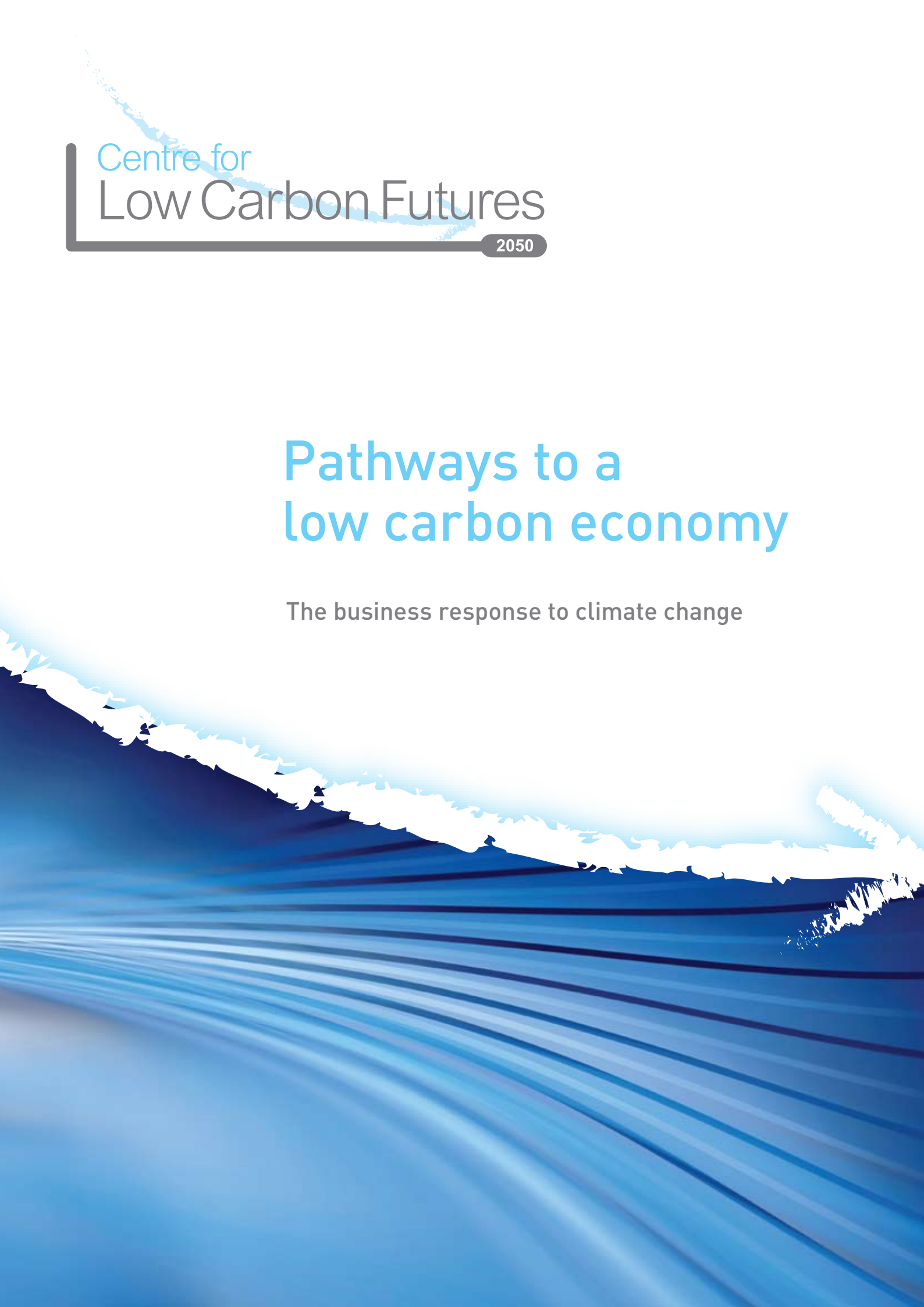
Centre for
Low Carbon Futures
2050

# Pathways to a low carbon economy

The business response to climate change



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# SUMMARY

Are companies embracing the opportunities to improve their energy efficiency and reduce their carbon footprints? Is business practice keeping pace with market opportunities, government targets and with the need for change? This policy briefing reports on new research that provides an insight into current business perspectives on investment in energy and carbon management, whilst also looking ahead at the implications of their expectations for the longer term transition to a low carbon economy.

