Organisational transformations for a greener future

Centre for **Climate Change** and **Social Transformations**

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Executive Summary

Background:

The business and management community are key stakeholders in driving organisational transformations toward a more sustainable future. The UK private sector comprises just over 253 thousand organisations and 18.2 million employees generating £3.6 trillion to the UK economy. Whilst 83% of these are small organisations employing between 10 and 49 people, and a further 14% employing up to 249 employees, the large organisations employ 58% of private sector employees and 65% of the financial revenues[1]. Identifying pathways to transformational change for such a diverse community is not always easy.

COP26 saw 60 of the UK's FTSE100 companies commit to achieving net zero carbon emissions by 2050 and just over two and half thousand firms join the Race to Net Zero. These figures indicate the extent to which there is a gap between the call to shift toward a green economy and confidence amongst the business community. Arguably, the lack of clear policy guidance and ambition means the business community must make its own way towards a sustainable future.

A review of the academic literature found that several pathways to change exist and represent a choice between, or more likely a combination of, incremental operational changes, disruptive strategic interventions and the circular economy. This report shows how transformative change is being driven through the integration of behavioural and technological innovations and provides a set of principles with applicability across the diverse business community. It provides evidence from 4 case studies of different UK businesses, with each working to achieve their own vision for sustainability. The businesses comprise a small accountancy firm, a large UK family construction firm, a large water utility firm and a large international refinery.

Key findings:

→ Sustainability interventions, being single actions intended to limit the environmental impact of an organisation's operations either directly or in the future, are tailored to the specific organisational context and sensitive to other ongoing initiatives and past history.

→ Sustainable transformations treat net-zero targets as a necessity within a larger transformation involving other environmental and social goals. Transformations, defined here as "a process leading to marked and qualitative change and processes that lead to fundamentally different forms of thinking, actions, systems, and structures"[2] of or within companies embody an organisational long-term goal or vision in order to escape

organisational siloes and enable coordination.

→ Both strategic management and ground-level workers were keen to see change towards sustainability but both groups assumed the other were or would be resistant to change. We found evidence of ambition and enthusiasm at different levels ripe for co-creative policy work within companies but also for a more supportive policy environment.

→ Organisational learning processes, being either the creation of new sets of metrics for value framing or direct consistent consultation with stakeholders, formed the core of organisational transformations.

→ Rather than trying to combine employee/staff behavioural interventions and technological fixes most have found that a value framework marries the two - in terms of processes and policies for interacting with all stakeholders. The spectrum of those values often goes well beyond net-zero targets and obligations because carbon emissions are tied into nearly all modern business and management activities. To change anything we must change everything.

→ Organisations at the forefront of transformational change are challenging their processes and value frameworks not just in service of lowering carbon emissions: at the same time they aim to provide a fair and equitable future providing connection to stakeholder communities and purpose from working life as well as profit.

→ Organisations are increasingly finding that their expressed values are winning them contracts, clients and similarly minded staff, particularly in cases where direct comparison of products is easy. Additional social value or environmental responsibility is increasingly seen as valuable in providing additional income.

Common barriers:

There is a notable disconnect between strategic decision-making and the achievement of consistent incremental changes. Organisations struggled with practical steps they can take in moving towards an agreed strategic objective. This problem can be paralysing even, and partly because, there was a noted strategic need for fast decisive action.

Low-innovation environments can be generated when companies operating on thin profit margins with large capital assets struggled to make significant changes within the space available to them. Similarly, when the company has a low-risk historical legacy and a stable workforce, or when an ambitious sustainability strategy has already depleted “low hanging fruit”. This can sometimes be understood as risk aversion.

Siloing of stakeholders, be they internal departments, supply chains, or associated organisations can fracture and dilute policies that require cohesion to be affective at an organisational level. This can manifest as different departments interpreting the requirements or footprint differently or organisations struggling to extend value frameworks to the supply chain that includes companies that need not hold the same values.

Several of our cases involved companies who have significant greenhouse gas emissions that were intrinsic to their operation but not directly connected with energy use or supply chain. Those emissions remain and require additional action even if direct energy emissions and supply chain emissions could be eliminated completely.

Innovations that can be easily copied by competitors do not produce a significant competitive edge in markets. This is particularly true in cases of smaller technical upgrades such as light fittings, efficiency measures and behavioural changes within the workforce. These early stages of transformation require an investment for no marketable advantage.

Key insights by case:

Added value wins work and allows a company to future-proof their activities. However, strategic level buy-in is not enough on its own to embed sustainability into a company.

A commitment to engage with community stakeholders and a consistent culture of steady innovative improvements can pave the way to a smoother transition to a sustainable economy ahead of the markets. However, shocks from unexpected quarters can derail a company's ambitions.

However well-intentioned firms are they are going to run into boundaries that require systemic by -in for their ambitions to spread beyond their footprint and workforce; reflecting that intention in their product offering is a good way to begin that process.

Assessing the value of sustainable decision-making needs to incorporate multiple measures that cannot always be aggregated into a singular meaningful value, but this difficulty was an insufficient reason not to assess relevant criteria.

Implications:

Holistic organisational solutions are critical but hardest to generate and implement, often requiring the creation of new metrics to measure progress and enable reflective improvement. Learning through and by doing is vital, particularly where interventions carry high risk. This means more than putting metrics and learning processes into place, there needs to be a mechanism for

reflecting on the success of an intervention in near-real time to ensure its success rather than reflect on a failure.

Developing a framework for social and environmental good, treated together, can enhance transformative change. Combining work around sustainability and social value as well as employee wellbeing builds trust and capacity within a company and limits resistance within a customer or client base.

Internal communication strategy that makes a point of listening to workers and making it clear, in context what the overall strategy is can be helpful in healing the divide between worker and strategic ambition. Enhanced communication processes beyond broadcasting management level decisions can help build confidence and determination towards more rapid targets.

The "Double externality" problem around sustainable innovation within markets can be sidestepped a little by extant value systems, i.e., the product and value an organisation offers. Taken as individual interventions, they can be easily copied, but as part of a holistic move towards genuine sustainability smaller interventions can amalgamate into a larger transformation.

Case companies frequently encountered tensions engendered through experiencing the limits of their own capacity and agency within a wider ecosystem of organisations, not all of which were fully aligned with their own ambitions of transformation towards sustainability. The effects of those limits could be mitigated by a consistent and encouraging policy environment aimed at creating a sustainable economic paradigm with rapid transition to net zero at its core.

Section 1: The integration challenge facing the business and management community

The policy terrain

This is a time in history that asks a great deal of us all. The IPCC's[3] "brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all" represents an uncompromising challenge at a policy[4], an organisational[5] and a personal level[6]. This challenge requires nothing less than a transformation of our current economic system from an unsustainable model to one that can continue to exist in the coming decades. This report details how that transformation has begun in the UK within four case studies of different organisations in different sectors.

In terms of meeting the global challenge of retooling our economic systems to work within our collective global carbon budget[7], there have been increasingly urgent sounding statements from international organisations like the UN[8] and IEA[9,10]. In response we saw laudable notions from national governments and "Climate Emergency" declarations from Councils and local authorities across the world[11] but extremely limited impact on actual carbon emissions. The Nationally Determined Contributions (NDCs) that countries have pledged following the Paris Accords and Glasgow Pact combined, still leave humanity with an apocalyptic future. With international or national governance structures not providing sufficient ambition the private sector is left without cohesive guidance on climate action and must make its own way towards a sustainable future.

