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Actionable Information enables SMEs to Journey towards Net Zero

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ABSTRACT

The focus on the transition of SMEs towards Net Zero has emphasised barriers and enablers in a variety of theoretical approaches. These theoretical approaches range from an emphasis on the influence of stakeholders and access to resources to internal capabilities, information and firm agency. The role of values has also been highlighted. In this study we use the concepts of stakeholders, values and agency as a lens to understand those who take action on Net Zero. Where agency also involves self-efficacy and managerial capacity. Using these lenses to analyse interviews and then test those against the data from Business Futures 2022.

In addition to a modest number of interviews with a variety of businesses who were both those who adopted Net Zero practices and those who did not. The study employs a new dataset, Business Futures 2022, which is the second wave of the first Business Futures survey. This is a survey of approximately 1000 UK firms which was conducted in the autumn of 2022

The study found that organisations with higher digital intensity, self-efficacy, formal knowledge sources, and an emphasis on innovation are more likely to engage in net zero activities. This is in line with the body of knowledge on sustainable business practices. These factors are consistent with the perspective which emphasises elements internal to the firm. Beside which the study emphasises how crucial it is for corporate managers to have access to trustworthy information in order to implement net zero. Those that were able to act said they were able to locate trustworthy information sources and frequently used information obtained both in person and online. It seems that one of the reasons for this is that the data had to be actionable information, which means that it had to be pertinent to the particular firm and setting. Consequently we suggest actionable information is key to the adoption of Net Zero practices and we discuss what actionable information means in this context with regard to intentions and self-efficacy. We attempt to reconcile some of these theoretical perspectives with actionable information.

1. INTRODUCTION

Based on the UK's statutory advisory body recommendations (Committee on Climate Change, 2023), the UK Government and the devolved governments agreed to reach Net Zero by 2050 in 2019. Over 5.9 million small and medium-sized enterprises (SME), employ 16.8 million people and produce an estimated £2.3 trillion in annual revenue (BEIS, 2020). Specific companies' environmental footprints might seem insignificant, but overall the environmental effects of SMEs are significant.

Previous research has examined influences on the reduction of environmental emissions by small businesses from three levels: structural, cultural, and agential viewpoints. The advantages of Net Zero in terms of stakeholder obligations or resource access are highlighted by structural issues, that also emphasises pressures from the supply chain (Mani, Jabbour et al. 2020; Sharma and Henriques 2005). Managers' cultural awareness and attitudes affect their adoption of Net Zero (Florea, Cheung et al. 2013). Also focusing on agential issues is an emphasis on capability where a company's internal operations highlight its capacity to create sustainable practices, which in turn may lead to innovation (Sharma 2000, Klewitz and Hansen 2014), and the agency is embodied by manager's self-motivation (Dey, Malesios et al. 2022). In addition we introduce the concept of social learning (Wood and Bandura 1989) to explain how firms are adopting Net Zero practices.

Our study makes three contributions. First, we show how the structural influences on SMEs seemed to play a subdued role. Although an interviewee identified the bidding process as a reason to take action on Net Zero our survey evidence was weak. Second, we compare the positive element of capability in the firm versus the potential difficulties of divided managerial capacity. We assess whether previous growth would have a positive (potential capability effect) against the negative potential to overload managerial capacity. Our results show a positive relationship between capabilities, growth and net zero adoption. This demonstrated the capability story is a much better fit for the data Third, we demonstrate the importance of reliable information for the adoption of net Zero. And we go on to discuss the concept of actionable information and how this is a critical element in Net Zero adoption.

2. CONCEPTUAL FRAMEWORK

The drive to reduce environmental emissions by small firms can be understood by several theoretical frameworks. A wide variety has been adopted in the literature with no clear consensus as to which approach has greater explanatory power. Some frameworks focus on the structural issues (including firm access to resources, their market position and role of stakeholders) whereby firms are encouraged to undertake Net Zero because their sustainable practices enable greater access to resources (Mani, Jabbour et al. 2020); in addition Net Zero practices can help fulfil stakeholder obligations (Sharma and Henriques 2005). In contrast, other frameworks stress the internal aspects of the firm and argue that small and medium sized enterprises (SMEs) need capabilities to develop sustainable practices (Shevchenko, Lévesque et al. 2016). By doing so, they can generate greater innovation (Sharma 2000, Klewitz and Hansen 2014), create better long-term resilience (Ortiz-de-Mandojana and Bansal 2016), and with their capability firms can group together and benefit from a collaborative advantage (Glavas and Mish 2015). Further, to the capabilities the adoption of business sustainable practices might depend on the cultural understanding and values of managers (Florea, Cheung et al. 2013) as well as their self-motivation (Dey, Malesios et al. 2022). Previous work, therefore, has been at a series of levels from the structural influences on firms to the cultural and through to the agency of managers. Consequently, we examined the topic at three levels: agency, culture and structural influences. These levels may encompass the influences on SMEs managed with respect to the adoption of net zero policies practices yet to be useful to have a theory of behavioural change as a means to understand when firms adopt net zero practices

In addition, Previous work another context that involve behavioural change search as the adoption of Net Zero practices theorised through the lens of social learning theory (Wood and Bandura, 1989). Albert Bandura created the social learning theory in the 1960s, and it has since been used in a number of disciplines, including psychology, education, and communication. It underlines how crucial reinforcement and self-efficacy are in influencing behaviour. The idea of "self-efficacy" is the conviction that one can effectively complete a task. We discuss self efficacy in more detail on page 8. The theory has been used to psychology, communication, and education. According to research (e.g. Markman et al., 2005), entrepreneurs have a high level of self-efficacy as a group. So armed with these three levels of influences: structural, cultural and agential, and a specific theory of behavioural change; we analysed the data from both qualitative and quantitative sources.

3. DATA

The data for the study has come from a small number of interviews with businesses who responded to the Business Futures survey 2022 as well as the responses to the survey itself. A modest number of interviews (9) to give a flavour of some of the influences on those businesses who were taking Net Zero action. We have used these responses in order to develop hypotheses which are tested against quantitative survey data.

The study employs a new dataset, Business Futures 2022, which is the second wave of the first Business Futures survey, which was conducted in the autumn of 2020. The survey, which was done in the spring of 2022, aims to raise awareness of environmental practices among UK SMEs and shed light on socially oriented operations. The data was acquired from about 1,000 SMEs across the United Kingdom via a combination of computer-assisted telephone interviews and an online survey.

The questionnaire matched sections of the questions from the corporate Futures 2020 survey in terms of corporate priorities, nine environmental practices, and the use of digital technologies, as well as a set of new questions to better measure the prosocial behaviour of SMEs. The sample included private sector organisations with 5 to 250 employees, including 213 micro firms with 5 to 9 employees, 537 small businesses with 10 to 49 employees, and 253 medium-sized businesses with 50 to 249 employees.

4. QUALITATIVE ANALYSIS FINDINGS

4.1. Agential responses

We use interview data to develop a series of hypothesis to test using our survey evidence. We began by examining the agential responses. Agential responses are crucial in predicting the activities of business owners towards net-zero goals. Priorities and personal convictions have a significant impact on an entrepreneur's attitude towards net-zero practices (Kesidou and Ri 2021). The intention of an individual to engage in a behaviour is a critical predictor of the actual behaviour, according to the theory of planned behaviour (Ajzen 1985, Bullough, Renko et al. 2014).

Personal convictions are especially important since they encourage entrepreneurs to persevere towards net-zero goals (Markman, Baron et al. 2005). As a result, entrepreneurs with strong personal convictions about achieving net-zero aims are more likely to take

action (Williams and Schaefer 2013). Entrepreneurs may also see environmental action as enhancing their firm's reputation (Kesidou and Ri 2021). As an interviewee suggested:

"...because it's an additive manufacturing technology, and some of our raw materials come from a sustainable source. It is something which we believe is, is good to talk about with the market" [Int ref 37]

THEREFORE, WE HYPOTHESIZE...

Business priorities:

Hypothesis 1 : Reducing environmental impact priority is associated with higher probability of net zero action

4.2. Structural responses

Next, we examine the influence of structural material causes from outside the firm. Government policies, such as environmental taxes and subsidies can persuade firms to commit to net zero emissions and follow organizational net zero practices (Kesidou and Ri 2021). Industry self-regulation or voluntary regulation may help to promote net zero activities (Prakash and Potoski 2014). Other influences on net zero are from stakeholders (Main, Jabbour et al 2020; Sharma and Henriques, 2005) where one of the ways to encourage next series is through customer demand. Customer demand for low-carbon products is a key driver of net zero practices (Kesidou and Demirel 2012).

More prosaically, evidence from the interviews showed the influence of costs.

"We have to because the bills are so high and it's a cost we can manipulate so we have to be able to manipulate it so we're very energy aware." [Int ref 36]

"because our electricity bill is extortionate and it always has been. So it is always something that is on our agenda. So we're always looking at ways to optimise the technology" [Int ref 37]

High energy costs can support collaborative efforts between tenants and property owners can all facilitate the adoption of sustainable practices and enable businesses to achieve Net Zero goals.

However, making changes towards Net Zero can be particularly challenging for businesses that are tenants, as they lack control over the building's infrastructure.

“we're tenants of English Heritage, they're our landlord. So it's grade II listed building and they control all the heating, lighting, etc” [Int ref 56]

The same effect is evident from sub-contracting where one interviewee believed it reduced their ability to act.