Based on a nationwide survey of over 400 of the larger and more active and engaged companies, we draw some unique insights into business perspectives and sensitivities on energy and carbon management. There are some positive findings: businesses have faith in climate science, they are highly aware of the options for reducing energy use and carbon footprints, and there is confidence in the economic opportunities associated with doing so. But there are also some causes for concern: confidence in government targets is low, there is restricted access to capital and management time, and the networks for learning are at times poorly developed. Put all of this together and we see a mixed picture: the prospects for incremental change are good, but the prospects for radical change are much lower. The firms that expect the most seem to have some characteristics that separate them from the firms that expect lower levels of change. Developing policies that reflect these diverse perspectives and that target policy interventions and support in the most effective and efficient ways are key priorities.

These policy options needn't be delivered by government – but government could play a critically important enabling role to encourage private or civic stakeholders to contribute more fully to the transition to an energy efficient, energy secure, low carbon economy.

# INTRODUCTION

There is a lot of technological and economic optimism in many assessments of the prospects for a low carbon economy. A common theme in the IPCC's 4th assessment report (IPCC, 2007a), in the Stern Review (Stern, 2006), in the International Energy Agency's scenario planning exercises (IEA, 2008), and in numerous other analyses is that it is both possible and desirable to manage energy demand and to shift supply as we make the transition to an energy efficient, energy secure, low carbon economy.

At least in some settings, these analyses and the optimism that they have created have been influential. In the UK, for example, they underpinned the adoption of the 2008 Climate Change Act that commits the country to 34% reductions on 1990 levels of greenhouse gas emissions by 2020, with reductions increasing to 50% by 2027 and 80% by 2050 (OPSI, 2008). With modest levels of economic growth, this implies a near total decarbonisation of every unit of GDP produced (or at least consumed) within 40 years. It is probably fair to say that beyond the numerous scenario planning exercises that are currently underway, the full implications of what this level of decarbonisation will mean for the economy and society have yet to sink in for many actors.

Whilst technological and economic optimism have played a critically important role in enabling political action on climate change, the assumptions that underpin them are not always fully debated. There is therefore a need to 'groundtruth' the predictions that they make and the policies that they inform. The research discussed in this report aims to do just this.

As part of the Centre for Low Carbon Futures (www.lowcarbonfutures.org) and the ESRC Centre for Climate Change Economics and Policy (www.cccep.ac.uk), a survey has been developed to measure how much of a reduction in energy use businesses realistically expect to secure between now and 2020, through what forms of change these savings are anticipated, and what the main drivers and barriers are that shape their expectations. The research reported is based on a nationwide survey of over 400 of the larger and more active and engaged companies and provides some unique insights into business perspectives and sensitivities on energy and carbon management.

# METHODOLOGY

The results discussed in this policy brief were collected through an online survey of 420 of the most actively engaged public (23%), private (70%) and hybrid (7%) organisations, which were mainly (75%) large in size (more that 250 employees).

The majority of respondents were directors or energy/environmental managers. The survey was launched online in October 2010 and the results reported here were collected up to March 2011. The survey asked respondents for their realistic assessment of the prospects for change in the organisation that they were employed by at the time of completion. The first section of the survey focussed on the sensitivities regarding energy reduction issues, including policy, technology, economics, finance, internal management and external networks. Each of the 30 sensitivities was ranked on a five-point scale ranging from very low to very high. The subsequent sections of the survey focussed on the three main forms of change that emerged from focus groups conducted in the early stages of the research. The forms ranged from operational change based on fine tuning, through capital change based on the gradual renewal of existing assets, through to strategic change and more fundamental revisions to the business model. In each case, respondents were asked for an assessment of the expected uptake of the available opportunities (ranging from 0% to 100%) in the period between 2010 and 2020.

# KEY FINDINGS

## LEVELS OF CONFIDENCE

Despite recent controversies, managers in the leading firms still have high levels of confidence in climate science. Although their confidence in government targets for decarbonisation is low, they are very aware of the technologies that could be applied to reduce energy use and their carbon footprint, and highly confident in the economic opportunities associated with doing so.

