The Real Estate Sector's Reflection On Sustainability In The Real Estate Sector

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Declaration: I confirm that this is my original work, except where indicated through the proper use of citations and references. I confirm that subject to final approval by the Board of Examiners of the Institute of Management and Health, a copy of this Dissertation may be placed on the shelves of the library of the University of Wales Trinity Saint David or made available electronically in the Library Dissertation repository and may be circulated as required.

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Abstract

Amidst global commitments to mitigate climate change and prioritise sustainability, the Real Estate Sector (RES) is a pivotal yet complex arena for sustainable development. Despite international agreements like the Kyoto Protocol and the Paris Agreement, carbon emissions have surged, with the RES significantly contributing to this trend. This dissertation delves into the perceptions and considerations of sustainability within the RES by stakeholders in the UK, recognising the sector's crucial role in shaping urban environments and addressing climate challenges. This study is motivated by personal observations in London and Israel and global imperatives, highlighting the disjuncture between sustainability rhetoric and real-world practices in Real Estate development.

Using qualitative research methods, in-depth semi-structured interviews were conducted to gather insights from UK RES stakeholders. The findings indicate a spectrum of sustainability interpretations and illuminate diverse perspectives on sustainability. Some stakeholders actively champion sustainable practices, while others prioritise financial gains over social and environmental concerns. Despite pockets of progressive sustainability leadership, decision-makers often overlook sustainability considerations constrained by entrenched moral norms rooted in capitalist economic growth paradigms. This, along with a lack of education and governmental inertia, hinders the progress towards sustainability goals.

Through a comprehensive literature review, methodological insights, and empirical findings, this dissertation contributes to the discourse on sustainable urban development. It sheds light on the complex interplay between sustainability aspirations and practical challenges within the RES. The thesis concludes with reflections on the broader implications of the findings and underscores the urgent need for enhanced education, the importance of aligning economic incentives with environmental and social objectives and calls for proactive government intervention and leadership to drive meaningful change towards a sustainable built environment. Furthermore, it highlights the need for a paradigm shift in moral norms, moving away from profit-driven models towards holistic sustainability. The thesis offers valuable insights for future research, practitioners and policymakers striving to foster sustainability in the built environment.

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1 Introduction

Nearly two hundred nations have signed the Kyoto Protocol of 1997, committing themselves to reduce carbon emissions by 5% based on 1990 levels by 2012. Further, nearly two hundred nations signed the Paris Agreement of 2015, committing to prioritise sustainability and climate in their decision-making concerning investment to achieve several sustainability targets by 2030 (UN Climate Change, 2016). However, we have, on the contrary, increased our carbon emissions by 60% compared to 1990 (Statista and Tiseo, 2023). The Real Estate Sector (RES) contributes heavily to global emissions and resource depletion. Considering the megatrend of urbanisation, the RES will likely increase its negative impact on human health and well-being and the decline of biodiversity.

Living in the vibrant city of London, I have observed house owners sealing surfaces of former gardens instead of embracing green spaces. This personal experience, coupled with my observations on vacation in Israel, where I was puzzled to see red saddle roofs on new build homes instead of the traditional white flat rooftops, has sparked my curiosity. The traditional flat rooftops in Israel are appropriate for the hot climate there, presenting a smaller surface to absorb heat and the white colour, additionally reflecting the sun (Figure 1, Figure 2).
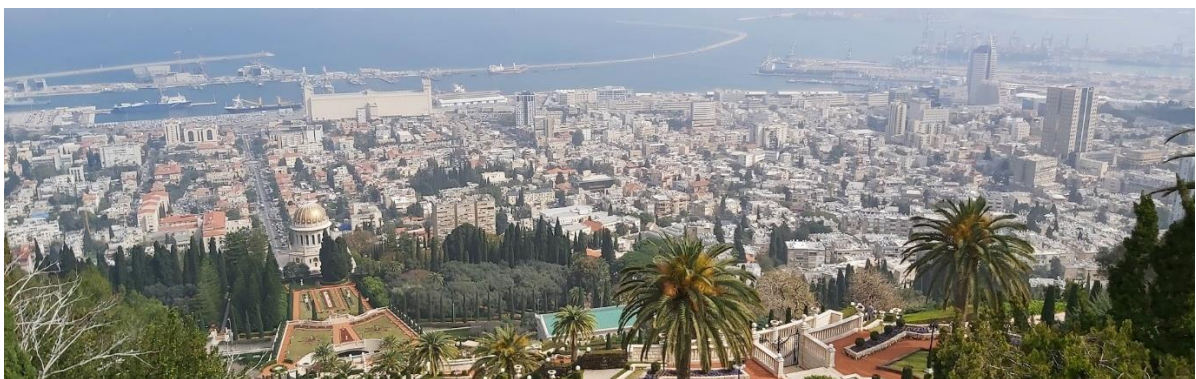

Figure 1 – Roofs of Jerusalem

Figure 2 – Roofs of Haifa

Considering governments' agreement to reduce carbon emissions and invest in sustainability, on the one hand, and my personal experience, on the other hand, I am driven to find out how stakeholders in the UK perceive the role of sustainability in the RES. I want to answer the research question, "How is sustainability considered in Real Estate Sector projects by stakeholders in the UK?". My research aims to understand how the RES stakeholders perceive sustainability in their day-to-day work. The objective of my research is to contribute to current knowledge about sustainability development in the RES and provide practical recommendations to make the RES more sustainable.

1.1 Main Methodological and Ethical Considerations

The following study was conducted to answer the crucial research question: "How is sustainability considered in Real Estate Sector projects by stakeholders in the UK?" This question holds immense importance in the current global context. To gather knowledge about the RES stakeholders' experiences and perceptions, I decided to apply a qualitative research method and gather information through deep qualitative, semi-structured interviews. For ethical reasons, I coded and anonymised the participants' names and places mentioned.

1.2 Summary of the Findings

This study demonstrates that there are RES stakeholders who consider sustainability in RE projects and try to get other stakeholders involved. Nevertheless, sustainability has different meanings to each of them. They want to create liveable, green neighbourhoods, resilient buildings made of or retrofitted with sustainable materials and lower carbon emissions on scope three. Further, they would like to introduce a circular economy approach to keeping resources in the loop and reducing waste. They want to create sustainable, energy-efficient RE and cities that are liveable and affordable and enhance people's well-being and biodiversity. However, this study reveals that organisations' financial decision-makers frequently omit sustainability. Organisations that consider sustainability beyond governmental regulation are exceptions. Another barrier to increasing the consideration of sustainability in RES projects is a lack of sustainability education appropriate for the various RES professions and, further, education's ineffectiveness due to persisting moral norms rooted in capitalism with organisations and government striving for economic growth equating well-being to GDP. Additionally, sustainability in the RES is not a government priority, resulting in lax legislation and decisions that postpone sustainability actions. Finally, this study highlights that there are optimistic, creative sustainability leaders in the RES who call for government leadership and support, which are currently insufficient to drive the change towards a sustainable RES.

1.3   Thesis Structure

The thesis begins with an overview of the relevant literature about the RES, sustainability and research gaps concerning sustainability in the RES. The following methodology chapter explains this study's applied methodological approach and process. Afterwards, the findings of the study are presented. A discussion of the findings in the context of the current research in this area follows. To conclude the study, the broader meaning of the findings and contributions are defined, and reflections on the work done and suggestions for further research are provided in the final chapter. The appendices provide a more detailed description of the interview process and the participants.

2   Literature Review

This chapter consists of two parts. The first part is a literature review of general sustainability and RES literature conducted before the research to identify research gaps and set the goal for the research. It also contains some literature review on methodology, which is further considered in the next chapter (methodology). The second part is a literature review conducted post-research. Literature referring to the concepts identified during my research was sought in the top-ranked journals to confirm or challenge my findings.

2.1   Literature Review Method

For the selection of the relevant literature, I employed three approaches. First, I consulted the literature suggested by the university for the course and the literature I had already consulted during my studies. This included books, journal articles, research papers by commercial organisations, government and NGO publications, and online news articles from newspapers such as The Guardian. Second, I used "Google Scholar" to look for specific publications related to my research and findings. Further, I used keywords from concepts and themes I identified to find corresponding publications. I have then selected articles published in top-tier journals as rated by the UCLA 100 Top Sustainability Journals, the Scimago journal ranking and the independent Observatory of International Research ranking to ensure the reliability of the referenced literature.

2.2   RES Literature and Research Gaps

In November 2022, the global population reached the 8 billion mark. The United Nations estimates that the world population will further increase to nearly 10 billion people by the mid-century (Guerra et al., 2021, United Nations, 2024). This development affects the megatrend of urbanisation.

The meaning of urbanisation differs between various disciplines (Dijkstra et al., 2021). Some of the criteria to define urbanisation are the population size, urban services or economic and social activities (Dijkstra et al., 2021). The lexica Britannica and Cambridge Dictionary consider the population size and migration to cities in their definitions of urbanisation. Urbanisation is the: "process by which large numbers of people become permanently concentrated in relatively small areas, forming cities" (Britannica, 2024) and "the process by which more and more people leave the countryside to live in cities" (Cambridge Dictionary, 2024).

According to the United Nations' estimates 68% of the world population will live in urban areas by the year 2050. This presents manifold challenges for the Real Estate Sector concerning urban planning and construction to develop sustainable cities for those approximately seven billion future citizens (Reuters, 2018, United Nations, 2018, Worldbank, 2023).

The challenges for the RES include public transport infrastructure, affordable housing, the longevity of buildings and their adaptability for change of usage, mitigation of air, noise and light pollution that have negative impacts on human health, waste management, access to green spaces, safety and liveability for people with diverse demographic backgrounds, prevention of informal settlements and slums, sustainable construction materials, resource scarcity and resilience to extreme weather conditions such as heavy rains and heat waves due to climate change. Referring to those challenges the UN have articulated under SDG 11, "Sustainable Cities and Communities", various objectives to be achieved within the next few years by 2030 (Worldbank, 2023, United Nations, 2023b).

The consequences of climate change due to humans' unsustainable activities are no longer easy to ignore threats to far away places but have affected countries all over Europe in recent years (Harari, 2016, Attenborough, 2020, Deloitte, 2020). There were fires and floods in London. Therefore, governments have to take action to make the built environment resilient and develop sustainable cities (London, 2023).

The megatrend of urbanisation and the therewith connected challenges for the RES to develop sustainable cities require humans on individual, organisational, societal and governmental levels to cooperate, analyse sustainability issues and their causes and develop creative solutions to combat them. Therefore, urbanisation and its sustainable development have become an area of growing interest for sustainability and social research (Fahy and Rau, 2013).

Lima et al. (2021) conducted a structured literature review of the main focus areas in sustainability research in the construction industry. They found that in articles from 2003 to 2021, the environmental pillar received the most attention (Lima et al., 2021, Falkenbach et al., 2010). These articles' main concerns were, from highest to lowest frequency: materials, project management, assessing sustainability and energy. Most of the articles regarded the project stages from design to completion of construction (Lima et al., 2021). These stages of interest cover the RIBA stages from zero to five, whilst stages six and seven were less considered. The RIBA Plan of Work (Figure 3) is a framework of the Royal Institute of British Architects that provides guidance for the various disciplines involved in an RES project. The stages go from zero strategic definition to seven use and maintenance (Royal Institute of British Architects, 2020).

Figure 3 - RIBA Plan of Work (from architecture.com)

Thus, there are research gaps concerning the RIBA stages six, the handover, and seven, the occupation and maintenance, and, further, demolition or refurbishment for change of buildings' usage. Additionally, the stakeholders' priorities concerning sustainability in the construction industry and the pillar of social sustainability are identified research gaps (Lima et al., 2021).

2.2.1 Sustainability

Sustainability and sustainable development mean different things to different people (Fahy and Rau, 2013, Johnston et al., 2007). For some people, sustainability means economic degrowth. For others, it is protecting nature; for again others, it is social equality and justice. However, sustainability is far more complex, and therefore, to attain real sustainability, a holistic view is necessary (Johnston et al., 2007, Meadows, 2008). The commonly used definition of Sustainable Development has been coined in the 1987 report "Our Common Future" of Dr Brundtland's led World Commission on Environment and Development: "It meets the needs of the present without compromising the ability of future generations to meet their own needs" (Imperatives, 1987).

"The Natural Step Framework" takes another approach to define sustainability. It considers humans' unsustainable activities in its definition of sustainability by indicating the following four rules:

-   reduce the depletion of natural resources from the Earth's crust;
-   reduce humans' emissions of pollutants into the atmosphere, soil and water;
-   reduce environmental degradation, for example, deforestation, which inhibits ecosystems from running their cycles;
-   do not inhibit people from meeting their basic needs, for example, by consuming cheap products produced in sweatshops (Natural Step International, 2020).

The Tripple Bottom Line concept adopts the three pillars of sustainability from an economic, social and ecological perspective. However, it is critical to apply a long-term view, and without stressing the

pillar's interconnectedness, the holistic view of sustainability might be in jeopardy (Siegrist et al., 2020, Kiani Mavi et al., 2021, Ranjbari et al., 2021).

Although the development of various concepts about sustainability demonstrates a positive trend of people becoming more conscious of the topic, this variety prevents a unanimous understanding of the term sustainability (Murphy and King, 2013).

2.2.2 Real Estate Sector

The real estate property does not only comprise built assets but also land itself and everything that is constantly attached to this land (Chen, 2023). The expression "built environment" exclusively refers to the environment made by humans, for example, buildings, infrastructure such as dams, bridges, roads, or a created park in contrast to wild nature. The real estate sector (RES) includes all industries and businesses that provide products or services (e.g., urban planning or property management) for real estate (RE). The RES further includes infrastructure and the public sector (e.g., policymakers or the Building Safety Regulator) (Cambridge University, 2021).

2.2.3 Sustainability in the RES

The global construction industry generates about $10 trillion and half of human's total annual carbon dioxide emissions (30% through construction and 70% through buildings' operation). Further, the construction industry consumes 50% of the global energy and extracted resources annually. This highlights the RES' massive impact on economic, social, and environmental sustainability (Coady, 2020, Brady and Kawamura, 2021, Carlin, 2022, United Nations, 2023a).

The UN's 17 Sustainable Development Goals (SDGs) cover issues concerning all three sustainability pillars. SDG 11 is about "sustainable cities and communities". It lists problems such as high energy consumption, carbon emissions, air pollution and connected health issues, waste management, access to basic services and public transport, people living in slums, affordability of housing, the lack of access to green spaces for recreation and lack of resilience concerning risks of disasters. This highlights that the various stakeholders of the RES must together combat those manifold issues to create living spaces in which humans and nature can thrive (United Nations, 2023b, Coady, 2020, Lima et al., 2021).

On average, we spend around 90% of our days indoors (Bunn and Duffield, 2023). Thus, it is important for the RES to construct sustainable buildings with the least possible negative impact on nature and health. Therefore, considering site location and orientation, construction methods and renewable materials, waste management, energy efficiency and sound quality are critical (Valle, 2022, Coady, 2020).

2.3 Methodological Literature

To identify possible research approaches, I reviewed the literature on research design and methods. Quantitative research methods work with numbers derived from numeric measurements and statistical studies. Best suited to answer questions such as "how many" and "what is the probability". Qualitative research methods use various approaches such as interviews, case studies and focus groups and answer questions such as "how" or "what kind of". Although both methods can be used and differ mainly in design and technique, the method should match the research question (King et al., 2021, Silverman, 2013). Both approaches would be generally justifiable for my research.

Bibri et al. (2020) used qualitative research methods to examine the development of the compact city concept. They collected the research data using a case study and qualitative interviews. They explored the concept's main strategies, and their findings demonstrate that the compact city model targets environmental, social, and, most importantly, economic sustainability goals.

An example of quantitative research is Fagerberg and Srholec (2017) who took a statistical approach and used factor analysis. They applied the capability concept from management to the macro level. They found that the positive development of technological capability (e.g., knowledge development and taking advantage of knowledge for creating products) and social capability (e.g., provision of skills) positively impacts living conditions and GDP. They conclude that improving technological capabilities does not prevent sustainability from being considered.

Abastante et al. (2020) researched which subjective criteria (perceived comfort of walking in a city), besides the objective criteria (technical data), were appropriate for walkability assessment. They used a mix of qualitative and quantitative research methods. They conducted a case study, a statistical analysis of surveys and a spatial evaluation to develop an assessment framework for measuring the walkability of urban areas.

I decided to do qualitative research. The detailed methodology, method and considerations are discussed in the Methodology chapter.

2.4 Overview of Literature for Discussion

This section provides a brief overview of papers I have examined after I have completed my analysis. These papers served as the basis for the Discussion chapter.

The literature confirmed that sustainability in the RES is a topic of recent interest which demands further attention. For example, the UK Government sponsored a study in 2020 to address sustainability in the RES (Environmental Audit, 2022).

For the remainder of the section, the literature is grouped based on the concepts identified in my analysis: Change, Government, Organisations, Sustainability Knowledge, Resource Efficiency and Financial Considerations.

2.4.1 Change

Change can happen in various ways, for example, foreseeably, incrementally, revolutionarily, abruptly, or slowly (Sayce et al., 2023). However, only if there is a perceived emergency, no matter if it is real or not, can real change happen (Kotter, 1995, Chomsky and Waterstone, 2021). If the sense of urgency is not high enough, then the change project will not succeed (Kotter, 1995).

To get this sense of urgency, people must be aware of the severity of sustainability issues. In the last decade, the awareness of sustainability issues has increased, and sustainability is not only discussed by academics but by the broad public, too (Murphy and King, 2013).

Despite this broader awareness of sustainability issues, it is difficult to engage individuals, organisations and governments to change their behaviour (Eberhardt-Toth and Wasieleski, 2013). Thus, the sustainability change in the RES is progressing only slowly considering, for example, that still, 40% of UK's houses' insulation is below average standard level (Guggisberg and Davidson, 2023). Of eleven inspected European countries, the UK's homes are the worst insulated, resulting in the highest temperature losses. Compared to Germany, the UK's buildings lose three times more heat, albeit the UK's building stock consists of only 3% more old buildings built before 1970 (Yanatma, 2022).

For assessing sustainability and monitoring the progress, the necessary evaluation tools must be provided. There is a growing demand for the measuring and comparability of sustainability criteria in the RES. Some businesses consider it an opportunity to set themselves apart from competitors and gain ethical customer legitimisation. Therefore, various sustainability ratings and certification standards (e.g., BREEAM, LEED, LETI, SAP calculation, BWN) have been developed over the last decades to rate, amongst other criteria, energy performance and emissions, water and waste management and integration of green areas (Falkenbach et al., 2010, Lima et al., 2021, Building Compliance, 2020).

The RES faces the challenges of a changing environment. The risks of heat waves and wildfires, heavy rains and floods have become more severe, and the frequency of natural disasters with harmful outcomes for the RES has increased. The need for the RES to adapt to this changing environment and to avoid further exacerbating and, on the contrary, try to mitigate these conditions has been a topic discussed in recent literature (United Nations, 2023a, Coady, 2020, Hawken, 2021, Sayce et al., 2023).

Eberhardt-Toth and Wasieleski (2013) point out that individuals' understanding of the urgency, proximity, and direct effects on them informs their ethical behaviour and enables a change of moral norms.

There are already examples of successful collaboration between research and industry, which have developed new technologies and substitutes, for example, for carbon-intensive materials such as cement and concrete. These alternatives present opportunities to pursue the required change in the RES (Lippiatt et al., 2020).

Current events, however, highlight that the uptake of those new technologies and substitutes is too slow (Kollewe, 2023).

Akhtar and Sarmah (2018) studied the status of waste generation in construction and demolition and the properties of recycled aggregate concrete. They noted that it is critical to remove the uncertainty about its characteristics and suitability and to achieve the RES' acceptance, according to its applicability.

2.4.2   Government

The role of the government has been addressed in the literature. Dernbach and Mintz (2011) summarise the different legal approaches to sustainability. This theme has been further discussed for over a decade. Albareda et al. (2008) looked at the interrelationship between the government and corporate social responsibility. They highlight differences in governments' approaches to CSR in different countries. Ross (2010) emphasise the importance of legislation to encourage sustainable development. Philipsen (2015) explains how some legal and statistical matters, such as the GDP, are being used counterproductively to drive consumption and weaken sustainability efforts. The lax governmental regulation, which allows the drive for more profits at high environmental and social costs, is one of the key points in Chomsky and Waterstone (2021).