“we do a lot of subcontracting so we said we have less control over how our subcontractors as well, obviously, they would like to think they're all good companies but they have they have to look after themselves, I guess, in that respect” [Int ref 56]

At the end of this structural section we suggest the hypothesis.

Business priorities:

Hypothesis 2: Cost reduction priority impact is associated with higher probability of net zero action

Innovation has been argued to be critical for the development of Net Zero. Cohen and Winn (2007) argue that the externalities and market imperfections lead to opportunities for aspiring entrepreneurs. For example, the increasing recognition of negative externalities such as pollution or carbon emissions can generate opportunities for entrepreneurs who can provide substituting or remedial practices to offset environmental externalities (Cohen and Winn, 2007; Kemp et al., 2014).

A second argument suggests innovative companies are more adept at adopting practices from outside in a suggestion that is consistent with our arguments for self-efficacy below. Consequently, we suggest:

Hypothesis 3: Innovation oriented businesses are more likely to undertake net zero action

4.2.1 Self efficacy

The next factor we considered was the self efficacy and behavioural change theory because it related closely to the agency and attributes of the SME managers. So we introduce self efficacy and show how simple quotes illustrate its presence and influence within the interviews.

For more than two decades, the literature has envisaged self-efficacy in entrepreneurship mainly as a precursor and indicator of who is more likely to start in business (Boyd and Vozikis 1994, Burnette, Pollack et al. 2020). More generally, people with a high level of self-efficacy have a strong belief in their own talents and are confident in their ability to do specified tasks (Bandura 1977). Wood and Bandura (1989) identified four ways to

strengthen self-efficacy: mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal, with mastery experiences serving as a major facilitator. Persuasion becomes increasingly crucial when mastery experiences are limited (e.g., novices) (Burnette, Pollack et al. 2020). As a result, self-efficacy is defined as having a high level of assessed task feasibility and a positive attitude about impending actions (Eccles and Wigfield 2002). It has a significant impact on an individual's choice, degree of effort, and perseverance (Chen, Gully et al. 2004). A high level of self-efficacy improves the pursuit and perseverance of certain acts and is a powerful predictor of human activity (Bandura 2012).

The two extremes of self-efficacy are seen in the following quotes from interviewees. The first bemoaning the lack of self-efficacy.

“we don't know what to do, how to reduce the risk of a that kind of things, and how to meet the targets with the major customers” [Int ref 47]

The second quotes demonstrate a more self-efficacious approach to get to Net Zero

“We start right from the very beginning of the process and look at each step and think like, what could we do here?” [Int ref 37]

In self-efficacy prior (mastery) experience with sustainable practices and energy efficiency might assist an entrepreneur and predict how they would react to net-zero initiatives. Entrepreneurs with experience in the energy sector or who use sustainable practices are more likely to pursue net-zero targets, because they are more aware of the obstacles and issues involved in achieving net-zero, they are more inclined to take proactive steps towards sustainability. Entrepreneurs who believe they are capable of change, with a growth-mindset, and have strong self-efficacy are more likely to take action (Burnette, Pollack et al. 2020). High self-efficacy leads to a greater belief in an individual's capacity to complete a certain objective, making them more likely to pursue net-zero efforts.

Although our suggestion is that self efficacy is important in the development of net zero actions, we did not have a direct measure of self efficacy. In the first place this might be because a measure of self efficacy in this context might be too similar to actually taking action. For example if you ask people whether they had the ability to take action on net zero one might expect those who took action to all answer in the affirmative making the question redundant. Instead, here we use two proxies for self efficacy. First, we argue that those businesses that had faced obstacles and overcome them and are still growing

demonstrate self efficacy within their business. And second, those businesses with higher digital intensity have acquired useful experience in adopting and implementing new practices may be more confident in adopting new ones and therefore are more likely to show higher levels of self efficacy.

Hypothesis 4: Businesses facing obstacles but still growing are more likely to undertake net zero action

Hypothesis 5: Businesses with higher digital intensity are more likely to undertake net zero action

4.2.2 Managerial capacity

The self efficacy concept implies that those firms are adopting digital and those firms that are overcoming obstacles are more likely to adopt net zero practices. Yet this takes no account of the managerial capacity required to take on different projects all at once. So we also considered the extent to which managerial attention may be relevant for the net zero adoption. In particular, is managerial attention a constraint on adoption? Certainly from Herbert Simon onwards we have known that the managerial capacity is constrained by people's limited attention

Overall this suggests two reasons that managerial capacity may play a role in explaining the adoption of Net Zero practices. First, the size of the managerial team will act as a constraint because management attention is limited. Second, since social awareness and the 'game rules' can indicate different ways that decisions are seen socially and within the firm. We might find the priorities of growth over sustainability for example suggesting faster growing businesses may pay less attention to Net Zero. The latter argues that growth in itself is challenging (Johnson, Webber et al. 2007) and often may lead firms to call from outside assistance alexia (Alexiev, Jansen et al. 2010) consequently this may push net zero lower down the managerial agenda for their necessarily limited attention.

Hypothesis 6: Businesses with small managerial team are less likely to undertake net zero action

Hypothesis 7: Businesses who experienced a large change in turnover over the last year are less likely to undertake net zero action

4.3. Cultural responses

Having discussed agency and structure and then the more theoretical approach of self-efficacy and the managerial constraints the next element we turn to is the cultural aspects that might influence net zero adoption.

Decision-makers have a formal and informal cultural repertoire of reactions or action options to deal with a wide range of organizational difficulties and opportunities (March and Simon 1958). Organizational decision-makers use this repertoire of answers to describe standard operating procedures (Simon 1957, Cyert and March 1963), organizational structures and routines (Nelson and Winter 1982), and cultural 'tool kit' of plans and programs (Swidler 1986) that are available as possible solutions to any problem or opportunity confronted by the firm.

We can see an example of cultural repertoire leading to action in the following quotes from an interviewee in their approach to running the business:

“...we make a sort of like a road map of where we're trying to get to with various stops or service station if we like keeping on the road map where we could stop. Are we going in the right direction that we did the right course, that sort of thing. So I create that and then and then what I'll do it involve the staff with the end goal' [Int ref 19]

This is cultural because it reflects an analogy of the business as going on a journey. This involves the direction of travel towards the goal. The goal is not stated rather the emphasis is on the direction of travel, a consistent thought pattern (Archer, 1996). Culture also involves the use of knowledge and the ability to reach out for new knowledge is an important part of cultural practices (Archer 1996)

Information

Cultural responses are important predictors of business owners' willingness to take action on Net Zero. They include the availability of accurate and reliable information, (Levy and Powell 2004) involving the workforce in sustainability efforts, and the development of accepted practices (Newman 2023). These responses can help reduce uncertainty and make it easier for businesses to adopt sustainable practices (Khan, Razzaq et al. 2021). Environmental information sources are critical for business owners, but they can be difficult to find (Julien and Ramangalahy 2003, McGee and Sawyerr 2003). Businesses may rely

on informal information in many circumstances, which may be a poor source of new practices (McGee and Sawyerr 2003).

One interviewees suggest the key decision-maker relied on informal information

“He has a couple of people that he seeks to use, like other people around the area that also run similar businesses to him and they all kind of like, sometimes meet up and talk about their businesses and how they can keep everything in line with like, how everything's like modernising and changing and helping their environments” [Int ref 14]

A business with a more successful Net Zero journey highlighted accessing formal information:

“We actually attended a talk maybe four months ago now about carbon management, which prompted us to create our carbon management policy that we now have readily available and also Case Studies and Information to promote to our clients with that as well.” [Int ref 26]

The influence of a formal source can affect two aspects. Either the formal source has greater expertise (Pfeffer and Sutton 2006) or the decision to take formal advice is a signal of a greater priority accorded to the issue (Viljamaa 2011). in this example the more formal service was a catalyst for taking advantage action.

However, the problem of how information is accessed and then applied was still reported:

“I would say the main barriers and challenges that we found is that there's a lot of information out there. And you do you have to try and condense it and understand it. But once you get your head around that it is easy to put something together. But I would say the massive amount of information quite difficult.” [Int ref 26]

The latter quote is interesting insofar as it problematizes the availability of information. This availability of information is seen as a problem not a solution is there is a process of condensing and understanding information consequently information needs to be perceived as reliable but it's much more than availability that matters. This topic we take up further in the discussion section. As a result, cultural responses that promote the availability of accurate and reliable information can be a significant stimulus for firms to embrace sustainable practices (Ricci, Battaglia et al. 2021).

CEOs may not be the prime movers in the March to Net Zero Employee involvement in sustainability activities can also predict corporate owners' proclivity to pursue Net Zero action (Veleva, Bodkin et al. 2017, Potoski and Callery 2018). Employees who engage in sustainable activities may become advocates for the cause and aid in the promotion of organisational sustainability. This can result in a more sustainable culture and a shared sense of responsibility for reaching Net Zero targets. By promoting a culture of sustainability, businesses can demonstrate their commitment to environmental responsibility and contribute to the achievement of Net Zero goals.

However, our interviewees often reflected a top-down decision-making approach. As the following quoter makes clear:

“the main guy here who owns it...makes pretty much all the decisions”. [Int ref 14]

In our interviews we did not find evidence of more participatory workplaces, rather decision-making seemed tightly controlled.