**KEY POINT: HOW DO WE BUILD CONFIDENCE IN CARBON BUDGETS AND GOVERNMENT TARGETS FOR THE LOW CARBON ECONOMY?**

**58%** are highly or very highly confident in climate science (32% medium; 8% low or very low).

**19%** are highly or very highly confident in the UK Government's 2020 targets (41% medium; 40% low or very low).

**14%** are highly or very highly confident in the UK Government's 2050 targets (36% medium; 45% low or very low).

**55%** are highly or very highly aware of the technologies that could be applied (32% medium; 13% low or very low).

**65%** have high or very high levels of confidence in the economic opportunities (27% medium; 8% low or very low).

## ECONOMIC SENSITIVITY

Business activity in the area of energy management and carbon reduction does not seem to be recession proof – investments are sensitive to the broader economic climate. Investments are more sensitive to energy prices and interest rates in some companies than others, but access to capital and to management time are issues in many companies.

**KEY POINT: HOW CAN WE INCREASE ACCESS TO CAPITAL FOR INVESTMENTS IN ENERGY AND CARBON MANAGEMENT?**

**46%** indicate that investments are highly or very highly sensitive to the broader economic climate (38% medium; 12% low or very low).

**42%** suggest investments in energy management are highly or very highly sensitive to energy prices (38% medium; 19% low or very low).

**17%** suggest that investments in energy management are highly or very highly dependent on interest rates (39% medium; 38% low or very low).

**27%** rate access to capital to invest in energy management as high or very high (36% medium; 35% low or very low).

**21%** rate access to management time to invest in energy management as high or very high (38% medium; 34% low or very low).

## LEVELS OF COMMITMENT

Energy and carbon management are given a fairly high priority by the boards of many organisations. Organisational objectives on energy and carbon management are generally clear, but levels of buy-in from staff across organisations are slightly lower. Most firms are confident that they can access the skills needed to manage energy and carbon.

**KEY POINT: HOW DO WE ENSURE THAT ENERGY AND CARBON MANAGEMENT ARE GIVEN A CONSISTENTLY HIGH PRIORITY IN BOARD LEVEL DECISION MAKING?**

**53%** suggest that the board has a high or very high level of commitment to energy and carbon (35% medium; 12% low or very low).

**49%** rank the clarity of their organisational objectives on energy and carbon as high or very high (32% medium; 18% low or very low).

**44%** indicate high or very high levels of buy-in to energy and carbon management across the organisation (35% medium; 21% low or very low).

**46%** 46% consider their access to skills in energy management as being high or very high (28% medium; 21% low or very low).

## SCOPE FOR CHANGE

Organisations are willing to change their activities to reduce energy demand, but many more companies are ready to make incremental rather than radical changes. Appetite for risk is evenly spread across the high, medium and low categories.

**KEY POINT: HOW CAN WE ENSURE THAT QUESTIONS OF ENERGY AND CARBON MANAGEMENT ARE FULLY INTEGRATED INTO STRATEGIC AS WELL AS OPERATIONAL DECISION MAKING?**

**64%** rate the prospects for incremental changes being made as high or very high (29% medium; 4% low or very low).

**25%** rate the prospects for radical changes being made as high or very high (37% medium; 33% low or very low).

**30%** suggest their willingness to take risks to reduce energy demand is high or very high (39% medium; 25% low or very low).

## SCOPE FOR LEARNING

The prospects for organisational learning are excellent, and professional networks play a key role in learning. But learning within sectors is lower, and learning within local networks is lower still.

**KEY POINT: HOW CAN WE STRENGTHEN NETWORKS TO INTENSIFY AND ACCELERATE BUSINESS LEARNING ON ENERGY AND CARBON MANAGEMENT?**

**82%** rate the prospects for organisational learning as high or very high (15% medium; 2% low or very low).

**56%** suggest levels of learning through professional networks are high or very high (30% medium; 10% low or very low).

**40%** indicate that levels of learning within their sectors are high or very high (35% medium; 24% low or very low).

**26%** indicate that levels of learning through local networks are high or very high (36% medium; 34% low or very low).

# OVERVIEW OF PATHWAYS

Respondents were then asked for a realistic assessment of the extent to which their organisation would have reduced energy use through three levels of change:

- operational change – i.e. through fine tuning and improving the energy efficiency of existing buildings, equipment etc.
- capital renewal – i.e. through the gradual replacement of existing buildings, equipment etc. with more efficient alternatives.
- strategic change – i.e. through changes in the business model that reduce the organisation's overall energy demand.