Within the UK, years of political instability combined with a previously promising record and the increasingly obvious reality of rapid climate change has led to some incoherent and unambitious policymaking that has progressed in some areas and fallen behind in others. Case in point, the UK has twice enacted legally binding climate targets[12], but is in real danger of failing to meet its carbon budget requirements[13] and is not expecting to meet its longer term budgets at all due to a "policy gap"[14]. Much of the UK government's net zero strategy is based on technological interventions like net-zero aviation combined with individual behavioural interventions based on providing information for initiatives designed to encourage home recycling and frugality[15]. Despite the known limitations of "information deficit" behaviour interventions[16] and the presence of the "value-action gap" whereby expressed preferences and awareness of technological solutions don't translate to significantly different behaviour[17], these two models are still commonly used as part of government policy. Technological and behavioural shifts are co-productive[18], treating them as separate risks missed opportunities for potential pathways for carbon reduction.

The integration challenge for organisations

This policy terrain leaves organisations to work in the absence of very much guidance to accelerate transition beyond the parameters of current policy, which tends to view technological and behavioural interventions as isolated. A key challenge for organisations is to tread the line between technological innovation and behavioural intervention in real time on the ground while maintaining profitable activity. Value frameworks can do much to bridge that separation of these into a wider process of transformation.

Our research shows that rather than trying to combine employee/staff behaviour and technological fixes most have found that a value framework marries the two in terms of processes and policies for interacting with stakeholders. The spectrum of those values often goes well beyond net-zero targets and obligations because carbon emissions are tied into nearly all modern business and management activities. To change anything we must change everything. Organisations at the forefront of transformational change are challenging their processes and value frameworks not just in service of lowering carbon emissions but at the same time to provide a fair and equitable future providing connection to stakeholder communities and purpose from working life as well as profit.

Section 2: The research

This research is based on collaboration with businesses with which the Centre has established links, to trial opportunities for change in organisational processes and employee activities as well as evaluate drivers, barriers and impacts of these changes. The research is embedded in social theories of economic action, with a specific focus on stakeholder involvement in changing organisational norms; this being the most effective route to achieving transformative impact in a firm[19] . With centre partners Anglian Water and Wates Group, as well as Vale Clydach and Triple Bottom Line Accounting, this project focused on how changing norms and practices are linked to material usage and consumption within supply chains. The project considered the co-benefits of climate mitigation action, in terms of the long-term resilience of business models and sustainability.

Case Study 1: Wates Construction - family construction firm

A family run construction business with a portfolio of revenue streams concerning management and maintenance and a strong legacy of social values that has recently updated those values to include an ambitious sustainability strategy. Although the organisation has a strong legacy of social value, the business is relatively new to the sustainability agenda, with the work that inspired this case study beginning in 2020. This case documents the initial steps of an ambitious plan to reduce the impact of a large company to as near to zero as possible and the initial effects of that commitment. It includes several different items that have been added to the company's portfolio alongside the staffing of new strategic positions and the embedding of new kinds of language, metrics and understandings around sustainability. This example highlights both a powerful case for forward-thinking strategic planning and a warning about some of the potential initial pitfalls of ambitious planning around sustainability.

Case Study 2: Vale Clydach - future-proof refinery

A high-end nickel refinery in the process of re-positioning itself as part of a circular economy. With a strong history of technological innovation as well as deep community roots, the refinery is positioning itself for new emergent markets and testing new technology to meet both its operational needs and the demands of the future. Vale Clydach is ahead of the curve in terms of the UK private sector and is also ahead of its parent company in practices of sustainable innovation. As a result, the refinery is well-placed to deal with the global regulatory and normative demands for rapid transition to net zero. Several recent inciting incidents have set the stage for a new phase in the technological development of the refinery that can enable the company to play an important part in the UK's green energy future.

Case Study 3: Triple Bottom Line Accounting - innovative accountancy practice

A small accounting firm using a novel approach to reduce its direct climate impact and also influence that of its staff, client base and wider industry. Drawing on academic experience and a long history of fostering younger talent the firm is setting out to challenge what it means to be an accountancy practice. Part of its commitment to sustainability is a strong focus on social justice and ethical company practice. This departure from what is considered to be normal for an accountancy practice stands as both a challenge to conventional wisdom and a promising source of new revenue in a world more and more in need of such services.

Case Study 4: Anglian Water - progressive utility company

A utility company in the East of England which has updated its articles of association to reflect this ongoing guarantee of environmental and social responsibility. This effort is reflected in the creation of a multi-capital framework which entails the inclusion of added criteria and metrics for new projects and initiatives around six 'capitals' at various stages of investment. It aims to further embed sustainability through carbon reduction and biodiversity net gain and also drives innovation and social responsibility, in addition to taking into account financial factors. The Six Capitals framework is the next natural step in a long history of work done by Anglian Water towards a more sustainable future and fulfilment of its sense of purpose as a company.

Section 3: Key findings - cross case themes

Our analysis identified the following themes across our four cases despite significant variances in size, sector, mandate, and experience with sustainability issues.

Strategic proactive engagement

Across all four cases it was found that proactive engagement with sustainability at a strategic level within the company was vital in providing impetus for sustainability initiatives. At Wates this manifested in much more ambitious targets than were initially deemed feasible by the sustainability team but which provided encouragement for more aggressive target setting. Within Vale International appointments have been made to encourage innovation towards sustainability at the highest level. TBLA and Anglian Water both have long-standing commitments to sustainability that have recently been enhanced further with management by-in to a strategic direction focused strongly on sustainability.

Ambitious targets and firm organisational governance

Along with strategic buy-in, there needs to be processes put in place to demonstrate an organisation's commitment to sustainability in practice. In the case of Wates and Anglian Water ambitious targets have been followed up with the installation of specialist staff and the formation of frameworks to both gather data on current impacts and instil consistent effort towards those goals. Vale Clydach has a long history of technological innovation even within a relatively risk averse industry, meaning that its reductions in localised impact to the surrounding area are well ahead of the curve set by Vale International. TBLA, as a much smaller company, exerts more direct, albeit intentionally collaborative control over its workforce with regular all-staff meetings giving the opportunity to engage employees' enthusiasm, sense-check new interventions and gain near real-time feedback.

Integrated tech innovation

Most organisations have struggled with instituting solely technologically based interventions. In the case of Wates this manifested in several different ways from struggling with the impact of replacing fleet vehicles with EV variants on employees' day-to-day lives, to having a section of the company created specifically to manage and encourage the introduction of new green technology into construction being hampered by construction procurement processes. TBLA seem to have hit the limits of where their own enthusiasm for sustainability can take them in that much of the software the company uses for its primary activity has never been required to take account of the sustainability of its offering and, as a result comparisons between software are largely impossible on the basis of sustainability. Vale found that low carbon energy

and water use reduction required specific solutions to meet the requirements of the Clydach site but that by carefully tailoring the technology involved to the practices expressed on site there were significant co-benefits in terms of both environmental impact and direct control of onsite processes allowing for a better product and lower impact. This suggests that it is most helpful to treat technology and behaviour not as separable but as co-productive parts of an integrated system of practices in order to ultimately deliver more effective and scaled impacts.