2.4.3   Organisations

Norton et al. (2014) studied how the perception of an organisation's environmental policies affected the employees' behaviour regarding sustainability. They found that the perception of the organisation influenced the employees' work-related sustainability behaviours, and the perception of co-workers influenced the employees' proactive sustainability behaviours beyond work. They infer that managements' high sustainability commitment and unambiguous communication of organisational norms stressing sustainability positively affect the employees' sustainability behaviour. However, Paillé and Raineri (2015) adopted the social exchange framework and warned that a psychological contract breach disrupts the positive effect of the perceived organisation's environmental policies on

employees' sustainability behaviour. Eberhardt-Toth and Wasieleski (2013) noted that organisations' business processes impacted employees' moral beliefs and suggested embedding sustainability in their processes, strategy, and vision.

Fullan (2004) noted that organisations' most effective lever to achieve sustainability is leadership throughout all hierarchies and across all departments, continuously creating new leaders and consistently developing their skills. Furthermore, managers should promote knowledge sharing with other organisations to reduce their desire for headhunting sustainability leaders to gather knowledge of them.

2.4.4   Sustainability Knowledge

Al Aina and Atan (2020) suggest that organisational training and career management notably affect the RES organisations' performance. Herrmann-Fankhänel (2022) emphasises that interactive learning instruments will continuously increase awareness of and knowledge building about sustainability. Further, it will impact the emotional capacity and confidence to engage in solving complex sustainability issues and, hence, empower sustainability leaders.

Hesselbarth and Schaltegger (2014) studied how Leuphana University's MBA program in sustainability management affected their former students' subsequent business practices to inform the curriculum development. They, too, highlighted the importance of networking and motivating new and experienced sustainability agents and underlined that continuous learning is critical for sustainability leaders to perform sustainability practices.

Annan-Diab and Molinari (2017) emphasised that due to the interconnectedness of sustainability issues, cooperation between different industries is necessary, and an interdisciplinary approach is needed for effective sustainability education.

This is also a finding of Wiesweg et al. (2022) in their analysis of the RE's supply chain to identify ways to improve information flow. They indicated that alliances of RES organisations are key to inter-organisational knowledge sharing for achieving the RES' sustainability. The better the quality of those alliances, the more efficient and richer the communication and knowledge sharing to enable, e.g., the utmost exploitation of new technologies.

Markovic and Bagherzadeh (2018) examined the relationship between the breadth of stakeholder co-creation and innovation performance. They found that the variety of stakeholders alone had no relevant impact on innovation performance. However, they found that knowledge sharing between diverse stakeholders who contributed ideas that evolved from different perspectives positively impacted product innovation and, therefore, the organisation's market share. They further

emphasised that the knowledge gained from diverse external shareholders must also be shared internally throughout the entire organisation.

2.4.5 Resource Efficiency

Coady (2020) notes that the annual extraction of resources for construction materials has increased by 240% from 1980 to 2013, disproportional to the population growth of about 63% in the same period (Worldbank, 2024). Coady (2020) further highlights the fact that 70% of globally extracted materials return to landfills each year. She urges reducing resource consumption, reusing material, and rethinking the way we build to improve the resilience and longevity of buildings.

Sayce et al. (2023) confirms that for the RES' sustainability, retrofit and readiness for change of use must be the future way for the construction industry instead of renewal of buildings, which means demolition resulting in producing waste. They quoted RIBA, who indicated that the yearly demolition of 50,000 buildings in the UK resulted in 126 million tonnes of waste, making up two-thirds of the UK's total waste.

Kedir and Hall (2021) investigated in their systematic literature review (SLR) the performance and opportunities concerning resource efficiency in housing construction. They identified product- and process-related themes (e.g., materials and technologies) of resource efficiency throughout a building's lifecycle. Further, they found that sustainability decisions considering those resource efficiency themes in the early design phase had a systems-level impact.

Benachio et al. (2020) too confirmed the importance of considering a circular economy (CE) already in the design phase. As a result of their SLR about the CE in the construction industry, they further found that the RES' stakeholders are aware of the necessity of a CE and that the introduction is prevented due to a lack of know-how.

Similar research was conducted by Guerra et al. (2021) who studied the opportunities and the trend of application of a CE in the construction industry. The results of their study highlight that the more complex CE concepts and business models are, the less likely organisations will implement them. Furthermore, they found that technological and scientific developments create new CE opportunities for the RES.

Johnston et al. (2007) point out that resource management, which is steered by governments' and organisations' primary goal of economic growth based on exploitation economics, is obstructing sustainability goals.

2.4.6   Financial Considerations

Eberhardt-Toth and Wasieleski (2013) examined financial managers' reasoning regarding decision-making concerning actions towards sustainability. They found that decisions to act were more negatively perceived than decisions not to act, albeit both decisions had the same outcome. Therefore, financial managers might reason to omit sustainability instead of committing to it because the risk of being blamed for their decision to act is higher. At the same time, the authors emphasise that decisions for sustainability innovation are opportunities for economic success in the long term.

Falkenbach et al. (2010) investigated the drivers for the RES investor for environmental sustainability. They found that investors associated sustainability with higher costs, which presented a barrier to sustainability. Further, they noted a lack of knowledge of successful economic examples of sustainability investments and of the benefits of sustainable buildings. They further pointed out that there is a lack of research concerning the benefits of sustainable real estate for investors. This is also noted by Hartenbeger et al. (2023) who explained that one reason for the lack of data was that at different lifecycle stages, different stakeholders are responsible for the building, and there was a lack of communication between the actors that hold information of each lifecycle stage. Hartenbeger et al. (2023) called this phenomenon lifecycle stage silos.

In their article about the revaluation of the meaning of sustainable development Johnston et al. (2007) also discussed financial considerations. They highlighted that continuing "business as usual": neglecting sustainability issues, will mean perilously increasing costs for materials, waste management, insurance, and loss of legitimacy in the future.

Siegrist et al. (2020) too emphasised in their article about embedding sustainability into corporate financial decision-making the importance of considering the risks of damage to reputation, loss of brand value and society's legitimisation due to decision-making focused on short-term profits instead of creating long-term shareholder value. Furthermore, they pointed out that financial markets with quarterly reports push managers to short-termism, presenting a main barrier to sustainability. Siegrist et al. (2020) suggest, for example, long-term goals for executive compensation plans with longer assessment periods. Additionally, they criticise that universities' finance courses kept teaching financial decision-making tools from the 1970s, further reinforcing short-termism and contradicting sustainability goals.

3 Methodology

The purpose of my research is to understand how sustainability is perceived in the Real Estate Sector (RES) by the various stakeholders that operate in it. The research question is "How is sustainability considered in Real Estate Sector's projects by stakeholders in the UK?" The aim of my research activity is to find out how actors in different roles and positions within RES companies perceive the degree of importance of sustainability within the RES in their day-to-day business activities. The objective of the research activity is to understand the RES' attitude towards sustainability.

This chapter covers my methodological approach to conducting the enquiry and provides a detailed description of how the data collection and analysis were executed. It starts with basic methodological and philosophical considerations before turning to the description of methods applied in the project.

3.1 Methodological Considerations

At the beginning of a research, it is important to get clarity about how we determine the reality in which the research is conducted. The chosen ontology sets the frame for the research project. In general, there are two major ontological views in management research: objectivism and subjectivism or realism and relativism (Hatch, 2006, Denzin and Lincoln, 2005).

Objectivist ontology assumes that the RES and sustainability within it exist independent of its stakeholders' actions and view of it (reality exists no matter if there is someone to perceive it). Further, there are universally applicable rules that can describe RES and sustainability.

On the other hand, subjectivist ontology puts the focus on human interactions, the social construction of reality and perceptions and interpretations of human actors (Denzin and Lincoln, 2005, Hatch, 2006, Creswell, 2013).

Informed through the research question and my personal belief that the sustainability of the RES is created through people, this research falls squarely into the subjectivist domain. The various stakeholders who represent the RES describe their experiences and define the meaning and role of sustainability in the RES. It is the sum of their subjective experiences that presents the reality for this research (Hatch, 2006).

The next question for this research is epistemology: How is knowledge constructed? The combination of ontological and epistemological views defines the "research lens" or "research paradigm" (Hatch, 2006, Denzin and Lincoln, 2005).

There is a variety of lenses through which the phenomena in the objectivist and subjectivist ontology can be examined. For example, the *positivist* perspective seeks to prove or refute the existing

knowledge (Hatch, 2006). In contrast, *constructivism* applies interpretivist epistemology and assumes that knowledge is individually created through interactions with the existing world and needs to be interpreted (Gray, 2021, Denzin and Lincoln, 2005). Another lens is *postmodernism,* which criticises and challenges reality and questions the universal validity of knowledge (Hatch, 2006).

I believe that knowledge is individual and situational and depends on the experiences and perceptions of the RES' stakeholders. The aim of the study is to understand their lived experiences. In this study, an interpretivist perspective is used. The stakeholders of the RES describe their individual experiences and interactions within the RES. The interpretivist approach taken for this study is hermeneutics, which prioritises interpretation over description and explanation (Gray, 2021). Through the interpretation of the stakeholders' experiences meaning is created. Hence, knowledge depends on subjective awareness.

The chosen research lens usually employs qualitative methods (Hatch, 2006, Gray, 2021, Silverman, 2013).

3.2   Qualitative Research

There are various research strategies for conducting qualitative research. For example, case studies focus on experiences made in one particular case that concentrates on a limited issue. It further focuses on the impacts of its environment (for example, the social, economic and natural ones) on this case, the various activities within the case and the triangulation of data taken from various perspectives. Case studies are representative for other cases presenting the same conditions; therefore, the derived findings are generalisable (Denzin and Lincoln, 2005, Silverman, 2013). I contemplated doing two comparative case studies, comparing attitudes in Germany and the UK; however, for practical reasons regarding lack of access to data, I discarded this strategy.

Another research strategy is ethnography, which studies the behaviour of a group of people in an environment and in an everyday life setting. Data for ethnographic studies can be collected in various unstructured ways, such as observation or interviews. The analysis includes ascribing meaning to peoples' actions (Brewer, 2000). I used elements of the ethnographic study, such as the collection of data on RES stakeholders' experiences regarding sustainability in their day-to-day jobs and the extraction of meaning of gathered data about their own behaviours and by them described behaviours.

Finally, grounded theory, originally an objectivist, positivist ontology, is another strategy for conducting research. It comprises, amongst other criteria, data coding, the creation of concepts, theoretical sampling and analysis (Denzin and Lincoln, 2005). I applied some grounded theory methods, such as coding and concept creation. However, I did not conduct a real grounded theory study according to

Glaser and Strauss (Glaser and Strauss, 1967) or Strauss and Corbin (Strauss and Corbin, 1990); most importantly, I did not derive a theory from my findings.

3.2.1   Data Collection Methods

There are various methods to collect data for research (Finch et al., 2003, Silverman, 2013). For example, *focus groups* is a method to collect data from a small group of people that usually have one thing in common, for example, working in the RES. The interviewer initiates a group discussion by asking questions and the people generate and provide data by answering not only the interviewer's questions but, through interactions within the group, also those prompted by other group members and, therefore, provide refined answers.

Another method is conducting *interviews*. There are three variants to collect data through interviews: structured, semi-structured and unstructured interviews. For conducting a *structured* interview, a list of closed-ended questions with predefined answers (e.g., yes/no, or very likely/likely/unlikely/impossible) is prepared and presented to each respondent in the same way.

In a *semi-structured* interview, the researcher prepares open-ended questions that require the interviewee to think about and phrase individual answers, which can prompt further spontaneous questions from the interviewer.

Finally, an *unstructured* interview can be started by the interviewer with one single question that prompts the interviewee to talk on freely about the topic in question.

There is no one singular method of data collection for a specific research strategy. However, the chosen methods must be appropriate, and resources must be available. I chose to collect interview data and, therefore, conducted in-depth semi-structured interviews with open-ended questions. I wanted the people to tell me about their personal experiences in the RES and their day-to-day jobs, their concerns and their appraisal of the RES' sustainability level.

3.2.2   Data Analysis

There are two main approaches to analysing interview data (Silverman, 2013).

In the first approach, the researcher starts with preconceived concepts and looks for data to confirm or refute these assumptions. In the second, the researcher first looks at the data and derives concepts from the data.

I used the first method to describe the participants. I used the framework of the three pillars of sustainability and ascribed statements to its three categories: economic, social, and environmental

sustainability. Thus, I described the participants' understanding of what sustainability in the RES means.

I used the second method to analyse what the participants said and to extract the meaning of it to find out how the role of sustainability is considered in the RES. In this instance, I have built up the concepts from the data rather than from a preconceived notion suggested by literature or observation.

3.3   Ethical Considerations

Before I started my research, I had to ensure that my approach was ethically appropriate. I consulted the UWTSD Research Ethics & Integrity Code of Practice and the UWTSD Research Data Management Policy for guidance. I asked for the University's ethical approval of my research and described the way I planned to proceed.

When I thought about ethical considerations, I wanted the participants to be informed about the purpose, scope and procedure of the research to make sure they knew what to expect and how I intended to use the information they agreed to provide. Further, I wanted to ensure that the participants felt comfortable with giving me the interview in regard to work-related consequences. Therefore, I agreed with the participants to assure their anonymity through the use of gender-neutral pseudonyms so that they would not be identifiable by their employers, colleagues or customers.

All interviews were recorded, which also helps ensure that they were conducted appropriately: the participants were aware of the fact that the interviews were voluntary, that they could refuse to answer questions or stop the interviews at any time and withdraw their consent still afterwards if they wished to. Additionally, it was important for confidentiality to ensure that the transcripts and recordings were only accessible to the researcher. Furthermore, the risk of harming the University's reputation had to be considered, and I, therefore, committed to conducting the research according to the UWTSD's Research Integrity and Ethics Code of Practice of the Research Ethics Committee. The procedure and ethical approach were explained in the participant's agreement form that was sent to every participant.

3.4   Method

This section provides a detailed description of data collection and analysis methods.

3.4.1   Data Collection

For the planned interviews, it was necessary to find people with experience in today's RES who were willing to take part in an interview. Therefore, I did purposive sampling, exclusively selecting people who work in the RES (Silverman, 2013, Denzin and Lincoln, 2005). For the initial attempt to recruit participants, I used LinkedIn (a professional online networking site) and approached my personal

contacts. Despite some positive feedback, none of my contacts agreed to an interview. I then widened my search on LinkedIn, looking for people working for RE organisations, asked them to connect, and messaged them. Finally, people confirmed that they would talk to me. Additionally, there were two people who, on the recommendation of other people, agreed to give an interview.

When participants agreed via email or LinkedIn messages, I set up online 45-minute Microsoft Team meetings with each participant. The invitation included the participant consent form. Despite having received a couple of last-minute cancellations, I was able to re-schedule and, finally, conduct all planned interviews.

For the actual meetings, I prepared an interview script. It contained a list of nine open-ended questions that I wanted to ask stakeholders of the RES to conduct in-depth semi-structured interviews. After the first two interviews, it became obvious that the understanding of a sustainable RE varies among individuals. This was also noted before by Murphy and King (Murphy and King, 2013). For understanding how the role of sustainability in the RES is perceived by its various stakeholders it is critical to clarify what the meaning of sustainability in the RE is for each participant. Therefore, I adapted the interview script and included the question, "What does sustainability in the RE mean to you? What makes the built environment sustainable?" to receive a direct, explicit answer.

All interviews were conducted online via Microsoft Teams, and I made use of its recording and transcription function. At the beginning of each interview I secured each participant's agreement to video recording and transcription. I conducted one interview in German and noticed after a while that I had not changed the transcription language before. Therefore, the transcription of the first minutes was not useable. However, I was lucky that I still had the recording and, therefore, was able to do this part of the transcription manually.

At the end of each interview, I asked if the interviewee could recommend further participants. However, after having interviewed six participants, I had gathered plenty of information to process, and I realised that with more interviews, the amount of collected data might exceed the scope of the master dissertation, and the additional insights gained from each new interview were diminishing. Therefore, I decided not to interview any more people and started with the analysis of the interviews.

The interviews were automatically transcribed using the built-in transcription feature in Microsoft Teams. I did not use the unverified transcription for data analysis. In order to verify the automatic transcripts, I listened to the recordings and collated them with each other. Therefore, I moved the transcripts from teams into Word for improved readability and editing options. When I detected errors in the automatic transcriptions, I corrected them in the Word document according to the recording.

Occasionally, I had to repeatedly listen to particular phrases until I was able to get every word right, either for acoustical reasons or not being familiar with special expressions.

3.4.2   Data Analysis

My initial idea for analysing the interview data was to develop some preconceived themes from the literature and then allocate the statements to these concepts. However, when I started with the coding, I proceeded differently, as discussed in the previous section. I decided to derive new concepts from the interview rather than to see how the data conforms to established frameworks. For the description of the participants, I continued to employ the predefined categories.

For the data analysis, I employed some of the grounded theory methods (Saldana, 2021). I used a three-stage approach to coding, first assigning "meaning" to each sentence, then a "code", and finally, combining the codes to more abstract concepts. This approach is based on the thematic analysis methods and techniques (Saldana, 2021).

The first step of the analysis process was reading the participants' statements, interpreting their meaning and then creating appropriate themes. At first, I worked with Word documents to analyse the interviews. I created two columns, one of which had the original participant's statements, and the second column was intended for the corresponding themes. However, in the end, I realised that I had mainly written summaries of the participants' statements instead of themes. I then decided it was easier to continue in Excel, which provides a filter function and makes it easier to check which themes I had already created.

For each interviewee, I used a separate Excel sheet formatted in the same manner. The first column contained the interview data. Each sentence occupied a separate row. The second column was named "meaning" and contained the summary of the statement which I had ascribed to it in the word document. The third column was named "Theme 1", and the fourth "Theme 2".

I re-read each statement, interpreted the meaning of them, and then summarised my interpretations with a few words, which I put into the columns "Theme 1" and "Theme 2". At the end of the interpretive process, these columns, therefore, contained the abbreviated summary of my interpretations.

After coding all interviews, I created a pivot table of all themes used to clean up the list – some themes were repetitions (e.g., "finance", "finances", or "financial considerations"), some were opposites of the same theme (e.g., "positive financial effects" and "negative financial effects").

The themes were filtered and similarly named themes were given a uniform name. Iterative themes were reviewed and changed again if a more apt term could be found. I then kept only those most prevalent (used more than just two or three times) still ending up with more than 30 distinct themes.

After this was finished, I created a new sheet that was named "Coding all" wherein I merged all participants' statements. I inserted a new column, using letters A-F to be able to attribute each statement to the corresponding participant. The other columns remained the same as before. Finally, I added an additional column labelled "description of people".

I filtered the statements on each of the thirty themes. I re-read each statement, and when I thought that a statement was useful to describe a participant, I then added a note in the column "description of people".

I now had a list of thirty themes and the corresponding participant statements to describe each theme. As a next step, I thought about how those themes related.

I started to group the themes and thought about broader concepts. At first, I derived nine concepts:

1. government's responsibility
2. short-term profit thinking/cost
3. cooperation
4. education
5. health and well-being
6. resource scarcity/approval of new materials and technology/circular economy
7. adaptability to changing environment/longevity
8. drivers for organisational sustainability journey
9. meaning of sustainable RES.

I wrote shortened names of these concepts onto paper cards and discarded the concept "health and well-being" when I reviewed the statements and realised that health and well-being was mentioned by the participants in various contexts, and I could include it in different themes/concepts. I laid the eight cards several times out on the table and arranged them according to my parallelly evolving thoughts about how they related to one another and so created concept maps (Figure 4, Figure 5). I found that the eight concepts were all interconnected and developed through the concept map the draft story for the analysis section in the findings chapter before I had started with writing up the description of participants or the concepts.

Figure 4 - First Concept Map
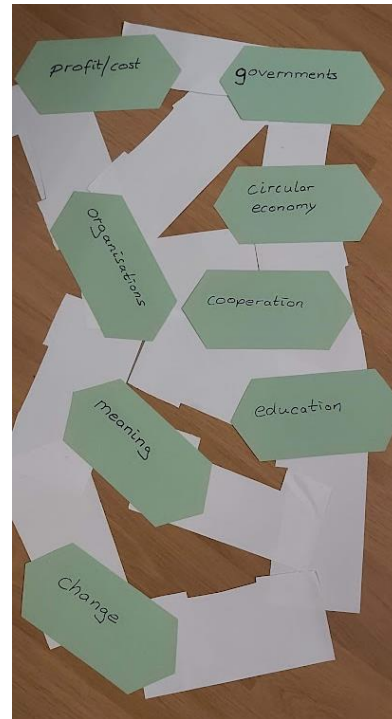
Figure 5 - Second Idea for a Concept Map

However, I still was not yet satisfied with those eight concepts. First, there were still too many; second, I thought they were not apt enough; and third, the concepts somehow overlapped. Therefore, I reviewed the themes which constituted each concept. I found that I could reduce the concepts from eight to six and re-arrange the theme allocation. By shortening some of the concept names, I increased the breadth of their meaning and, hence, their appropriateness for the subthemes they covered instead of limiting their meaning through too narrow naming. The six new concepts were:

1. circular economy
2. organisations
3. sustainability knowledge
4. financial considerations
5. change and
6. government.

