

The green transition: Net Zero as an opportunity to improve productivity

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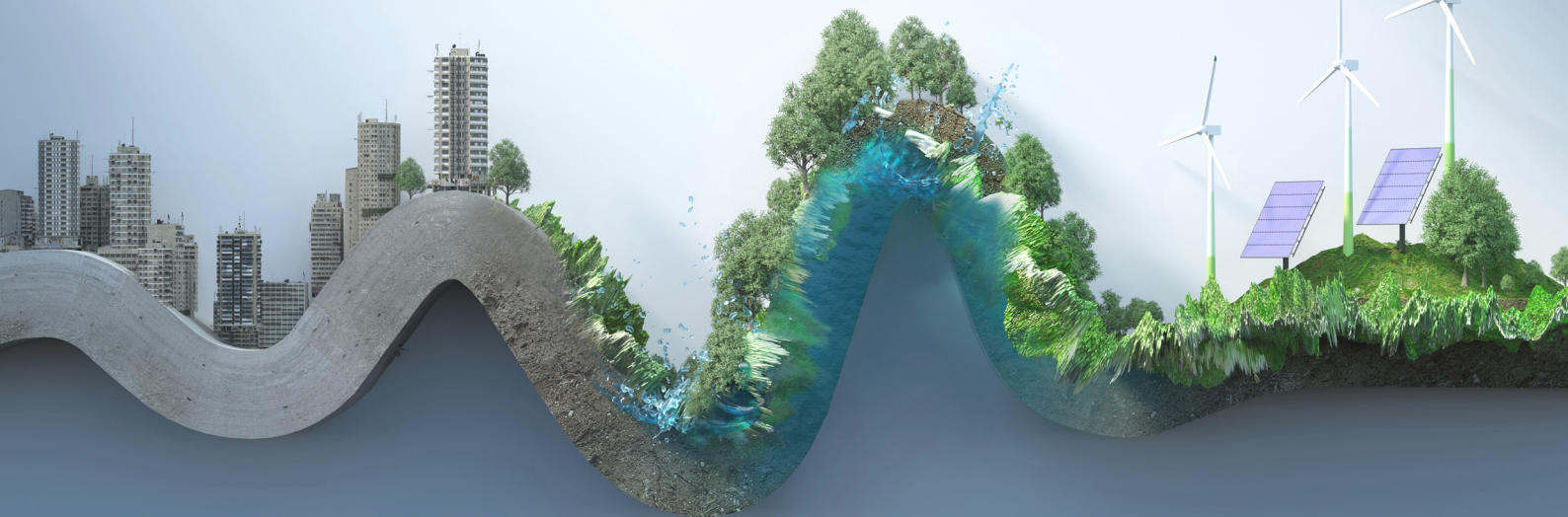
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The green transition: net zero as an opportunity to improve productivity



CHAPTER SEVEN

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The transition to net zero is an opportunity for businesses to improve productivity, generate new jobs, and create the markets of the future, but this is not guaranteed. While the prospects are promising, many sectors have not yet reached the tipping point where making the transition is the obvious move.

So how can the government make sure that it provides the relevant support to make this the new reality? This chapter will unpack the business opportunities, uncover the intricate links between productivity and net zero investment, and set out some of the policy implications.

Losing ground

Once a leader in responding to climate change, the UK is losing ground. Passing the Climate Change Act in 2008 and the law to reduce greenhouse gas (GHG) emissions to net zero in 2019, made the UK a global climate leader. It was the first major economy to legally bind itself to a green growth agenda.¹ This ambition to achieve net zero emissions by 2050 was firmly built on the belief that addressing the climate emergency will help the UK create economic growth, not sacrifice it.² The legislation would stimulate green growth and provide companies with the push to think of net zero as a business opportunity to futureproof their business models.

However, while the UK was long considered a climate leader, it is now struggling to maintain this position. The rhetoric is in place, but concrete policy

actions are lagging in comparison to close competitors in Europe and beyond.³ The UK is no longer meeting its own commitments set out in consecutive carbon budgets.⁴ And, recently, the Conservatives have been backtracking on earlier commitments, risking making net zero part of an unproductive culture war, not dissimilar from the one in the US.⁵ The UK government is sending a rather confusing signal about how serious it is about tackling the climate emergency.