“...we consulted with the workforce at the time when we were putting that in place. So in certain aspects, we will consider the workforce but in others, we will go independently make the decisions if we believe it's the right thing” [Int ref 37]

The top-down decision making process is often considered as the norm in small firms although small firms are considered on the whole more informal (Marlow, Taylor et al., 2010). Consequently, we had no suggestion to reinforce an argument for greater participation within the firm or indeed to refute it. Consequently, we complete this section by making more of the distinction between informal and formal information to hypothesise:

Formal vs Informal information:

Hypothesis 8: Use of formal sources of information are associated with higher probability of net zero action

Hypothesis 9: Use of informal sources of information is associated with lower probability of net zero action

In this section we have used the interviews and our understanding of the levels of influences and behavioural theories to suggest 9 hypotheses which we could connect to the comments and discussion from the interviews. The next section tests the hypothesis in

the light of the survey to assess the degree to which survey data confirms or refutes these hypotheses.

5. QUANTITATIVE ANALYSIS FINDINGS

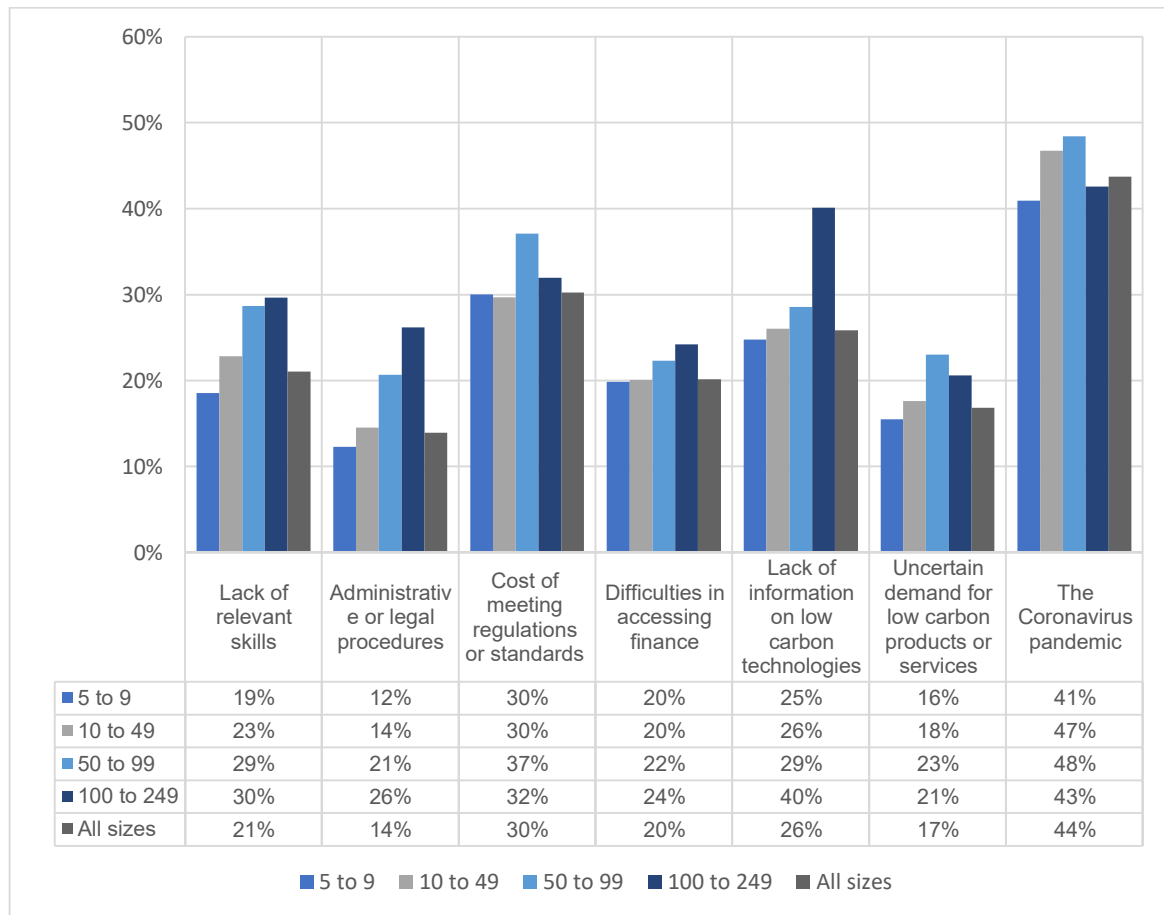
In this section, we draw on the analysis of the Business Futures 2022 Survey data. First we assess the importance of informational barriers encountered by UK SMEs on their journey toward net zero and to understand their ability to access the sources of knowledge. We present descriptive statistics on informational barrier and access to information by firm size, sector, region and other business characteristics. Then, in the second step, we conduct econometric analysis to test hypothesis suggested by qualitative analysis.

5.1. Descriptive statistics

5.1.1 Lack of information – one of the main barriers to net zero transition

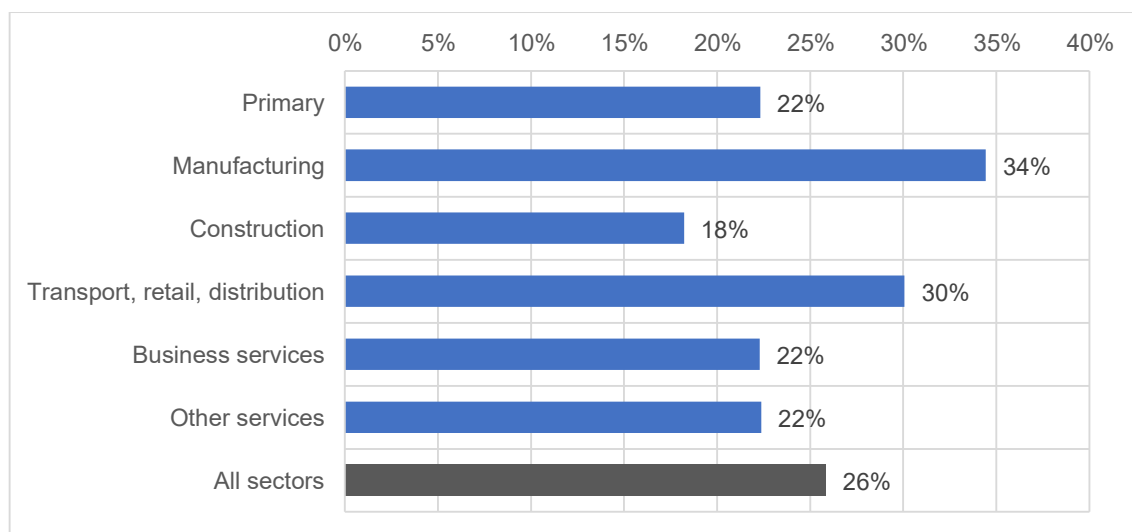
Figure 1 shows that 'lack of information on low carbon technologies' stands out as one the main barriers to net zero (26% of UK SMEs) after the Coronavirus pandemic (44%) and the 'cost of meeting regulations or standards' (30%). This is true across all firm sizes. Interestingly, for larger businesses with more than 100 employees, the informational barrier is the second most frequently cited barrier (40%), before costs (32%).

Figure 1. Barriers to net zero



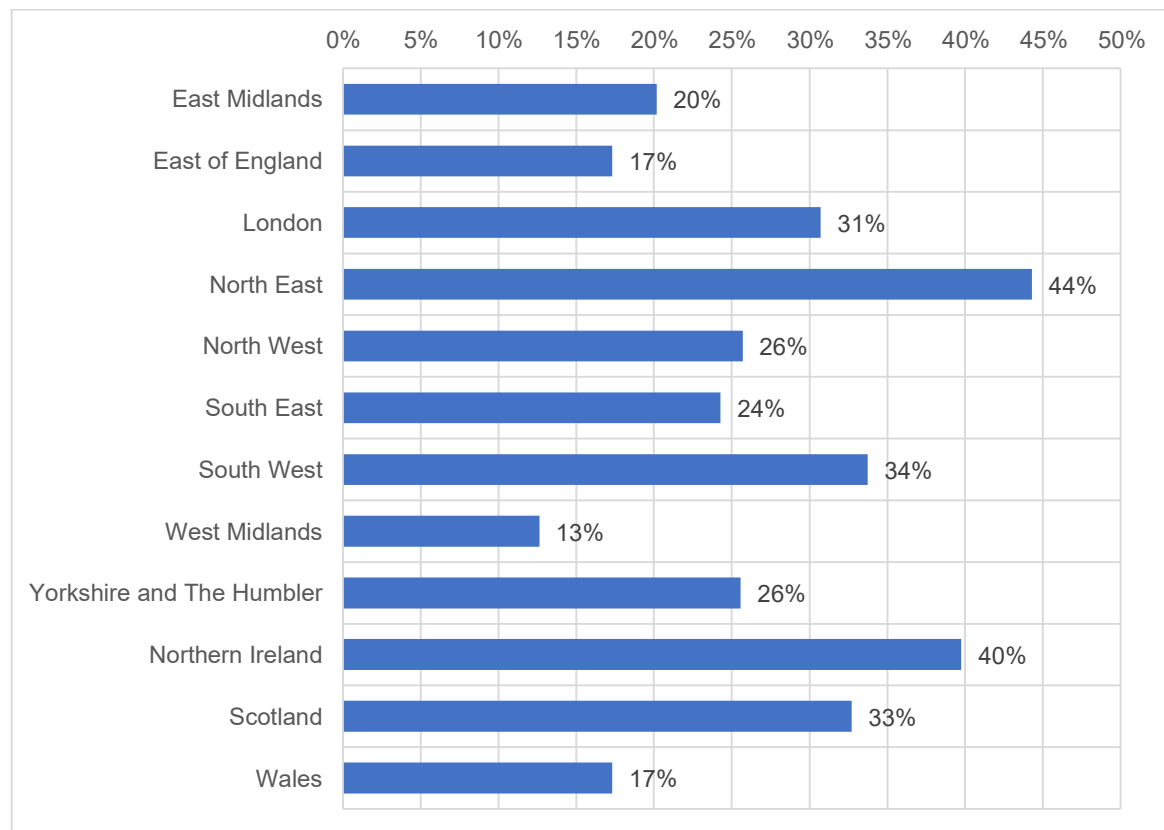
Businesses in manufacturing and transport, retail and distribution sectors appear to face informational barriers on average more often than in other sectors with around 1 in 3 firms facing the lack of information on low carbon technologies (Figure 2).