This section outlines the survey results in terms of the uptake of opportunities of all three forms of change in 2010 and 2020.

For **operational change,** it is clear that many managers expect their organisations to move from a low to a high level of exploitation of the available options by 2020. However, around a quarter of managers expect that their organisation will continue with a low level of exploitation of the available options through to 2020.

For **capital renewal,** we see a widespread shift from low to medium and to a lesser extent from medium to high levels of exploitation of the available options by 2020. However, around a quarter of the managers questioned do not foresee their organisation progressing beyond their 2010 uptake of the options in this area by 2020.

For **strategic change,** the picture is more mixed. A significant number of managers expect their organisations to continue with low levels of exploitation of the available options through to 2020, and expectations for medium and high levels of exploitation are not as high as for other levels of change. More than a third do not foresee an increase in their uptake of strategic change options in the period to 2020.

In each case we see a significant proportion of **hard to reach businesses,** and **the willingness to explore strategic approaches to energy and carbon management is markedly lower** than the willingness to explore more operational forms of change.

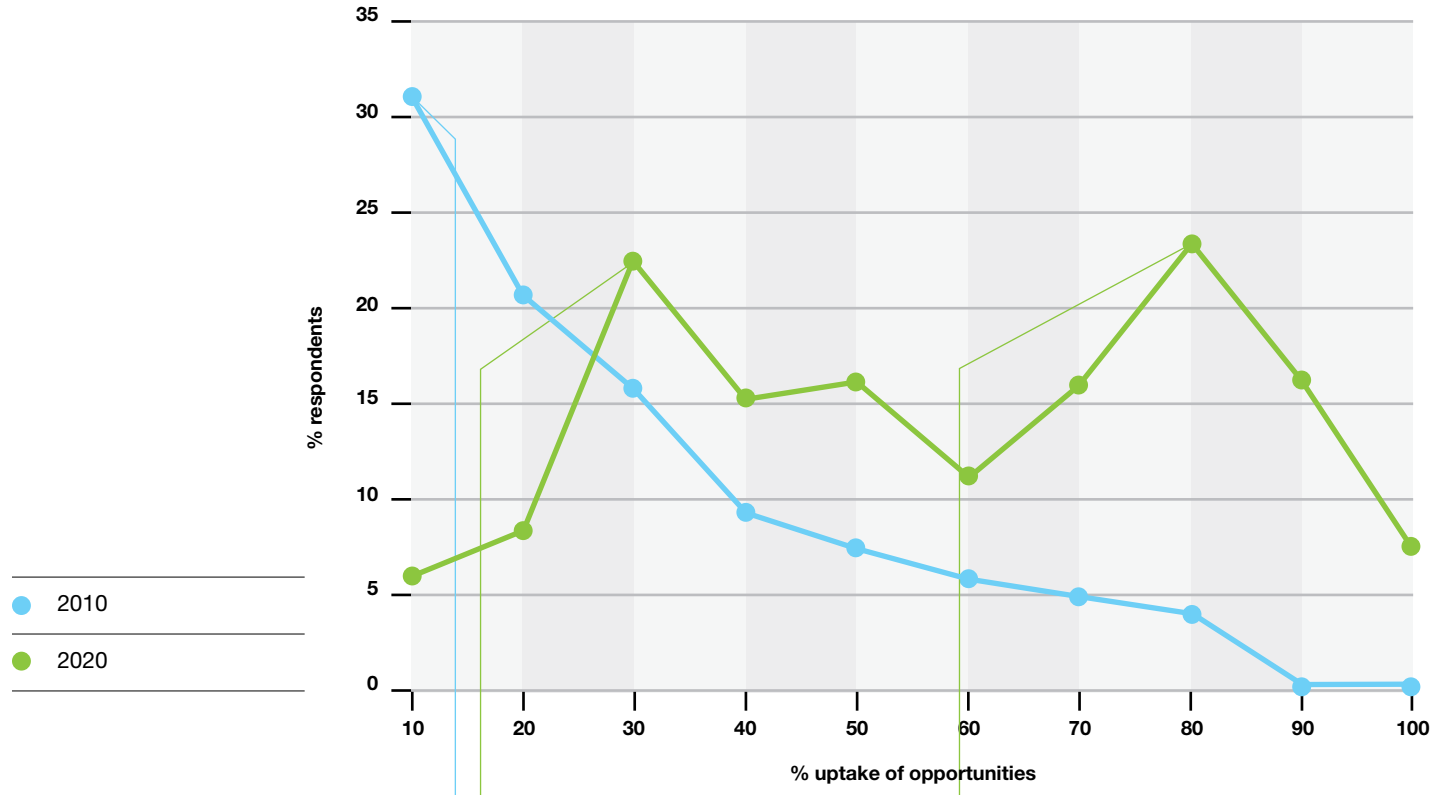
So what characteristics separate the leaders from the followers in the transition to low carbon business?