I found the concept name "circular economy" to be inappropriate because it does not cover all the subthemes that I had grouped in this concept. However, after thinking about it for several more days, I found no better expression. Finally, I had the idea to use the constituent themes in ChatGPT and ask the artificial intelligence for a suitable umbrella term. ChatGPT suggested "resource efficiency". I then looked on Google Scholar for a journal article that provided a definition of resource efficiency. The definitions that I found there confirmed that the term resource efficiency comprised exactly the

themes I wanted to cover. Therefore, circular economy became a theme, and the concept was renamed "resource efficiency".

I then started structuring the findings chapter and planned to have three main parts. The first part was to describe the participants by briefly indicating their professional background and experience and then providing my interpretation of their understanding and their appraisal of the current situation of sustainability in the RES, what their main concerns regarding sustainability are and concluding what impression they made on me. I supported my interpretations with a statement from the interviews.

The second part was to explain the concepts derived from the subthemes and to provide the meaning of concepts and subthemes. The third part provided the analysis of my findings.

When I had finished the structure, I wrote up the findings according to the draft that I had developed based on the concept map. Afterwards, I created a table to categorise the main points of that analysis. The columns were headed: concept, issue, cause, and solution/mitigation. This table provides a structured overview of the main findings of the analysis.

Then, I started writing up the first part of the findings chapter: the description of the participants. I had the idea to create a table and categorise the participants' understanding of sustainability by using the three pillars (social, economic, environmental) of sustainability. This helps to make clear what realms the RES' stakeholders are thinking of when they talk about sustainability and if all three pillars are in some way considered. This is where I did not derive additional concepts from data but looked for data to fit my pre-defined structure.

In the second part of the findings chapter, I then described the concepts and sub-themes and discussed them.

The next chapter provides a detailed description of the participants, definitions of the six concepts and their constituent themes, and an analysis and discussion of the findings.

4   Findings Chapter

This chapter presents the findings from the interviews. It consists of three parts. First, the participants are introduced, and their views on sustainability in the Real Estate Sector (RES) are presented. Second, the developed *Concepts* and the constituent *Themes* are presented. Finally, in the Analysis section, the themes and concepts are linked to current challenges and opportunities.

4.1   Introduction

To answer the research question "How is sustainability considered in Real Estate Sector projects by stakeholders in the UK?" the personal perceptions and opinions of people involved in the various operations of the RES were sought. For the study, six semi-structured interviews with people working in various roles in the RES in the UK were conducted (Table 1). Interviewing stakeholders of the UK makes their statements, on the one hand, more comparable within the geo-political context. On the other hand, different professions and involvement at different RIBA plan stages provide a more rounded picture.

When coding and thus quoting, the statements have been anonymised for ethical reasons. E.g., "the Gherkin" would be replaced with "a tall office building in a major UK city".

4.2   Summary of Participants

The participants represent different positions and organisations in the RE Sector and give their insights from a variety of RE projects in which they have been involved over time.

Participant	Role	RIBA-stages involved	Tasks
Jamie	Architect	0 to 5	production of information from Stages 0-5; specification writing; collaboration with developers, contractors and consultants and cooperation with statutory authorities; resource allocation on jobs; design coordination; team leader; and coaching of junior staff.
Charlie	ESG Trainer	Not directly involved in RE construction projects	Production and execution of ESG and Health and safety training

Participant	Role	RIBA-stages involved	Tasks
Leslie	Head of Supply Chain Management	2 to 5	Involved in the procurement, specification and technical development of facades; involved in the procurement phase and technical phase of delivery of façades; ensures quality and efficiency of procurement, order fulfilment and logistics to meet the client's requirements; managing supply chain departments; strategy planning for the supply chain management adjusted to the organisation's objectives, reviewing metrics and performance to plan;
Devin	Architect	0 to 5	Feasibility studies, architectural design, cooperation with statutory authorities, team leader, production of information for tender;
Morgan	Sustainability manager	Not directly involved in RE construction projects	Contribution to the development of the organisational sustainability strategy considering carbon emissions, energy efficiency, and circular economy; developing retrofit strategies to increase the organisation's residential properties' sustainability and for developments' biodiversity; sustainability education;
Cameron	Project manager	4 to 5	Creating letting packages for subcontractors; production and execution of health and safety training for staff on site; leading and coordinating the project management team; coordination and supervising the construction workers; reviewing work on site; scheduling of work; reporting the job status to the client and informing all concerned stakeholders about issues and suggested solutions;

Table 1 - Study participants

I noticed that all participants believe that there is a lack of governmental commitment concerning the RES' sustainability. They talked about loopholes in existing regulations that make them irrelevant. All

participants believe that tougher, legally binding government regulations would be a powerful driver for the RES' sustainability. This will be discussed in the next chapter.

The participants also talked about various management styles in organisations considering their sustainability engagement. They said that senior managements' high personal engagement and incentives would lead to a top-down driven increased sustainability endeavour within the whole organisation.

Another concern was a lack of sustainability education within the RES. Some participants are involved in providing sustainability education. However, there were different views of the effectiveness of sustainability training and education.

Further, the participants have different environmental concerns. Their individual focuses are the reduction of carbon emissions and the increase of energy efficiency, biodiversity, and green spaces in the RES. The exploitation of the Earth's natural resources was another environmental concern.

Referring to resource scarcity, the participants also mentioned economic concerns. For example, they talked about the disposal of unused material, the lack of a circular economy, and the RES's hesitation to approve new materials and technologies to support the RES sustainability development. Furthermore, the participants talked about new energy sources for the RES and the dependence on fossil fuels.

Finally, the participants were concerned about humans' well-being in the RES. For example, they talked about access to green spaces, light, noise and air pollution, affordability of sustainable homes and fair and safe working conditions. However, these concerns did not seem to be a common main concern, but partly secondary concerns.

4.3   Presentation of Findings

The analysis of the participants' interpretation of "sustainable RES", their appraisal of the sector's status and their main concerns yielded six concepts. These are change, government, organisations, sustainability knowledge, resource efficiency and financial considerations.

In this section, each concept and its constituent parts (themes) are discussed in detail.

4.3.1   Change

The Real Estate Sector needs to change to become more sustainable. To do so requires awareness of new requirements, challenges, materials, and technologies. It also needs to be willing to change its norms, processes, and skills. Finally, the rate of change and the results must be measured.

Awareness

The awareness of unsustainable conditions, behaviour and operations is a prerequisite for a change towards a sustainable RES (Fullan, 2004, Kotter and Schlesinger, 2008). Global sustainability issues such as overexploitation of natural resources, air, water and soil pollution, the destruction of ecosystems and the unjust distribution of wealth and unfair exploitation of poorer societies have been communicated for decades (Hawken, 2021). However, when the participants talked about the RES' transformation into a sustainable industry, they indicated that the awareness of existing sustainability issues within the sector has only started to rise recently.

> *I think there's bit, there's much more awareness on sustainability, particularly in the last few years. (Morgan)*

> *It is definitely more doable and for the industry. And let's say at the starting point, because we are at a starting point where we're late. (Leslie)*

> *Investors suddenly woke up, and at the same time as there were tougher planning requirements, "property group" suddenly had very clear guidelines on carbon emissions in operation as well as in production, and that was benchmarked. There's this LETI Guide (London Energy Transformation Initiative), which I think is now nationwide, and so we looked at what the requirements are. (Devin)*

Adaptability

When governments, organisations, and individuals become aware of the changing environments in which they govern, operate, and live, they must find ways to combat the causes of those changes or change course to adapt to new realities. The participants agreed that government, organisational and individual actors in the RES must change the established routines. Notable was the uniform disappointment of the participants with the slow pace of change.

> *[…] why work to minimum space standards? Are you working at home at the moment? Have apartments and houses that have enough space to have a studio or a study or something in it to allow people to do it (working from home). (Jamie)*

> *The energy sector, it is a bit similar to the European Energy Saving Regulation. It is actually also harmonized with it and specifies certain CO 2 savings, which come into force gradually over 20 years (Devin)*

> *residents are not buying the property so they're just living in the property and their big concern for them is energy bills as part of the cost of living crisis (Morgan)*

Readiness for Change

To achieve the SDG 11, "Sustainable Cities and Communities", by 2030 (United Nations, 2018), the sector must change its processes, technologies, materials, infrastructure, behaviour, legislation, etc.

However, the participants described the sector as clinging to old technologies and processes and refusing to build partnerships for sustainability.

> *The project, that I finished two years ago… No, I have to say, this building looks wonderful and is architecturally a great building. However, as far as sustainability is concerned, I don't think you would build something like that today. That's actually already outdated. (Devin)*

> *No, there's very little collaboration and coordination in the real estate sector (Leslie)*

> *[…] unbelievably conservative and very, very little innovative, very fragmented the whole industry. (Devin)*

> *And the other option is modular construction. You can now have the whole apartments preconstructed off site and lifted into place, clipped together, dry line over the joints. It's happening and it's moving that way, but just very slowly. (Cameron)*

> *I certainly don't see any signs that people are reacting to an emergency, a climate emergency. It's very slow and very clunky. (Leslie)*

Measurability of sustainability change

There are no established sustainability KPIs used across the industry. This makes the measure and comparison of progress impossible. Reportedly, every organisation understands and measures "sustainability" in their idiosyncratic ways.

> *But BREEAM and LEED and Green Star and all these things around the world, I believe they are a little bit light you know. So they don't tackle embodied carbon. […] I live in a world mainly where things are measured by a metric. […] And so who sets those metrics? It's not BREEAM. It's not in LEED. It's not in Green Star, it's not in any regulation anywhere in the world. (Leslie)*

> *[…] an onus on organizations to report more on the sort of sustainability improvements that they're making […] I think some contractors are better at reporting than others and there's not really that consistency. (Morgan)*

Moral norms

Moral norms describe certain expected behaviours and judgement of behaviours observed that are valid for a distinct group of people in a distinct relationship, such as families and organisations. The participants talked about the issue of existing moral norms that inhibit sustainable behaviour in the RES and about the challenge of changing those moral norms and cultural behaviours.

You know, the whole construction industry is one of the biggest carbon producers in the world. Yes, they've all been setting targets and things like that. But will they hit them targets? Well, not if they don't do something drastic to change this culture that they've got. (Charlie)

One project had an investor who received plenty of financial capital of some Middle-East government fund and they have other aspirations considering sustainability. (Devin)

Yes, we just started working on an engagement program with our partners who are doing the installations. So it's looking at like a long process of engagement ahead of the measures, cause residents need to agree to have it done. And sometimes people don't. They say that they won't have it done even though it's our building. They don't want it. They don't want the change. They don't want the upheaval. (Morgan)

Trying to change an attitude is always difficult. Like, look at religion[…], sustainability is like that way, if you go in and say you're doing it wrong, do it like this, they will be like, **** ***. So it's one of those difficult things, unfortunately, because it's a change of attitudes and the change of mentality. (Jamie)

Availability of sustainability skills

Sustainability leaders require a certain skill set to empower change (Hatch, 2006). However, the participants said that sustainability skills were rare within the RES. Further, those with skills did not receive management's recognition.

[…] I'm sick of the way that this city treats projects. Uh, so I'm moving to a city where hopefully - it's probably the same, but bigger - hopefully there will be more emphasis in care when it comes to things such as sustainability. (Jamie)

I requested offers from seven contractors […] and we actually found just one who said they can build the shelling the way we want. (Devin)

I think the industry is overwhelmed with the requirements in terms of energy saving and water savings and the embodied carbon in buildings (Devin)

But I think the smaller contractors are certainly more interested in taking action [towards a sustainable RES], but they don't necessarily have the resources or the skills internally. (Morgan)

Substitutes for materials

The RES uses vast amounts of carbon-intensive materials such as cement, which account for almost 10% of global CO_2 emissions (Lippiatt et al., 2020). The participants talked about the availability of alternative materials and the challenge of traceability throughout the supply chain to ensure sustainable and ethically sourced materials.

It's an insanely difficult topic because the origins of these materials, and how they're passed on, the ways are so long. To document all this and to get an actually credible documentation is possible for very few materials. (Devin)

[…] it could be something quite granular like new materiality. And where do we get it from? And what's the best materials on the market? And are they, are they available to us in the UK? (Leslie)

In summary, participants agree that sustainability has recently moved onto the agenda. However, the change is slow and hindered by conservatism in the industry, lack of skills and technical issues such as availability and traceability of sustainable materials and lack of common sustainability KPIs.

4.3.2   Government

The concept Government comprises six sub-themes. The concept encompasses the government's prioritisation of sustainability, the lack of leadership, incentives and legislation, and the existence of legal loopholes.

Lack of sustainability leadership

The global population is suffering from the effects of unsustainable conditions in the RES. However, the participants criticised the government's negligent commitment and called for governments to step up to the plate and take action to enforce sustainability in the RES.

there's nobody within the government sector leading the charge here, you know. […] So, you know, why isn't there a minister leading this? Do we need to see a catastrophe before somebody reacts to a problem? (Leslie)

I think it (sustainability in the RES) needs to be government led. (Jamie)

Lack of legislation

Legislation is a prerequisite to drive sustainability in the RES (Ross, 2010). However, the participants stated that there is a lack of legislation to pursue the achievement of the SDGs within the RES.

Yes, definitely. It [level of sustainability in the RES] could be a lot bigger, a lot more enforced it could be. (Jamie)

But at the end of the day, it's just talking a good job. They [the government] are not actually controversial and getting out there saying you must do this. It just winds me up big time. (Charlie)

Well, there is no governmental regulations really, you know so, and that's a big issue. (Leslie)

Obviously, the government side of things, I mean any policy is obviously a big driver [for sustainability in the RES]. Yeah, definitely more policy and regulation. […]

Loopholes in legislation

The participants gave examples of current legislation loopholes being exploited by actors in the RES to reduce sustainability measures.

> *When they buy land in 2010 they do start to put in for planning permission. And when they do start building they only have to use building regulations that were in force when they bought the land and initially put the pre applications in. So they can still build in 2020, 2022, 2023 to building regulations whenever they land banked. (Charlie)*

> *depending on when you apply for planning permission and submit the Building Control Application, you have to achieve a certain minimum building standard [standard at time of application, not at time of building]. (Devin)*

> *And of course, investors always find ways to argue to dilute that. Social housing, for example, is typical. The target from the Greater London Authority is actually that 50% of every private new building is built for social housing, and no one actually achieves that. (Devin)*

Governmental incentives

Financial incentives are proven to enforce behaviour change in organisations. The participants talked about the RES stakeholders' lacking motivation to take the matter of sustainability seriously due to lacking governmental incentives.

> *The government needs to make it [prioritisation of sustainability] financially attractive for the clients and contractors to move in the right direction. (Jamie)*

> *You don't get more money for a house that consumes less energy. (Devin)*

> *And, so the only way to force people to do something is by a regulation or a tax. [...] maybe a carbon tax is sitting there at the moment, but you know that's - I don't think it's enough. (Leslie)*

Prioritisation of sustainability

The legislation follows the government's priorities. However, the participants questioned the governments' prioritisation of a sustainable RES.

> *I think when it comes back to hierarchy of problems, the government place hierarchy in different places, and this [the RES' sustainability] is just not seen to be as important as other things. (Leslie)*

> *It (sustainability) has been downgraded quite a bit by the Conservative government - there were more ambitious targets at the local level, the Greater London Authority, which had set higher sustainability targets than the national targets. (Devin)*

The participants unanimously highlighted the lack of the government's engagement in creating a more sustainable RES. The shortcomings include lax regulations, which are easily circumvented, lack of incentives and lack of enforcement.

4.3.3   Organisations

The concept Organisations covers six sub-themes. It covers the internal view of the organisation from different angles, including leadership and management, organisational commitment and vision, stakeholder management, and cross-departmental collaboration.

Management's Commitment

The senior management's commitment to sustainability is critical to legitimising sustainability projects. The participants talked about different experiences that showed how organisations' intentions vary when they introduce sustainability roles.

> *When I first started in my career about 13 years ago, it was very much "that person is doing sustainability over there, so I don't have to think about it." And that happened "Yeah, she's doing it. That's fine. We've got it covered. We're doing sustainability, there is somebody doing it." (Morgan)*

> *There are aspirations, however, I think sustainability is not yet on top of the priority list. (Devin)*

> *We've had a trial last year where we were trying to procure our trades on the basis of safety and not cost. So I can see in the next couple of years where we will start to procure and trade on the basis of safety and sustainability and cost would be the third criteria. (Leslie)*

> *[…] a lot of larger organisations are introducing shadow carbon taxes internally within their business to promote positive, sustainable thinking within their own businesses. (Leslie)*

Stakeholder's Sustainability Engagement

Stakeholder engagement is important for any successful project in the RES. There were positive and negative examples of how a single sustainability-engaged stakeholder, or the lack of any, could influence a project's sustainability.

> *There was one project where the freeholder set the goal to achieve BREEAM excellent. […] And this building had to be refurbished in such a way that it would be at least adequate for practically the next 60 years. (Devin)*

But I would also say that if there are not certain [sustainability] aspirations from clients, the Legislative Framework is the only guideline for what is done. What the legislator says that happens. It is very rare for contractors or clients to do anything beyond that. (Devin)

But I think the smaller contractors are certainly more interested in taking action, but they don't necessarily have the resources or the skills internally. So, I suppose it's probably for the organisation and their other large contracts to help bring them along on the journey and use our contracts and our specifications to help drive sustainability through our supply chain. (Morgan)

I do speak to colleagues about sustainability and try and engage with as many people as possible. And I've also been trying to go to lots of team meetings to talk about what's going on. To try and get the message out there a bit wider. (Morgan)

Using The Organisation's Levers

Organisations operating in the RES have the power and means to transform the sector into a sustainable industry when they use their organisational levers. The participants described how their organisations use, for example, their buying power to create awareness of sustainability issues within their upstream supply chain.

So invariably what we're seeing is, as a strategy, to win work while we bring in I P in terms of sustainability and how we work and how we kind of developed our supply chain in the same way. (Leslie)

If you're thinking about it (driving sustainability) from an organisational perspective, it's about using your organisational levers. So maybe where you're going to put your money or who you're going to award things to enable that change. So maybe asking more questions about what organisations are doing in terms of sustainability when you're fitting tenders out there or ask or specifying for more sustainable materials or lots you can make use of your buying power. (Morgan)

Sustainability Leadership

Sustainability leaders use their knowledge, charisma, ability to network and to inspire others and induce the spark of sustainability thinking in them to spearhead the sustainability transformation of the RES (Fullan, 2004, Hatch, 2006). The participants gave examples of sustainability leadership in practice but also highlighted challenges associated with the role.

[sustainability] generally happens by people putting their hand up and saying that they will go out and lead and by doing that they open themselves up for a lot of criticism. (Leslie)

I should have probably pursued it further, [...] I went back to my colleague and he said well, that's what you're up against (Charlie)

I've been going to the regional investment plan meetings internally and talking about the sustainability strategy but also asking them about the sustainability issues in their particular area. Just trying to have a more of an open conversation about what are the important issues for them I think and then it helps with the direction of travel for the sustainability strategy because I know where the sort of easy wins are in different teams. (Morgan)

For example, when I walk around the site, I sometimes stop and tell people that they're doing a good job. I did it a couple of weeks ago. There was a brick layer out in the balcony who was doing a nice job. I said, that his work looks really good. Well done. The reaction was Oh, wow. Thank you. You just made my day! (Cameron)

Sustainability Vision

If one does not know to which port one is sailing, no wind is favourable (Seneca). The participants shared their visions and gave examples of how they illustrated their sustainability vision in projects.

waste and how it could be streamlined if there was someone who could collect the material and [...], get material sent out to small builders to charities and things like that. It would work. (Cameron)

[...] we are looking at us and reducing buildings from embodied carbon perspective. ahead of the LETI targets. [...] That's driven by our own internal target of being absolute net zero by 2040. [...] our strategy is for scope one and two to be net zero by 2025. (Leslie)

2050 for our whole organisation to be net zero carbon. (Morgan)

It's the brief that's the important thing that we're saying to our design team go and design these billing plans, but we want you to do XY [...] We give our consultant a brief and then they try and match that brief. (Leslie)

Cross-departmental sustainability

Siloed sustainability activities are less impactful. The participants explained which platforms they use to gather information about specific sustainability issues in various departments and how sustainability can be embedded into roles across different departments.