Figure 2. Lack of information barrier by sector



As shown in Figure 3, there are important variation by region regarding informational barrier to net zero. While in the West Midlands, East Midlands and Wales only a relatively small proportion of firms (13%, 17% and 17%) state the lack of information as an important barrier, it is notably higher in Northern Ireland (40%) and in the North East (44%).

Figure 3. Lack of information barrier by region



Ethnic minority-led businesses in our sample were more likely to face informational barriers compared to other firms (31% vs 25%) (Figure 4), although lack of information on net zero comes only third place in the ranking of obstacles after the coronavirus pandemic and the cost of investments. At the same time, female-led firms did not differ significantly from other firms in their perception of informational barrier to net zero (24% vs 27%) (Figure 5).

Figure 4. Lack of information barrier: ethnic minority-led vs other

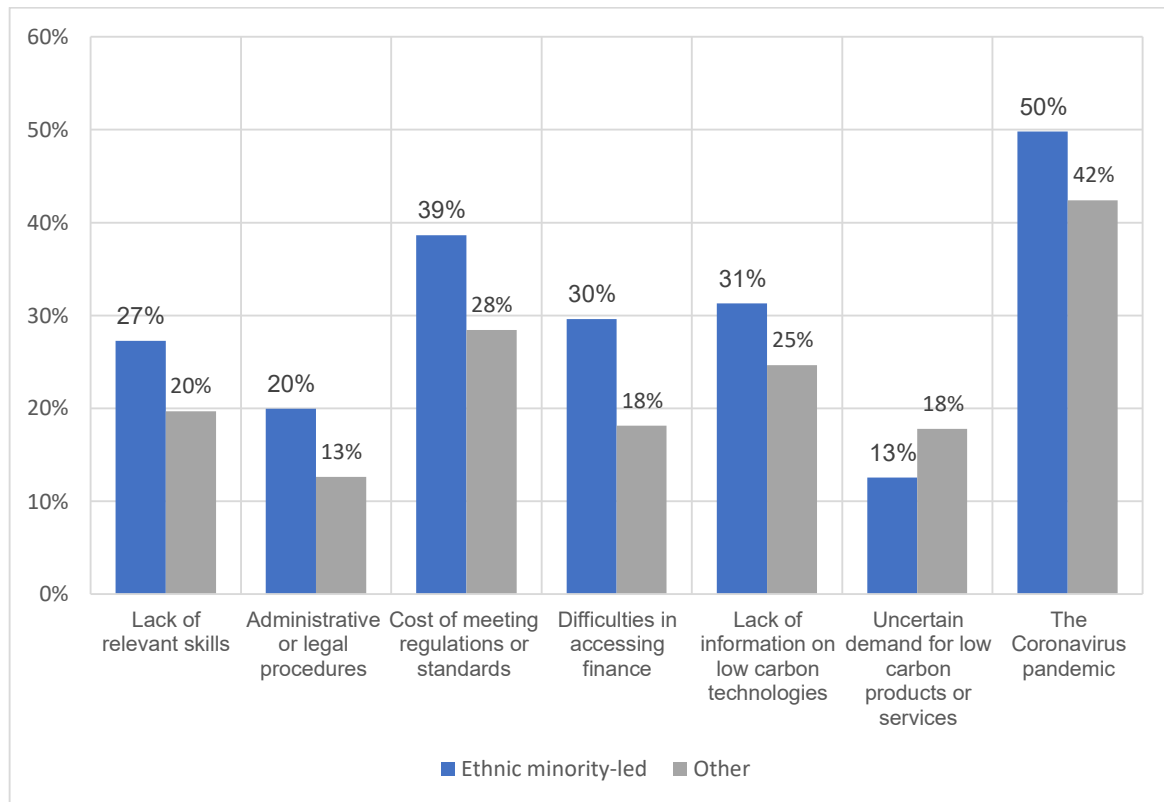
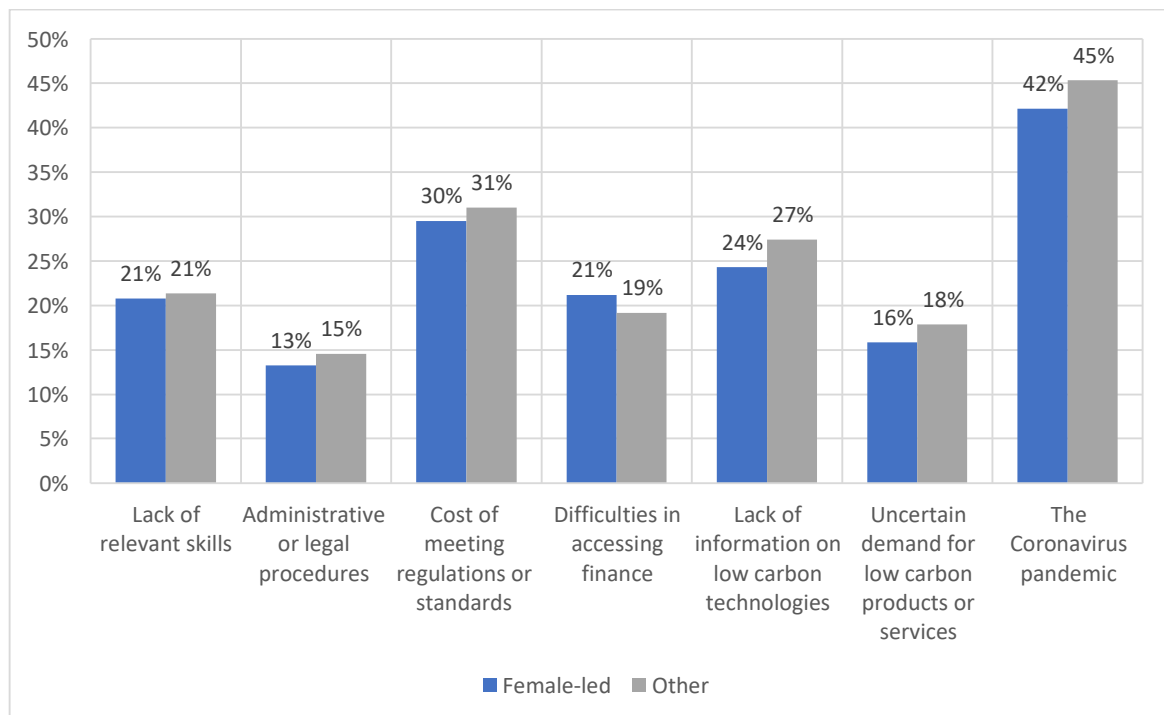


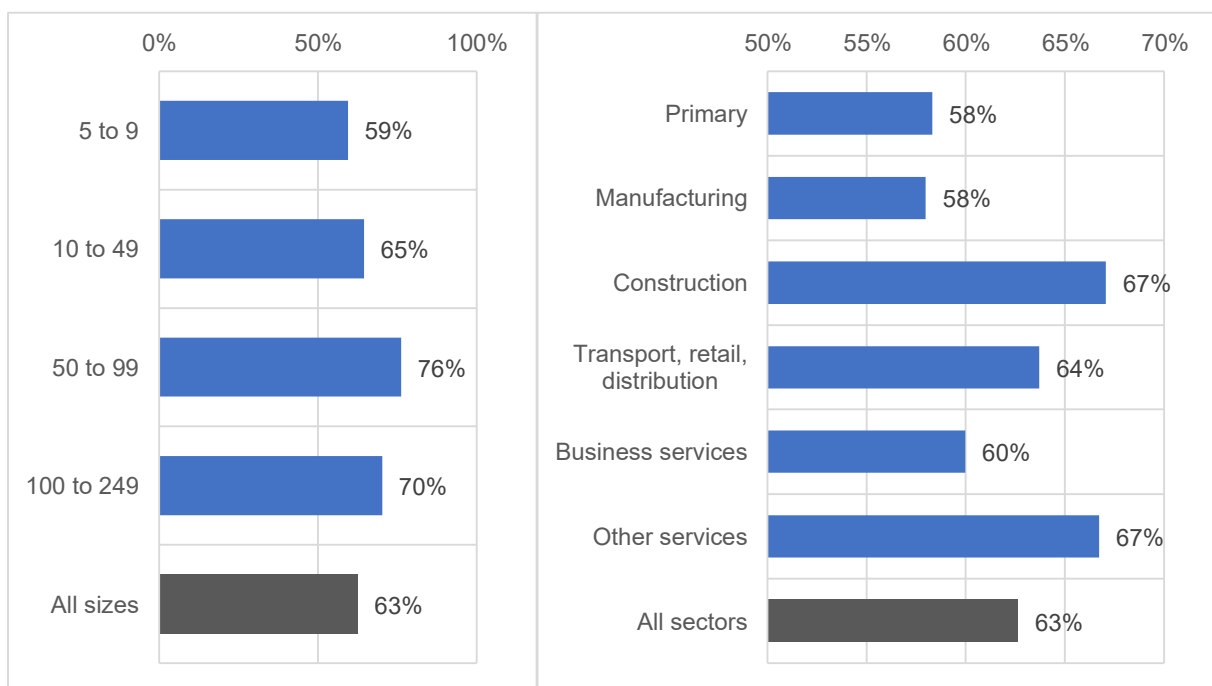
Figure 5. Lack of information barrier: female minority-led vs other