Quantifiable values for social good

Across all cases net zero ambitions invariably became part of a wider value framework that engaged with social wellbeing of staff and customers as well though carbon emissions. Wates and Anglian Water both arrived at this point from opposite directions with the former having established history of going above and beyond in terms of social goods from projects but struggling to quantify carbon impacts, and the latter having put in place carbon metrics and net-zero policies with notable success but struggling to find easily quantifiable values for social good. TBLA has maintained firm commitments to lowering its environmental impact as much as possible while providing an equitable and nurturing working space, particularly for younger staff development. While Vale has not been as focused on creating metrics for a wide range of possible impacts the company exhibits a strong sense of being embedded in the local community and communicating through open and consistent dialogue.

Stakeholder engagement

While this is a theme across all cases, the exact nature of the engagement varied significantly between organisations and based on each company's individual ambitions and the nature of their stakeholders. These relationships could be with staff, investors, supply chain, regulators, third sector groups and clients or customers. Part of the impact of an expanded scope for values created by exploring relationships within organisational activity is the identification of a greater range and number of stakeholders. In the case of Anglian Water the company focused on better metrics for impact on customers and relationships with strategic allies and supply chain. With Vale there was a focus for the local community in terms of maintaining positive relationships with local groups and being a responsible member of the community. TBLA are simultaneously working with their employees to help them reduce their personal carbon footprints, and thus the company's overall impact and building professional alliances within an ecosystem of local accountancy practices to deliver sustainability-based services to a much wider customer base. Wates already had a strong history of stakeholder engagement and community support but is now working to change the nature of the engagement towards environmental goals. These stakeholder activities reflected the ways in which sustainability formed part of the strategic goals and vision of each of the organisations. As such the stakeholder groups were an important pathway for the implementation of organisational performance goals.

Understanding and aligning interests

We frequently found a situation in which senior management is keen to see rapid motion towards sustainability but worried about the impacts of any resistance from the workforce. At the same time that workforce, being aware of a wider cultural shift towards a need for sustainability, would be happy being pushed harder than currently but require authentic direction and a firm pathway to shape ambition within the company. For Wates this manifested between management and contractors who both underestimated the others' enthusiasm to change. In TBLA's case, management had already hit most of the limits of what could be done within the company's direct remit but because of that were recruiting new staff with knowledge and enthusiasm for greater sustainability the onus lowering the company's footprint falls to staff which would normally be outside a management team's remit. In Anglian's case strategic ambition for sustainability is well embedded but with such a large company many staff operating with a range of remits and tasks over a wide geographic area it is easy to see how that ambition, or rather the requirement and staff to fulfil it can become less coherent. As a result employees who do want to see more sustainable practices can struggle to match their own ambition with the perceived envisioned management in more general terms.

Key insights from each case:

→ From Wates we learned that added value wins work and allows a company to future-proof their activities but that strategic level buy-in is not enough on its own to embed sustainability into a company. Attention needs to be paid to the way in which high level strategic decisions affect different actors within a company either through standardisation of language and processes or a focus on mutual understanding and shared goals.

→ From Vale Clydach we learned that a commitment to engage with community stakeholders and a consistent culture of steady innovative improvements can pave the way to a smoother transition to a sustainable economy ahead of the markets but that shocks from unexpected quarters can derail a company's ambitions. Establishing trust within a stakeholder network, particularly in the case of local communities can go a long way towards circumventing potential resistance to new projects.

→ From TBLA we learned that however well-intentioned, firms are going to run into boundaries that require systemic by-in for their ambitions to spread beyond their own footprint and workforce. Reflecting that intention in their product offering is a good way to begin that process and the combination of demonstrated values has done a great deal to accelerate the expansion of a small business.

→ From Anglian Water we learn that assessing the value of sustainable decision making needs to incorporate multiple measures that cannot always be aggregated into a singular meaningful value. Retaining a multi-dimensional value framework and applying it to the decision making through a firm value framework allows the company to develop holistic assessment of the value of investments in a transparent way.

Section 4: Case Study 1 - Wates Construction, Family Construction Firm

This case study is a family run construction business with a portfolio of revenue streams concerning management and maintenance and a strong legacy of social values that has recently updated those values to include an ambitious sustainability strategy. Although the organisation has a strong legacy of social value, the business is relatively new to the sustainability agenda, with the work that inspired this case study beginning in 2020. This case documents the initial steps of an ambitious plan to reduce the impact of a large company to as near to zero as possible and the initial effects of that commitment. It includes several different items that have been added to the company's portfolio alongside the staffing of new strategic positions and the embedding of new kinds of language, metrics and understandings around sustainability. This example highlights both a powerful case for enthusiastic forward-thinking strategic planning and a warning about some of the potential initial pitfalls of ambitious planning around sustainability.

Spotlight on the issue:

The company's action on sustainability is highlighting the difficulties for instantiating ambitious policies in large organisations, even when leadership is ideally predisposed to rapid action.

How has the company got to the place they're in?

Now in its fourth generation of family ownership the company has a century-long history of working within its own and client communities to create a better built environment, taking in to account the social structures that surround and suffuse bricks and mortar. The company, which employed roughly 4,000 people and has a turnover of around £1.5Bn P/A also has a strong legacy of creating added social value within its portfolio by being engaged with a wide range of stakeholders from education institutions and research groups to community groups. It has also recently expanded the definitions around value to include an ambitious sustainability strategy. This value creation takes the form of community programmes, apprenticeships and training programmes to ensure not just that the final project has value in itself but the process of creation adds value to the community. It is now more commonly understood that social value includes a minimal environmental footprint and it can be that offering that can win work.

The company consists of a family/executive group and "Group services" division, who deal with centralised policy decisions and administration as well as a number of regional groups which administer major projects within their territories. Under these structures, are four business units who are independently responsible for tendering for, administering, and delivering projects within four different mandates:

→ Large construction

→ Housing

→ Facilities management

→ Maintenance

This kind of siloed, hierarchical structure is not atypical within the industry and is valuable in terms of distribution of labour and resources, but comes with significant downsides in terms of instantiating systemic change. Each group not only has different remits and certain autonomy to create their own processes but also has different metrics for, for example, waste leading to different groups working with very different datasets and baselines for waste reduction.

Since 2020 there has been some success with the integration of a "Zero Harm" health and safety policy. The "Zero harm" target was implemented with the knowledge that a truly spotless record was extremely challenging. A large firm, engaged in work with a relatively high number of hazards or risks of serious accidents. As previously noted, this is a company with no problem setting ambitious goals. Building on that ambition, the company has also begun the process of being "Zero Carbon" in operations by 2025 as well as "Zero Waste", and net positive biodiversity. While the instigators of the policy at group level understand that this is unlikely to be executed flawlessly and that there will be hurdles and delays to the process but this commitment and sense of urgency in what is for the company, a relatively new arena is both quite rare for a company of this size and complexity.

What are they doing to move forward?

Having set ambitious targets, the company is working on operationalising those commitments. Elements within the environmental teams at both a group and regional level are gathering and consolidating data on the company's environmental impacts. This includes auditing projects currently being completed in addition to signing up to nationally and internationally recognised carbon tracking measures and initiatives. Different schemes require slightly different ranges of metrics for fulfilment but the core challenge remains carbon emissions. Embedding the "language of carbon" into the workforce is a key part of this challenge, so that future initiatives and their necessity in terms of the work being done are better understood. It is vital that the workforce understands, ideally at a personal level but at least at an operational one, that what they do contributes to carbon emissions and that needs to change rapidly.