Lack of clarity

This lack of clarity is unfortunate because for the most part the realisation has taken root that there is no future for businesses not shifting their activities toward the net zero emissions economy. Since the 2015 Paris agreement, the needle on corporate climate action has moved decisively. While the debate used to be about how companies could reduce GHG emissions in a cost-efficient manner and minimize the cost of compliance, it is currently about the business opportunity of net zero from investing in low-carbon technologies and making fossil fuels a relic of the past.

There is increased awareness, too, that the real impacts of climate change are already being felt across industries. Extreme weather events such as storms, floods and heatwaves are now regularly disrupting business operations and supply chains. Such experiences have led to calls for infrastructure investments such as flood defences that will make the economy more resilient.⁶

Green investments

The rhetoric of opportunity around green investments is not new,⁷ but it is taking on a whole new dimension. This is not surprising. There is evidence that green investments can be hugely successful in generating revenues and creating jobs.⁸ A case in point is the UK's greening of the electricity supply, where offshore wind has become a success story while coal has been almost phased out (see Figure 1).⁹

In other low-carbon technologies, such as electric vehicles (EVs), batteries, and solar PV, however, the UK is seriously falling behind the US with its Inflation reduction Act, the EU with its Green Deal Investment Plan, and China with its many investments in all possible low-carbon technologies. On top of this there is public outrage about the many sewage spills which are the result of decades of underinvestment by water companies. The UK has turned into a green laggard, rather than a leader.

Across the globe, other governments are taking the lead, using public-private investment to create new infrastructure to deliver green energy and to make the economy more resilient to climate shocks. The UK should follow suit, but that will not be easy as it requires massive investment in low-carbon technologies and climate-resilient infrastructure, and above all consistency in climate policy.

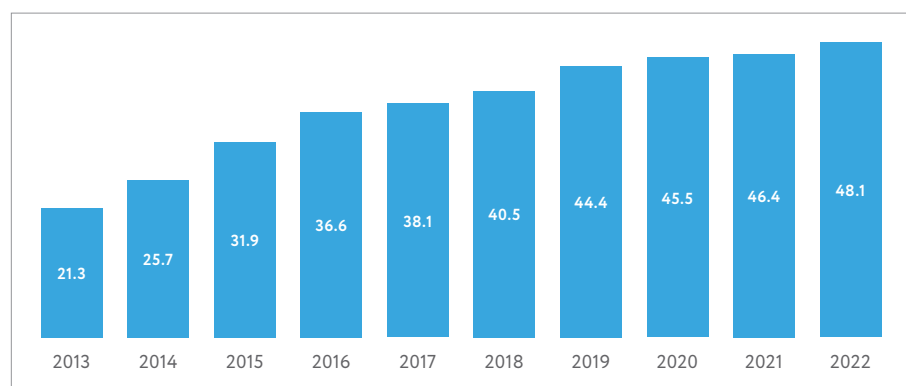


Figure 1: The UK's renewable energy share of electricity capacity (%) - Based on data from IRENA, 2023, Renewable capacity statistics 2023

The complexity of net zero for business

The business opportunities of net zero have long been recognised.¹⁰ Yet most sectors are still slow in taking advantage of them. Fossil fuels remain dominant as energy source and as an input for materials and chemicals. Achieving net zero requires a strategic reorientation of major sectors of the economy and a significant acceleration of investment and innovation to reduce dependency on fossil fuels. This is an arduous task for several reasons.¹¹

First, companies can no longer rely on existing knowledge and competences when they aim to offer products and services without emitting GHG emissions. They must obtain new knowledge to decide which low-carbon technologies to use, and new competences to fit them into existing activities.

In some sectors, the go-to low-carbon solutions have become evident, such as solar PV and wind power for electricity generation, electric vehicles for personal mobility, and heat pumps for heating houses. For many other sectors, the low-carbon solution of choice is not yet so obvious.