# OPERATIONAL CHANGE

**This is the most accessible route to reducing energy use and carbon footprints. In general, companies were highly aware of the opportunities in this area, they were committed to exploiting the opportunities and they felt they had the capacity to do so.**

When we break down the pathways by characterising the companies at various points, we find a range of factors that distinguish the different rates of uptake – generally the key determinants of change become more positive and enabling as uptake increases. For example, in 2010 uptake peaks at 10% and organisations with this level of uptake are characterised by low access to capital; a low awareness of the range of organisational changes available; a low willingness to take risks to reduce energy demand; and low levels of management time and skills available. Whilst these are the characteristics we would expect to see at this low level of uptake of the most accessible energy reduction options, the findings serve to inform where incentives are needed, to what degree and in which format.

In stark contrast to the 10% peak in 2010, when we look forward to 2020, we find that the companies expecting to have utilised most (80%) of the 'low hanging fruit' options are characterised by a high priority of energy management at the board level; a high awareness of the range of the energy reduction technologies available; very clear energy management objectives; high capacity for energy management; high level of awareness of the range of organisational changes available; high level of organisational buy-in for energy reduction; a strong willingness to change practices/behaviour; and a high level of skills available regarding energy management. Again, the findings are expected but they serve to demonstrate the key factors that are required in order for a company to position itself on a more favourable low carbon pathway. In turn, this highlights the opportunities for policy to support and enable low carbon transitions.




### 10% PEAK IN 2010

**The highs:** confidence in climate science.

**The lows:** access to capital; awareness of range of organisational changes; learning within local area; willingness to take risks to reduce energy demand; prospects for making step changes; management time and skills available.

### 30% PEAK IN 2020

**The highs:** awareness of technologies; management time and skills available.

**The lows:** access to capital; awareness of range of organisational changes; willingness to take risks to reduce energy demand; prospects for making step changes.