In addition to the more foundational changes around language and values being made there has been an influx of technical expertise and technology to add value to potential new projects. The expertise comes specifically in the form of new hires at group level to help craft and develop policy. More environmentally focused roles at a strategic level help to change the relative gravity of the issue within strategic discussions and can, themselves, help to embed its importance. With an extremely tight 2025 deadline for its goals the company needs to produce as much momentum as it can from the group level ready to interface with the more autonomous business units.

The creation of a new Wates Sustainable Technology Services whose role is to monitor new technological advances and insert them into appropriate projects at design stage is a source of both added value and a

new income stream for the company. Created through a doctoral programme the Wates Sustainable Technology Services produces a framework for finding and adding sustainable technologies into new projects. This adds value to the company' tendering process as well as being, in itself a product that can be sold to other firms. Unfortunately these kinds of technological add-ins are exactly the sort of thing that get removed from projects during the "value engineering" process that takes place between client and contractor ahead of ground being broken on a new project. Once a project has been initiated it can be very difficult to make changes as the cost of specifications have already been agreed. The Wates Sustainable Technology Services is viewed as a promising and necessary step forward but one that will require structural support if it is to reach its full potential.

These two interventions represent quite different approaches and significant effort put into the transition to "Zero Harm/Carbon/Waste". Gathering multiple elements together to form a cohesive push towards ambitious targets from several different angles and at different levels of the company multiplies the impacts of each action and makes the sense of urgency clearer. But this intersectionality creates inevitable complexity in organising and in terms of the capacity of the business to extract and makes sense of the new learning.

Where are the barriers?

Executive and operational groups within the company are described within the group services division as being "cragfast". This is a reference to being stuck on a cliff with both an understanding that urgent action is required but that the immediate next step is unclear. Identifying the very broad scope of the problems that need to be dealt with in terms of "Zero Harm/Carbon/Waste" gives a direction of travel and a deadline but an almost infinite number of pathways to that goal. Each of those pathways comes with their own risks, barriers and opportunity costs.

Construction is an industry with relatively limited space for innovation. Capital intensity, with contractors being very asset heavy in terms of equipment and fleet leading to low marginal profitability was noted within the case study as putting pressure on those trying to achieve changes. As a result thoughts of innovation are often considered secondary to operational needs. These three factors build inertia into an already complex system which is likely to slow down action towards an already significant challenge. While not specific to this case study this inertia, inherited from the construction sector more generally, provides a significant barrier.

Construction is a risk-averse industry with and as a result advancement more often coming from not making mistakes rather than successful innovation. Shifting into a mode of rapid innovation across many levels of a company with goals as comprehensive as Zero harm, Zero carbon, and Zero waste rapidly cascades in complexity beyond what can be dealt with by a small executive group.

For the process to begin the company needs first to make a clear assessment of its impacts and its resources as well as consciously embedding the language to engage with such things within the workforce. The key barriers to action here are mismatches between divisions in being able to quantify values on

targets around waste or carbon and the relative newness of language and consciousness around carbon emissions to the workforce.

The distributed nature of power being exercised at a group level and between different executive elements of the corporate ecosystem is forcing co-production of policy between different divisions. While it allows different executive groups to craft their own, need and task specific policies around sustainability there are difficulties. For example, having different elements of the ecosystem being left to interpret necessarily nebulous goals independently risks the initial intention being lost, or at least inefficiency as effort must be duplicated in different areas as different divisions decide for and amongst themselves how to interpret the targets they are given.

With a high level of autonomy found within separate business units it is difficult to see, even from within the executive group, how large-scale policy decisions might be applied consistently across the company. This decentralisation is not inherently problematic as each group or region is able to interpret new policies within contexts leading, theoretically, to more appropriate outcomes. However the lack of consistency in definition, measurement, metrics or scoping on emissions or resource use is likely to hamper top-down efforts to make meaningful change in the very tight deadline given.

What could they do/use to move forward?

The company has an excellent track record for being engaged with a wide range of stakeholders from education institutions and research groups to community groups as well as a long history of social responsibility and legacy building. Already, a well embedded understanding that "added value wins work" has done much to sidestep any potential resistance to green innovation on the grounds of narrow marginal profitability and risk aversion noted above. Sustainability is seen as another form of added value within even the narrow confines of a purely profit orientated business model. There is potential to both learn from and influence a wide range of actors through a more environmental sustainability focus for legacy building. Coupled with an increasing external customer demand and a regulatory push towards environmental credentials there is a real chance to build sustainability into the business model at a bid team level where it can be a foundational part of new projects. The ability to begin with the understanding that sustainability means a better product provides a powerful incentive.

Leveraging previous work as a social/community champion the company is now bending that considerable social cache and expertise towards its sustainability agenda. With the rollout of more and more focused health and safety/mental health efforts through the "Zero Harm" programme, processes and mind-sets have been put in place to make and embed lasting changes in a large and segmented workforce. While not explicitly aimed at environmental sustainability efforts to embedded changes, if successful, can demonstrate the value of change and provide evidence to eliminate potential anxieties around further changes. Demonstrated resolve towards more socially orientated goals and success in shifting working practices to the demonstrable betterment of the workforce have the effect of de-risking movement towards sustainability in the sense that the pathway towards sustainability has some familiarity with

previously established successes.

Construction is a highly "project led" industry, meaning the company itself does not always have the greatest influence over its outputs, and every possible change is mediated through a client and their initial specification. Alongside this, every project is a new start, and potential for innovation is ever-present. Very ambitious targets driven by high level authentic buy-in from strategic management can not only have an influence on design, but win clients looking for added value, a more efficient building stock and more socially responsible products.

The company seems to be having some difficulty reconciling the need to move fast towards a tight deadline and the structure of the business, compounded by the risk adverse nature of the industry. Smaller subgroups and divisions within the company have recently been created to help accelerate change within the wider company and in some cases Wates Sustainable Technology Services further out into the wider ecosystem of customers and stakeholders. This particular example still needs to be integrated further into the design or tender processes. Coordination directly with different business units could be a powerful catalyst for change.

Section 5: Case Study 2 - Vale, future-proof refinery

This case study is centred on a nickel refinery in the process of re-positioning itself as part of a circular economy. With a strong history of technological innovation as well as deep community roots, the refinery is positioning itself for new markets and testing new technology to meet both its operational needs and demand of future markets. Vale Clydach is well ahead of the curve in terms of the UK private sector but is also ahead of its parent company in practices of sustainable innovation leaving the refinery well-placed to deal with the global regulatory and normative demands for rapid transition to net zero. Several recent inciting incidents have set the stage for a new phase in the technological development of the refinery that can enable the company to play an important part in the UK's green energy future.

Spotlight on the issue:

Vale Clydach is an excellent demonstration of a subsidiary within a large multinational corporation that is using its innovation in sustainable production processes to transition to new business markets and generate a place based competitive advantage strategy. Drawing on decades of local partnership working with regulatory, environmental and community stakeholders globally and locally the firm is at the vanguard of sustainability innovation. It has created a partnership culture, sustainability competences and an explorative mindset that underpins the innovations in evidence.

How has the company got to the place they are in?

The Vale Clydach refinery is a high value nickel carbonylation operation which is strongly embedded in the local community, employing some 200 people. The refinery itself is around 100 years old and currently owned and operated by Vale mining. The parent company as an international mining organisation headquartered in Brazil with subsidiaries in eight of the countries. The refinery uses a specific chemical process to produce particularly high grade, high purity nickel products. The company's offering as a producer of high quality, in demand material based on innovative technology has led to its longevity and deep roots within the local community.