The steel industry, for example, has been going through periods of increased exploration of low-carbon alternatives to then abandon these again. Consequently, the UK steel industry has not yet settled on a clear path forward on net zero.¹² While achieving net zero soon is imperative, there are still many questions about how realistic the prospects are for specific low-carbon solutions for specific sectors. For example, what will be the role of nuclear

energy for electricity generation? How likely is the scaling up of (green) hydrogen for wide application in industry? And which low-carbon fuels can be realistically deployed in the short to medium term for shipping and aviation?

Clear direction

Whichever route to net zero is taken, companies are expecting the government to set a clear direction. While the market is the best way to help scale up and diffuse commercially viable low-carbon technologies, the government has a role to play in protecting such emerging technologies until they reach maturity.¹³

For instance, Tesla's current success is in part down to vast amounts of public investment for R&D and generous subsidies for the purchase of EVs.¹⁴ Due to the risk of investing in the 'wrong' green technology, companies expect the government to de-risk their investments through appropriate policy support.¹⁵

The success of the UK's offshore wind is largely the result of effective policy, such as the Contracts for Difference auctions which have provided long-term price certainty.¹⁶ Likewise, Germany's large-scale deployment of solar PV owed its success to feed-in tariffs which guaranteed investors with financial pay-offs for a period of 20 years. Such support is also imperative because deploying low-carbon technologies at scale involves a system transition. Companies cannot make the transition alone, they need a well-functioning infrastructure, including

an upgraded and expanded electric grid,¹⁷ and the buy-in of customers, suppliers, governments, and society.¹⁸ Government has to co-ordinate their multiple decisions.

Urgency

And then there is the question of urgency of net zero. One reason for companies' indecision about the business opportunity of net zero is hitherto a seeming lack of noticeable climate impacts. Although the IPPC (Intergovernmental Panel on Climate Change) has been sending a clear message for decades that the need to act is ever more urgent, for companies the lack of noticeable impacts close to home has meant that investing in net zero felt like throwing money at an abstract future.¹⁹

With extreme weather such as floods and heatwaves making headlines year on year, the urgency is more obvious. However, the need to act now means that companies must accelerate their strategic reorientation and make massive investments at an unprecedented pace.²⁰ This requires a radical change in industries such as heavy manufacturing that are not used to such sudden moves due to the long lifetime of their assets.²¹

Clearly, the route to net zero is ridden with complexities and uncertainty, not only about which low-carbon technologies will deliver the much-needed emissions reductions and who will take the lead, but also about the impact of the transition on companies' financial performance and productivity.

The link between net zero and firm-level productivity

The link between environmental regulation, firms' investments in green technologies, and economic outcomes such as financial performance, competitiveness, and productivity has been much debated.²² At first, government attempts to have companies reduce emissions were seen as driving up costs and harming firm-level productivity.²³

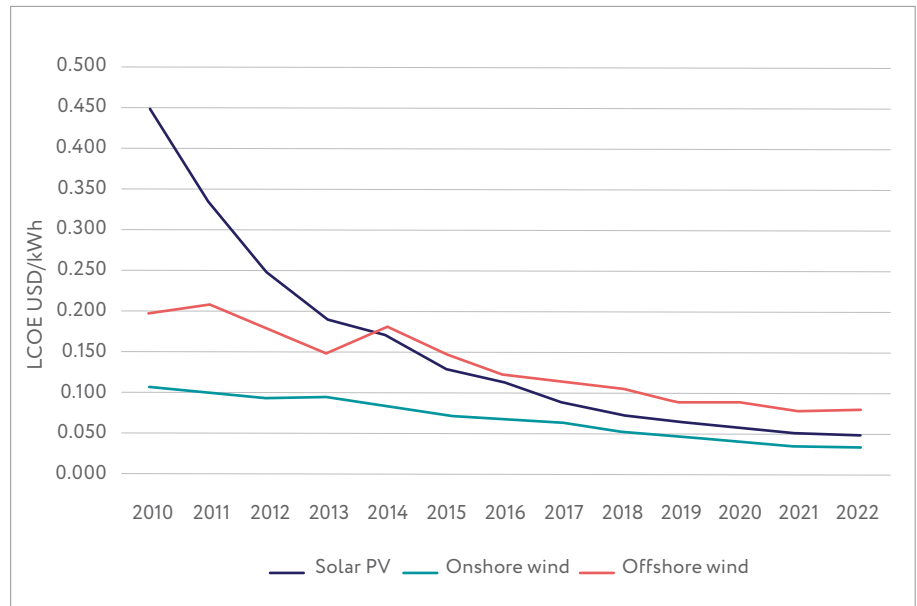
High costs of compliance are a concern because it is not obvious how companies can recoup these costs without increasing prices and thereby harming their competitiveness. There is indeed evidence from German manufacturing industry which suggests a negative relation between previous environmental regulations that drive up costs and firm-level productivity.²⁴