5.1.2. Access to reliable information

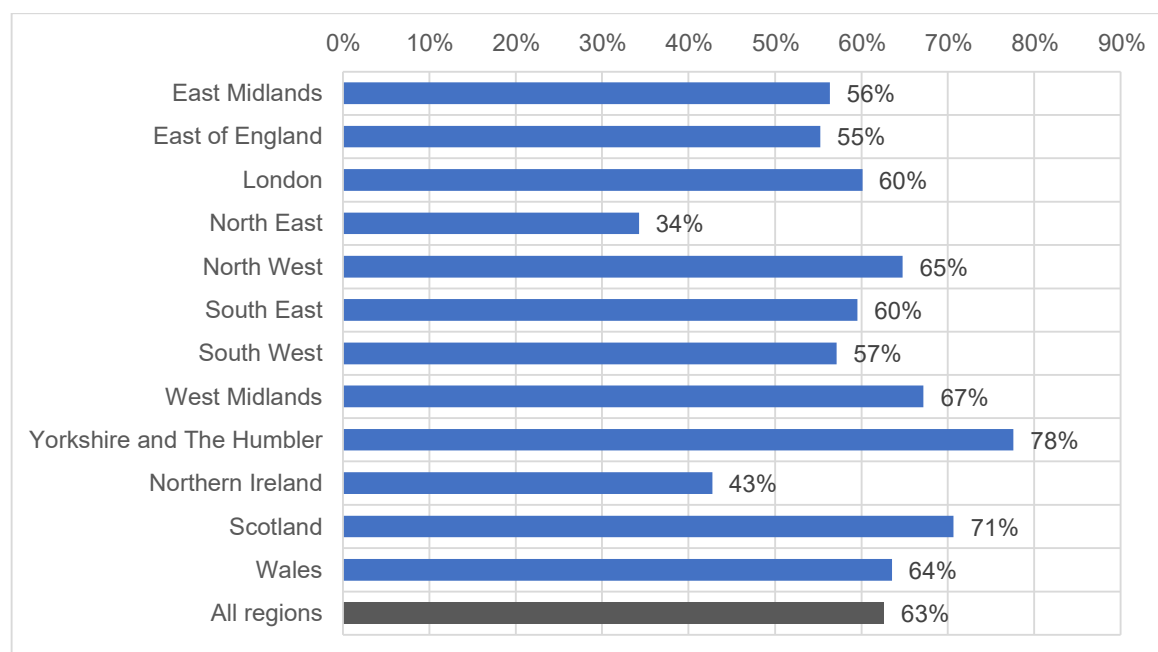
Only 63% of UKs SMEs know where to find reliable information on net zero (Figure 6). It differs by size and sector with higher percentages of medium-sized businesses (70-76%) compared to small and micro-businesses (65% and 59% respectively). SMEs in primary and manufacturing sectors were less likely to say that they now where to find relyable information to help with net zero transition compared to businesses in construction and services.

Figure 6. Percentage of firms knowing where to find reliable information on environmental solutions: by size and sector



Echoing the distribution of informational barrier by region (Figure 3), the percentage of firms knowing where to find reliable information on environmental solutions varies across UK regions with only 34% of firms in North East and 43% in Northern Ireland replying positively to this question (Figure 7).

Figure 7. Percentage of firms knowing where to find reliable information on environmental solutions: by region



To explore the differences between those businesses ‘who know’ and those ‘who do not’, we compare averages for a set of business characteristics and test whether the difference between these averages is statistically significant (Table 1). We find that businesses who know where to find reliable information on net zero are larger (employing on average 21 employees) than those who do not (17.6 employees). They are also more likely to have experienced significant employment growth of over 20% (38% vs 28%) and innovated over the last year (51% vs 36%). Looking to the future, they were also more likely to be prioritising product or service innovation (55% vs 46%), digital adoption (43% vs 32%), reduction of environmental impact (58% vs 41%), and generating social and community benefits (28% vs 22%). They were also more likely both to consider environmental implications of business decisions (94% vs 80%) and to take active steps to reduce business’ environmental impact (80% vs 48%). This is true across all 10 environmental practices businesses were asked about in Business Futures 2022 survey. On average, those businesses who know where to find reliable information on net zero, adopted 2.4 active steps to reduce business environmental impact compared to 1.3 for those who are not sure about reliable sources of information. Finding reliable information may be a necessary condition for those who consider the environmental implications of decisions and is certainly related to adopting Net Zero practices.

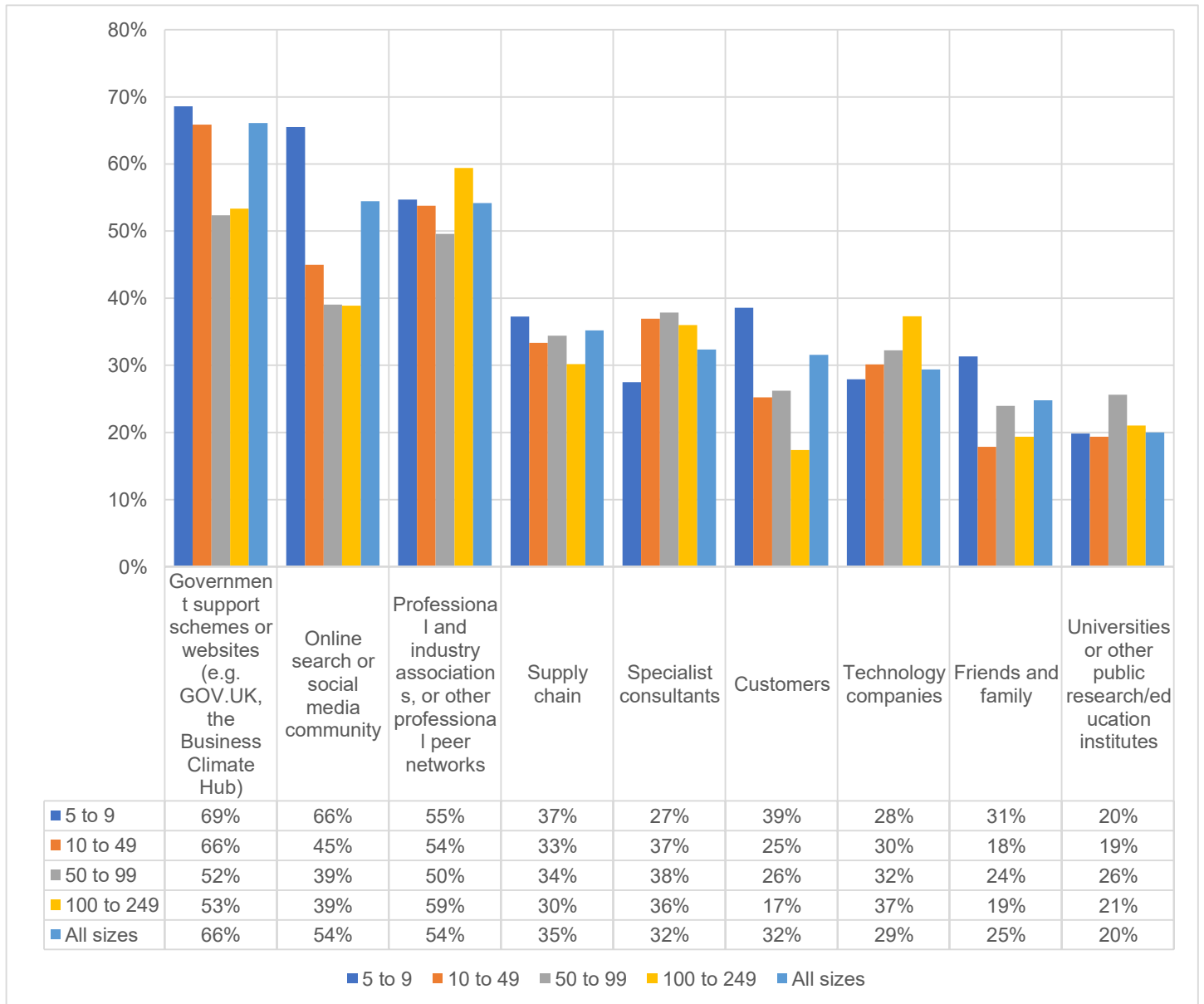
Table 1. Business characteristics of firms knowing where to find reliable information on net zero compared to those who do not know

