of 152,219 jobs created, the only mention of CO₂ emissions savings was in a small scale case study, despite being a strategic priority (European Commission, 2016). If incentive based schemes such as those funded by ERDF were to be quantitatively evaluated and formally included in the UK’s energy reduction targets, they may benefit from greater prominence, monitoring by central government and rigorous evaluation. Such an exercise would pose a significant challenge however, as estimates of emissions savings for projects delivered at the local level often fail to follow carbon accounting principles (Hampton, 2016a).

Discussion

Energy policy focused on the organisation as the target unit in the UK and France frequently includes minimum thresholds and exemptions for SMEs, particularly in relation to taxes and regulatory instruments. This is strongly influenced by a narrative, which seeks to minimise red-tape for SMEs, acknowledging their comparatively lower administrative capacity. The approach to policy making seems similar in both countries, with EU-level policy obviously being influential in reducing national differences. However, the UK’s more market-focused approach to policy design can increase complexity, and result in SMEs being exempted from policy initiatives (e.g. recycling of packaging). Where efforts are made to plug the gap created by regulatory exemptions, these are led by ‘carrots’ such as in-

centive schemes, advice and information provision. However, the fact that energy and emissions savings from these policies are not included in national targets suggests that there is little pressure from central government to rigorously and quantitatively evaluate and aggregate impacts.

This discussion builds on these findings by presenting two distinct arguments. Firstly we argue that while ‘carrot’ approaches are crucial for reducing emissions from SMEs, these are not sufficient to achieve the scale of carbon reductions required to meet the EU’s emissions reductions targets. Universal approaches such as building regulations and product standards present opportunities for extending energy efficiency throughout the economy, but usually involve hard-fought legislation. Approaches, which focus on smart technologies, building tenancy infrastructures or business practices may help policy makers at the national level to target policies at SMEs in ways which avoid additional administrative burden. Second, we argue that while incentive based programmes, which target SMEs are essential, questions remain over the ways in which these are delivered by business support organisations, which primarily exist to promote economic growth and job creation. We argue that low carbon initiatives and energy efficiency programmes are ‘bolted-on’ to these priorities, meaning that SMEs with stable business plans are deprioritised, and ‘contradictory’ effects may arise (Marsden et al., 2014).

POLICY FOCUS AND FRAMING

SMEs are less likely to be excluded from policy when the unit of focus is not the organisation, but technologies, products, accreditation or buildings. These policies are more politically palatable than taxes and regulations placed on businesses and can have significant impact on emissions reductions (European Commission, 2015). Therefore, in the design of such approaches, the target of the policy becomes crucial. Table 2 sets out a number of ways in which energy policy can define its unit of focus.

Table 2 shows that there are a number of options for policy makers to design approaches other than by focusing on characteristics of organisations such as size, sector, location or business strategy. As a *diagnostic* category, size highlights the nature of the SME energy policy gap, but as organisations with fewer than 250 employees are so diverse, it is not an adequate basis on which to designing effective solutions. As described in section 3.2, the number of policies targeting the organisation as the unit of focus which exclude smaller users implies that seeking alternative approaches may offer potential to include SMEs in scope, and help to close the policy gap.

Alternative policy approaches serve different purposes. When focused on individual technologies, problems, or building types, policy is driven by particular outcomes, such as increasing the proportion of distributed renewable energy generation, reducing air pollution in urban areas, or increasing efficiency in space heating or lighting. Although such pro-environmental policies inevitably face resistance from a variety of sources such as industry incumbents, the lobby which seeks to protect SMEs from burdensome regulation is not mobilised to the same degree as when policy targets organisations. For example, whereas the UK roll-out of smart meters is set to cost more than £10 bn (€11.8 bn) in total, opposition from SME representatives has been limited. Empha-

Table 2. Options for energy policy focus.