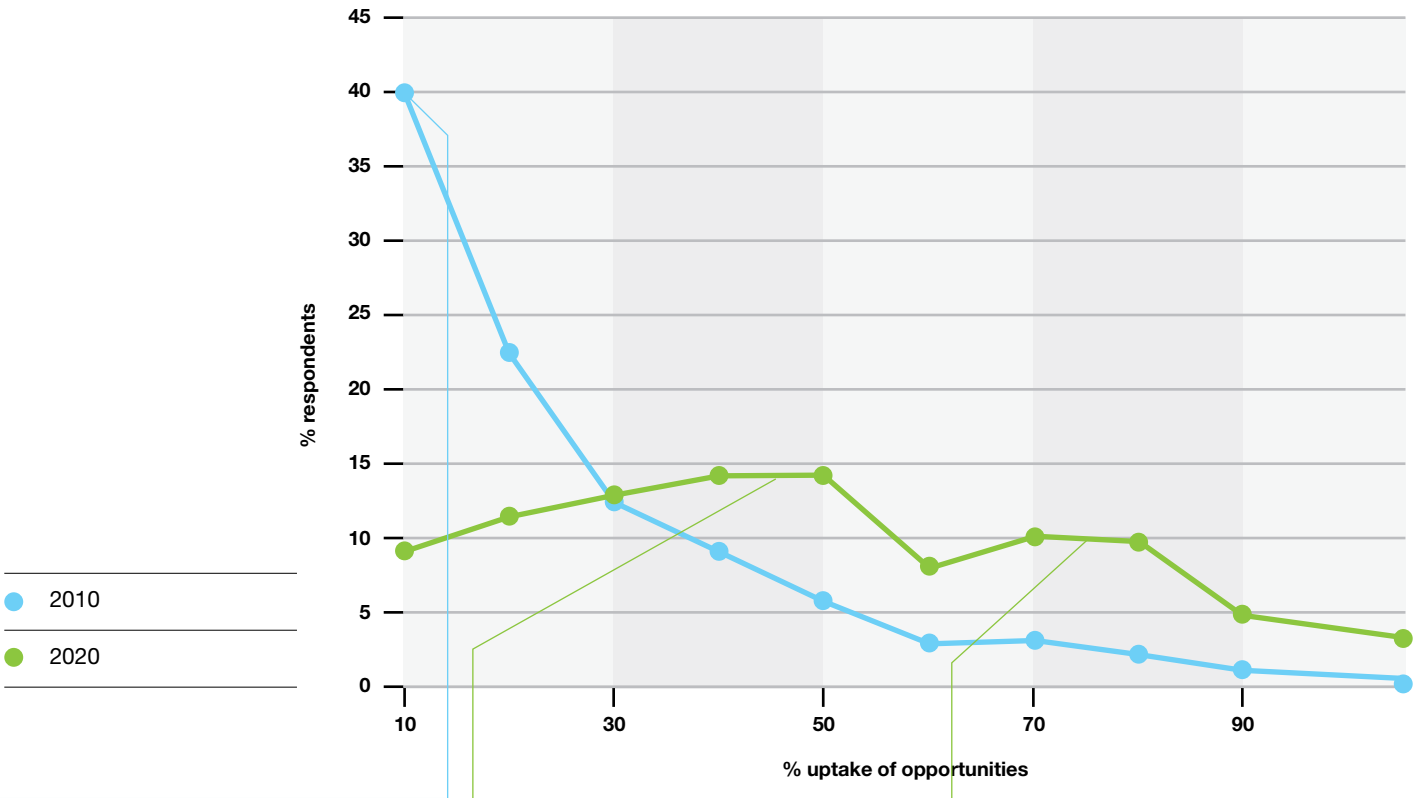
### 80% PEAK IN 2020

**The highs:** priority at board level; awareness of technologies; clarity of energy management objectives; capacity for energy management; awareness of range of organisational changes; organisational buy-in for energy reduction; confidence in climate science; willingness to change; skills available.

# CAPITAL RENEWAL

**This is the next most accessible route to reducing energy use and carbon footprints. Companies were again highly aware of the opportunities in this area, but they were slightly less committed to exploiting them than they were the opportunities for operational change, and their capacities to do so were also slightly lower.**

The chart below outlines the range of responses and highlights the factors that distinguish the different rates of uptake – as for operational change, generally the key determinants of change become more positive and enabling as uptake increases. Again we have a peak uptake of 10% in 2010, characterised by factors similar to the low uptake of operational change (low access to capital; low awareness of range of organisational changes available; low prospects for making step changes; low levels of management time and skills available). By 2020, companies that fall in the 40%-50% category for peak uptake are characterised by a high willingness to change and with ready access to appropriate skills. As uptake increases to 70%-80% in 2020, additional key factors become important – a high level of access to capital; a high capacity for energy management; and a high level of organisational buy-in for energy reduction. Again, the findings serve to highlight the importance of the key determinants for progressing along low carbon pathways and the potential for policy to accelerate change.




### 10% PEAK IN 2010

**The highs:** extent to which investments depend on energy prices and broader economic climate.

**The lows:** access to capital; awareness of range of organisational changes; learning within local area; prospects for making step changes; management time and skills available.