	Know	Do not know	Statistical Significance
Number of employees	21.0	17.6	*
Exporting	46%	43%	ns
Experienced employment growth over the last year	53%	50%	ns
Experienced high growth (employment increased by 20% or more over the last year)	38%	28%	***
Product or process innovator over the last year	51%	36%	***
Business Priorities:			
<i>Introducing new products or services</i>	55%	46%	***
<i>Entering new markets</i>	33%	31%	ns
<i>Introducing new digital technologies</i>	43%	32%	***
<i>Reducing costs</i>	71%	71%	ns
<i>Reducing environmental impact</i>	58%	41%	***
<i>Introducing new processes</i>	45%	45%	ns
<i>Generating social and community benefits for people</i>	28%	22%	**
Always or sometimes consider environmental implications when taking business decisions	94%	80%	***
Taken steps to reduce environmental impact	80%	48%	***
Practices introduced:			
<i>Undertaken environmental reports or audits</i>	19%	10%	***
<i>Introduced new or improved production processes with environmental benefits</i>	24%	14%	***
<i>Introduced new or improved delivery, transport, or distribution systems</i>	22%	10%	***
<i>Invested in research and development related to the environment</i>	11%	6%	***
<i>Introduced air pollution monitoring and filtering</i>	11%	6%	**
<i>Conducted training on environmental matters</i>	25%	15%	***
<i>Conducted market research related to low carbon products or services</i>	14%	6%	***
<i>Introduced new low carbon products or services</i>	27%	14%	***
<i>Switched to more renewable energy</i>	29%	12%	***
<i>Recycled waste, water, or materials (circular economy)</i>	54%	34%	***
Number of practices introduced	2.4	1.3	***

UK SMEs rely heavily on formal sources of information, in particular Government support schemes and websites, to obtain information on net zero transition (66% of all firms knowing where to find reliable information on net zero cited this source of information), see figure 8. This is particularly true for micro and small businesses for which it is the most frequently cited source followed by online search and social media. Medium-sized and larger small businesses are slightly more likely to source information from specialist consultants and technology firms. The reliance on formal sources raises issues concerning

the ability of firms to ‘condense’ this information as one of our interviewees put it, although support schemes may be more interactive.

Figure 8. Sources of information on net zero by business size



Source: ERC Business Futures 2022

Base: Firms knowing where to find reliable information (604); 5 to 9 employees (108); 10 to 49 (323); 50 to 99 (114); 100 to 249 (59).

5.2. ECONOMETRIC ANALYSIS

Table 2 presents the results on the probability of businesses undertaking steps to reduce their environmental impact. The data is presented in five columns, each representing a different regression model. The marginal effects of various variables on the probability of businesses taking steps to reduce their environmental impact are shown in the rows.

All models (1 to 5) include the impact of information on net zero received from different sources: professional and industry associations, government support schemes or websites, universities or other public research/education institutes, technology companies, specialist consultants, online and social media community, customers, supply chain, and friends and family. In all models, three sources of information have a positive and significant effect on the probability of undertaking net zero steps. These are online search and social media community, government support schemes or websites and specialist consultants, with the first source of information having the highest magnitude. Thus, for example, in model (1) the use of online search as source of information on net zero increases the probability of taking net zero action by 14 percentage points (compared to businesses not using this type of information). This is followed by government support schemes and information provided by specialist consultants which increase the probability of undertaking net zero by 12 and 8.7 percentage points respectively.

In addition, as a proxy of managerial capacity, model (1) includes a dummy variable which takes value of 1 if the business had a small managerial team (when a business has no more than one or two managers / owners actively involved in day-to-day operations) and 0 otherwise. As expected, the coefficient is negative but not significant. The second column includes whether the firm experienced a big change in turnover which was significant. The third column tests whether this big change in turnover was positive i.e. represented growth which was significant supporting the idea that managerial capacity mattered. The fourth column tests whether this big change in turnover was negative i.e. represented decline or a crisis which was insignificant. Finally, column five tested whether the business had taken steps to generate social benefits which was positive and significant.

Other variables that may influence the probability of businesses taking steps to reduce their environmental impact are also included in the table. These variables include priorities such as introducing new products or services, entering new markets, introducing new digital technologies, reducing costs, reducing environmental impact, introducing new processes, and generating social and community benefits for people. The table also includes variables related to the size and performance of the business, is an exporter, or is a product or process innovator in the past 12 months.

Overall, this table demonstrates that the priority to reduce environmental impact makes a business more likely to undertake active net zero steps which supports hypothesis 1. There was no support for hypothesis 2 suggesting cost reduction was not important to reduce environmental actions despite interviewees stressing energy costs. There was more

support for hypothesis 3: Innovation oriented businesses are more likely to undertake net zero action as being an innovator in the past 12 months and having a priority of new product or services innovation was associated with undertaking net zero action although having a priority of new process was associated with not undertaking net zero action.

We did not find evidence to support the hypotheses on managerial capacity. On Hypothesis 6 we found businesses with small managerial team were no less likely to undertake net zero action. The marginal effect was negative but insignificant. Moreover, we found businesses with a large positive turnover were *more* likely to undertake net zero action which rejected hypothesis 7.

Table 2. Probability of undertaking steps to reduce environmental impact dependent on sources of information, business priorities and managerial attention, marginal effects

VARIABLES	(1)	(2)	(3)	(4)	(5)
<i>Sources of information:</i>					
Professional and industry associations	0.012 (0.044)	0.008 (0.044)	0.013 (0.043)	0.015 (0.044)	0.004 (0.044)
Government support schemes or websites (e.g. GOV.UK, the Business Climate Hub)	0.120*** (0.045)	0.120*** (0.045)	0.119*** (0.044)	0.118*** (0.045)	0.120*** (0.045)
Universities or other public research/education institutes	-0.049 (0.046)	-0.049 (0.047)	-0.051 (0.047)	-0.050 (0.047)	-0.062 (0.046)
Technology companies	-0.004 (0.046)	-0.000 (0.045)	0.001 (0.046)	-0.002 (0.046)	0.003 (0.046)
Specialist consultants	0.087* (0.046)	0.087* (0.045)	0.085* (0.046)	0.090* (0.046)	0.087* (0.046)
Online search or social media community	0.140*** (0.046)	0.133*** (0.045)	0.137*** (0.045)	0.138*** (0.046)	0.141*** (0.046)
Customers	-0.035 (0.045)	-0.026 (0.044)	-0.027 (0.044)	-0.034 (0.045)	-0.039 (0.045)
Supply chain	-0.018 (0.048)	-0.023 (0.048)	-0.028 (0.048)	-0.021 (0.048)	-0.021 (0.048)
Friends and family	-0.051 (0.050)	-0.050 (0.049)	-0.054 (0.049)	-0.053 (0.050)	-0.060 (0.049)
Small managerial team (0/1)	-0.041 (0.035)				
Big change in turnover (0/1)		0.074* (0.039)			
Big positive change in turnover (0/1)			0.121*** (0.045)		
Big negative change in turnover (0/1)				-0.001 (0.056)	
Taken steps to generate social benefits					0.059* (0.035)
Priorities: Introducing new products or services	0.082** (0.035)	0.085** (0.035)	0.084** (0.035)	0.085** (0.035)	0.082** (0.035)
Priorities: Entering new markets	-0.073** (0.033)	-0.080** (0.032)	-0.076** (0.033)	-0.072** (0.033)	-0.077** (0.033)
Priorities: Introducing new digital technologies	0.011 (0.035)	0.020 (0.035)	0.015 (0.035)	0.015 (0.036)	0.010 (0.036)
Priorities: Reducing costs	0.036 (0.032)	0.033 (0.033)	0.038 (0.033)	0.038 (0.033)	0.037 (0.033)
Priorities: Reducing environmental impact	0.302*** (0.029)	0.295*** (0.029)	0.297*** (0.029)	0.296*** (0.029)	0.293*** (0.029)
Priorities: Introducing new processes	-0.090*** (0.033)	-0.095*** (0.033)	-0.096*** (0.033)	-0.092*** (0.033)	-0.094*** (0.033)
Priorities: Generating social and community benefits for people	0.070 (0.046)	0.065 (0.046)	0.065 (0.046)	0.070 (0.047)	0.058 (0.047)
Exporter (0/1)	0.028 (0.034)	0.024 (0.034)	0.021 (0.035)	0.023 (0.035)	0.022 (0.035)
Product or process innovator in the past 12 months (0/1)	0.151*** (0.035)	0.148*** (0.035)	0.146*** (0.035)	0.154*** (0.035)	0.143*** (0.035)
Women-led business (0/1)	0.058* (0.033)	0.054* (0.032)	0.048 (0.032)	0.054* (0.032)	0.051 (0.032)
Ethnic minority-led business (0/1)	0.121*** (0.046)	0.123*** (0.047)	0.127*** (0.046)	0.117** (0.047)	0.110** (0.046)
Firm size	yes	yes	yes	yes	yes
Firm age	yes	yes	yes	yes	yes
Sector	yes	yes	yes	yes	yes
Region	yes	yes	yes	yes	yes
Number of observations	997	997	997	997	997