The famous 'Porter Hypothesis' – that environmental regulation would stimulate efficiency and innovation – changed how we now see this link.²⁵ The underlying idea is that environmental regulation compels companies to innovate and run operations more efficiently, which will not only drive down costs but also increase revenues. This 'win-win' rhetoric has gained much traction, but the evidence is inconclusive. Many studies have found a negative relationship instead, although most failed to reckon with the dynamic effects. That is, green investments will not produce immediate results because companies need to learn how to use green technologies to become more efficient.²⁶

Dynamics

Clearly, understanding the underlying dynamics is key to explaining the link between net zero and productivity.²⁷ If it takes time for companies to use low-

Figure 2: Global weighted average of levelized cost of electricity (LCOE)



Source: Based on data from IRENA, 2023, Renewable power generation costs 2022

carbon technologies productively, then investing in them will likely lower firm-level productivity in the short-run. This is similar to the productivity J-curve from using digital technologies described in Chapter Five.

There is considerable uncertainty, too, about whether low-carbon technologies will perform as promised. Many green technologies, such as biofuels and hydrogen, have gone through periods of considerable hype to then lead to disappointing results, both environmentally and economically. It is not surprising then that companies are reluctant to make green investments. When green investments have to be

funded by taking resources away from continued investments in fossil fuel-based technologies, the short-term negative productivity effects might even worsen. Companies would be ceasing investments in technologies known to be productive, to instead bet on green technologies which have not yet proven themselves.²⁸

Then again, there is evidence that low-carbon technologies drive down prices in the long-run.²⁹ The costs of renewables such as solar PV and wind power have been falling exponentially, thereby lowering the price of electricity (compared to what it would otherwise have been) and pushing out coal in the UK (see Figure 2).