Segmentation approach	Detail and examples
Size of organisation	The EU SME definition differentiates between sizes based on employee numbers: Micro <10 employees; Small 10–49 employees; Medium-sized 50–249 employees; Large >250 employees.
Sector	Trade associations seek to represent businesses in sectors such as construction, retail and manufacturing. However, SME representative organisations tend to be seen to represent SMEs across sectors, and there are few examples of SME specific sector associations.
Location	This segmentation approach is dominant in the UK as Local Enterprise Partnerships explicitly address economic challenges and strengths in the local geographic area. Regional Councils and Chambers of Commerce provide business advice in France.
Business strategy	Organisations can be segmented according to their plans for growth. Business Link in the UK for example developed approaches to identify businesses with most job creation and growth potential.
Building type	The UK Building Energy Efficiency Survey (BEES) gathers evidence on energy use in non-domestic buildings, accounting for size and sector of business occupants. Building regulations in France and UK set energy efficiency standards.
Technology	Renewable generating technologies are supported by policies such as feed-in-tariffs and the renewable heat incentive. Product standards target energy consuming technology such as vacuum cleaners and refrigerators.
Problem-focused	Waste regulations, including producer responsibility and landfill tax incentivise recycling as an environmental practice. Low Emissions Zones in urban areas are enforced to reduce air pollution.
Data availability	Energy data availability is variable for SMEs (Janda et al., 2014). Whereas some organisations have advanced or smart metering capability and an employed energy manager, others have legacy meters and no energy analysis. The smart meter roll-out directly addresses elements of this discrepancy.
Legal infrastructure	Janda et al (2014) argue that owner occupiers, landlords and tenants vary significantly in relation to energy practices and investment potential.
Practice	Powells et al (2015) call for a focus on common business practices, including how technology and spaces are used, and the role of knowledge, skill and organisational meanings in energy consumption.
Determinants of behaviour	Anable et al (2015) seek to segment business travel by looking beyond the behaviour, to the determinants and drivers. These include aspects of organisational culture, governance and strategic mission.

sis the benefits of greater control and cost saving potential, as well as capitalising on the opportunity for energy advice to be offered during installation have helped to gain support from SMEs, and may offer insights for the promotion of other smart technologies such as Integrated Building Management Systems (IMBS).

The 'split-incentive' is a significant barrier to energy efficiency investments for SMEs occupying non-domestic premises (DECC, 2014), and so segmenting on the basis of legal status

of building tenancy can help to direct policy instruments targeted at overcoming this principle-agent problem. Focusing on legal infrastructure cuts across organisational size categories, as large businesses are also affected, such as retail chains leasing large numbers of small properties (Janda et al., 2016). Green leases represent one possible way through this 'wicked' problem for businesses of all sizes, and could be promoted by local or national government, for instance by using their own purchasing power to introduce the practice (ibid).

Recent academic work has suggested that an attention to business practices, and the drivers behind behaviours may help to produce effective policy. With increasing proportions of intermittent renewables on the electricity grid, there are financial and emissions-based benefits from increasing flexibility on the demand side. Realising the potential £8.6 bn (€9.9 bn) savings resulting from the use of smart technologies as identified by the UK government depends however on the integration of smart technologies into energy users' existing practices. Looking in depth at SME activities for example, Powells et al. (2015) identify flexibility in some everyday business practices, such as those reliant on mobile ICT technology, or heating practices and rigidity in others. The growing use of portable ICT equipment, 'cloud-based' systems and even storage-heating may enable SMEs to take advantage of time-of-use tariffs and partake in 'active network management' in future smart grids. In-depth social scientific studies such as this may help policy makers to target instruments at particular practices, rather than approach the organisation as the focal unit, potentially encountering resistance to red tape.