I've been going to the regional investment plan meetings internally and talking about the sustainability strategy but also asking them about the sustainability issues in their particular area. (Morgan)

[...] if they think that it [sustainability] is just part of their role and part of their everyday and if it's linked to what they're doing, I think for the people that are harder to reach, that makes it easier to sort of get them on board. (Morgan)

Some organisations actively try to become more sustainable. This includes the creation of a "sustainability officer" role or even whole teams. However, in some cases, this is simply a tick-box without due attention to what the sustainability team is doing. On the other hand, organisations with highly committed managers place strong emphasis on sustainability in their business decisions and would internally incentivise sustainability-oriented actions. Across the board, clear communication of a vision was recognised as a key to success.

4.3.4 Sustainability Knowledge

The concept Sustainability Knowledge covers a wide area of knowledge management from sustainability education to knowledge sharing at a micro, macro, and even global levels.

Availability of Sustainability Education

The participants acknowledged the importance of sustainability training as a key element of professional training in the sector. At the same time, they highlighted issues such as the availability of training on the one hand and being overwhelmed by too many information sources on the other hand.

> *That's where actually education might come in for the insurers- for having an understanding of what materials can be used. (Jamie)*

> *I would say there is a lack of [sustainability] training, especially on a technical level unfortunately. (Devin)*

> *There's the net zero carbon building standard that's being worked on. I think that's definitely going to be really positive because there's going to be sort of a single source of truth for what people should be doing. (Morgan)*

Effectiveness of Sustainability Education

To ensure education's effectiveness, sustainability education must be adapted to the intended target groups' previous knowledge and needs and by making it relevant to the target group (Annan-Diab and Molinari, 2017). The participants gave examples of how they adapted the training to be more effective and gave examples where training was ignored.

> *I think that a big part of the role of sustainability is engaging with our customers and residents on why we're doing these things and the benefits of sustainability to them in their home. (Morgan)*

> *You can only educate people who want to be educated I think. […] we give them a talk about housekeeping and clearing up after themselves. […] everyone will sign the sheet to confirm that they have attended the training and listened to it and then they will completely ignore those instructions. They do what they want to do. (Cameron)*

> *Education is difficult, particularly because normally the people perceive themselves as being victimised. And if they are adults, it's hard to teach them […] you know, you can't teach an old dog new tricks. (Jamie)*

Moral norms

Moral norms define our understanding of ethical and unethical behaviour in a particular environment, e.g., the organisation we work for, the community where we live, the gym we attend, etc. (Solinger et al., 2020). Moral norms, therefore, also define what is important for us and what we should believe. For example, a person working for a car manufacturer might believe that the price and availability of gasoline and parking lots are more important than clean air and public transport infrastructure. The participants talked about the impact of moral norms based on cultural and societal backgrounds on individuals' application of sustainability knowledge in the RES and the difficulty of behavioural change despite the provision of RE sustainability education. They gave examples that showed that sustainable behaviour concerning the RES was not a priority of those people's moral norms.

> When I say people don't like wasting material, that's more the management level. I think a lot of the guys that are working on the site have come from Eastern Europe and they've got different mindsets. They don't care. They are there to make their money and that's all they're there for. And if it's easier to throw material away and get a new material, they will do that. (Cameron)

> With these horror stories that they used to say about some of the stuff when they go back into these housing estates and find some of the issues e.g. that the workmanship just haven't put insulation in or they haven't done the air tightness testing, they haven't sealed things up etc. It is just a myriad of poor workmanship and attitude. (Charlie)

> Residents need to agree to have it [sustainability retrofits] done. And sometimes people don't. They say that they won't have it done even though it's our building. They don't want it. (Morgan)

Governmental Knowledge Sharing

The global cooperation of governments for knowledge sharing is critical for the RES to achieve the global SDGs (Figueres and Rivett-Carnac, 2020). The participants mentioned examples of sustainability solutions, which have been common practice in other countries for decades but not in the UK.

> The building was actually planned with a wrap-around balcony. Something that wasn't really known in London until a few years ago. In Germany, such naturally ventilated office buildings were planned as early as the 1980s. (Devin)

> I think Germany is further ahead in the technical field. [..] For example, double glazing is actually not standard here in this country. (Devin)

> In Germany, there is the principle of "shock ventilation" you have to open the windows to let in fresh air. In this country, there are the so-called trickle vents, so that there is constant ventilation. In terms of energy, the shock ventilation is much better. Ventilation systems are even better. (Devin)

> And then you've got construction materials. We're always trying to push new materials, new ways of construction. Again, Europe is further ahead. (Jamie)

Organisational knowledge sharing

Internal and inter-organisational knowledge sharing within the RES creates a multitude of advantages, such as risk reduction, innovation, economic gains, etc., which support the development of a sustainable RES (Markovic and Bagherzadeh, 2018). The participants gave examples of successful knowledge-sharing inside and outside their respective organisations, as well as examples of failures.

> *So we had to have an education process first. Then we had to, you know, to go through steps to get our supply chain up to a point where we were talking about, you know, we were on the same page and then the supply chain actually started to take ownership of that and go out into the market and source better materiality. (Leslie)*

> *I have been speaking to, for example, operational teams about waste generation by contractors. That is a key issue for them and that's obviously an in for sustainability and having those circular economy conversations. (Morgan)*

> *They don't try and reduce the amount of water flow by reducing the pressure or they don't look at water harvesting, which is ridiculous, it's not considered. […] no one listens. […] We are not considered as experts; we are considered as nuisances as the control so… (Jamie)*

Knowledge management is a wide and complex domain. The participants' insights highlighted difficulties in creating and accessing training, the challenges of training adoption and the challenges of disseminating existing knowledge across the organisation, the supply chain and even across countries.

4.3.5   Resource Efficiency

Resource efficiency covers themes dealing with the use, reuse and disposal of resources and materials, logistics and the adoption of new technologies and processes.

Waste

The participants talked about various issues concerning waste, including stages at which waste occurs, waste-less design and recycling.

> *There's an awful lot of material that just gets thrown away, does end in skips, doesn't get recycled, but it just gets thrown away.[…] gypsum, for example. I'd say 30% waste on plaster wall that comes in. […] You know we talk about waste a lot because it's a major logistical issue on site. We have probably 8 skips a day going out. (Cameron)*

> *No [material cannot be returned to the supplier], because most things have been made specially. So the supplier would have no other use for it. It just goes in the bin. (Cameron)*

> *It could be someone has made a mistake. It could be the design has changed or they've ordered something and then the client wanted to change it. There are various different reasons for that [for having wrong material on site]. (Cameron)*

[…] like nosing on a staircase: the manufacturers go: "it's 100% recyclable". But I ask how many times before a demolition do people go around and take off all the nosings on a stair and then recycle them. It's never. (Jamie)

I know that colleagues have been through the building and they've taken any fixtures and fittings any metal, any hinges they've taken those out of the building and they've looked at opportunities to reuse those items. (Morgan)

Circular economy (CE)

The participants spoke about issues with material reuse and re-purposing, as well as obstacles to a circular economy.

Because there's such a big company, they can't allow people to take things to reuse them because you end up with potential corruption issues and that sort of thing. So it all gets thrown away. (Cameron)

I think when I've spoken to people about the sort of circularity before, people are always and not in this organisation, but in other organisations, people are always saying where we're gonna store it [material gained from buildings to be demolished], what we're gonna do with it when we don't need it anymore. (Morgan)

[…] I think that we're looking at what can be done in terms of like logging materials and keeping materials in their existing state and then looking to either reuse those In the new building, or maybe share those with other organisations so they can use them. […] I think we're not quite there yet but... (Morgan)

Approval of new materials

The participants talked about the availability of new materials, such as hempcrete and cross-laminated timber, that could be a substitute for unsustainable materials. Simultaneously, they highlighted obstacles to adopting these materials in practice.

We're only starting to really see CLT [cross laminated timber, thin strips of timber glued together to make strong beams] and glulam [natural material, laminated beams, an alternative to steel and concrete] and all that being used. (Jamie)

You know, we keep building things in concrete and there are alternatives I've done. I have gone to see Cross Laminated Timber building before, which is considered to be more sustainable than concrete. It was very interesting and the industry was moving to that way and then the Grenfell Tower fire happened and suddenly everyone thinks timber/fire - can't do it. (Cameron)

SIP panels, some structurally insulated panels it is another way to go. (Charlie)

For example, have you heard of hempcrete? Industrial hemp is certainly a way which is brilliant. (Charlie)

Approval of new technologies and processes

In addition to new materials, new technologies and processes were mentioned as potential solutions. The participants described and unanimously praised the advantages of those technologies and processes.

> *Which is why I guess things like BIM [building information modelling] are good, because if you have a model that has every element noted down, that monitors the composition of everything, that makes it a lot easier to know what's on the building, what's in the building, so they can say right, all the windows are made out of this type of aluminium. There are some steel ones at the front because of whatever reason. The furniture is made of whatever, and so they can then, hopefully, start to have a catalogue before it's already gone into demolition and, therefore, it's just a skim down the list and go: We can use this, we can use that... (Jamie)*

> *Yes BIM, is a great concept, a brilliant concept. We've been talking about BIM for 10 years now. And, unfortunately, it's still not there. [...] But how many people use it? How widespread is it within the industry? It's not, unfortunately. It should be. (Charlie)*

> *Regarding the environmental sustainability I'll bring it back to waste as well and transport. Everything that comes here is coming on lorries. I don't know what the answer to that is, but I'm sure there's better ways of doing things. (Cameron)*

> *And the other option is modular construction. You can now have the whole apartments preconstructed off site and lifted into place, clipped together, dry line over the joints. It's happening and it's moving that way, but just very slowly. (Cameron)*

> *I think that the industry is definitely changing. And MMC modern methods of construction is disrupting that. There are hundreds and hundreds of companies now setting up factories where they're building modular houses in factories. [...] The technology has been there for many, many years. But again, it's just getting people on board with it. [...] Building houses in factories is going to be a lot less carbon footprint, with all the stuff that comes on the back of it, with vehicles, vans and snagging. And the quality of the build is going to be so much better because it is in a factory. It's going to be a quality control at every stage of the build. You know, it is going to be monitored. (Charlie)*

> *Prefabrication plays a big role. [...] And that's very, very good, the quality is enormous and of course you can source the materials in a completely different way. [...] All the modular rooms are prefabricated and then taken to the construction site. This has huge advantages for logistical reasons, also in terms of quality control. There is actually a huge shortage of construction companies that can do this. There is enormous demand and the supply chain is actually not sufficiently well positioned. There's business potential there, I'd say. (Devin)*

Resource Efficiency was a major concern that participants talked about. They mentioned the finiteness of Earth's resources on the one hand and, on the other hand, the unconcerned waste of material during construction and at the end of the lifetime of a building. Resource efficiency for the participants

stood on three pillars: material reuse, repurpose and recycling; adoption of new materials; and implementation of new technologies. Notably, the material and technology adoption in RES appears to be much slower than in other industries, such as consumer electronics.

4.3.6   Financial Considerations

The following chapter regards factors mentioned by the participants that affect the decision-making process concerning sustainability solutions in the RES. It covers the challenge for organisations of planning in the long term whilst they must generate profits in the short term. Further, the issue of prioritisation of cost versus sustainability solutions is approached. Finally, the affordability of sustainable RE is discussed.

Long-term versus short-term planning

The participants said that RES organisations usually plan for one business year. The long-term financial benefit of investments into sustainable RE solutions was often ignored.

> *I think the challenge is always that budgets are only 12 months. And sometimes it's challenging for big organisations to think beyond that 12-month period. Our organisation seems very good at thinking about things in a slightly longer term sense. (Morgan)*

> *It might get saved hundreds, maybe thousands, of pounds on one site over the course of a year. You still want your showers and taps to be clean, but you know, using the grey water for your toilets or stuff like that - why not? Why not do that? (Jamie)*

> *And it's not all about money and the economy, but I think it's ultimately about what the organisation is willing to invest both in sort of resources like building a team and then finances because it's not cheaper, certainly in the upfront, but it will be cheaper in the long run. (Morgan)*

Cost versus sustainability

The participants described the decision-making processes whereby assigning a higher or lower priority to sustainability versus cost would lead to different outcomes.

> *That does happen and that happens a lot - 'Is that like some amazing idea?' And then it doesn't end up coming to fruition because of the cost. (Morgan)*

> *So sometimes you do get it [realisation of sustainability features], but it seems to be far and few between. […] but then you often go back and have to deal with the kind of mid level developer who just wants to make a lot of money for as little cost as possible. (Jamie)*

> *It's the economic and financial issue, which then leads to minimizing of and the reduction in the environmental ones because If they didn't care about their money, then they'd put it into the environment and stuff. (Jamie)*

[…] cost is really, really important and it has to be right. But we need to prioritise. Pushing this, the sustainability and safety agendas higher in a priority list and just taking it as a given, the cost would be right, you know. (Leslie)

[…] we said look we want to take immediate advantage of buying the best sustainable material that we can in Europe and then what we discovered after that was that there wasn't much of a cost difference. So there wasn't much of a premium to do that. (Leslie)

Affordability of sustainable RE

The participants spoke about higher initial costs being passed on to buyers and tenants, pushing real estate prices up. Further, they questioned whether a higher entry cost of implementing sustainable solutions is a myth.

Most of all, I have to say, I had to experience this with our own project, that we have a bid of £250K for the conversion and I sent that out to 7 contractors and the prices came back between £380K and £420K. (Devin)

Well, that's the issue, it's particularly the things are being developed, the systems are being developed, they're more expensive. It's harder to build and it takes more time. Time costs which ultimately, as the developers still want to make the money, it just pushes up the prices of the product you're selling. And people still want to be able to afford somewhere to live. (Cameron)

But I know that with our retrofitting side of things, we're looking at offsetting some of the costs of the green space improvements through a reduced maintenance regime. (Morgan)

Until you get anything like this in mass production it's always going to be more expensive. (Charlie)

Is there a cost to sustainability to the business of the moment? And the how we're tracking against that because that's always a point of contention - immediately people think that sustainable building and sustainable real estate is more expensive than just building in the way we did for the last 50 years. And on what's the reasoning behind that and is there hard data and data collection? (Leslie)

Notable was the (sometimes questioned) assumption of higher up-front cost of sustainable real estate. Simultaneously, there is a belief that energy-efficient RE is more profitable in the long run. Financial consideration in RE development projects appears to be driven by short-term profitability rather than a long-term view on the overall balance between sustainability and cost.

4.3.7 Analysis

Based on the analysis of the data, several sustainability issues and causes within the RES were identified. In this section, some solutions and mitigation strategies are proposed (Table 2).

Concept	Issue	Cause	Solution/Mitigation
Change	Applied knowledge and technologies already dated at the time of completion of the RE project, Unsustainable practices	Fragmented sector; Slowly moving industry; Existing moral norms based on cultural backgrounds;	Individual approaches to drive stakeholders' engagement in the RES' sustainability change
Government	Lack of legislation Loopholes in regulation and legislation	Lack of prioritisation of sustainability	Governmental sustainability engagement on national and global level
Organisations	Organisations in the RES do not operate sustainably,	Lack of legislation, Lack of sustainability knowledge, Moral norms/cultural behaviour	Senior Managers must recognise their sustainability leaders and support them in their sustainability actions; They must enable sustainability leaders to create new sustainability leaders through, e.g. education/knowledge sharing

Concept	Issue	Cause	Solution/Mitigation
Sustainability Knowledge	Sustainability education of employees/other stakeholders is not effective	Sustainability knowledge is disregarded and rejected as nonsense	Senior managements must determine new moral norms and develop a cultural change; Governments must enforce this cultural change through legislation to make sustainability knowledge important for all RES stakeholders
Change/ Sustainability Knowledge	Different understanding of sustainability in the RES	Lack of communicating a clear vision of a sustainable RES	Governmental use of social marketing to reach the masses and effect a change of moral norms.
Resource Efficiency	Waste – disposal of unused surplus materials, Materials used are not recovered before demolition	Customised products for individual architecture cannot be returned to suppliers, Developers/Contractors do not know where to store recovered materials;	Governmental knowledge Sharing on a global level, for example, copying elements of the former Soviet Union's resource scarcity-oriented economy (material had to be recovered before demolition and were centrally administered, dwellings were built in the same way);
Resource Efficiency	Materials used are not recovered before demolition	Developers/Owners do not know which materials had been used in a building;	Legal obligation to use BIM to catalogue material used in developments

Concept	Issue	Cause	Solution/Mitigation
Financial Considerations	RES organisations' financial decision-making based on the priority of profits over sustainability	Affordability and/or availability of: new sustainable materials, technology that supports the change into a sustainable RES, sustainability skills	Organisational sustainability engagement by using their lever of buying power to force their supply chain to become sustainable. This leads to increasing production and sales of sustainable materials and sustainability-supporting technology, therefore increasing affordability through upscale. And further, it would induce the necessity for the supply chains' senior managements to support and develop sustainability leaders.
Thought: Sustainability will then, in turn, reinforce itself as the new moral norm.			
Systems Thinking			

Table 2 - Concept Analysis Summary

Change is difficult: the RES is a fragmented sector, which means poor sustainability communication between its stakeholders. Further, the industry is slowly moving, with developments taking about a decade from the time of submitting planning applications till completion. Thus, it happens that at the time a RE project is completed, the applied sustainability regulations and sustainability knowledge are already dated. Existing moral norms based on individual cultural backgrounds require individual approaches to drive stakeholders' engagement in the RES' sustainability change.

Participants in unison indicated that governments would be able to drive sustainability in the RES further. However, there is a lack of governmental engagement (prioritisation → legislation) concerning the sustainability within the RES. It begs the question, "How do governments engage with higher-priority issues?" Political issues of high concern end up as laws, whereas those of low importance

remain mere guidelines. The lack of legislation highlighted by the participants suggests that sustainability is not a government priority. To drive sustainability in the RES, there is a necessity for governmental engagement in and prioritisation of sustainability on national and global levels (for example, prohibition to dispose of building materials).

In a capitalist world, the main goal of governments is to increase GDP and, therefore, economic growth. However, it is this continuously ongoing economic growth that intensifies the RES' unsustainability with its increased need for resources and take, make and waste mentality (Khoo, 2013, Philipsen, 2015, Raworth, 2017, Chomsky and Waterstone, 2021, Schmelzer et al., 2022). If the UK government wants to combat the RES' unsustainability and increase the liveability of their urban areas and their people's health and quality of life, they need to make sustainability a top priority and facilitate the development of a sustainable RES. However, the participants questioned the governments' prioritisation of a sustainable RES. It raises the question of whether the government assumes that GDP can only be generated by unsustainable businesses and why it is worth it for them to make sustainability only a trivial goal.

There is a lack of sustainability leadership in the government, with no one responsible for the development of the RES' sustainability and accountable for its unsustainable condition. Further, the participants called for mandatory legislation to enforce the RES' sustainability and said that one of the reasons that organisations in the RES do not invest in available sustainability solutions was that there is no legal obligation to do so. Additionally, there are loopholes in legislation that allow RES organisations to avoid the current building regulations. This leads to bureaucratic efforts to handle the organisations' excuses and arguments for avoiding compliance with legislation. Another issue criticised by the participants is that the government does not incentivise sustainability in the RES. There are no benefits for organisations that invest in sustainability and no punishment for unsustainable operations. Finally, the participants stated that the government's commitment to driving the RES' sustainability was not perceivable. They do not have the impression that sustainability in the RES is highly prioritised in the government's agenda.

It takes sustainability leaders within the government to spearhead the sustainability development of the RES (Albareda et al., 2008). Therefore, it would, for example, be counterproductive if the current Prime Minister did not support local sustainability leaders in mitigating pollution in urban areas and transforming them into healthier environments for their inhabitants (Bowden and Fouché, 2023).