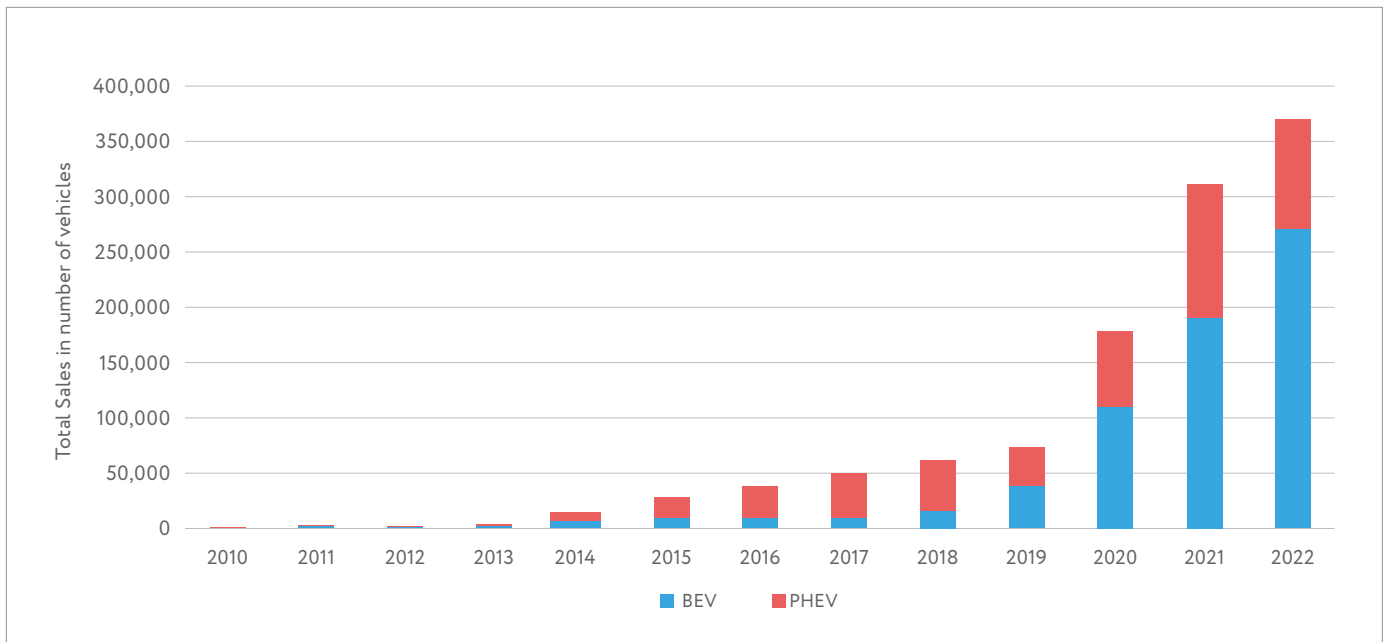
While low-carbon technologies require high upfront capital investments, they do not depend on highly variable fuel costs such as oil, gas, and coal. A similar dynamic is noticeable with EVs which has stimulated their demand (see Figure 3). Currently, EVs are still more expensive, but their running and maintenance costs are lower than conventional cars. If economies of scale further bring down the price of EVs and their batteries, there will eventually be a virtuous circle of increased purchases, lower costs, and lower prices.

There is increasing evidence that low-carbon technologies can indeed reach this kind of tipping point, after which their deployment speeds up considerably, creating new markets altogether.³⁰ A business is therefore ill-advised to look only at what investing in low-carbon technologies will do to short-term costs. While the cost implications are important, they do not tell the full story of the business opportunity of net zero.

Furthermore, investing in a net zero economy might be a matter of essential insurance to sustain productivity levels in the long-run. With the increasing occurrence of disruptive weather events, the need for industries to become more resilient and 'weather the storm' will be crucial to even maintain current productivity levels. Excessive heat, for example, might lead to significant drops in labour productivity as people are not used to working in such conditions.³¹

"While low-carbon technologies require high upfront capital investments, they do not depend on highly variable fuel costs such as oil, gas and coal."

Figure 3: The UK's electric vehicles sales



Source: Based on data from the International Energy Agency, <https://www.iea.org/data-and-statistics/data-tools/global-ev-data-explorer>

NB: BEVs are battery electric vehicles, while PHEVs are plug-in hybrid electric vehicles

Seizing the business opportunity of net zero

The business opportunity of net zero is not just determined by the cost implications of deploying low-carbon technologies at scale. Yes, if low-carbon technologies are far more expensive than their conventional counterparts, it will be very difficult to convince companies to make a large-scale transition. However, now that many low-carbon technologies are reaching sufficient scale, their price is going down significantly.

Moreover, the price of fossil fuel-based technologies is going up due to regulation. Emissions trading schemes (ETSs) have put a price on carbon, no longer making it an unpriced externality. The carbon price influences how companies make their investment decisions. The fact that renewables have reached price parity with fossil fuels, and have even become cheaper at times, has swayed many companies to favour low-carbon technologies in their plans. Investing in them simply makes business sense from a standard investment perspective of looking at the net present value. The future financial pay-offs make it worthwhile to invest now.

Carbon price

However, not all sectors face a price on carbon. The UK ETS only covers the energy intensive industries, power generation, and (domestic) aviation. Yet, this lack of carbon price does not mean that there is no business case at all. Technologies reach a tipping point, not only because they become affordable, but also because they create other benefits.³² Society is changing in what it expects from business regarding its role in tackling the climate emergency.