The parent company has recently experienced several important events which affected the refinery in a number of different ways. The first was a recent critical incident, specifically a dam failure, that led to a number of fatalities. This has caused Vale international to reassess risks within its various subsidiaries and put a heavy emphasis on reduction of risk in any new projects and initiatives. This has coincided with a push across the whole company toward greater sustainability, and the hiring of the new COO with the express purpose of making disruptive changes. These two events have caused some difficulty in that there

is a push towards sustainability but challenges in a way funding is allocated for new products that, while they are intended to mitigate risks, tend to be considered behind innovations aimed at more immediate risks such as safety.

With the outbreak of the COVID19 pandemic and push to have more employees working remotely, there has been something of a fracturing of the work environment. While the physical processes of refining require on-site staff, much of the support staff has been encouraged to work off-site. This process was actually in place prior to COVID19, with staff, not directly engaged on site being encouraged to avoid the area due to safety risk mitigation concerns. It should be noted this is not due to any particular safety concerns from this case site, but rather to a heightened focus on risk reduction across the whole company. These moves are complemented by an existing push towards digitalisation of operations which has since been accelerated by a push to work off-site.

Recently several ambitious technological projects have been tested or brought fully online within the Clydach refinery. These include a closed-loop water system that has rendered the site almost completely independent of local water supplies, a pilot programme to produce both power and feedstock gases for the plant on site, and an algae farm built in collaboration with a local university to test the potential of particular strains of blue-green algae for future economic value. All three of these represent fascinating technological leaps forward for a company based within an industry that is famously risk averse and low-innovation.

What are they doing to move forward?

As a company, Vale have set environmental goals to reduce carbon output and water usage. At an international level, the installation of a new COO to make demonstrable changes and secure investment. Against this backdrop, the Clydach refinery is in both quite a privileged market position based on its output and well ahead of the curve on the metrics of environmental impact. Obviously mining and refining is not a totally clean industry and there are legacy pollution issues but the site, as it stands has reduced its water use almost to zero and has some ambitious plans to tackle its carbon emissions.

The closed-loop water system was originally instigated by environmental regulations requiring the filtering of water onto the site to protect local eel populations. It quickly became clear that, while not required by regulation, it would be easier going forwards to create a closed-loop water system on site. This meant the extraction of water from other watercourses fell to almost nothing with outflows also dropping significantly. Slightly ironically, this project has created a problem for groups responsible for protecting the canal, since much of their funding came from the refinery which now has no need to pay for the protection since no water is required to be abstracted from it. A compromise has since been reached whereby Vale Clydach is continuing to fund the community's efforts to maintain the canal.

The algae farm is a testbed project for turning CO2 emissions from industry into new products alongside a smaller plant used to demonstrate creation of hydrogen and oxygen using renewables. It was created as a collaboration with Swansea University and the RICE project. The algae can be used to create a wide range

of products including advanced medical pigments and treatments for blindness, food dyes, and animal feed and seems to be a source of some pride to employees at the site. While it remains very much a demonstration plant and is unlikely to become part of the company's core business, the algae farm represents a demonstrated enthusiasm for and commitment to a circular economy and associated innovation in carbon sequestration technology that also produces useful products rather than simply storage. Work is also currently being progressed to demonstrate the scale up of this technology to be able to use the majority of the CO2 generated on site to produce animal feed that would replace Brazilian Soy Protein.

In an effort to simultaneously cut its on-site carbon emissions and make another move towards closed loop resource management, Vale Clydach has begun the process of engineering studies to develop a method of producing process gases, heat and power from a sustainable biogenic feed source (ASPIRE Project). It is expected that this new technology will address several sustainability challenges faced by the refinery. Vale Clydach is one of very few companies that requires hydrogen production as well as a source carbon monoxide, as this is one of the primary gases used for nickel carbonylation. Producing these gases in a sustainable manner is a key challenge the ASPIRE project is going to address.

The refinery is also looking to understand how it can position itself to be a major player within the UK and European battery industry. The technical innovations have enabled the firm to acquire and build on its sustainability knowledge and competence. This has formed the bedrock of its new quest to transition into the electric vehicle battery market which is expected to see an unprecedented boom with the mainstream introduction of electric vehicles as well as larger scale battery storage. The intention is to play a part in the recycling of the batteries rather than producing new ones. This reflects an evolution in terms of both technology and business model innovation enabling a transition towards sustainable economy.

Where are the barriers?

Mining is a risk averse industry; as such innovations can be difficult to embed. The concept of risk by the parent company has become focused on health and safety which paradoxically may have detracted from more holistic social and environmental health and wellbeing sustainability approaches with regards to project funding. This has meant that the site has been looking at co-funded options for some of their projects like the Algae farm. Co-production has its advantages in distribution of financial weight and risk, sharing expertise and making sure benefits are more easily distributed but despite promises of disruptive change the governance systems of the parent company can result in delays to funding.

This refinery has a very long history going back over a century, and deep roots within the community. While there are many positive aspects to this longevity it can present problems for innovation. Many of the workers within the refinery started decades ago and have had their entire careers on the same site, operating in largely the same way. The wealth of knowledge and experience is invaluable but can present a challenge to embedding new technology or indeed new ideas or concepts as employees who are extremely well trained and practiced in their roles. However, initial employee resistance to change was mitigated by demonstrable success.

Refinery's CO2 output is not only produced by its process gas generation but also by some of the processes required by its plant. While energy intensity of those processes is also important and needs to be reduced, at least in relative terms, the more direct carbon footprint also needs to be addressed. This is where the ASPIRE decarbonisation project forms more than just an efficiency measure as it will allow reduction not just in heat and power generation emissions but also allow the refinery to more sustainably generate its feedstock gases. What this means is that the sites emissions will not achieve zero carbon as it will be required to produce CO2 as a feedstock gas which will still need to be sequestered through other projects.

What could they do/use to move forward?

Mining, as an industry, is not known for a focus on innovation but the Clydach plant does have a record of utilising relatively radical new technology. The plant currently in place has been on site for decades but is based on a rarely used carbonylation process that was revolutionary when it was first introduced and is still quite rare. The highly technical nature of the work being done in a refinery does give rise to a process of incremental improvement in terms of efficiency and technology. This long-standing focus on technical innovation has meant that the relatively radical interventions of the water cycle system and the future ASPIRE Project are accepted at an organisational level more easily. This is partly because they are technological interventions in a very technologically focused system with clear quantifiable improvements, and partly because a long-standing attitude towards incremental change builds acceptance of larger changes when needed. The previous, very successful, closed circuit water system project has been greeted with great enthusiasm since its completion and has lowered organisational barriers to further technological innovations. In adopting a leading posture even within a corporate structure attempting to rapidly raise its sustainability profile Vale Clydach is claiming a mandate for itself and setting out its offering to capitalise on markets that are set to boom.

With the mainstreaming of EV's and large-scale battery production as well as the need for grid scale energy storage, there is huge potential for capital investment into green nickel production in the relatively near future. In addition there is potential for a future market of more cyclical metal use and production. This organisation has explicitly confronted the life cycle of the industry and is looking long term at envisioning the skills and capabilities it needs to transition to growth markets as well as actively positioning itself to support and participate in a more sustainable economic model.