The government's lack of sustainability engagement increases the importance of senior management's sustainability engagement at the organisational level. The participants talked about organisations' short-term planning to meet their yearly profit targets that undermines the necessary long-term

planning for investments into sustainability solutions for the RES that are believed to mean higher upfront costs. However, they also gave examples of organisations that prioritised investment in sustainability and realised that it did not always result in much higher costs. Another indicated issue was the affordability of sustainable RE. However, there were participants who suggested that the sustainable RE could be made affordable through upscaling and design, which would lead to lower maintenance costs afterwards. Finally, they regretted the lack of available data to prove whether creating a sustainable RE would, in fact, mean higher costs.

There are organisations that understand that a sustainable RES in which people can healthily thrive is important. Organisations must exploit their internal sustainability skills. Hence, senior managements must appreciate the skills of sustainability leaders and take advantage of them. Considering the scarce availability of sustainability skills, it is important for senior managements to recognise their sustainability leaders and reinforce and support them in their sustainability-driving actions. This enables the development of new organisational moral norms, building the basis for the organisation to become a sustainability leader in the industry. Further, it enhances the sustainability leaders' ability to create new sustainability leaders for sustained sustainability leadership, for example, through sustainability education (Fullan, 2004).

The participants noted varying levels of senior managements' sustainability commitment in the RES' organisations and how it, in some cases, changed over the last decade. They further highlighted how the RES' sustainability progress rises and falls with the intensity of their various stakeholders' sustainability engagement and how those stakeholders can use organisational levers to nudge other RES organisations towards sustainability. Furthermore, they demonstrated that sustainability leaders often have to endure criticism and what, nonetheless, they can achieve through persistent sustainability leadership. Additionally, the importance of a clearly defined sustainability vision for the RES was emphasised. Finally, it became clear that sustainability must not be exclusively the task of the organisation's sustainability team and, on the contrary, must be embedded in external roles to achieve cross-departmental sustainability in the RE organisation.

Internal and inter-organisational knowledge sharing within the RES creates a multitude of advantages, such as risk reduction, innovation, economic gains, etc., which support the development of a sustainable RES (Markovic and Bagherzadeh, 2018). Therefore, it is important that organisations within the RES build alliances, make the achievement of the RES' sustainability a common goal and establish good relationships to enhance communication and knowledge sharing (Wiesweg et al., 2022). The participants gave examples of successful sustainability knowledge sharing with their suppliers to enable sustainability development throughout their upstream supply chain. Furthermore, they said

that they internally shared sustainability knowledge with other departments to enable sustainability thinking within the organisation. However, there were also participants who stated that sometimes the sustainability knowledge was rejected by external stakeholders.

Considering the potential of RES' sustainability knowledge to increase the RES' overall sustainability level and, therefore, the positive impact it has on people's work and lives, it raises the question of why sustainability education is not eagerly absorbed by all people and, therefore, not effective.

The work of sustainability leaders and their reinforcement through the senior management is critical for the effectiveness of sustainability education of employees and sustainability knowledge sharing with external stakeholders. However, although education will reduce the number of people who are not acting sustainably simply because of unawareness, education is not effective if, due to existing moral norms, the new knowledge is regarded as nonsense. Thus, education alone will not suffice to manage the change to become a sustainable RES. Sustainability knowledge must be regarded as important; otherwise, it will be disregarded. New moral norms and behavioural change are critical for the change into a sustainable RES and must, therefore, be created by organisations and through enforcement by government legislation and accepted by all stakeholders. Then, new knowledge can be considered important, applied and further shared to enable the change towards a sustainable RES.

Through international knowledge sharing, the UK can benefit from other countries' adoptable, existing sustainability solutions in the RES and vice versa. Further, the application of those solutions can then be declared mandatory for the RES to increase the RES sustainability level. However, the participants mentioned examples of sustainability solutions, e.g., the use of new materials or double glazing, which has been common practice in other European countries for 40 years and has still not been implemented in every building in the UK. This raises the question of why the UK does not take the opportunity of governmental cooperation to exploit the RES knowledge of other European countries to accelerate the transformation into a sustainable UK RES.

Sharing of sustainability knowledge through the cooperation of governments, research and organisations operating in the RES and corresponding governmental prioritisation will be essential for increasing resource efficiency and developing a circular economy (CE) in the RES. However, the individuality in architecture and construction with customised materials appears to inhibit the RES' change into a sustainable CE (specially customised material cannot be returned to the supplier). The former Soviet Union's system of building everything in the same way and the planned economy seems to be a more sustainable system for allowing a CE. It might be useful if governments made use of the former Soviet Union's sustainability knowledge and applied elements of their resource scarcity and resource efficiency-oriented system.

The increase of resource efficiency and introduction of a CE depends further on the availability and affordability of sustainability solutions (e.g., materials and technology) and skills (e.g. intellectual property) that impact financial considerations. Suppose more organisations use their levers, such as buying power, to demand that their supply chain operate sustainably, then the upscale would positively affect the affordability of sustainable production/service. Consequently, the RES organisations' sustainability engagement that impacts the supply chain's sustainability would consequently influence the financial decision-making process of other organisations within the RES in favour of sustainability solutions. Further, organisations (supply chains) would have to train their employees on sustainability. Sustainability would then, in turn, reinforce itself as the new moral norm.

The participants all saw the potential for increasing resource efficiency by keeping resources longer in the loop and indicated which barriers there are to overcome to introduce a CE. Further, they favoured the use of new materials of lower carbon intensity and higher recyclability and talked about the RES' slow approval of those more sustainable materials. Additionally, the participants mentioned technologies which enhance the ability to introduce a CE in the RES and processes to build more efficiently.

The participants talked about various issues concerning waste. For example, they talked about the stages at which waste occurs, e.g., during the time of construction or at the end-of-life stage of a building when it is demolished. Further, they indicated reasons for waste creation during construction, e.g., design change. Finally, they mentioned that recyclable materials are not recovered. It raises the question of why RE organisations do not try to combat the issue of wasting materials, which means higher costs and reduced profits. Why is it ok for organisations in the RES to lose money by wasting materials when, at the same time, they do not want to invest in sustainability solutions for the reason of higher cost?

The finite availability of resources and the year-on-year increase of resource extraction for the RES make the introduction of a CE seem to be an attractive solution to mitigate the risk of running out of resources. There are various programs, such as "Cradle to Cradle", for introducing a CE. However, the participants said that none of those CE programs were applied in the RES. They explained that surplus materials could not be passed on to other organisations or people because of accusations of integrity violations. Further, they mentioned the lack of an appropriate infrastructure to tackle logistical issues such as storage capacity, the administration and brokerage of recovered materials. The question is whether this could either be a business opportunity or whether it should be a governmental task to provide the infrastructure and administration of recovered materials from and for the RES.

The RES uses many materials that are unsustainable due to their toxicity, high carbon emissions during production, and long transport journeys. The participants talked about the availability of several new materials, such as hempcrete and cross-laminated timber, that could be a substitute for unsustainable materials used in the RES. However, they further said that those materials have not yet found the RES' broad approval. They mentioned various reasons for that hesitation, for example, the lack of knowledge about the materials' performance, resulting in insurance firms not wanting to cover potential risks of unsafety due to the untested performance of materials. This calls for better global knowledge sharing and governmental support to adopt new materials more quickly.

There have been new technologies and building processes, e.g., BIM (Building Information Modeling) and modular building, developed over the last decades that can, for example, support the implementation of a CE and reduce the amount of waste created on-site in the RES. The participants described and unanimously praised the advantages of those technologies and processes. They said, however, that those sustainability solutions are paradoxically rarely used in the RES. It is perplexing how, on the one hand, the evolution of technology has been racing over the last 50 years and how quickly, for example, personal computers, smartphones, social media, etc., were accepted and how slowly, on the other hand, the evolution and approval of technology in the RES is. These circumstances raise the question of why the RE organisations have not made use of these technologies and processes and why governments have not made them obligatory.

The purpose of organisations is to make profits. For managers, it is important to make those profits in the short term to meet their shareholders' expectations. However, to make the RES sustainable, the organisations must plan in the long term to ensure RE's longevity and its resilience to extreme weather conditions due to climate change. The participants said that this presents a challenge for the RES organisations because they usually plan for one business year. Further, they indicated that organisations do not recognise where they could save money in the long term through sustainability investments and thus do not explore sustainability opportunities in the RES for profit generation in the long term. Additionally, the participants talked about the decision makers' short-term profit thinking that undermines the non-financial benefits of sustainable solutions and the RES' transition into a sustainable industry in the long term.

Governments pledged through signing the Paris Agreement to combat the various issues of unsustainability. Therefore, organisations in the RES too must now present how they contribute to the United Nations' SDGs, albeit some of them are questionable regarding their contribution to sustainability as, for example, SDG 8, which aims for sustained economic growth (United Nations, 2021). However, the participants said that organisations have an issue with prioritising the tasks cost-

oriented and sustainability thinking. They indicated that organisations often decide against sustainability solutions due to their higher costs, although they originally had favoured them. Nonetheless, they, on the contrary, described how their organisations experimented with another approach prioritising sustainability over cost and demonstrated that sustainability is doable without suffering economic damage.

4.4   Summary

The normative capitalistic thinking with the ultimate goal of economic growth has led to an economy that neglects social and environmental sustainability issues.

Sustainability solutions in the RES are believed to be more cost-intensive upfront and, therefore, are rejected for the sake of short-term profits, disregarding the long-term benefits of sustainability solutions. It raises the question: Doesn't money always win? How do we make decisions on an individual level? For example, when we think about ourselves deciding on whether to buy organic products in the grocery store. Do we choose the organic eggs for GBP 1.80 or the non-organic variant for GBP 0.9 to make our Victoria Sponge cake?

However, it is difficult for individuals to fight battles on many fronts at the same time. On the other hand, organisations are a group of people working together for a common purpose. If a group of organisations such as the RES redefines its purpose to be "social, economic and environmental sustainability", then a holistic strategy could be worked out.

The next chapter juxtaposes the findings from this study with recent literature.

5 Discussion

This chapter discusses the findings from this study in the context of current literature. The Systems Thinking approach (Meadows, 2008) is used as an overarching theory to assess and discuss the findings and their implications. After a brief discussion of Systems Thinking, the chapter follows the format of the identified concepts and discusses these individually before ending with a summary and a call for action.

5.1 Systems Thinking

The participants show some semblance of wider thought about sustainability and consider issues of all three pillars (environmental, social, economic) of sustainability (Elkington, 1998, Siegrist et al., 2020). Nevertheless, they focus on various singular issues and sustainability actions in the RES. They rarely mentioned how one particular action to combat a specific sustainability issue could result in a domino effect affecting further issues. However, recognising and understanding the interlinks, mutual relationships, and feedback loops are necessary for developing solutions that have a holistic impact on the RES' sustainability.

Meadows (2008) described this complexity of the Earth's intertwined subsystems as a continuum in which we must apply systems thinking to avoid unintended consequences that are often hard to trace back due to delayed feedback loops. However, humans would have to cooperate on micro and macro levels and across industries, making a continuous effort to detect and deal with all possible side effects, however small, understanding that the smallest changes can have a profound effect in the long term.

5.2 Change

This study demonstrates that the RES stakeholders' awareness of sustainability issues and solutions within the sector has increased over the last decade. This aligns with existing studies (Coady, 2020, Hawken, 2021, Sayce et al., 2023). Nonetheless, the findings also confirm the difficulty of securing people's commitment to change (Eberhardt-Toth and Wasieleski, 2013). Arguably, this is a call to action for the governments to be more decisive.

This study shows that no extensive actions have been taken to tackle an emergency, and change is happening only slowly and infrequently. This confirms the research by Kotter (1995), who pointed out that real change can only happen when there is a perceived emergency. It raises the question of why governments do not push this critical sense of urgency. Shouldn't they use their levers to create a common understanding of the situations' graveness amongst their citizens? It is, however, a balancing act between generating a sense of urgency and avoiding panic, which would result in counterproductive hastily activity.

Furthermore, this study confirmed Akhtar and Sarmah (2018) in that new technologies and materials find their application only sporadically due to stakeholders' uncertainty about their performance. Ironically, people usually embrace new products and constantly consume the very latest must-haves. The global marketing sector is set to spend USD 1tn in 2024 (Statista, 2023). This immense spending successfully aims to induce our longing for things and to ensure that people know that what they want is to have the must-haves that marketing wants them to want (Chomsky and Waterstone, 2021). It raises the question of why governments do not make use of social marketing.

5.3 Organisations

The RES organisations must adapt to changing environmental conditions and innovate to remain a player in the market. Sustainability presents an opportunity for organisations to become leaders in their industry. The participants, for example, talked about the advantages (e.g., faster completion) of modular building and the scarcity of companies producing these modular buildings. One organisation was predicted to disrupt the market. Ironically, the RES' slowness in taking up sustainability solutions killed those spearheads who could have driven the change (Kollewe, 2023). Examples like this raise the question of why RE organisations are resistant to innovation instead of taking the opportunity to advance the sector's capability, considering the challenges that climate change and the megatrend of urbanisation present.

Norton et al. (2014) observed that an organisation's emphasis on sustainability in policy and operation positively influences employees' moral norms and behaviours. My study also shows that organisations have the power to spread sustainability-minded thinking internally and externally. Some of the participants indicated that buying power is the organisation's powerful lever that impacts the supply chain's sustainability. This was contingent on individual sustainability leaders who positively influenced co-workers in procurement and finance. Arguably, developing and multiplying sustainability leaders inside the organisation would have a lasting positive effect. This was highlighted by several examples of the participants' experiences and confirms the research of Fullan (2004), who described leadership as the "organisation's longest leaver" (p. 94).

The findings of this research demonstrate, however, that currently, organisations that create a vision that is centred around sustainability goals and put sustainability leadership at the forefront of their business strategy are still exceptions. If organisations continue their unsustainable practices, it is likely to result in externalised costs that are unbearable for the public and exceed the short-term financial gains of businesses (Siegrist et al., 2020, Philipsen, 2015, Chomsky and Waterstone, 2021). This raises the question of why governments do not interfere forcefully to prevent organisations from causing

disastrous outcomes. Might the participants be right in assuming that the fear of losing necessary votes to stay in power would be the reason for governments to stand aside?

Fahy and Rau (2013) noted the necessity of cooperation between organisations, research, and governments for a successful change of the RES towards sustainability. However, there are two sides of a coin considering the cooperation with organisations. On the one hand, their specialised knowledge provides an advantage. On the other hand, there is the question of whether they might misuse the opportunity to have a seat at the table to prevent governments from making strict laws that might mean restrictions on their way of doing business.

5.4   Sustainability Knowledge

Several studies highlighted the positive impacts of awareness, education and internal training on organisational performance (Al Aina and Atan, 2020, Herrmann-Fankhänel, 2022). However, the findings of this study only partially agree with the literature. This study revealed that education on its own, regardless of its quality, will not be a successful means to effect sustainability-oriented behaviour.

This study highlighted that without emphasising the priority of sustainability in the organisation's moral norms, employees will not acknowledge sustainability education as important and will disregard the knowledge. Therefore, organisations' policies and daily operations must reflect the substance of sustainability education programs, as previously noted in (Eberhardt-Toth and Wasieleski, 2013, Norton et al., 2014). Organisations must demonstrate and emphasise that to comply with the organisation's moral norms, employees' sustainable behaviour is imperative. Employees' adoption of these moral norms is the absolute prerequisite for the effectiveness of education and the increase and dissemination of sustainability knowledge. Further, the findings confirm the importance of cultural and individual backgrounds in successful education (Annan-Diab and Molinari, 2017, Wamsler, 2020).

5.5   Resource Efficiency

This study highlights how inefficiently and wasteful the RES handles resources. Every day, vast amounts of usable material go to landfills (Coady, 2020, Sayce et al., 2023). This study revealed that one of the reasons is that new customised material ends up unused in landfills when there are later alterations in design. This raises several questions: Would it not be possible to create individually designed buildings with standardised materials that could be used for other projects? Does our society need and should governments further and accept such extreme individualism despite causing economic, environmental, and, in the end, social issues when resources are depleted, and landfills take valuable space and contaminate precious groundwaters and soil?

Further, this study highlights that the RES is overwhelmed by the implementation of a circular economy (CE). The main issue is the lack of logistical capacities such as transportation and storage. Additionally, the question of further usage, possible brokerage and quality assurance presents a challenge. This confirms previous studies which highlight the complexity of a CE and the lack of know-how (Benachio et al., 2020, Guerra et al., 2021). Most surprising was the fact that the RE organisations do not know which materials could be recovered from existing buildings before demolition as they are not catalogued. Despite its well-known advantages, the use of BIM technology and cataloguing of used materials are not mandatory in the UK. Considering finite natural resources and carbon emissions associated with sourcing and processing materials, it raises the question of why the UK government does not tackle these issues, has not been vehemently pursuing the introduction of a practicable CE concept and has not taken up responsibility for supporting the development of the therefore necessary infrastructure in the last decade.

For example, the GLA's London Plan considered only in its publication of March 2021 sustainability solutions, such as circular economy principles and adaptability to changing uses for prolonged longevity. However, it does not suggest how to do that (Pipe, 2021). Considering the constant population growth, the built world will have to expand to accommodate these people; thus, the RES will consume more resources. Therefore, a CE in the RES is crucial, and exploitation economics must be replaced by resource-conserving economics.

5.6   Financial Considerations

This study identified organisations in different stages of decision-making on sustainability. There are examples of organisations that have started to raise sustainability's priority in their financial considerations. However, often, decision-makers prioritised higher short-term profits over sustainability. No solid argument was made that sustainable RE would lower profits or be more expensive. However, the reluctance to act was comparable to other findings (Eberhardt-Toth and Wasieleski, 2013) when financial managers omitted decisions for sustainability for fear of possible negative impact on profitability. The lack of commitment appears to be further strengthened by the lack of reliable data (Falkenbach et al., 2010, Hartenbeger et al., 2023).

The study participants suggested that organisations should incentivise the achievement of internal sustainability goals, confirming previous studies (Siegrist et al., 2020). With this knowledge, why does the government not provide incentives for sustainable RE? Previous studies have alerted us to short- and long-term decremental effects of financial decision-making against sustainability (Johnston et al., 2007, Siegrist et al., 2020). Arguably, this calls for more celebration and prominent reporting of successful sustainability projects and leadership.

5.7 Government – The RES' Call for Action

This study demonstrates that the stakeholders who want to drive the RES' change towards sustainability call for the government to come to the plate and act.

The role of the government is wide-ranging and comprises various responsibilities. These include responsibilities that affect the RES, for example, the protection of the environment and human rights, resource distribution, establishment and enforcement of legislation and economic regulation, provision of public services and goods and upholding international relationships and agreements (Brooks, 2024).

This study highlights that the RES' sustainability leaders need the government to become sustainability leaders themselves and take the lead in the sector's sustainability transformation. If the sustainability leaders do not get the government's support, the sector's sustainability change cannot be realised fast enough to achieve the set targets timely.

The study emphasises that existing regulations and laws are too lax and vague. This is also evident in the Greater London Authority's *London Plan* published in March 2021, which encourages, however, does not stipulate. For example, it says buildings' longevity should be "considered" instead of making it obligatory. Further, it does not indicate how many years, decades, or centuries the buildings should be usable (Pipe, 2021).

This study further highlights that the RES' sustainability leaders expect the government to introduce legal institutions and obligatory rules and laws that do not yet exist for sustainability progress. These new mandatory rules must direct decision-makers to commit to sustainability. Furthermore, the government's support for the development and enforcement of obligatory use of creative solutions to accelerate the sustainability movement are pivotal for sustainability leaders' success in their organisations.

This resonates with previous research stating that governments must create a common interest of businesses, local authorities, academic institutions, and individuals in sustainability (Albareda et al., 2008, Ross, 2010, Dernbach and Mintz, 2011, Philipsen, 2015, Chomsky and Waterstone, 2021). Additionally, they must influence and encourage stakeholders' engagement in achieving the committed sustainability goals.

However, this study further demonstrates that economic growth is paramount for organisations and governments and, therefore, sustainability is a lesser priority. The neo-liberal approach with voluntary guidelines and non-interference in markets has been widely criticised (Philipsen, 2015, Chomsky and Waterstone, 2021). The recent UK government's decision to relax its commitment is a further

confirmation of this and previous studies' findings (Prime Minister, 2023) and is the very opposite of what is needed for the RES' sustainability change.