The government's toolbox comprises many policy instruments, not only the ETS, to support the development and deployment of low-carbon products and services.³³ And curbing emissions is not the sole benefit of low-carbon technologies, people favour them for many other reasons too.³⁴ They are often simply considered the technologies of the future.

Markets for green products and services develop not only because they are cheaper but also because of what customers want. The business

opportunity of net zero is multifaceted and there are multiple potential business cases.³⁵ Nonetheless, in many sectors, the tipping point has not been reached yet, and low-carbon technologies continue to face an uphill struggle.³⁶

And in those industries that have not yet been hit directly by climate impacts, companies tend to underestimate the need to invest in measures to become more resilient.³⁷ This means there is an important role for government to support the development of these opportunities.

"Society is changing in what it expects from business regarding its role in tackling the climate emergency."

Policy implications

The transition from a carbon to a zero carbon-based economy is a systemic change that will require consistent policy support across a wide waterfront. This will range from financial support to – more importantly – changes to regulatory and institutional frameworks.

- The market for green products and services is growing year on year.³⁸ Customers are increasingly looking for greener alternatives and are willing to pay a price premium. Companies are no longer limited to targeting a green niche, as mainstream interest grows. For example, launching its latest iPhone 15 series with a commercial featuring Mother Nature, Apple highlighted its ambition to make all their products carbon neutral by 2030. Such initiatives are changing the industry norm. Not offering low-carbon products will become a liability for companies in the years to come when their competitors do offer such products. Governments can help expand mainstream markets for low-carbon products to increase economies of scale and move the market to a tipping point. For example, they can do so through the introduction of product standards that set a maximum amount of GHG emissions. Ever-stricter performance standards for CO₂ emissions, for example, have proven successful in driving the car industry to strategically reorient towards EVs.³⁹
- Companies investing in net zero tend to have better access to finance.⁴⁰ They have access to financial resources from ESG funds, but mainstream investors will be more interested too because they can avoid being left with stranded fossil fuel-oriented assets. The fast decline of coal is a case in point, showing the risk of continuing investments in fossil fuels. Given London's prime position in the world as a financial hub, the UK can play a pivotal role in further unlocking green finance, for example by incentivising institutional investors to invest in low-carbon technologies and energy infrastructure, or by incorporating climate risk in stress testing financial institutions.⁴¹ While there is much potential for private investors to be pivotal in providing the capital needed for the net zero transition, fiscal incentives are needed to trigger significant change in current investment patterns.⁴²
- Net zero may be an important force in attracting Foreign Direct Investment (FDI). Global investment is increasingly going into the green economy.⁴³ There is currently a global race between countries to become the location of choice for green investments, and the UK cannot afford to entirely ignore it. Multinational corporations expect the government to create favourable conditions for them to invest in the UK or to prevent them from offshoring their current assets by helping them to decarbonise operations. Recently, for example, the UK government offered Tata Steel £500 million to support it in making the switch to green steel in Port Talbot.⁴⁴ To become attractive as a destination for green FDI, the government needs to make sure that the necessary infrastructure is in place to help foreign companies work with local partners and achieve positive spillovers from such investments.
- Investing in net zero creates new jobs which tend to require more skilled labour and are therefore generally better paid.⁴⁵ Low-carbon technologies tend to be labour intensive as they require many support services. However, there are currently not enough people with the relevant skills so considerable public investment is needed in vocational training and further education to create a green workforce, in a co-ordinated manner across education sectors and regions (see Chapter Six). Without a pool of workers with green skills, UK businesses will not be able to exploit the many opportunities.
- Low-carbon products and services rely on complementary technologies such as a charging infrastructure for EVs, installation and maintenance services for solar panels and wind farms, and batteries for energy storage. These complementary technologies create new markets themselves which will generate new business opportunities and jobs. Low-carbon technologies have therefore been likened to general purpose technologies (GPTs) which trigger future business opportunities because of their widespread application across the economy.⁴⁶ Government will need to assist in upgrading existing infrastructure by tackling potential bottlenecks such as the availability of grid connections, and rolling out new infrastructure by supporting new entrants in their early stages before they break-even.
- Companies invest in net zero because they realise that it has become the most urgent issue facing our generation. Being a first-mover on net zero can also bring companies tremendous reputational benefits and make them an employer of choice for the younger generation. But the risk of 'greenwashing' is real and requires adequate consumer and saver protection to guard against it. For example, regulators need to make sure that there is effective regulation against misleading advertising.