One practice relevant to a large proportion of SMEs is working from home, which is undertaken by more than 25 % of the workforce in the UK, and 19 % in France. A number of studies have sought to quantify the energy and environmental impacts of the practice, finding potential savings of up to £3 bn (€3.55 bn), and over 3 m TCO_e in the UK (Carbon Trust, 2014). However, the environmental benefits of home working depend on a number of variables, including the length of the commute and the flexible use of office space by employers, meaning that the precise circumstances of telework can influence net energy demand (Banister et al., 2007). Based on interviews with a sample of UK workers, one study indicated that home workers may be likely to tolerate lower ambient temperatures when working from home, and are likely to conduct energy using practices such as laundry during the working day: both of which have potential benefits for the electricity system (Hampton, 2016b). Designing public policy which intervenes in behaviours in the domestic setting is problematic both practically and politically, and encouraging working from home may therefore be best pursued as intra-corporate policy. Nonetheless, examples exist of central government initiatives to support the spread of flexible work, including the UK Department for Transport's (DfT) 'Anywhere Working' initiative. Social scientific energy research can contribute to these initiatives by highlighting the factors with most impact on energy and emissions savings.

For SMEs in the service industry, transport is likely to represent a significant proportion of energy consumption. In a report commissioned by the UK DfT, Anable et al (2015) argue that research on travel behaviour often focuses on the question of 'why do you travel', leading to narrow insights based on individual motivation and conscious choice. This in turn leads to policies dominated by the tradition of behavioural economics or 'nudge', which has been found to have limited impact on travel behaviours (Behavioural Insights Team, 2017). The authors instead identify a need for policy to address the wider 'determinants of [business] travel behaviour', which include contextual factors such as the economic, social and regulatory operating environment, an individual company's mission, degree of employee autonomy and decision-making hierarchies.

Practice-based analyses typically provide policy recommendations which imply a need for wide-reaching mechanisms that cut across the boundaries of government departments' jurisdictions, and can be problematic for civil servants wishing to develop and deliver policies influencing SME travel with limited budgets and scope for intervention. For example, Eadson (2014) appeals directly to business support policy makers in proposing that pro-environmental behaviours could be fostered through better engagement by SMEs within local civil networks. However, the realisation of these measures would require coordination beyond business support networks, including local community groups, the charity sector and local government. Further, although the social and spatial embedding of SMEs may help to foster sustainable mobility practices, these are priorities that are primarily supported by the DfT rather than the Department for Business, Energy and Industrial Strategy, implying a need for cross departmental support and evaluation.

Given the scale of the challenge of meeting the emissions reductions targets set during the Paris climate agreements, there is certainly a case for radical changes to be made in the design of policy. Stopping short of a policy paradigm shift however, the alternative focuses identified in the examples above point to smaller scale opportunities for intervention. Smart technologies such as IBMS and fleet management represent areas for policy makers to explore further, having already been identified as having potential for financial and emissions savings. Green-leases, potentially introduced through government building portfolios, may help to address the 'split-incentive problem', often cited as limiting the capacity for SME building tenants to implement efficiency savings. Finally, promoting the practice of working from home and supporting SMEs to become more embedded in local communities offer further potential.

BUSINESS SUPPORT AND THE GROWTH AGENDA

As illustrated in section 3.3, business-support represents a significant proportion of the incentive-based policies targeted at SMEs. In the UK, the ERDF represents the single largest source of funds for SMEs, and in the 2014–2020 programme in England, €792 m (£670 m) has been allocated to supporting the 'shift towards a low-carbon economy', with a further €1.4 bn (£1.2 bn) to support SME competitiveness (European Commission, n.d.). Local Enterprise Partnerships are responsible for distributing these funds through energy efficiency programmes, which are designed and delivered according to the priorities set out by LEPs' 'strategic economic plans'. As such, energy efficiency tends to be couched in the narrative of 'resource efficiency', leading to maximal profit (OBS, n.d.), while the low carbon sector is promoted on the basis of its above-average growth and job creation potential (WOLEP, n.d.). While there is merit in integrating energy efficiency into existing networks of business support delivery, there are potential pitfalls associated with this approach.

The first is that the reach of energy efficiency programmes is inevitably influenced by existing networks of advisors, attracting well-networked, externally focused and growth-oriented businesses (Open University, 2013). SMEs less likely to be reached include those with business plans prioritising stability and consolidation, and those operating for more than 5 years. From an energy perspective, an assumption worthy of empiri-

cal testing is that low-growth businesses are likely to operate from older buildings, and use older, less efficient process equipment. If true, not only would this highlight a group of SMEs which could significantly benefit from energy efficiency measures, but it would challenge business support organisations responsible for delivering energy efficiency programmes to seek alternative networks and audiences for their messaging.