The government's lack of progress on sustainable building measures has been criticised (Committee, 2022). The research found that "There is little government guidance as to how these targets [UK's COP26 commitment to reduce carbon emissions by 68% based on 1990 values] are to be met by the built environment industry". Further, they noted that there is a lack of incentives and a presence of barriers such as skills gaps and knowledge about performance hindering the transition to new materials and technologies for sustainable construction (Committee, 2022). This study highlights that the findings of the House of Commons are still valid today, four years after the report has been compiled.

Assuming that the participants' suggestions are right, and governments fear the loss of votes due to the people's resistance to sustainability actions and legislation, it raises the question of why they do not take more subtle measures to move organisations in the right direction. Would it not be possible to use the same means that led us into this situation of unsustainability? According to Chomsky and Waterstone (2021) we want what marketing tells us to want, and we believe what the media wants us to believe. So why does the government not use social marketing to reach the masses and effect a change in moral norms? To achieve an overall sustainable RES sustainability leaders must communicate a clear vision of how a sustainable RES looks like to every stakeholder within the RES. Why does the government not become a sustainability leader and create a vision of a sustainable RES? Coady (2020) and Figueres and Rivett-Carnac (2020) both presented knowledgeable, thoughtful visions which the government could make use of. A vision of a sustainable RES with rewilded, walkable cities that are built for people and community, not for cars.

6 Conclusion

The following section provides an overview of the process followed in this study and the major findings. Further, the contribution to management science, practitioners and policymakers are highlighted. Additionally, a retrospective view on the conduct of this study is taken. Finally, limitations of this work are acknowledged and further research following from my findings is suggested.

6.1 Summary of Process and Method

This study attempts to answer the research question, "How is sustainability considered in Real Estate Sector projects by stakeholders in the UK?" To answer the question, I conducted deep qualitative semi-structured interviews. When I processed the transcripts, I coded and, for ethical reasons, anonymised names and places. Through the interpretation of the collected data, themes arose, and broader concepts were derived from them. Attempting to answer the research question, an analysis of the data presented in the themes and concepts revealed several findings.

6.2 Major Findings

The major findings of this study confirm the published literature. Organisations that consider sustainability in RE projects are an exception. The differences in stakeholders' understanding of a sustainable RES are intensified by a plethora of sustainability frameworks, resulting in different goal settings. This ambiguity of sustainability's meaning obscures ideas of what values need to be prioritised over monetary ones. Additionally, excessive individualism presents a barrier to resource-conscious behaviour, neglecting impacts on common well-being. The prevalent capitalistic thinking that prioritises continuous economic growth and mistakes increasing GDP for an indicator of national welfare dominates society's development of moral norms and organisational cultures. However, Albert Einstein said, "The world we have made as a result of the level of thinking we have done thus far creates problems that we cannot solve at the level of thinking at which we created them". Hence, without changing these persisting moral norms, sustainability education will not be regarded as important and, consequently, cannot be effective. Thus, it is critical to apply a new, more collectivist thinking rather than capitalism to develop sustainability-oriented norms that allow the required behavioural change to put sustainability in the RES projects at the forefront. Furthermore, the government, together with the business, must develop a clear vision of a sustainable RES. Disseminating this vision via social marketing will contribute to influencing the masses that are currently manipulated by marketing strategies that promote consumerism. Further, there are various levers that can affect different areas of the RES' sustainability. However, it is crucial to apply systems thinking, observe feedback loops and consider the domino effects of our actions and implications that might only become visible in the long term. To create RE that is liveable and promotes health, well-

being, and biodiversity, organisations and governments must carefully balance their sustainability actions. It is further important to balance the cooperation between organisations and the government. On the one hand, the industry's know-how is essential for developing practicable sustainability policies, and organisations need room to develop creative sustainability solutions. On the other hand, the influence of resistant organisations, which would negatively impact the government's sustainability decisions, should be avoided. Sustainability leaders depend on organisations' and government's determined support for the successful change to holistic social, environmental and economic sustainability in the RES.

6.3   Contributions

This research contributes to academic knowledge and methodology and provides practical applications and recommendations.

6.3.1   Contributions to Management Science

This study provides evidence that the widespread belief that education induces behavioural change is not entirely true. The research shows that the moral norms that employees hold true influence whether they regard or disregard sustainability education. Therefore, organisations' cultural change is prescriptive for the effectiveness of sustainability education and for increasing sustainability knowledge. Further, this study highlighted that organisations must empower sustainability leaders to spread sustainability knowledge across industries to generate a resilient, sustainable RES.

The participants of this study covered all RE development stages in which decisions on sustainability are made. Therefore, this study provides valuable insights into the current state of sustainability approaches in the UK Real Estate Sector.

6.3.2   Methodological Contribution

The study employed qualitative research using modern communications technologies. Specifically, the interviews were conducted via Microsoft Teams, and the transcription feature of the software was used to automatically transcribe the interviews. The video interview approach, ethical considerations and methods of reviewing and verifying the interviews is a valuable example of using automated transcriptions with AI (language recognition) for the collection of qualitative data.

6.3.3   Practical Applications

The knowledge gathered from this study calls for the government's action. Legislators must introduce obligatory, definite laws, regulations and incentives to support organisations that are sustainability leaders and to force resistant organisations to consider sustainability in their projects to reduce the RES' negative impact on social, environmental, and, hence, economic sustainability in the long term.

Further, practitioners benefit from the findings of this study by understanding that sustainability leaders have, on the one hand, the power to support organisational transformation towards more sustainability. On the other hand, they also need management support and care to be successful in their mission.

6.4   Reflections

During my studies and research, I gained valuable transferable skills, as well as a deeper knowledge and understanding of organisations and management. I became a more confident interviewer, and I have learned to structure my thoughts. The independent work on my research project also sharpened my organisational skills, time-keeping and writing skills.

In day-to-day operations, it is difficult to find time for additional tasks and meetings. Thus, the efforts which the participants made to support the research with their interviews, although not knowing me, were very much appreciated. The participants made time to talk to me, including while waiting in a garage to have their car repaired or while walking in the rain from one engagement to the next. One participant skipped dinner to make sure they could take part in the research. They all granted me plenty of their precious time, for which I am very thankful.

When I would do this study again, I would keep a research diary in which I would make notes of all the alternations that I made and the thoughts that led to them. I realised that no matter how much sense some decisions made to me at a given moment, now I sometimes do not remember exactly the order of my thoughts when explaining the process.

When I started with the analysis of the data, I noticed on some occasions that it might have been useful if I had followed up on a particular statement of an interviewee. Unfortunately, I did not realise this when I conducted the interview. Although I thought that I had been listening well during the interviews, I think now, after having read all the transcripts, that I often was unnecessarily commenting things. This happened probably due to my nervosity. I realised that sometimes I had interrupted the participants without contributing something useful to get deeper information.

Although my supervisor recommended starting the analysis as soon as I had the first two interviews, I did not feel confident enough and thought I needed to have the complete data before I could start analysing them. Retrospectively, I believe I should have followed my supervisor's advice. I lost plenty of time between the various interviews that I could have used for analysis. Further, I think I could have benefitted from early findings and had been able to adapt the interview script correspondingly.

One of my suggestions to motivate decision-making in favour of sustainability was to collect examples of successful sustainability projects/organisations and to make them public. I was delighted when I afterwards read that a similar suggestion was made by Chomsky (Chomsky and Waterstone, 2021).

6.5 Limitations and Further Research

Although the findings gathered from the rich data obtained by using the qualitative research method of semi-structured deep interviews are significant, there are limitations regarding the small sample of participants. Further, the interviewed RES stakeholders all operate in the UK. The findings may not apply to other countries. This may limit the transferability of my findings. To address this, future research applying a mixed-methods approach to additionally receive complementary statistical information may be conducted. Studies in other countries could provide insight into whether the findings of this study reflect the situation in those countries or whether there are opportunities to take advantage of their possible head starts in particular areas. This will make the findings of the study more generalisable.

All stakeholders who agreed to talk to me were interested in sustainability. Other RES stakeholders whom I asked for an interview refused to take part in this study, indicating they had no knowledge about sustainability in the RES. Future studies could find out why employees of RES organisations have no knowledge about sustainability issues and solutions, if they are simply unaware of its meaning, and whether their experiences would lead to other findings. Further research could be done investigating the effectiveness of social marketing in relation to sustainability in the RES and the publishing of success stories of sustainable RES organisations.

7 References

ABASTANTE, F., LAMI, I. M., LA RICCIA, L. & GABALLO, M. 2020. Supporting Resilient Urban Planning through Walkability Assessment. *Sustainability,* 12**,** 8131.

AKHTAR, A. & SARMAH, A. K. 2018. Construction and demolition waste generation and properties of recycled aggregate concrete: A global perspective. *Journal of Cleaner Production,* 186**,** 262-281.

AL AINA, R. & ATAN, T. 2020. The impact of implementing talent management practices on sustainable organizational performance. *Sustainability,* 12**,** 8372.

ALBAREDA, L., LOZANO, J. M., TENCATI, A., MIDTTUN, A. & PERRINI, F. 2008. The changing role of governments in corporate social responsibility: drivers and responses. *Business ethics: a European review,* 17**,** 347-363.

ANNAN-DIAB, F. & MOLINARI, C. 2017. Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals. *The International Journal of Management Education,* 15**,** 73-83.

ATTENBOROUGH, D. 2020. *A life on our planet: My witness statement and a vision for the future*, Random House.

BENACHIO, G. L. F., FREITAS, M. D. C. D. & TAVARES, S. F. 2020. Circular economy in the construction industry: A systematic literature review. *Journal of Cleaner Production,* 260**,** 121046.

BIBRI, S. E., KROGSTIE, J. & KÄRRHOLM, M. 2020. Compact city planning and development: Emerging practices and strategies for achieving the goals of sustainability. *Developments in the built environment,* 4**,** 100021.

BOWDEN, G. & FOUCHÉ, A. 2023. *Sunak hits out over Ulez but Khan says charge is vital for clean air* [Online]. BBC. Available: https://www.bbc.co.uk/news/live/uk-england-london-66620549/page/2 [Accessed February 2024].

BRADY, C. & KAWAMURA, S. 2021. *An integrated approach to a sustainable built environment: the co-benefits of resources & circularity* [Online]. World Green Building Council. Available: https://worldgbc.org/article/an-integrated-approach-to-a-sustainable-built-environment-the-co-benefits-of-resources-circularity/ [Accessed February 2024].

BREWER, J. 2000. *Ethnography,* Buckingham, Philadelphia, McGraw-Hill Education (UK).

BRITANNICA, T. E. O. E. 2024. *Urbanization | Definition, History, Examples, & Facts | Britannica* [Online]. Online: Encyclopedia Britannica. Available: https://www.britannica.com/topic/urbanization [Accessed March 2024].

BROOKS, R. 2024. *The fundamental role of government* [Online]. University of York. Available: https://online.york.ac.uk/the-fundamental-role-of-government/ [Accessed February 2024].

BUILDING COMPLIANCE, U. K. 2020. *What are sap calculations? The ultimate guide* [Online]. UK Building Compliance. Available: https://www.ukbuildingcompliance.co.uk/what-are-sap-calculations/ [Accessed February 2024].

BUNN, S. & DUFFIELD, G. 2023. *Indoor Air Quality: Research Briefing* [Online]. UK Parliament. Available: https://post.parliament.uk/research-briefings/post-pb-0054 [Accessed February 2024].

CAMBRIDGE DICTIONARY. 2024. *URBANIZATION | English meaning - Cambridge Dictionary* [Online]. Online: Cambridge Dictionary. Available:

https://dictionary.cambridge.org/dictionary/english/urbanization [Accessed February 2024].

CAMBRIDGE UNIVERSITY, I. 2021. Cambridge Sustainable Real Estate: Creating a Better Built Environment. Online: University of Cambridge, Institute for Sustainability Leadership.

CARLIN, D. 2022. *40% Of Emissions Come From Real Estate; Here's How The Sector Can Decarbonize* [Online]. Forbes. Available: https://www.forbes.com/sites/davidcarlin/2022/04/05/40-of-emissions-come-from-real-estate-heres-how-the-sector-can-decarbonize/ [Accessed February 2024].

CHEN, J. 2023. *Real Estate: Definition, Types, How to Invest in It* [Online]. Investopedia. Available: https://www.investopedia.com/terms/r/realestate.asp [Accessed February 2024].

CHOMSKY, N. & WATERSTONE, M. 2021. *Consequences of Capitalism: Manufacturing Discontent and Resistance,* London, Penguin Books Ltd (Hamish Hamilton Ltd).

COADY, T. 2020. *Rebuilding Earth : designing ecoconscious habitats for humans,* Berkeley, California, North Atlantic Books.

COMMITTEE, H. O. C. E. A. 2022. Building to Net Zero: Costing Carbon in Construction. *First Report of Session 2022-23.*

CRESWELL, J. W. 2013. *Qualitative inquiry and research design : choosing among five approaches,* Los Angeles, SAGE Publications.

DELOITTE. 2020. *Reducing Environmental Impact Is Now A Business Imperative* [Online]. Available: https://www.forbes.com/sites/deloitte/2020/01/22/reducing-environmental-impact-is-now-a-business-imperative [Accessed March 2021].

DELOITTE. 2021. *Zero in on scope 1, 2 and 3 emissions* [Online]. Available: https://www2.deloitte.com/uk/en/focus/climate-change/zero-in-on-scope-1-2-and-3-emissions.html [Accessed May 2023].

DENZIN, N. K. & LINCOLN, Y. S. 2005. *The Sage handbook of qualitative research,* California, Sage.

DERNBACH, J. C. & MINTZ, J. A. 2011. Environmental laws and sustainability: An introduction. *Sustainability,* 3**,** 531-540.

DIJKSTRA, L., FLORCZYK, A. J., FREIRE, S., KEMPER, T., MELCHIORRI, M., PESARESI, M. & SCHIAVINA, M. 2021. Applying the degree of urbanisation to the globe: A new harmonised definition reveals a different picture of global urbanisation. *Journal of Urban Economics,* 125**,** 103312.

EBERHARDT-TOTH, E. & WASIELESKI, D. M. 2013. A cognitive elaboration model of sustainability decision making: Investigating financial managers' orientation toward environmental issues. *Journal of Business Ethics,* 117**,** 735-751.

ELKINGTON, J. 1998. Accounting for the triple bottom line. *Measuring business excellence,* 2**,** 18-22.

ENVIRONMENTAL AUDIT, C. 2022. *Building to net zero: costing carbon in construction* [Online]. UK Parliament. Available: https://publications.parliament.uk/pa/cm5803/cmselect/cmenvaud/103/report.html [Accessed February 2024].

FAGERBERG, J. & SRHOLEC, M. 2017. Capabilities, economic development, sustainability. *Cambridge Journal of Economics,* 41**,** 905-926.

FAHY, F. & RAU, H. 2013. *Methods of Sustainability Research in the Social Sciences,* London, Sage.

FALKENBACH, H., LINDHOLM, A.-L. & SCHLEICH, H. 2010. Review articles: environmental sustainability: drivers for the real estate investor. *Journal of Real Estate Literature,* 18**,** 201-223.

FIGUERES, C. & RIVETT-CARNAC, T. 2020. *The Future We Choose: Surviving the Climate Crisis*, Bonnier Books UK.

FINCH, H., LEWIS, J. & TURLEY, C. 2003. Focus groups. *Qualitative research practice: A guide for social science students and researchers,* 2**,** 211-242.

FULLAN, M. 2004. *Leadership & sustainability: System thinkers in action,* Thousand Oaks, CA, Corwin Press.

GLASER, B. & STRAUSS, A. 1967. *The discovery of grounded theory: Strategies of qualitative research,* London, Wiedenfeld and Nicholson.

GRAY, D. E. 2021. Doing research in the real world. 5 ed. London: Sage Publications.

GUERRA, B. C., SHAHI, S., MOLLAEI, A., SKAF, N., WEBER, O., LEITE, F. & HAAS, C. 2021. Circular economy applications in the construction industry: A global scan of trends and opportunities. *Journal of cleaner production,* 324**,** 129125.

GUGGISBERG, S. & DAVIDSON, N. 2023. *Insulation and energy efficiency of housing in England and Wales: 2022* [Online]. Office for National Statistics. Available: https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/insulatio nandenergyefficiencyofhousinginenglandandwales/2022 [Accessed February 2024].

HARARI, Y. N. 2016. *Homo deus*, random house.

HARTENBEGER, U., SAYCE, S. & TOTH, Z. 2023. Financing retrofits. *Resilient Building Retrofits - Combating the Climate Crisis.* Abingdon: Routledge.

HATCH, M. J. C., ANN L. 2006. *Organization Theory: Modern, Symbolic, and Postmodern Perspectives,* New York, Oxford University Press.

HAWKEN, P. 2021. *Regeneration: Ending the Climate Crisis in One Generation*, Penguin Books Limited.

HERRMANN-FANKHÄNEL, A. 2022. Perceiving Sustainability: A Workshop Concept for Creating Awareness and Building Knowledge About Sustainable Development. *Achieving Sustainability Using Creativity, Innovation, and Education: A Multidisciplinary Approach.* IGI Global.

HESSELBARTH, C. & SCHALTEGGER, S. 2014. Educating change agents for sustainability–learnings from the first sustainability management master of business administration. *Journal of cleaner production,* 62**,** 24-36.

IMPERATIVES, S. 1987. Report of the World Commission on Environment and Development: Our common future. *Accessed Feb,* 10.

JOHNSTON, P., EVERARD, M., SANTILLO, D. & ROBÈRT, K.-H. 2007. Reclaiming the definition of sustainability. *Environmental science and pollution research international,* 14**,** 60-66.

KEDIR, F. & HALL, D. M. 2021. Resource efficiency in industrialized housing construction–A systematic review of current performance and future opportunities. *Journal of Cleaner Production,* 286**,** 125443.

KHOO, S.-M. 2013. Sustainable Development of What? Contesting global development concepts and measures. *In:* FAHY, F. & RAU, H. (eds.) *Methods of Sustainability Research in the Social Sciences.* London: Sage Publications Ltd.

KIANI MAVI, R., GENGATHAREN, D., KIANI MAVI, N., HUGHES, R., CAMPBELL, A. & YATES, R. 2021. Sustainability in construction projects: A systematic literature review. *Sustainability,* 13**,** 1932.

KING, G., KEOHANE, R. O. & VERBA, S. 2021. *Designing social inquiry: Scientific inference in qualitative research*, Princeton university press.

KOLLEWE, J. 2023. *Legal & General halts new production at modular homes factory near Leeds* [Online]. The Guardian. Available: https://www.theguardian.com/business/2023/may/04/legal-general-halts-new-production-at-modular-homes-factory-near-leeds [Accessed February 2024].

KOTTER, J. P. 1995. Leading change. *harvard business review,* 2**,** 1-10.

KOTTER, J. P. & SCHLESINGER, L. A. 2008. Choosing strategies for change. *Harvard business review*.

LIMA, L., TRINDADE, E., ALENCAR, L., ALENCAR, M. & SILVA, L. 2021. Sustainability in the construction industry: A systematic review of the literature. *Journal of Cleaner Production,* 289**,** 125730.

LIPPIATT, N., LING, T.-C. & PAN, S.-Y. 2020. Towards carbon-neutral construction materials: Carbonation of cement-based materials and the future perspective. *Journal of Building Engineering,* 28**,** 101062.

LONDON, M. O. 2023. *Millions of pounds invested to plant an additional 100,000 new trees and expand woodland in the capital* [Online]. London GLA. Available: https://www.london.gov.uk/millions-pounds-invested-plant-additional-100000-new-trees-and-expand-woodland-capital [Accessed February 2024].

MARKOVIC, S. & BAGHERZADEH, M. 2018. How does breadth of external stakeholder co-creation influence innovation performance? Analyzing the mediating roles of knowledge sharing and product innovation. *Journal of Business Research,* 88**,** 173-186.

MEADOWS, D. H. 2008. *Thinking in systems: A primer*, chelsea green publishing.

MURPHY, E. & KING, E. A. 2013. Mapping for sustainability: Environmental noise and the city. *In:* FAHY, F. & RAU, H. (eds.) *Methods of Sustainability Research in the Social Sciences.* London: Sage.

NATURAL STEP INTERNATIONAL, T. 2020. *The Natural Step Framework* [Online]. Natural Step International. Available: https://thenaturalstep.org/ [Accessed February 2024].

NORTON, T. A., ZACHER, H. & ASHKANASY, N. M. 2014. Organisational sustainability policies and employee green behaviour: The mediating role of work climate perceptions. *Journal of Environmental Psychology,* 38**,** 49-54.