- Investing in low-carbon technologies will push companies to rethink their business models and reimagine how they can create and capture value. The diffusion of renewables, for example, can benefit from a further platformisation of the economy where companies make money by facilitating peer-to-peer transactions for energy between people. In the construction sector, newcomers have pioneered modular business models to deliver more energy-efficient homes in a more productive way.⁴⁷ But new business models clash with the mindset of the industry and often struggle to succeed within existing institutional frameworks. There is currently no regulatory framework, for example, that allows peer-to-peer trading of energy between households, hindering platform business models.⁴⁸
- Low-carbon technologies such as renewable electricity with its intermittency, and EVs with their limited range, are only useful when they are paired with digital technologies and infrastructure. Companies that leverage the digital opportunities of net zero can provide a multitude of products and services that will generate additional revenue streams. The full suite of digital technologies including Artificial Intelligence (AI), Internet of Things (IoT), cloud computing, and data analytics can help companies make the transition to net zero. However, SMEs especially risk being left behind as they lack the resources and skills to make the digital transition. Government can help scale up initiatives like Made Smarter to enable companies to adopt digital technologies that also help them on their net zero journey.⁴⁹

Opportunities

Clearly, there are multiple potential business cases and opportunities from the net zero transition. Yet, many companies still need to be convinced of the viability of the business case in their sector. Government will play a pivotal role in supporting sectors across the economy to reach the tipping point beyond which investments in low-carbon technologies will generate increasing returns and green markets will continue to develop at pace.

However, there is considerable heterogeneity across industries. In some industries, the low-carbon technology is there, but it is still not the default option – such as heat pumps. In other industries, such as heavy manufacturing, there is far more uncertainty about what the default low-carbon solution will be. The government will have to co-ordinate with the relevant actors and make a clear choice. Without a decisive government, companies delay making big commitments – and this would hamper UK businesses in global markets of the future.

Currently, government policy is of a start-stop nature. The recent watering down of the UK's net zero plans could put a halt on green investments in sectors such as housing construction and automobiles. Relying on a carbon price as the only policy lever needed is short-sighted. There are many other bottlenecks such as an outdated electricity grid which is not fit for the massive electrification of the economy, dysfunctional regulatory frameworks such as planning systems that prevent the building of new infrastructure, and the delayed implementation of much-needed climate policies.

Multi-faceted

It is key for government, too, to appreciate the multi-faceted nature of the net zero transition. No one policy intervention will bring about change. Rather, it is a combination of changing expectations of consumers, experience with the use of low-carbon technologies, a growing group of people working in the green economy, public pressure from social activists, and well-designed policies that together create the positive feedback loops that accelerate the transition.⁵⁰ Stimulating innovation in low-carbon technologies is important, but when a labour force with green skills is lacking, it will be very difficult for the UK to become a prime destination for green investment.

Unlocking the business opportunity of net zero requires action both on the supply and demand side. Most policies are targeting the supply side of low-carbon technologies, which is based on a belief that once the technology is there, it will diffuse throughout the market.

However, to help companies which supply green products and services, the government should also stimulate demand. While subsidies and purchase incentives can be effective, it can also use its public procurement to buy low-carbon products and services only.⁵¹ By introducing low-carbon product standards and changing customer behaviour through nudging, the government can change markets and protect the risky investment of green champions. Only the government can play this co-ordination game and help UK businesses achieve the long-term productivity gains available from new green technologies and the net zero transition.

Key takeaways

Need to appreciate the multi-faceted nature of the net zero transition – no single policy intervention will bring about change.

Unlocking the business opportunity of net zero requires action on both the supply and demand side.

Investing in a net zero economy might be a matter of essential insurance for companies to sustain productivity levels in the long run.



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