### 40%/50% PEAK IN 2020

**The highs:** willingness to change; skills available.

### 70%/80% PEAK IN 2020

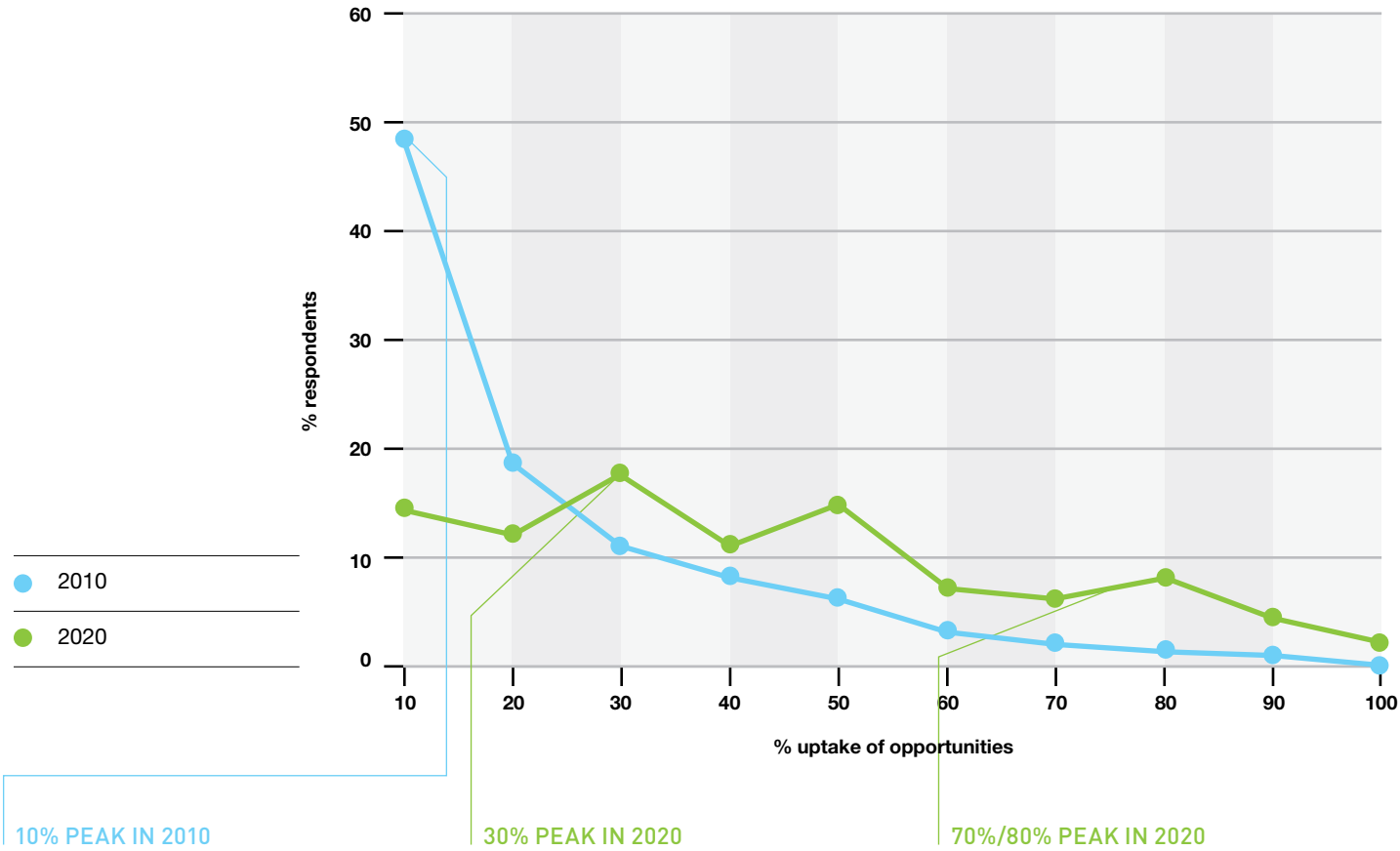
**The highs:** access to capital; extent of learning within sector; extent to which investments depend on energy prices and broader economic climate; capacity for energy management; awareness of range of organisational changes; organisational buy-in for energy reduction; willingness to change; skills available.

**The lows:** learning within local area.

# STRATEGIC CHANGE

**This is perhaps the least accessible route to reducing energy use and carbon footprints, as energy and carbon management seem to be very much operational rather than strategic issues. Companies were still very aware of the opportunities in this area, and even though their capacities to exploit them were approximately the same as for the other levels of change, they were significantly less committed to exploiting them.**

The chart below outlines the range of responses and highlights the factors that distinguish the different rates of uptake. Again we see a 10% uptake peak in 2010. The analysis reveals that companies within this peak have a high awareness of the technologies available but also low prospects for making step changes and low levels of management time available. Together these factors suggest strong barriers for increasing uptake of strategic change options. We see a similar picture in 2020 for the 30% peak, with the addition of clearly defined energy management objectives and high levels of organisational buy-in for energy reduction which are possibly key reasons why these companies have progressed further. In order to transition further along the pathway, towards the most demanding and most rewarding position in terms of carbon reductions, the findings suggest that additional factors are essential – a high access to capital; a high capacity for energy management; a high willingness to take risks to reduce energy demand; and a high willingness to change. Therefore, increasing capacity appears to be an essential component of enabling significant carbon reductions.