While every business has a supply chain and thus is subject to "scope three" emissions, the small, relatively contained refinery site means that interventions towards more circular economy can be much more easily understood since mostly, the processes being altered are taking place openly and where onsite staff can see them. Staff have more direct control over their technology and communicate well with local stakeholders meaning those interventions can also be grounded and embedded more quickly within the local community and its practice. The question of where to and how to break from a more linear economic model is one of the main barriers to the creation of a circular economy and with a small controlled environment and decreasing need for outside resources and support the refinery has moved itself to a strong position to make the break.

Using an existing Kaizen process allowing constant low-shock innovation and a platform for building towards more substantive changes and using technological innovation as a means of educating a relatively sedentary workforce about the required pace and possible benefits of change has the potential to make an effective transformation into an economic paradigm well ahead of where other companies or stakeholders might be currently. There has already been some recent cycling of senior management and an influx of new younger staff. Introducing prototype technology into its refinery processes, adding revenue streams with algae farm and massively reducing its environmental footprint with cyclical water system, can all contribute to this process.

Section 6: Case Study 3 Triple Bottom Line Accounting- Innovative accounting firm

This case study focuses on a small accounting firm using a novel approach to reduce its direct climate impact and also influence that of its staff, client base and wider industry. Drawing on academic experience and a long history of fostering younger talent the firm is setting out to challenge what it means to be an accountancy practice. Part of its commitment to sustainability is a strong focus on social justice and ethical company practice. This departure from what is considered to be normal practice for an accountancy practice stands as both a challenge to conventional wisdom and a promising source of new revenue in a world more and more in need of such services.

Spotlight on the issue:

The company is challenging the nature of its business offering and addressing difficulties of moving past low hanging fruit and pushing towards helping other firms rethink how they do business using ESG as a vehicle for accelerating change.

How has the company got to the place they are in?

TBLA demonstrated an interest in moving away from traditional accountancy practice right from its inception with a commitment to being operationally paperless in defiance of norms around producing hard copy as verification of work done. Already sector leading in sustainability due to a commitment to paperless practice and placement within a Passivhaus sustainable office space, the company has already addressed much of what would already be considered "low hanging fruit". Recently their focus on sustainability has expanded due to a change in strategic management and the addition of a new Environmental, Social and Governance (ESG) Impact narrative service.

With the introduction more recently of the ESG narrative process in collaboration with an outside consultant TBLA has moved more explicitly towards a role of fostering sustainability in a range of SMEs in the area as well as providing an advisory service not often offered by a business of this size or to SME clients. The advisory wing of the business is almost separate from the regular accountancy functions of the business and aims to help clients transition to a lower impact business model. These form two separate strings to the offering from the company with one primary manager for each. Having already set out their own relatively low impact business model and encouraged staff to make changes in their own behaviours the ESG narrative has supercharged that process and pushed a greener narrative out further into the customer base. Information presented about the company, for instance on it's website, is much more explicitly geared towards fostering sustainability. In this way the ESG narrative offering has operated as a

pathway accelerator for transferring professional expertise to the business community.

In addition to environmental goals, the firm is committed to social sustainability and responsible working practices. This is evidenced by a commitment to pay a living wage at all levels of the staff hierarchy, promote discussion about direction and sustainability across the whole company and offer flexible working hours. The company's vision for sustainability is also shaped by all staff, this is achieved through regular all-staff meetings to enable active discussion ensuring everyone feels they are being heard and that ideas are listened to. In addition, early career and kick-starter staff are paid above their contemporaries in the same position, which is a policy noted to foster greater autonomy and efficiency as staff time is valued more highly. It was evident that the firm had explicitly identified sustainability as both a technical challenge around lowering carbon emissions and a social challenge around how business is conducted. One of the key enablers in meeting both these priorities was building the intellectual flexibility and financial breathing space to tackle the more indirect challenges of sustainability like managing travel and material consumption. Giving employees the space and resources to manage their own affairs while showing leadership and setting a good example promotes and enhances agency and ultimately, aids the transition.

What are they doing to move forward?

Having already bypassed many of the issues confronting other companies and organisations, TBLA is moving forward in two important ways. First, the firm has capitalised on its position as an accountancy firm with a strong reputation for green values and specific access/relationships to companies. In this way the firm built on its legitimacy in the sector as a source of sound advice. Second, to innovate the firm took a high workforce involvement strategy that enabled it to draw in diverse expertise, and inter-generational thinking. A core element seemed to be the recognition of the intersectionality in the business case for environmental credentials and social justice around the sustainability agenda; and acknowledging conflict resolution as a necessary part of the process for innovating solutions by involving the workforce in decisions-making. This kind of work represents a key challenge in the journey towards more systemic sustainability.

Impacting the business eco-system was identified as a critical pathway to realising the firm's strategic goals. Specifically, the role of an accountancy practice is primarily outward facing. Staff are constantly interacting with agents and groups from outside their workplace. The company has already set out a strong offering as an ethical, low impact service which seems to have attracted much of their current clientele. The nature of accountancy as a practice also means developing long-stranding and relatively close relationships with companies. Accountants frequently sit on the boards of SMEs. This gives an opportunity to influence other business's practices, going beyond a functional accountant and using relationships to offer guidance. Fundamentally, what this firm is doing is challenging what accountancy can be and what accountants' role is within companies. The ESG narrative/advisory work being taken up more recently capitalises on the previous close links and cements this shift, not only offering new insights to clients but shifting the idea that management accountancy is only for huge companies with millions of pounds to spend on the service. The next ambitious step is to export that practice into a wider ecosystem

of other local accountancy practices as a product they themselves can offer to maximise and amplify the impact of the ESG narrative work through existing systems.

This insight comes from the unique academic and activist mentality embodied within TBLA. Both mentalities produce the impulse to do differently but in different ways. Academic insights foster innovation in thinking about what accountancy can be and what the role of such a company is in transition. A more activist approach builds on a history of environmental and social activism, challenging the choices being made by and within the company. Between the two, they are beginning to challenge the wider ecosystem of organisations they serve too.

Central to the firm's sustainability effort is their exceptional communication strategy and reflexive approach. Participatory decision making is key to both embedding concepts and strategic direction. This is an example of a firm using it's relatively small size to make sure it's full staff are both aware of the reasoning for strategic decisions and actively engaged in generating sustainability solutions that work for both them and the wider company.

TBLA is invested in a research culture aiming to both initiate and learn from changes within themselves, the available literature and the wider industry in real time. Already positioned within an ultra-low carbon building, there is a constant push to reduce impact further, by introducing additional recycling efforts, encouraging staff to travel more sustainably and giving information on home-behaviours that can also be beneficial. This kind of interaction may be difficult to achieve on a much larger scale, but is an important benchmark to note.

Where are the barriers?

This case presents the unique problem of having started from a very small ecological footprint. Accountancy does not have a massive material or travel footprint and the day to day business of the company is primarily determined by the footprint of the services it uses. Having basically ticked all the obvious boxes for lowering a businesses impact they are now struggling with issues like sourcing low-impact servers and software which are not straightforward to address; so finding products is difficult and takes time and energy. In addition, having lowered the impact of the working environment the challenge with staff footprints is that of changing both travel and home behaviours, which is usually considered outside a normal company's remit and often quite entrenched. Both of these require more in-depth thinking and a more sensitive approach than the more technical and material challenges facing our other cases as working relationships could be jeopardized if staff are challenged too much.