The numbers in parentheses represent the standard errors of the coefficients. The symbols ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Table 3. Probability of undertaking steps to reduce environmental impact dependent on sources of information, business priorities and self-efficacy, marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Sources of information</i>							
Number of sources of information (0/9)	0.037*** (0.008)						
Formal (0/1)		0.134*** (0.042)	0.142*** (0.046)	0.164*** (0.047)	0.114*** (0.042)	0.128*** (0.041)	0.141*** (0.042)
Online (0/1)		0.110** (0.044)	0.178** (0.090)	0.111** (0.044)	0.219*** (0.065)	0.116*** (0.044)	0.097** (0.043)
Network (0/1)		-0.016 (0.042)	-0.016 (0.042)	0.139* (0.077)	0.075 (0.050)	-0.020 (0.042)	-0.017 (0.042)
Formal#Online			-0.080 (0.105)				
Formal#Network				-0.197** (0.092)			
Online#Network					-0.220*** (0.084)		
Donotstop (0/7)						0.035** (0.015)	
Digital intensity (0/10)							0.018* (0.010)
<i>Priorities:</i>							
Introducing new products or services (0/1)	0.075** (0.037)	0.078** (0.036)	0.078** (0.036)	0.082** (0.036)	0.081** (0.036)	0.080** (0.036)	0.067* (0.036)
Entering new markets (0/1)	-0.072** (0.034)	-0.069** (0.034)	-0.068** (0.034)	-0.066** (0.034)	-0.073** (0.034)	-0.071** (0.034)	-0.077** (0.034)
Introducing new digital technologies (0/1)	0.000 (0.037)	0.007 (0.036)	0.007 (0.036)	0.013 (0.036)	0.015 (0.036)	-0.005 (0.036)	-0.009 (0.037)
Reducing costs	0.043 (0.033)	0.044 (0.032)	0.044 (0.032)	0.049 (0.032)	0.039 (0.032)	0.042 (0.032)	0.037 (0.032)
Reducing environmental impact (0/1)	0.307*** (0.030)	0.293*** (0.030)	0.292*** (0.030)	0.292*** (0.030)	0.295*** (0.030)	0.288*** (0.030)	0.289*** (0.030)
Introducing new processes (0/1)	-0.086** (0.034)	-0.084** (0.034)	-0.082** (0.034)	-0.080** (0.034)	-0.076** (0.033)	-0.084** (0.033)	-0.090*** (0.034)
Generating social and community benefits for people (0/1)	0.055 (0.047)	0.070 (0.046)	0.071 (0.046)	0.073 (0.045)	0.069 (0.046)	0.070 (0.045)	0.066 (0.047)
Exporter (0/1)	0.029 (0.036)	0.027 (0.035)	0.028 (0.035)	0.026 (0.035)	0.026 (0.035)	0.021 (0.035)	0.017 (0.035)
Product or process innovator in the past 12 months (0/1)	0.155*** (0.036)	0.149*** (0.036)	0.147*** (0.036)	0.143*** (0.036)	0.140*** (0.036)	0.133*** (0.036)	0.142*** (0.035)
Women-led business (0/1)	0.048 (0.034)	0.054 (0.033)	0.053 (0.033)	0.053* (0.032)	0.055* (0.032)	0.051 (0.033)	0.054* (0.033)
Ethnic minority-led business (0/1)	0.113** (0.050)	0.103** (0.046)	0.101** (0.046)	0.098** (0.046)	0.106** (0.046)	0.095** (0.045)	0.102** (0.047)
Firm size	yes	yes	yes	yes	yes	yes	yes
Firm age	yes	yes	yes	yes	yes	yes	yes
Sector	yes	yes	yes	yes	yes	yes	yes
Region	yes	yes	yes	yes	yes	yes	yes
	997	997	997	997	997	997	997

The numbers in parentheses represent the standard errors of the coefficients. The symbols ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Additionally, we test for self-efficacy hypothesis, managerial capacity and explore how the diversity of sources of information affect the probability of undertaking taking actions to lessen environmental impact by running 7 alternative models. Table 3 shows the results by reporting the marginal effects of taking actions to lessen environmental impact based on knowledge sources, business priorities, and self-efficacy. All models include a set of business priorities and additional firm-level characteristics discussed previously.

The first model (Table 3, column 1) introduces the number of different sources of information on net zero used by the business, which takes value from 0 to 9. We posit that firms combining several sources of information are mor likely to engage with net zero. The results show that the probability of taking action to lessen environmental harm is positively impacted by this variable in a statistically meaningful way: each additional source of information increases the probability of undertaking net zero steps by 3.7 percentage points.

The model reported in column (2) makes the distinction between formal and informal sources of information by introducing three dummies: *formal* (0/1) taking value of 1 if a firm uses any of the formal sources of information such as professional and industry associations, government support schemes or websites, universities or other public research/education institutes, technology companies, specialist consultants and 0 otherwise; *online* (0/1) if a firm uses online search or social media to gather information on net zero and 0 otherwise, and *network* (0/1) if a firm turns to customers, supply chain business, friends and family as a source of reliable information about implementation of environmental solutions and 0 otherwise. The online source had the most statistically significant beneficial effects of the three variables on the likelihood of acting to mitigate environmental damage but formal was also significant. This supports hypothesis 8 *Use of formal sources of information are associated with higher probability of net zero action. The impact of networks was negligible* supporting hypothesis 9 which suggested informal sources would be less important because the *Use of informal sources of information is associated with lower probability of net zero action.*

Models reported in columns (3), (4), and (5) introduce the interaction effects between the sources of information. Interestingly, the interplay between formal and network and online an network sources of information demonstrate statistically significant but negative effect meaning that when firms seeking information in social networks to complement formal and online sources of information are less likely to undertake active net zero steps.

The following model (column 6) introduces variable *Donotstop* which gauges the difficulties the business has faced but overcome in order to keep growing. It takes value from 0 to 7 based on number of reported obstacles that business face and a dummy variable accounting for growth. We posit that a firm still growing while facing more barriers is more likely to be characterised by higher levels of self-efficacy. This variable has a statistically significant positive impact on the likelihood of taking action to reduce environmental damage, lending support to Hypothesis 4: Businesses facing obstacles but still growing are more likely to undertake net zero action.

The final model (column 7) shows the results when latent self-efficacy is proxied by "Digital intensity," which measures how much the company uses digital technology. This variable has a statistically significant positive impact on the likelihood of taking action to reduce environmental harm, lending support to Hypothesis 5: Businesses with higher digital intensity are more likely to undertake net zero action

The final eight rows show the many company priorities, such as exporting, introducing new goods or services, entering new markets, utilising new digital technologies, reducing costs, minimising environmental impact, introducing new practices, and offering new products or services. All eight categories statistically significantly affected efforts to lessen environmental damage, with decreasing environmental impact having the greatest influence. Positive influences include new product innovation and innovation from the past 12 months; women-led businesses are more likely to take Net Zero action, although when a large increase in turnover or social benefits is introduced this becomes insignificant. Introducing new processes seems to have a negative influence on adopting Net Zero practices.

Table4. Net zero practices vs sources of information on net zero

	Professional and industry associations, or other professional	Government support schemes or websites (e.g. GOV.UK, the	Universities or other public research/education institutes	Technology companies	Specialist consultants	Online search or social media community	Customers	Supply chain	Friends and family
Undertaken environmental reports or audits			+		+++			++	
Introduced new or improved production processes with environmental benefits	+			+++			+		
Introduced new or improved delivery, transport, or distribution systems				++					
Invested in research and development related to the environment		-*	+		+++		++		
Introduced air pollution monitoring and filtering			+	++					++
Conducted training on environmental matters	++		++		+				
Conducted market research related to low carbon products or services	+								
Introduced new low carbon products or services	+	+						+++	
Switched to more renewable energy		+++							
Recycled waste, water, or materials (circular economy)		+++			++	++			

Note: - Negative relationship; + positive relationship; *** p<0.01, ** p<0.05, * p<0.1
Marginal effects are reported in Annex, Table A1

Table 4 presents a comparison between different net zero practices and the sources of information that organizations rely on for their net zero initiatives. The practices are listed in the leftmost column, while the sources of information are listed in the remaining columns. Taking each of the net zero practices in turn the table essentially shows the sources of information are contingent upon the net zero practices adopted.

"Undertaken environmental reports or audits" shows a positive relationship with information from, government support schemes or websites, specialist consultants, and the supply chain.

"Introduced new or improved production processes with environmental benefits" is positively associated with professional and industry associations, information from technology companies, and from customers.

"Introduced new or improved delivery, transport, or distribution systems" is positively related to information from technology companies.

Overall the table suggests that no source is useful for all the environmental approaches which puts the business in the position of using a plethora of information sources and effectively means that they have to manage their information gathering.

Finally, we gather the evidence together in table 5 which collates our survey evidence for what is, and is not, supported. Our supports are mainly around priorities, self-efficacy and information.

Table5. Summary of Hypotheses Supported/Not Supported

Hypothesis	Supported/ Not Supported
<u><i>Business priorities:</i></u>	
<i>Hypothesis 1 : a priority to reducing environmental impact is associated with higher probability of net zero action</i>	Supported
<i>Hypothesis 2: Cost reduction priority impact is associated with higher probability of net zero action</i>	Not Supported
<i>Hypothesis 3: Innovation oriented businesses are more likely to undertake net zero action</i>	Supported
<u><i>Self efficacy:</i></u>	
<i>Hypothesis 4: Businesses facing obstacles but still growing are more likely to undertake net zero action</i>	Supported
<i>Hypothesis 5: Businesses with higher digital intensity are more likely to undertake net zero action</i>	Supported
<u><i>Managerial Attention</i></u>	
<i>Hypothesis 6: Businesses with small managerial team are less likely to undertake net zero action</i>	Not Supported
<i>Hypothesis 7: Businesses who experienced a large change in turnover over the last year are less likely to undertake net zero action</i>	Not Supported
<u><i>Formal vs Informal information:</i></u>	
<i>Hypothesis 8: Use of formal sources of information are associated with higher probability of net zero action</i>	Supported
<i>Hypothesis 9: Use of informal sources of information is associated with lower probability of net zero action</i>	Supported

6. DISCUSSION AND CONCLUSION

Sources of information are critical to Net Zero and even more so for larger businesses. Regional influences matter, with higher information barriers by Northern Irish and North East Firms. Ethnic minority businesses report higher information barriers. Businesses who know where to find reliable information are larger, growing, innovative, adopt digital and prioritise social and community benefits. SMEs rely on formal information.