PAILLÉ, P. & RAINERI, N. 2015. Linking perceived corporate environmental policies and employees eco-initiatives: The influence of perceived organizational support and psychological contract breach. *Journal of Business Research,* 68**,** 2404-2411.

PHILIPSEN, D. 2015. *The little big number: how GDP came to rule the world and what to do about it*, Princeton University Press.

PIPE, J. 2021. *The London Plan 2021* [Online]. London GLA. Available: https://www.london.gov.uk/programmes-strategies/planning/london-plan [Accessed February 2024].

PRIME MINISTER, O. 2023. *PM recommits UK to Net Zero by 2050 and pledges a "fairer" path to achieving target to ease the financial burden on British families* [Online]. GOV.UK. Available: https://www.gov.uk/government/news/pm-recommits-uk-to-net-zero-by-2050-and-pledges-a-fairer-path-to-achieving-target-to-ease-the-financial-burden-on-british-families [Accessed February 2024].

RANJBARI, M., ESFANDABADI, Z. S., ZANETTI, M. C., SCAGNELLI, S. D., SIEBERS, P.-O., AGHBASHLO, M., PENG, W., QUATRARO, F. & TABATABAEI, M. 2021. Three pillars of

sustainability in the wake of COVID-19: A systematic review and future research agenda for sustainable development. *Journal of Cleaner Production,* 297**,** 126660.

RAWORTH, K. 2017. *Doughnut economics: seven ways to think like a 21st-century economist,* Chelsea Green Publishing.

REUTERS. 2018. *Two-thirds of world population will live in cities by 2050, says UN* [Online]. The Guardian. Available: https://www.theguardian.com/world/2018/may/17/two-thirds-of-world-population-will-live-in-cities-by-2050-says-un [Accessed February 2024].

ROSS, A. 2010. It's Time to Get Serious—Why Legislation Is Needed to Make Sustainable Development a Reality in the UK. *Sustainability,* 2**,** 1101-1127.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, T. 2020. *RIBA Plan of Work* [Online]. RIBA. Available: https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work [Accessed February 2024].

SALDANA, J. 2021. *The Coding Manual for Qualitative Researchers,* London, Sage.

SAYCE, S., WILKINSON, S., ARMSTRONG, G. & ORGAN, S. 2023. *Resilient Building Retrofits: Combating the Climate Crisis,* Abingdon, Taylor & Francis.

SCHMELZER, M., VETTER, A. & VANSINTJAN, A. 2022. *The future is degrowth: A guide to a world beyond capitalism,* Verso Books.

SIEGRIST, M., BOWMAN, G., MERVINE, E. & SOUTHAM, C. 2020. Embedding environment and sustainability into corporate financial decision-making. *Accounting & Finance,* 60**,** 129-147.

SILVERMAN, D. 2013. *Doing qualitative research,* London, Sage.

SOLINGER, O. N., JANSEN, P. G. W. & CORNELISSEN, J. P. 2020. The Emergence of Moral Leadership. *Academy of Management Review,* 45**,** 504-527.

STATISTA. 2023. *Advertising - Worldwide* [Online]. Statista. Available: https://www.statista.com/outlook/amo/advertising/worldwide [Accessed February 2024].

STATISTA & TISEO, I. 2023. *Annual greenhouse gas emissions worldwide from 1970 to 2022* [Online]. Available: https://www.statista.com/statistics/1285502/annual-global-greenhouse-gas-emissions/ [Accessed April 2024].

STRAUSS, A. & CORBIN, J. M. 1990. *Basics of qualitative research: Grounded theory procedures and techniques,* Sage Publications, Inc.

UN CLIMATE CHANGE, U. 2016. *Paris Signing Marks Critical Next Step to Sustainable Future* [Online]. Available: https://unfccc.int/news/paris-signing-marks-critical-next-step-to-sustainable-future-1 [Accessed April 2024].

UNITED NATIONS, U. N. 2018. *Urbanization* [Online]. UNITED NATIONS, U.N. Available: https://www.un.org/development/desa/pd/content/urbanization-0 [Accessed February 2024].

UNITED NATIONS, U. N. 2021. *Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all* [Online]. Online: UN. Available: https://sdgs.un.org/goals/goal8 [Accessed February 2024].

UNITED NATIONS, U. N. 2023a. *Climate Risks in the Real Estate Sector* [Online]. UNITED NATIONS, U.N. Available: https://www.unepfi.org/themes/climate-change/climate-risks-in-the-real-estate-sector/ [Accessed February 2024].

UNITED NATIONS, U. N. 2023b. *Goal 11: Make cities inclusive, safe, resilient and sustainable* [Online]. UNITED NATIONS, U.N. Available: https://www.un.org/sustainabledevelopment/cities/ [Accessed February 2024].

UNITED NATIONS, U. N. 2024. *Population* [Online]. Online: UN. Available: https://www.un.org/en/global-issues/population [Accessed February 2024].

VALLE, G. 2022. *The life cycle of a sustainable building explained* [Online]. Builder Space. Available: https://www.builderspace.com/the-life-cycle-of-a-sustainable-building-explained [Accessed February 2024].

WALLACE-WELLS, D. 2019. *The uninhabitable earth*, Columbia University Press.

WAMSLER, C. 2020. Education for sustainability: Fostering a more conscious society and transformation towards sustainability. *International Journal of Sustainability in Higher Education,* 21**,** 112-130.

WIESWEG, N., SCHÄPERS, P., BERNHOLD, T. & HARTMANN, T. 2022. On the challenges of inter-organisational data in real estate: the role of knowledge sharing. *Engineering, Construction and Architectural Management*.

WORLDBANK. 2023. *Urban Development* [Online]. Worldbank. Available: https://www.worldbank.org/en/topic/urbandevelopment/overview [Accessed February 2024].

WORLDBANK. 2024. *World Bank Data: Population* [Online]. Worldbank. Available: https://data.worldbank.org/indicator/SP.POP.TOTL [Accessed February 2024].

YANATMA, S. 2022. *Europe's energy crisis in data: Which countries have the best and worst insulated homes?* [Online]. Euronews. Available: https://www.euronews.com/green/2022/12/09/europes-energy-crisis-in-data-which-countries-have-the-best-and-worst-insulated-homes [Accessed February 2024].

Appendix A   Interview Script

1) How many employees work in your organisation?

- 1-9; 10-49; 50-249; 250+;

2) What type of real estate does your company develop, retrofit, or renovate?

- Commercial (Offices, Retail, Industrial, Leisure, Healthcare)

- Residential

- Mixed Use

- Other

3) What is your role in RES projects?

4) How do you personally perceive the role of sustainability in the Real Estate Sector?

5) Do you feel that sustainability plays an important role in Real Estate projects?

6) Is sustainability in the RES an issue that you discuss with your colleagues?

7) Are there stakeholders who particularly focus on/demand sustainability?

8) Which sustainability issues are most often considered? Can you give examples?

- Environmental issues

- Economic issues

- Social issues

9) Does the level of sustainability issues considered in a RES project depend on external pressure, such as governmental regulation, investors' mindset, or something else?

10) What do you think would be necessary to make sustainability important and a matter of course to all stakeholders within the industry?

Appendix B   Description of Participants

Participant Jamie, Architect

Jamie is an architect with over ten years of experience in the RES. Jamie has worked in residential and commercial RE projects. Jamie's current role involves capacity studies, planning, tender preparation, and providing technical information. After that stage, the contract with the developer is closed, and Jamie is novated and works in stages four and five on the contractor's team.

Jamie's understanding of sustainability is summarised in Table 3.

Pillar of sustainability	Interpretation of sustainable RES	Quotes
Social	Fair treatment of and payment for all people working in the RES	So when you talk about sustainability, there's also sustainability of the workforce that, you know, companies have an obligation to, too. But sometimes they don't look at the sustainability of workforces and other professionals, and they don't take payments sensibly.
Social Environmental	Integration of green spaces for the regeneration of biodiversity and as a positive contribution to the health and well-being of people.	[…] rain gardens, or, you know, green roofs over everything […]which, you know, encourages the biodiversity within cities, which has been lacking and lost, quite a loss
Environmental Economic	Prolonged longevity of real estate through retrofit and change of use to keep material longer in use considering resource scarcity.	There was a building, it's a big concrete office. And it's just been demolished and taken down as opposed to being repurposed or stripped back to the frame and reused.[…] They must have been able to reuse it somehow.
Environmental Economic	Considering resource scarcity and observing the principles of a circular economy (Reuse, Refurbish, Recycle, Reduce and Maintain).	It (using greywater) might get saved hundreds, maybe thousands, of pounds on one site over the course of a year. You still want your showers and taps to be clean, but you know, using the greywater for your toilets or stuff like that - why not? Why not do that?

Table 3 - Jamie's view on sustainability

Overall, Jamie's assessment of the state of sustainability in the sector can be summarised in two main statements.

The awareness of sustainability issues in the RES has emerged only in recent years. The stakeholders have not yet recognised which risks those sustainability issues present for their field of operations in the long term. Therefore, they have not yet elaborated strategies to prevent those risks.

> *Again, it's probably because things like sustainability only taken seriously in the last sort of 5-10 years.*

> *[Does sustainability play an important role in projects?] No, no, I feel that a lot of times in the UK, at least in the city I work in, I'd say that the emphasis is based on [...] budgets and money.*

Costs and profits are more important than sustainability. The purpose of organisations is to make profits for the shareholders. Therefore, managers develop business strategies to increase short-term profits. Even if the RES stakeholders are not categorically denying sustainability issues and, have good intentions in the beginning, their decision-making is driven by a cost-oriented thinking to secure short-term profitability.

> *The clients are the developers. So the developers who get investors in, they might sell their scheme as being sustainable. And then the investors go: Oh, that's great. Yes, we will invest in that. But then as soon as the investors' money comes under threat, the investor doesn't give a **** and they're happy just going to get it built. So they'd much rather look after money.*

Jamie is concerned with several sustainability issues in the sector, including the lack of commitment, speed of change, social dimension and greenwashing.

Since organisations must meet their shareholders' expectations of increased profits, the investment in sustainability solutions appears counterproductive. Therefore, organisations are not committed to achieving higher standards than required by governmental regulation. That means that without a rise in legal requirements, it will be unlikely that the RES will become sustainable fast enough to meet the sustainability targets of the Paris Agreement.

> *[...] there are standards and if they hit the minimum requirement government standards, then that's good enough.*

> *think it needs to be government led (change towards sustainable RES). I think the government needs to, like government council, let's say, really take a grip on it. [...] Make big changes, because otherwise we're going to destroy the planet.*

Several new materials and technologies are already available that can contribute to sustainability and long-term profitability. However, these solutions are still not a common practice. It raises the question whether organisations are not able or not willing to think in longer terms and what it takes to make environmental goods such as water more desirable than money on a balance sheet at the end of a fiscal year?

> *They don't try and reduce the amount of water flow by reducing the pressure or they don't look at water harvesting, which is ridiculous, it's not considered.*

When a RE's utility is over, the choice is often demolition instead of retrofitting and change-of-use, which would prolong their lifecycle. The RES' is accountable for almost 50% of global resource extraction (Brady and Kawamura, 2021). Keeping buildings and construction materials in use for as long as possible should be a common interest.

> *[…] it's a big concrete office. And it's just been demolished and taken down as opposed to being repurposed or stripped back to the frame and reused.*

The RES affects people's well-being in various ways. Particularly in large cities, the RES contributes to air, noise, and light pollution. Attempts to mitigate these often result in the problem being shifted elsewhere. Weaker communities, such as students and people on low incomes, are affected more than people living in more expensive places.

> *So, they like the clean air zone, are trying to get rid of cars in the city centre. But even though with that, the issue there is that you just take the pollution and put it on to the suburbs. Normally areas around city centres, which are lower social, economical value […]. And they are normally for poorer families. And then I'm pushing all the pollution on into those areas […].*

It is fashionable to sell green products. Organisations understand that and play the system. However, those green products are, in reality, not contributing to the RES' sustainability because the claims are not supported by day-to-day practices.

> *[…] like nosing on a staircase the manufacturers go: it's 100% recyclable. But I ask how many times before a demolition do people go around and take off all the nosings on a stair and then recycle them. It's never.*

> *So sometimes tile manufacturers say they're made of 80% recycled products […]. They put all the clay through a machine, bits fall off and then they just put those bits back on and say that's recycled.*

Jamie tries actively to influence stakeholders in projects to take action towards sustainability in the RES. However, it is difficult to get through to people who have done their job for many years in the industry and think they know everything there is to know.

> *I do try (to convince stakeholders to consider sustainability solutions), but sometimes it's difficult to get heard.*

Jamie believes education will not be a panacea for a sustainable RES. He understands that it is hard for people to question beliefs they have been holding for years and that have been mutually reconfirmed within their peer group.

> *Education is difficult, particularly because normally the people perceive themselves as being victimised. And if they are adults, it's hard to teach them […] you know, you can't teach an old dog new tricks.*

Jamie is disappointed by RES' resistance to suggested sustainability solutions. Hanging on to established practices either not daring to try something new or not understanding that now is the time to act in order to benefit from the positive effects in the long term.

> *As you can tell it is a bit sort of annoying sometimes with what we do. Take that to 10 years of, you know, being trying to care and to look for the best to do all that. It seems very much like our role as a considered designer and expert is just dismissed through someone else coming in and going well, that's not what we want. That's not good - that's too good. That's almost like we don't want it to be good. We want it to be OK. And I think that's the frustrating thing.*
>
> *But what do we know? No, no one listens. We are not considered as experts; we are considered as nuisances.*

Jamie recognises the unsustainability within the RES and stays optimistic, believing that the change into a sustainable RES is possible.

> *I'm optimistic. I see the doom and the gloom and get annoyed. But it's because I do care and I think it can happen, but it's frustrating.*
>
> *So, you know, it's a horrible mess we've got ourselves in, but hopefully something will happen at some point - I don't know - revolution.*

Participant Charlie, ESG Trainer

Charlie looks back on over 30 years in the industry, he has been a ESG Trainer in various organisations producing construction materials or providing services within the construction industry. Additionally, Charlie is a private investor in sustainable RE projects.

Charlie's understanding of sustainability is summarised in Table 4.

Pillar of sustainability	Interpretation of sustainable RES	Quotes
Environmental Economic	Using new technologies that enable operating buildings sustainably and cataloguing materials used	Well, like I say, it (a sustainable RES) is embracing the new technology that's coming up. [...]Yes, BIM is a great concept, a brilliant concept.
Environmental	Using sustainable, recyclable materials	For example, have you heard of hempcrete? Industrial hemp is certainly a way which is brilliant. Yes, sustainable material.
Environmental Economic	A sustainably operating supply chain is critical for the sustainable RES	And then the supply chain
Environmental Economic Social	Energy-positive buildings that are operated without fossil fuels	All material is carbon neutral, no need of fossil fuel, and energy-positive. [...] The whole roof and facade are solar panels. [...] These lodges, depending on shading where they are located and things like that, will produce 21,000 kilowatts of energy. So you can charge all your electric vehicles. You can sell back to the grid. You can sell it to the next-door neighbour or to the community around you.
Social	People's health and well-being	And then people are buying these new houses thinking of happy days, and then it just turns out to be a nightmare because the workmanship is shoddy, and it is nowhere near the standards it should be out.

Table 4 - Charlie's view on sustainability

Charlie's assessment of the state of sustainability in RES is that it is progressing slowly, and the government is not doing enough.

Sustainability is not yet sufficiently considered in the RES. The organisations that have innovative ideas to make the RES more sustainable are the minority and not able to mitigate the negative outcomes of the many developers that have grown over decades with unsustainable practices.

[Is sustainability important in RES?] No. Absolutely not. And I'm going to tar them all with the same brush. [...] There are some good independent companies out there that are doing some real good stuff, but all the major developers [...], you know, they are the worst of the worst.

The RES is a ponderous cruiser instead of a swift speed boat. The RES is adapting only very slowly to the changing environmental and societal requirements. Although there have been various technologies available for years to support the development of a sustainable RES, the stakeholders operating within it have still not taken up those solutions.

We've been talking about BIM for 10 years now. And, unfortunately, it's still not there. [...] The technology (modular building) has been there for many, many years. But again, it's just getting people on board with it.

Sustainability is not sufficiently enforced by the government. The RES stakeholders tend not to apply sustainability solutions beyond governmental regulation. Therefore, sustainability leaders in the sector call for governments to act and are wondering why governments hesitate to push forward with an assertive sustainability agenda.

But again, it needs legislation, it needs some serious weight behind it to say: "you must do this". Not saying it (sustainability solutions) is there and then sitting in the background. Governments have to step up to the plate and put some big boy pants on and actually make these things happen. But they won't because they all want [is] to stay in power and that will upset the apple cart.

Charlie is concerned with the exploitation of legal loopholes, lack of education and the adoption of new technologies.

There are loopholes in legislation which are exploited by the RES. Those loopholes allow developers to apply dated regulations and knowledge despite their advanced abilities.

You've heard of land banking? When they do land banking, they hold on to land. [...] When they buy land in 2010 they do start to put in for planning permission. And when they do start building they only have to use building regulations that were in force when they bought the land and initially put the pre applications in. So they can still build in 2020, 2022, 2023 to building regulations whenever they land banked.

There is a lack of sustainability education for the RES. Sustainability is not a central part of the curriculum for RES professions. This helps maintain the status quo and lower regard for sustainability in the sector.

I think a lot of the teachers still don't understand the concepts (of sustainability) themselves and that's the problem.

[…] the progressive property company who do lots of education about how to buy, refurbish, refinance and rent out property. […]they've got all these courses but they haven't got one on sustainable real estate and all that side of it.

New technologies are not broadly used, and the sector does not exploit the available opportunities to become sustainable. If the sector does not use these technologies, does it mean that those technologies will not be further developed and improved?

And he asked me then: can it be linked to BIM. And I said yes, we will do that. But the trouble with them is that it has been 10 years going and we're still not doing it. The industry is still not doing it. You know, it's still there in the periphery and the concept is fantastic.

Charlie believes new technologies are essential for meeting global sustainability targets. However, the sector needs to be pushed from unsustainable to sustainable technologies.

You know, there is technology out there not to use this type of old technology, they know they should not use this type of old technology, but they're still doing it. And the government, because they're being subsidised by them, they're not, stopping them. […] Yes, they've all been setting targets and things like that. But will they hit them targets?

Charlie has set his mind on education about all three pillars of sustainability. B believes that education will help to transform the RES into a sustainable industry and stays hopeful that the younger generations will turn the wheel around and make the RES sustainable.

So me and the architect want to set up a course for that (sustainability within the RES) within progressive property. So we could start educating people about this as well.

And you know you're another generation coming forward and obviously you're very passionate about it and that's great. […] Your generation could take this stuff (sustainability in the RES) forward.

Charlie feels disappointed when sustainability solutions are rejected and talks about people's perception that talking about sustainability is something to sneer at. However, Charlie does overall not get discouraged and keeps engaging.

I should have probably pursued it further, but I was absolutely mortified that somebody could just say that, and I went back to my colleague and he said well, that's what you're up against. It's so frustrating. And again you tend not to say these sort of things (talking about sustainability) in public because unfortunately people do look at you and think you are a tree hugger.

It's going to be frustrating for me, I wish I could do more, but we just got to keep plugging away and getting the message out there because who else is going to do it?

Participant Leslie, Supply-chain Manager

Leslie has a management role in the construction industry. At the present the participant is working for an organisation that works on environmental, economic and social sustainability. Leslie has an engineering background and 20+ years of experience working on residential, commercial and mixed-use developments.

Table 5 summarises Leslie's view on sustainability.

Pillar of sustainability	Interpretation of sustainable RES	Quotes
Environmental	Sustainable RE is a on scope three decarbonised RES (carbon emissions of all the RES organisations' complete value chain) (Deloitte, 2021).	So what makes a great sustainable project, obviously very good operational carbon outcomes. But then we look at embodied carbon, which is the upfront carbon, and very few people understand that world.
Environmental Economic Social	The most important criterion for a sustainable RES is its decarbonisation.	What makes it a granular sustainable project? You've got the various different criteria of, you know, social, economic and carbon outcomes, and you know. Ideally, we're trying to get to the point of, well, in our case, by 2040, we want to be net zero, and we've also got social targets as well. A big focus is on embodied carbon, and how do we reduce that, you know?

Table 5 - Leslie's view on sustainability

In Leslie's view, there is a lack of a common effort in the sector, lack of government regulation and education to achieve meaningful results.