Expanding the green values and credentials of the company into its wider client base presents a similar challenge. This requires not only a careful and sensitive delivery but also requires tackling the question of what accountancy is for, and the role it plays. This debate is being played out not just with clients but internally as well, with staff trained in accountancy and book keeping finding themselves part of a sustainability transition. With that all being said, the practice's rapid recent expansion has led to discussions of moving to a larger office, which introduces new challenges as possible venues would be less

energy efficient and would require retrofitting to match the low-impact status of the current office space, if possible. This is a company asking itself big, ambitious, and important questions, and while that does represent progress worthy of note and praise, but their growth and success presents new challenges.

While certainly not lacking in ambition, the ESG process runs into a number of problems in terms of its scope. The first being that while it begins with a full carbon foot-printing exercise, it simply does not have the resources to maintain the technical expertise needed. Instead, the narrative allows smaller clients and SMEs to gain a certain amount of advisory expertise and make changes in their own footprint while learning how to express the story of their work for their own offering. Smaller clients, many of them charities, have a tendency to expect or require more time than they have or can pay for, and this shortfall has to be subsidised by larger clients. Smaller groups and SMEs also tend to have a smaller scope for their own perceived agency as well, having relatively short temporal horizons and limited capacity to invest. Often they do not expect to see the carbon impact they have or don't expect what they can do to matter. This can make it difficult to assure them of the value of the ESG narrative.

What could they do/use to move forward?

This case demonstrates a number of important levers and pathways. While much of the companies offering was digital previously, the impact of the pandemic has both demonstrated the resilience of that model and if anything heightened its impact as companies are now more comfortable with digital interactions. The relatively tiny workforce has reduced the potential losses from empty office space and the focus on embedding understandings has meant that spill-over effects begun pre-pandemic have now had more of an impact now staff are spending more time at home. This is also strengthened by the noted focus on employee welfare and flexibility, maintaining a loyal and skilled workforce. This means, that going forward into an uncertain, hybridised future, the practice is both already well positioned to capitalise on opportunities and more resilient to possible shocks.

The kind of work the ESG narrative is doing is often performed through outside consultants. However skilled and knowledgeable such specialists might be, accountants are often embedded in companies, having lasting and trusted relationships with clients in a way a consultant simply can't. An accountancy practice using existing relationships to shape strategic change toward sustainability within firms represents a very different form of intervention than outside consultants coming in. Rather than starting from scratch with new companies, existing relationships can be built upon and enriched with the ESG process to everyone's benefit. In addition to capitalising on assets the company already has it can continues to defy the model of both what accountancy can be in an emergent sustainability transition but also what, for the sake of that transition, can be considered as assets to a company.

Section 7: Case Study 4 Anglian Water– progressive utility company

This case study looks at Anglian Water, a utility company in the east of England which has recently instituted a new value framework for assessing investments. The framework entails the inclusion of added criteria and metrics for new projects and initiatives around six 'capitals' at various stages of investment. It aims to further embed sustainability through carbon reduction and biodiversity net gain and also drives innovation and social responsibility, in addition to taking into account financial factors. The Six Capitals framework is the next natural step in a long history of work done by Anglian Water towards a more sustainable future and fulfilment of its sense of purpose as a company.

Spotlight on the issue:

Anglian Water is engaged in a process of embedding progressive values and ambitions using a new investment value framework, with the main obstacle being a difficulty in emphasising the value of that process against an already advanced backdrop.

How has the company got to the place they are in?

Anglian Water is a water utility company operating primarily in the East of England and employing around 5,000 people across a strategic alliance network. These networks enable access to the kinds of knowledge, skills, finance and material required for big infrastructure projects, which the company does not have capacity for itself. Alliances are longer term, more involved than a traditional client/contractor association and maintain longer lasting relationships between member organisations. This can be important as Anglian Water tries to leverage its position within these alliances to influence decision making towards commitments on sustainability.

Anglian has a strong record of environmental commitments, particularly carbon reductions and has recently updated it's articles of association to reflect this ongoing guarantee of environmental and social responsibility. While no one would argue that return on investment is not a priority for any company, Anglian Water has committed to enshrining the public interest into its decision making for now and for generations to come recognising that a utility company should have as its purpose more than just shareholder returns. The Six Capitals process is part of how that ambition is embedded at a systemic level. Six Capitals is a framework made up of a much expanded set of metrics. Previously, similar models have been used to retroactively judge the success of projects but Six Capitals is now being applied to decisions regarding new projects and onward through the investment, design and project phases. Implementing this values framework is an important step that requires Anglian Water to embed values into investment and

project management processes and structures throughout the company.

The Six Capitals framework encompasses:

→ Social

Brings in the impact of works on local people of or the potential additional value to society from a project as well as the value of potential relationships with other stakeholders.

→ Natural

Fortifies the already familiar language of carbon reductions and quantifies carbon reductions according to the cost of mitigation/offsetting. Brings net-biodiversity gain and damage mitigation efforts into decision making processes, promising not only damage limitation but regeneration of soil and water systems.

→ Financial

The financial capacity and resilience of the company as well as the ability to access sustainable financing.

→ Intellectual

Asks for new ideas, knowledge, systems or processes being generated from each project that can be shared between company and alliance partners. Questioning if something can be done better or if innovation is being added to the company's portfolio through the work being done.

→ Manufactured

The capacity and resilience of infrastructure and services against current and future needs and demands.

→ People

The knowledge, skills and wellbeing of people as well as the health, happiness and safety of working environments, organisational culture and modes of practice.

Currently Six Capitals is being applied to approximately one hundred projects, which are at either initial investment stages or slightly more advanced. None has yet been finalised so the full impact of the Six Capitals process has yet to be quantified but it is providing insights that will determine the next stages of the process and how it is implemented for future projects. The lessons learned are already being incorporated into the current risk/value framework and so the Six Capitals are being embedded into the wider institutional language of value going forward.

What are they doing to move forward?

The Six Capitals framework is changing the institutional logic of investment, design and management decisions by widening the value basis for any given project. The framework follows previous work on sustainability and aims to substantiate good intentions cemented within new Articles of Association by putting those values and commitments into effect through investment decision making and management of capital expenditure.

Building on a strong statement of purpose, a legacy of being seen as a relatively ethical and low environmental impact service has enabled Anglian to encourage sustainable behaviour spill-over into its customer base and workforce. Encouraging this spill-over into strategic partners through relationship building and cooperation is also likely to be important going forwards. Six Capitals provides a language for understanding a wider definition of sustainable development which other organisations currently do not "speak" but with its introduction and testing within a respected long-term partner, such as Anglian Water, it may proliferate. Particularly novel in the broad understanding of sustainability encapsulated by the Six Capitals is the inclusion of innovation. This builds on Anglian Water's long standing record of engaging with research institutions across the UK to better understand their impact and ways in which they can innovate. In an ecosystem of companies covering a huge geographical area and different industries the ability to act as a disseminating point for the most up to date, tested information could be an invaluable asset. Moreover, the sustainability transition required by climate change necessitates innovation, not only in technical processes, but how organizations reconfigure to address climate change.

Where are the barriers and challenges?

Following application to the first one hundred projects the Six Capitals framework was paused as these projects were assessed to evaluate whether the framework is achieving its aims. As yet it has been difficult to specify explicit benefits that may have come from the process in terms of measurable outcomes. Comparing metrics for different capitals presents a particular difficulty. Quantifying them in monetary value allows comparison but is not straightforward. When thinking of social, people or intellectual capital the valuation is partly based on predicted impact and subjective views of values influence how these can be quantified making comparison difficult.