The overall results of our study show that organisations with a higher digital intensity, self-efficacy, formal knowledge sources, and an emphasis on innovation are more likely to engage in net zero activities. These results are in line with the body of knowledge on sustainable business practices.

Our results confirm previous research showing a focus on sustainability is positively associated with the adoption of green business practices (Kesidou and Ri 2021) confirming the importance of cultural awareness and self-motivation (Dey, Malesios et al., 2022 Florea, Cheung et al., 2013, Husted and de Sousa-Filho, 2017; Stubbs and Cocklin, 2008). This is consistent with the theory of planned behaviour (Ajzen 1985, Bullough, Renko et al 2014). In addition combinations of environmental technologies can be complementary and boost firm performance (Ozusaglam, Kesidou et al. 2018)

Our findings add to the growing body of evidence showing innovation is crucial for advancing sustainable business practices, as innovative companies are more likely to embrace sustainable business practices (Cohen and Winn, 2007; Kemp et al., 2014). It is not clear whether it is that the firms possess the capability to adopt sustainable processes (Shevchenko, Lévesque et al., 2016) and thereby develops more innovation as the mechanism through which the two are linked (Sharma, 2000; Klewitz and Hansen 2014). Further research might be warranted. Our evidence suggests firms with greater self efficacy in capabilities and innovation who used formal sources of information were more likely to adopt Net Zero practices

Our findings about the importance of self-efficacy and reliable information sources are further supported by the research on innovative sustainable business practices. According to our research, resilient and growing businesses are more likely to pursue net zero action because the adoption of sustainable practices has been connected to self-efficacy (Wood and Bandura, 1989). The use of official information sources has been identified as one of the driving drivers behind sustainable business practices and our study suggests that

businesses that rely on formal sources of information are more informed and knowledgeable about net zero action.

Our evidence is less consistent with work that has emphasised costs and the role of stakeholders including procurement (Vermeulen and Seuring, 2009) and costs. We found that less evidence for structure works relations the world structural explanations although place matters for the ability of the firm to access information and also cost was highlighted as a barrier to the adoption of environmental practices.

Actionable Information

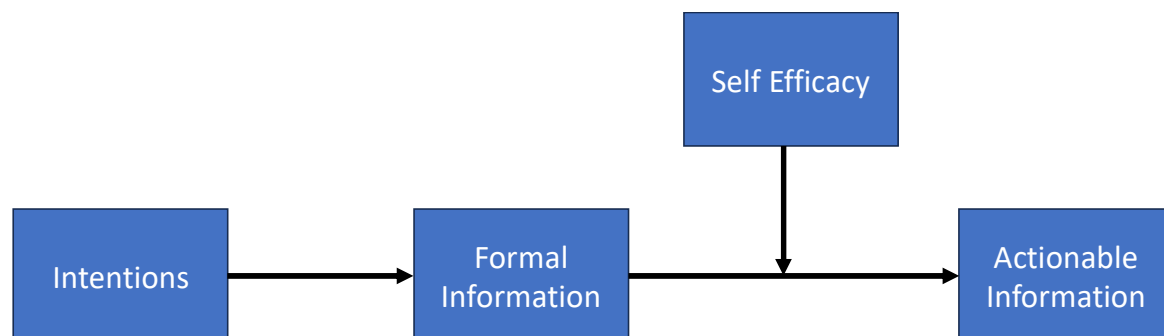
The research highlights the importance of business managers having access to reliable information to take action on net zero. Those who acted reported that they were able to find reliable sources of information, and often used information not only from online, but also in person. Previous work emphasized the role of relationships in the development of actionable knowledge (Cross and Sproull 2004). Our interviewee who pointed to the availability of so much information was a problem rather than a solution it suggests a process is required before information becomes useful. It appears that one reason for this is that the information had to be actionable, meaning that it was relevant to the specific context and firm.

Actionable information can be defined as information that can be applied to a particular context or situation. For example, one interviewee mentioned that they looked at their production process step by step and determined what actions they could take at each stage. This required having access to specific information on what they could do. Another interviewee mentioned using information from a presentation to take actionable steps to improve their firm's net zero position.

In conclusion, it is important to consider what constitutes actionable information to effectively address net zero goals. Business managers need access to reliable information that is relevant to their specific context and that can be applied to take meaningful actions. We expect self-efficacy to relate to action *wi* because self-efficacy suggests an ability to use information to overcome obstacles. We also suggest intentions are important since those with greater priority for net zero were more likely to take action. Our suggestion of the relationship between intentions, formal information and self-efficacy can be seen in Figure 9. The simple model begins with the intentions (Ajzen, 1985). It then suggests those who prioritise Net Zero will be more likely to seek and find more formal information. Then

we think that the formal information combined with a belief that you have the ability to take action (moderated by self efficacy) can create actionable information.

Figure 9: A theory of Actionable Information



Our analysis provides new insights into the factors influencing corporate adoption of net zero action as a result. Our study found that firms that place a high importance on innovation, self-efficacy, official sources of information, and environmental sustainability are more likely to take net zero action. Net zero adoption is related to self-efficacy theory. According to the self-efficacy theory, one of the most important factors in determining whether a person would engage in a particular activity or behaviour is their belief in their ability to do so.

The paper has some limitations given that we are using a cross-sectional survey. Our suggestion is that these relationships are associative rather than causal we cannot suggest innovation causes net zero practices. It is possible to say is that innovation and self efficacy are associated with net zero practices. Moreover the finding that priority towards net zero increases one's likelihood to take action would seem to have a strong association and be consistent with intentions theories (Ajzen, 1985). There were other elements which were not tested such as social influences. Other work has shown how environmental attitudes have been associated with social norms (Gadenne, Sharma et al, 2011) Moreover as a survey this has lead to a snapshot rather than examining the trajectory that a firm has taken (e.g. Berger-Schmitz, George, et al, forthcoming).

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Table A1. Probability of undertaking net zero practices dependent on sources of information, marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Undertaken environmental reports or audits	Introduced new or improved production processes with environmental benefits	Introduced new or improved delivery, transport, or distribution systems	Invested in research and development related to the environment	Introduced air pollution monitoring and filtering	Conducted training on environmental matters	Conducted market research related to low carbon products or services	Introduced new low carbon products or services	Switched to more renewable energy	Recycled waste, water, or materials (circular economy)
Professional and industry associations, or other professional	0.001 (0.030)	0.066* (0.037)	0.041 (0.039)	0.026 (0.020)	-0.004 (0.021)	0.095** (0.041)	0.040* (0.022)	0.071* (0.040)	0.027 (0.045)	0.041 (0.050)
Government support schemes or websites (e.g. GOV.UK, the Business Climate Hub)	-0.015 (0.028)	-0.025 (0.035)	0.023 (0.038)	-0.039* (0.022)	0.001 (0.020)	-0.017 (0.037)	0.020 (0.021)	0.074* (0.040)	0.117*** (0.045)	0.193*** (0.048)
Universities or other public research/education institutes	0.064* (0.036)	0.071 (0.046)	0.065 (0.045)	0.047* (0.027)	0.043* (0.023)	0.107** (0.050)	0.039 (0.033)	0.074 (0.051)	0.053 (0.053)	-0.027 (0.067)
Technology companies	0.019 (0.034)	0.113*** (0.041)	0.084** (0.039)	0.022 (0.025)	0.058** (0.024)	0.031 (0.044)	0.002 (0.028)	0.004 (0.043)	-0.017 (0.045)	0.007 (0.056)
Specialist consultants	0.125*** (0.032)	0.027 (0.040)	0.057 (0.041)	0.048*** (0.022)	-0.001 (0.021)	0.072* (0.041)	0.029 (0.027)	0.018 (0.040)	0.036 (0.049)	0.104** (0.051)
Online search or social media community	-0.024 (0.031)	0.030 (0.038)	0.006 (0.039)	-0.014 (0.023)	-0.010 (0.022)	0.031 (0.039)	0.023 (0.023)	-0.017 (0.037)	0.018 (0.046)	0.123** (0.050)
Customers	0.023 (0.037)	0.083* (0.044)	-0.007 (0.047)	0.064*** (0.027)	-0.016 (0.021)	-0.008 (0.048)	0.020 (0.031)	0.064 (0.049)	0.040 (0.051)	-0.093 (0.060)
Supply chain	0.081** (0.038)	0.025 (0.048)	-0.026 (0.042)	-0.003 (0.026)	0.027 (0.021)	0.019 (0.044)	0.038 (0.027)	0.112*** (0.043)	-0.024 (0.048)	0.064 (0.062)
Friends and family	0.010 (0.040)	-0.058 (0.048)	0.027 (0.050)	-0.002 (0.028)	0.048** (0.023)	-0.055 (0.053)	0.023 (0.031)	-0.032 (0.050)	-0.029 (0.051)	-0.048 (0.065)
Ownership	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm size	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm age	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sector	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Region	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Nbr of observations	997	997	997	997	997	997	997	997	997	997



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