Second, not only does the growth narrative skew the reach of energy efficiency programmes, it may also produce what Marsden et al (2014) describe as 'contradictory' policy impacts. For instance, an assumption implicit in the economic growth narrative is that higher levels of traffic are a sign of productivity. This leads to a situation where LEPs fund expansions to the road network and boost access to airports while simultaneously delivering behaviour change initiatives designed to encourage shifting to lower carbon modes of transport (Coast to Capital, 2014; GBSLEP, 2016). Further, the UK's Department for International Trade (DIT), often working through and alongside LEPs, encourages SMEs to export and has in recent years offered grants for business owners to explore international markets. Another example of a policy which has potential for contradictory consequences includes the availability of funding such as capital grants for replacing energy using equipment or the Enhanced Capital Allowances (ECA) scheme in the UK. Whereas some measures such as replacing halogen bulbs with LEDs before the end of their useful life may be justified on the basis of radically reduced energy costs, the net impact of funding for other equipment is more contentious (Rosenow et al., 2016). The energy impact of replacing motors, drives and refrigeration equipment for example, depends on the efficiency of existing machinery and the intended use of new and old units. Many schemes (such as ECA in the UK) assume, but do not require, the disposal of older equipment, meaning that energy consumption may increase overall. These policies indicate that SME energy efficiency policy in the UK is not currently aligned with its broader industrial strategy, and in some cases, energy efficiency goals can be undermined by economic growth policy.

Conclusion

This paper has identified a number of challenges regarding designing and delivering effective SME policy. Firstly, although SMEs collectively are very significant users of energy, there is an incomplete understanding of their energy consumption and the potential for energy savings. Next, there is disagreement as to how SMEs make decisions around energy, and therefore how policy can be best designed to influence their choices. Given their huge diversity in business sectors, types of buildings occupied, equipment used, forms of organisation, and so on, using empirical evidence on SMEs to improve understanding and policy design is inherently difficult. Further, policies which impose additional costs or administrative burdens on SMEs are strongly resisted. Acknowledging the limitations of current policy opportunities, including widespread resistance to 'red tape', we explore new ways of focusing policy design, so that SMEs are included. Possible policy focuses include building type, business strategy, legal infrastructure, practices and technologies. Some of these are already use, e.g. in setting universal minimum efficiency standards for end use energy equipment,

while others are at a very exploratory stage. We have brought together a list of SME-specific policies from the UK and France to show what is already in place.

Whichever focus or focuses are used, a significant proportion of SME energy policy is based on the provision of information and incentives, primarily delivered in both the UK and France by regional business support organisations. While offering benefits in terms of using existing networks and known brands, there are disadvantages in that these organisations tend to support only certain types of SMEs - and not necessarily those with the greatest opportunity for energy savings. In addition, their central goals are based on growth, rather than promoting a lower carbon, more energy efficient economy.

It is clear that there are a number of challenges to designing and implementing effective energy policy for SMEs, but we have suggested that addressing this group as a whole may *not* offer the best solutions. For the future, there is a clear need for the improved evaluation and monitoring of local energy efficiency programmes. Reliable, quantitative data, aggregated at a national scale would help to formalise the SME contribution towards energy efficiency, leading to greater attention from policy makers with a national remit. Energy researchers from positivist traditions can help in these efforts. There is also a need for further research into the policy implications of alternative units of focus; in highlighting opportunities in areas such as building tenancy or working from home, social scientists can help to support policy makers in bringing the benefits of energy efficiency to SMEs.

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Acknowledgements

This research was funded by the UK Research Councils (Grant no: EPSRC EP/L024756/1) as part of the Decision Making Theme of the UK Energy Research Centre Phase 3. Thanks to Elodie Trauchessec and Catherine Guermont-Bernardi of ADEME for additional information on SME energy policy in France.