There has also been some debate over the extent to which all capitals must be addressed within a given project. For instance, while innovation is of course valued it is not necessarily essential, if other capitals are satisfied without the need for any new process or technology then an argument can be made that intellectual capital is less relevant. If the initial investment phase assessment does not render a perfect score for each capital initially, steady improvement over the course of a project is considered adequate. With an already strong reputation and committed management there is a struggle to make the Six Capitals process matter in the sense of material change with the danger that it creates additional bureaucracy and work to more accurately measure progress against goals that may have been achieved anyway.

Anglian is struggling to make space to invest in new, larger, longer-term projects required for a

sustainability transition. The regulatory structure under which water companies operate is based on an assessment of five year time horizons which impacts decisions made that affect the longer term. The company is soon to be expected to produce statutory strategic management plans for both water resources and water recycling which are on a twenty five year timeframe. These guide investment in longer term projects or climate mitigation/resilience efforts but when funding is still largely limited to a five year cycle it could handicap those more strategic efforts too.

The issue of communicating the value of Six Capitals across a wider strategic network constitutes a barrier at the moment but holds within it the seeds of its own solution. Six Capitals expands the potential dialogue around value between strategic partners within alliances or supply chains and this has led to friction as it is not always clear what is being asked of those partners, or exactly why. This arises from a disconnect between Anglian Water's expanded organisational goals compared with traditional organizational goals underpinned by a narrower, definition of value. However, the Six Capitals work has created metrics contributing to the translation of goals around biodiversity and innovation into terms that fit more easily into a more traditional business mindset. With much of the challenge of applying Six Capitals being around understanding how an organisation embeds different concepts of value into its thinking, there is hope that learning from Anglian Water's process can be replicated with partners.

What could they do/use to move forward?

Anglian Water has a strong legacy on both environmental protection and intervention and is seen as a responsible custodian not simply motivated by the bottom line. Six Capitals provides a framework to put in place mechanisms that drive commitments to sustainability at a foundational level, and to be more comprehensive using the framework to forward plan, as well as assess previous work. The company provides an example of harnessing existing institutional momentum to be more extensive in its transition to sustainable business practice. Anglian is able to leverage their trusted status to make gains within wider networks as more than just an exemplar but an active participant in wider change.

The use of new metrics and data coming out of Six Capitals could be key to this process. With potentially large amounts of data being generated by the process the key will be using it effectively to drive and make change. Going beyond already ambitious commitment to sustainability to demonstrate tangible advances made through Six Capitals might be a challenge but the process itself is providing benefits. The data gathering and value assessment processes being undertaken allow teams and individuals working across the Six Capitals to better appreciate the challenges for others and work being done by them. It is hoped that this breaking down of siloed working practices can be extended in future relationships with alliance members to see increasing cross-communication between groups and breaking down of institutional barriers.

Section 8 Future pathways

What can be taken from this report is that there is good, authentic work being done to secure a sustainable future within the private sector in the UK. This has been achieved creatively through many different means across different companies and scales largely because there is no blueprint for such a transition. As noted in the introduction, the task facing our companies is unlike any challenge such entities have encountered before. The case study companies are excellent examples of the various ways in which organisations can move towards sustainability and address the tensions that arise within the process through social strategic buy-in, multifaceted stakeholder engagement, integration of technology and behaviour in interventions and an acknowledgement of a more generalised enthusiasm for sustainability at all levels. However, in the context of the uncompromising challenge of climate change and the systemic nature of the problem, none of it is "enough" and there is no blueprint for the kind of change that organisations need to undertake. Therefore, it is hoped that this report provides insights for companies wishing to become more sustainable, how to approach the massive challenge and avoid some of the pitfalls and inertia.

If the question becomes how do we help or encourage ambitious companies? Then in addition to the points noted above such as strategic buy-in, multifaceted stakeholder engagement, integration of technology and behaviour in interventions and an acknowledgement of a more generalised enthusiasm for sustainability at all levels, there needs to be systemic support. This has policy implications of various levels, but specifically in the UK, from BEIS and similar bodies to provide guidance, direction and a cohesive pathway for organisations to follow knowing that they will be supported in the permission. There is also a need for financial support and investment in not just new technologies but to give space for organisational innovations and changes to management practices that can allow sustainability interventions to be better embedded into the economy. Such investment and strategic support provide not just the direct technical solutions to the challenge of net zero but provide ways to successfully embed solutions so the increasing sustainability becomes a permanent and implicit part of the way organisations operate the UK.

References

[1]ONS (2021) Figures based on small employers with 10-49 employees; medium employers with 50 to 249 employees and large employers 250 plus employees.

[2]Fazey, I. & Schäpke, N. et al. (2018). Ten essentials for action-oriented and second order energy transitions, transformations and climate change research. Energy Research & Social Science, 40, 54-70.pp. 55–56.

[3]IPCC AR6 (2021) Accessed online: https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/

[4]Tollefson, J. (2021). IPCC climate report: Earth is warmer than it's been in 125,000 years. Nature, 596(7871), 171-172. Accessed online: https://www.nature.com/articles/d41586-021-02179-1

[5]Nyberg, D., & Wright, C. (2022). Climate-proofing management research. Academy of Management Perspectives, 36(2), 713-728.

[6]CAST (2021) Accessed online: https://cast.ac.uk/wp-content/uploads/2021/03/CAST-Briefing-08.pdf

[7]IPCC Special Report: Global Warming of 1.5 ⊠C (2018) Accessed Online: https://www.ipcc.ch/sr15/

[8]UN Secretary-General Warns of Climate Emergency (2022) Accessed online: https://press.un.org/en/2022/sgsm21228.doc.htm

[9]IEA (2021) Accessed online: https://www.iea.org/commentaries/cop26-climate-pledges-could-help-limit-global-warming-to-1-8-c-but-implementing-them-will-be-the-key

[10]Gidden et al. (2021) Accessed online: https://climateanalytics.org/publications/2021/15c-remains-out-of-reach-in-the-ieas-announced-pledges-scenario/

[11]Climate Emergency UK (2022) https://www.climateemergency.uk/blog/map-of-local-council-declarations/

[12]Carbon brief (2019) Accessed online: https://www.carbonbrief.org/in-depth-qa-the-uk-becomes-first-major-economy-to-set-net-zero-climate-goal/

[13]BBC (2022) Accessed online: https://www.bbc.co.uk/news/58160547

[14]Carbon brief (2021) Accessed online: https://www.carbonbrief.org/in-depth-qa-the-uk-becomes-first-major-economy-to-set-net-zero-climate-goal/

[15]BEIS (2021) Accessed online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

[16]Hargreaves, T. (2011). Practicing behaviour change: Applying social practice theory to pro-environmental behaviour change. Journal of Consumer Culture, 11(1), 79-99.

[17]Barr, S. (2006). Environmental action in the home: investigating the 'value-action' gap. Geography, 91(1), 43-54.

[18]Spaargaren, G. (2011). "Theories of practices: Agency, technology, and culture: Exploring the relevance of practice theories for the governance of sustainable consumption practices in the new world-order." Global Environmental Change 21(3): 813-822.

[19]Wamsler, C. (2017). Stakeholder involvement in strategic adaptation planning: Transdisciplinarity and co-production at stake? Environmental Science & Policy, 75, 148-157.

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