Sustainability is not a priority on the global scale. Leslie fails to see a common effort to combat the established unsustainable practices.

> *[…] very little collaboration, but then it gets more complex when you start to look at a European collaboration where you bring states together and the European Commission are doing an OK job I think, but it's very slow and so I think the answer really is no and you know I certainly don't see any signs that people are reacting to an emergency, a climate emergency. It's very slow and very clunky. And I find that very frustrating.*

There is need for governmental regulation to get everyone on board. Governments must make sustainability in the sector a major goal. Otherwise, the RES organisations will avoid investing in sustainability solutions.

> *Well, there is no governmental regulations really, is there? You know that and that's a big issue.*

> *[What will it take to make the sector more sustainable?] Well, there's only one answer to that: it is regulation. It has to be regulation. You can't be self-regulated because you will have people that will want to do the right thing and then there will be people who will just say no we just want to make profit. And, so the only way to force people to do something is by a regulation or a tax*

There is a need for sustainability education to create awareness of sustainability issues and to disseminate sustainability knowledge in the RES. That means that every stakeholder in the RES must cooperate with their whole supply chain to develop suitable creative solutions.

> *[…] we had to start with a scan of the industry to see where people were at, you know what their knowledge base was. So we went right back to very basic things by asking our supply chain, do they even understand what sustainability means from particularly an embodied carbon perspective? And what it was? What turned out was that they didn't understand.*

Leslie is worried about the impact of carbon emissions in the sector and is highlighting the need to pressure the government to take action.

It is critical for the RES to understand the scope and importance of embodied carbon. The RES is accountable for 40% of global carbon emissions, 30% of which are embodied carbon. Therefore, the RES is a main contributor to climate warming (Carlin, 2022, United Nations, 2023b). The emergency that arises here must be tackled by the RES.

> *I know you're talking about sustainability in the round, but I keep coming back to embodied carbon because [...] it's our biggest problem at the moment, you know, in terms of percentage of a problem it's the biggest problem.*

A lack of governmental regulation and incentives hinders the RES to acknowledge the seriousness of the RES unsustainable operations. If governments would find ways to incentivise sustainability actions in the RES this could motivate people to become sustainability entrepreneurs.

> *It's actual and forcible government regulation that's required globally, you know. But if we talk about the UK, there's nothing there at the moment. There's maybe a carbon tax is sitting there at the moment, but you know, that's - I don't think it's enough.*

Education of and cooperation with the whole supply chain are critical to drive sustainability. When governmental regulations are lacking can alliances of some engaged organisations force noncommitted stakeholders to sing from the same sheet a powerful sustainability hymn sheet?

> *And so we would be lobbying and meeting external stakeholders and so to try and push that agenda whereby the industry does get regulated and that sustainability gets regulated.*

Leslie is highly engaged in trying to make his organisation net zero on scope 3. That means that the whole upfront and downstream chain must become net zero, too. Therefore, this is a sustainability action with a large reach.

> *But then we look at embodied carbon, which is the upfront carbon and very few people understand that world. So that's what we've spent two to three years educating the industry and our supply chain about what is what does that actually mean?*

Leslie's tunnel view on carbon might impair a holistic pursuit of the SDGs concerning the RES' sustainability. However, it is difficult for individuals to fight battles on many fronts at the same time. Therefore, it takes a team to tackle the various sustainability issues in the RES.

> *what makes it a granular sustainable project? You've got the various different criteria of, you know, social, economic and carbon outcomes and you know, ideally, we're trying to get to the point of well, in our case by 2040, we want to be net zero and we've also got social targets as well. A big focus is in embodied carbon and how do we reduce that, you know?*

Leslie feels that a high commitment to sustainability provides people with a target. Being a sustainability leader in the pursuit of the net zero carbon emissions target, Leslie stays optimistic and continues engaging RES stakeholders for sustainability.

> *No, there's very little collaboration and coordination in the real estate sector, and it generally happens by people putting their hand up and saying that they will go out and lead and by doing that they open themselves up for a lot of criticism.*
>
> *I'm chairperson of the Sustainability Committee within that group and that is an example of collaboration where we bring everybody within the industry together to educate and try and lead the industry to a better position.*

Participant Devin, Architect

Participant D is an architect with 20+ years of experience. Participant D has been working on residential, commercial, mixed-use and infrastructure developments for established architecture firms. Currently, the participant is self-employed and working on a residential refurbishment project.

Devin's assessment of the sector's sustainability state is presented in Table 6.

Pillar of sustainability	Interpretation of sustainable RES	Quotes
Economic Environmental	RE that is operated highly energy efficient.	In the energy sector, which in my opinion is actually the most important thing, we are fortunately on a relatively good track.
Environmental Economic Social	RE that operates resources efficiently and presents a healthy environment for humans.	Energy is certainly one of the most important then, of course, water consumption, then embodied carbon, well-being, good air, access to nature, and things like that.

Table 6 - Devin's view on sustainability

In Devin's view there are four highlights in assessing sustainability of the sector. These are lack of awareness, slow speed of change, lack of government regulation and disparity of building standards across Europe.

Professionals and occupants are unaware of sustainability issues in the RES. For example, occupants accept high energy bills without questioning whether there is a sustainability solution that could improve their situation. The status quo is always perceived as the "norm". What needs to be done to encourage the development of sustainable solutions when faced with problems such as high carbon emissions?

> *I think a lot of people don't even know how many kilowatt hours of electricity they use and how much they pay for it and how much less that could be.*

> Investors suddenly woke up, and at the same time as stronger planning requirements, the property group suddenly had very clear guidelines on carbon expenditure in operation as well as in production, and that was benchmarked.

The RES has not adapted to the challenges of society's changing needs. Over the last decades, work schemes and lifestyles have changed. Office buildings in districts where no social live activities are possible are no longer desirable. Can the RES create workspaces where people can undisturbed make the utmost of their professional skills and where they enjoy live with their colleagues within daylit and natural ventilated green offices?

> *People now come to the office because they want to meet colleagues, because there are interesting restaurants in the area, and so on. [...] I mean, office work is a huge issue. It has changed enormously since COVID and then we are only at the beginning with all artificial intelligence. [...] So these interpersonal encounters and the attractiveness of the place will play a bigger role.*

The government is not enforcing the RES' sustainability and provides indistinct guidelines instead of statutory law. This raises the question of whether sustainability is not important enough for the government to make it obligatory.

> *It's all always very vague in this country. So often there is an aspiration and it says that you should do it this way unless you show that it doesn't work for certain reasons. And of course, investors always find ways to make an argument to dilute regulations.*

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Knowledge from other countries is not enacted in law or practice. Some long-established European sustainability standards have not made it to the UK. It appears that country borders prevent the dissemination of knowledge.

> *So I think there is an insane lack of knowledge in this area among people, especially architects, who would perhaps like to do something and are very open to the topic.*

> *The building was actually planned with an all-around balcony, which was not really known in London until a few years ago. In Germany, such naturally ventilated office buildings were planned as early as the 1980s. I think the fact that there is no requirement in this country that office workplaces have to be naturally lit speaks volumes.*

Devin highlights some interesting points which raise further questions.

There is a lack of sustainability education for the professions in the RES. This means professionals open for sustainability tend not to have the right technical knowledge. Is the perceived lack of education because training does not exist or are people not actively seeking to be educated in this area?

> *They just don't have the knowledge of how to actually do it (sustainable RE). I would say there is a lack of training, especially on a technical level, of the architects I have met, especially here in England, who have a very underdeveloped technical understanding of how to actually build such things.*

Developers exploit loopholes in legislation, making sustainability goals unachievable. Should individual developers, who look after their own profits at the cost of individuals on low income, communities, local governments and the UK as a whole be punished for the indirect damage they cause?

> *Social housing, for example, is typical. The target of the Greater London Authority is actually that 50% social housing is built in every private new building, and nobody actually achieves that and in Westminster it is often only 5%, in Canary Wharf only 35% social housing was provided.*

Energy efficiency is important to slow down global climate change. Existing standards such as Passivhaus are proven to reduce energy consumption. Why it is not yet standard in the UK and why, despite government support, there are still so many uninsulated houses?

> *In the case of the shell, we have defined everything in terms of energetic and acoustic performance so that we don't have to make any savings.*

> *I mean, in the subject of energy efficiency, which in my opinion is actually the most important thing, fortunately we are on the right track, I would say.*

Devin is open to sustainability and particularly interested in operational energy efficiency. Actively promoting the Passivhaus standard amongst colleagues for private projects. However, admittedly, he follows the customer's wishes when working on commissioned projects.

> *So I would say that we are very much involved there, in the area of feasibility studies. But I would also say that if there are not certain aspirations of clients, the legislative framework is actually the guideline for what is done*

Devin believes that the RES is making progress in areas such as operational energy efficiency, however, in other areas the RES efforts to collaborate to find sustainability solutions is hindered by litigation.

I mean, the construction industry is also very litigious. I don't think there is any other industry that has as many lawsuits as the construction industry. On the one hand, of course, because it is so fragmented.

Participant Morgan, Sustainability Manager

Morgan has occupied sustainability management roles in development and construction, and other industries. Morgan has 10+ years of experience and currently works for an organisation that develops, acquires refurbishes, regenerates and rents out residential RE.

Morgan's assessment of sustainability in the sector is summarised in Table 7.

Pillar of sustainability	Interpretation of sustainable RES	Quotes
Economic Environmental	Low operational carbon emissions and energy efficiency	it (sustainable RE) is a low- or zero-carbon building and highly insulated, so there's little requirement for heating, but any heating would be renewable or low-carbon.
Environmental	RE that considers spaces for increasing biodiversity	looking at the way that biodiversity is prevalent as well.
Social	RE that provides indoor and green outdoor spaces for communal activities	So not just thinking about the building itself but thinking about the sort of community for the outside space as well as the inside space.
Social Environmental	Creating green spaces for biodiversity and for health and well-being	But also looking at resident engagement with green spaces, so green spaces for health. Sort of community gardens or vegetable patches? So, just to get that engagement. We're not just going to put loads of wildflowers in so that people would not really be able to use those spaces anymore. Everyone would be annoyed. Just thinking about, like, the engagement side of things as well and how we can develop like a menu of options that will both improve biodiversity but also engage our residents and improve health and well-being.

| Economic | Applying appropriate materials and designs for climate resilience to mitigate economic risks | That (sustainable RE) is resilient to the impacts of climate change. So, thinking about what are the weather effects that that building is going to face in the future. And that we've designed appropriately for those. |

Table 7 - Morgan's view on sustainability

In Morgan's view, awareness of sustainability has risen recently. Sustainability issues impact the "downstream" tenants, and landlords, as well as engagement from individual managers, may force a change.

The awareness of sustainability has increased over the last few years. Rachel Carson had already raised environmental concerns before the US Congress, which she published also in her book "Silent Spring" in 1962, and the Kyoto Protocol was adopted in 1997 by industrial nations. Considering that governments have been aware of environmental sustainability issues for more than half a century, it is astonishing that the awareness of sustainability issues has increased only over the last few years.

> *I think there's a bit, there's much more awareness on sustainability, particularly in the last few years.*

The economic situation in the energy sector impacts residents' wallets leading to higher sustainability expectations of residents concerning operational costs. In the market-driven capitalist society, increasing operational cost may put more pressure on the developers to deliver more sustainable (energy efficient) real estate.

> *residents, do ask for sustainability measures on their properties as well. […] People are asking for things like improved energy efficiency of their properties, particularly due to the cost-of-living crisis as well as renting our properties for social rent.*
>
> *for the social rent, our residents are not buying the property so they're just living in the property and their big concern for them is energy bills as part of the cost of living crisis, it's probably not a huge percentage. I mean this is a complete sort of estimate, but I would say probably like 10% or 15%. Going from not many at all to more people are asking for things.*

The sustainability engagement depends on management commitment varies between organisations. CEOs have understood that they must include sustainability goals in the organisation's values. However, only if they live up to those communicated values these statements will become believable and can become a common goal of the CEO and all employees down to the shop floor.

Because I think it can be really challenging if you don't have those senior people engaged to get traction and to do all of the things like training and to build a team and to spend time working on sustainability issues. I think that's definitely positive for our organisation that all of the senior team are very engaged and that sort of then percolates down through the organisation.

Morgan is concerned by the impact of resource consumption regarding urbanisation trends, and by the attempts to avoid action. Education is seen as the solution to sustainability challenges.

The global RES consumes almost 50% of extracted natural resources (Coady, 2020). Considering the finite availability of natural resources combined with the constant growth of population and their need for dwellings the development of a circular economy is crucial. Therefore, organisations must start to recover and reuse materials of RE at its end-of-life.

And then looking at the types of materials that we are using, if we're regenerating, seeing if we can reuse any of the materials from the previous building in the new building as well.

I think that we're looking at what can be done in terms of like logging materials and keeping materials in their existing state and then looking to either reuse those In the new building, or maybe share those with other organisations so they can use them.

Urbanisation and, thus, the expansion of RE has caused a significant loss of Biodiversity. To regenerate biodiversity, cities must be rewilded (Wallace-Wells, 2019, Coady, 2020, Hawken, 2021). Will single committed organisations be able to set a new trend and turn our cities' depressing grey into an uplifting green, and will citizens appreciate these valuable green spots?

We're just looking at developing a strategy around biodiversity in the development side [...] I'm just calling it like retrofitting biodiversity but improving our current green spaces as well. We're probably going to land on 30% improvement by 2030 for our state cause.

We're not just going to put loads of wildflowers in so that people would not really be able to use those spaces anymore. Everyone would be annoyed.

Organisations feel pressure to act sustainably. However, some of them claim to be a sustainable organisation in their ESG and CSR reports whilst, in reality, neither operating sustainably nor taking any significant action to further the RES' sustainability.

I have seen some good examples of greenwashing as well. I think it depends on the organisation's integrity and I do often think it depends on the senior management as well and whether they do want to drive it (RES' sustainability) forward.

Education is critical to create awareness of sustainability solutions. Organisation's sustainability leaders contribute to the development of frameworks that support the RES sustainability. It is important to apply those frameworks within the RES' supply chain to create a common understanding of those issues and solutions.

> *And then you can use that (the net zero building standard) with contractors as well.*

Morgan is a highly committed sustainability leader. By educating and engaging internal and external stakeholders, Morgan increases the awareness of sustainability issues and solutions and tries to launch a snowball system to make the RES more sustainable.

> *we're just starting on the internal training so we've got a meeting on Friday. I think about internal green skills, about looking internally at green skills for our staff and upskilling people and then looking externally at our contractors as well. So how we can promote green skills in the sector more broadly.*

Morgan has a holistic view of the three pillars (social, economic, environmental) of sustainability and is committed to combating sustainability issues in various areas of the RES to contribute to the UNO's SDGs.

> *I suppose it's having that more holistic view, isn't it? And not looking at just carbon in construction. It is sort of looking at the whole life of the building as well and sort of deconstruction as well. At the end of the building, if it's got a finite life, yeah.*
>
> *I think that a big part of the role of sustainability is engaging with our customers and residents on why we're doing these things and the benefits of sustainability to them in their home.*

Participant Cameron, Project Manager

Cameron is a project manager in the construction industry with 20+ years of experience. Cameron has worked on residential, commercial and mixed-use projects and is currently working for a construction company that mainly does new developments and only a few retrofits. Cameron's current role involves the commercial side of bid and letting packages, health and safety on site, and leading and coordinating the project management team. Cameron starts at stage four of the project.

A summary of Cameron's view on sustainability in the sector is presented in Table 8.

Pillar of sustainability	Interpretation of sustainable RES	Quotes
Economic Environmental	Avoiding waste on-site	But a company like that where they have materials left over happens a lot. There's an awful lot of material that just gets thrown away, does end in skips, doesn't get recycled, but it just gets thrown away.
Economic Environmental	Developing a circular economy	And I really feel there's an opportunity for someone to start a business, whether it's non-profit, makes money for charity or whatever, to collate these materials.
Environmental	Sustainable materials	Materials. I mean, there's a lot of concrete. For something environmental…
Environmental Economic	Adaptability to changing demographic situations by enabling change of use. Planning for longevity of RE and keeping resources in use.	Well, the project I'm currently working on - from a social perspective - it consist of two blocks one is 12 stories and the other one is a 15 stories student accommodation. And we're future proofing a lot of it. The way it's built now, it can be changed. It's built in such a way that if in 10 years time they want to change it into apartments that can happen.
Social	Affordability of housing	The other block is a residential apartment block. That's all affordable. Some of it is rental and the others are shared ownership lots.

Table 8 - Cameron's view on sustainability

Cameron views RES as unsustainable, slow to adopt and deregulated.

Sustainability is not highly prioritised in the RES. While wildlife habitats are destroyed and polluted throughout the process of resource extraction and labour and energy is invested to turn them into building material, lot of the brand-new material is sent unused to landfills. It is important to develop solutions to decrease the amount of waste on sites.

[Is sustainability important in the sector?] Not enough, no. […] There's an awful lot of material that just gets thrown away, does end in skips, doesn't get recycled, but it just gets thrown away.

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Change happens slowly, as it is not uncommon that it takes a decade to complete a large new development. By the time a building is completed, the standards are decades old. During the building time many subcontractors come and go, so it is challenging to establish a common sustainability culture.

For example, I was on a project, which has started in 2010 on site and it's still going on. It's going to finish in two years [2025], a very large project, delivering a lot of sectors of a new park.

There is a lack of governmental regulation addressing the disposal and re-use of unused new materials. RES appears to believe that the supply of raw materials is endless and that no care needs to be taken.

So, it all gets thrown away. Which I think is criminal.

It's (sustainability) only going to become more important. Eventually you run out of things. Eventually we'll run out of everything.

Cameron is highly concerned with the use of building materials. Further, education, communication and management commitment are suggested as possible improvement strategies.

The phenomenon of wasting unconsumed materials and products is a common issue across industries. In 2023, the EU passed a law banning the destruction of unsold apparel. Another example is France, which introduced its AGEC law (anti-gaspillage pour une économie circulaire = anti-waste for a circular economy) in February 2020. The UK government's adoption of similar legislation would be a large step towards sustainability in the RES.

Well, my big thing was, as I mentioned to you before, about waste and how it could be streamlined if there was someone who could collect the material and get material really used get material sent out to small builders to charities and things like that. It would work. And it would be very well received in the industry. Because everyone hates seeing material thrown away.

Despite the availability of more sustainable building materials, adoption is slow. On the one hand, the use of these materials is untested. On the other hand, it may require an initial investment into training and process change. Developers, investors and contractors are risk-averse and hesitant to change.

Would the adoption of new technologies need to be enforced, e.g., legal requirement to use renewable energies for new heating systems in Germany from 2024?

> *Well, that's the issue, it's particularly the things are being developed, the systems are being developed, they're more expensive. It's harder to build and it takes more time. Time costs which ultimately, as the developers still want to make the money, it just pushes up the prices of the product you're selling. And people still want to be able to afford somewhere to live.*

Whilst education and training might be available, it appears that they are not always effective. Effective communication is required to change behaviour consistently. This, on the other hand, appears to get more difficult as more hierarchies and communication channels are involved, especially when there are many subcontractors involved and the responsible manager on site might not have full authority to issue directives. Further, different cultural backgrounds can lead to different interpretations and prioritisation of information.

> *You can only educate people that want to be educated I think.*

> *So we'll say to our contractor that he needs to get all his staff together and we give them a talk about housekeeping and clearing up after themselves. They will do that and I will give the talk and then everyone will sign the sheet to confirm that they have attended the training and listened to it and then they will completely ignore those instructions. They do what they want to do.*

Cameron has ideas to make the RES more sustainable, however, does not feel supported by senior management. It is important that senior managers recognise the opportunities that their employees' sustainability skills present for the organisation. Otherwise, organisations risk losing a sustainability leader to another organisation.

> *For example, when I walk around the site, I sometimes stop and tell people that they're doing a good job. I did it a couple of weeks ago. There was a brick layer out in the balcony who was doing a nice job. I said, that his work looks really good. Well done. The reaction was Oh, wow. Thank you. You just made my day!*

> *At my last job, we gave people a voucher for £5 to have breakfast in the canteen if we saw somebody doing well. And then they would tell their friends and they would ask: why didn't I get one? Because you have created such a mess all over the floor. And that does work. But the company I work for now don't do it.*

> *Well, I don't know that I'll be with this business for very long. Where I was working before, I was very happy there and I liked a lot of the work they were doing.*