### 10% PEAK IN 2010

**The highs:** awareness of technologies.

**The lows:** credibility of 2050 GHG target; awareness of range of organisational changes; learning within local area; prospects for making step changes; management time.

### 30% PEAK IN 2020

**The highs:** clarity of energy management objectives; awareness of range of organisational changes; learning within local area; organisational buy-in for energy reduction.

**The lows:** credibility of 2050 GHG target; prospects for making step changes; management time.

### 70%/80% PEAK IN 2020

**The highs:** awareness of technologies; clarity of energy management objectives; access to capital; capacity for energy management; organisational buy-in for energy reduction; willingness to take risks to reduce energy demand; willingness to change.

# CONCLUSIONS AND POLICY IMPLICATIONS

## So what does this tell us about the prospects for transition to an energy efficient, low carbon business sector by 2020?

### BUSINESS AS USUAL... BUT MORE EFFICIENT

The prospects for fine tuning and incremental change in energy and carbon management are much higher than those for potentially more transformative strategic change. It seems very likely that we'll see a continuation of business as usual in a more efficient form in the next ten years.

### UNEXPLOITED OPPORTUNITIES

Many of the available options for energy and carbon management will remain unexploited even in ten years time, despite high levels of confidence in climate science, awareness in the available technologies, and confidence in the commercial benefits.

### LOW EXPECTATIONS AMONGST THE MOST ENGAGED

Even amongst the more active and engaged firms there are some hard to reach organisations that don't expect significant changes in the next ten years.

### IDENTIFYING LEADERS

There are some key characteristics that separate the leaders from the followers.

### HIGH EXPECTATIONS = GREATEST COMMITMENT...

The companies with the highest expectations have higher levels of priority from the board, buy-in from staff, capacities for and willingness to change, appetite for risk and access to capital.

### ...BUT THE OPPOSITE IS ALSO TRUE

The companies with the lowest expectations have lower levels of awareness, willingness to change, appetite for risk and access to capital, management time and skills.

## And what could innovative forms of policy do about this?

### PROVIDE AN ENABLING FRAMEWORK

A framework can be created, not only through regulation and incentives but also through capacity building and the strengthening of learning networks.

### INTRODUCE INNOVATION FRIENDLY POLICY MIXES

These can combine standards, incentives and capacity building measures and could accelerate the rate at which the available options are exploited.

### ENSURE THAT ENERGY AND CARBON MANAGEMENT ARE INTEGRAL ASPECTS OF STRATEGIC AS WELL AS OPERATIONAL DECISION MAKING

Getting energy and carbon management to the top of the board room is at least as important as getting them into every area of the business.

### STRENGTHEN THE CREDIBILITY OF THE 2020 AND 2050 TARGETS

Businesses often ask for clarity and certainty – initiating a campaign to raise the profile and strengthen the credibility of the carbon budgets and associated targets could help to unlock investment.

### CREATE AND COMMUNICATE VISIONS OF RADICALLY DECARBONISED BUSINESS

Showing that it really can be done in different sectors and for different sizes of organisation will build confidence and commitment.

### HELP TO ENSURE THAT THE LEADERS CAN GO FURTHER AND FASTER WITHOUT BEING HELD BACK BY THE FOLLOWERS

The views expressed in this survey are those of the more active and engaged firms, the hard to reach businesses mentioned here may only be the tip of the iceberg.

These policy options needn't be delivered by government – but government could play a critically important enabling role to encourage private or civic stakeholders to contribute more fully to the transition to low carbon business.

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## ABOUT US

The Centre for Low Carbon Futures is a collaborative membership organisation that focuses on sustainability for competitive advantage. Founded by the Universities of Hull, Leeds, Sheffield and York, the Centre brings together multidisciplinary and evidence-based research to both inform policy making and to demonstrate low carbon innovations. Our research themes are Smart Infrastructure, Energy Systems and the Circular Economy. Our activities are focused on the needs of business in both the demonstration of innovation and the associated skills development. Registered in the UK at Companies House 29th September 2009 Company No: 7033134.


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