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<b>Title</b>	From Initiative to Action: lessons form the journey to net zero through retrofit for building regenerative cities
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<b>Type</b>	Conference or Workshop Item
<b>Publication title</b>	
<b>Publisher</b>	
<b>ISSN/ISBN</b>	
<b>Date</b>	3 September 2025
<b>Version</b>	
<b>DOI</b>	
<b>Repository link</b>	<a href="https://ube.repository.guildhe.ac.uk/id/eprint/188/">https://ube.repository.guildhe.ac.uk/id/eprint/188/</a>
<b>Link to publication</b>	
<b>Notes</b>	This publication version may differ from the final version

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# FROM INITIATIVE TO ACTION: LESSONS FROM THE JOURNEY TO NET ZERO THROUGH RETROFIT FOR BUILDING REGENERATIVE CITIES

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The transformative changes required to make cities regenerative are like those encountered in the drive to net zero. Investor-side stakeholders are challenged by the emerging and contested discourse of what developing regenerative cities means for their businesses. Whilst challenges may be conceptualised differently, central for investors is the impact of change on traditional investment models. This research draws on the net zero through retrofit movement to inform the development of frameworks facilitating investment decisions and rationales for regenerative cities. Aligning with socio-technical perspectives, the research mobilises a case study of a specialist sustainability consultancy, focused on building performance. Informed by co-creation, open coding of semi-structured interviews and archive documents is used to examine key challenges. Findings suggest confused rationales and vocabularies between investor-side and operator-side stakeholders, and conflicts between development and investment which cut across debates around the transition to net zero and the development of regenerative cities. These findings underscore the need to develop frameworks which translate sustainable actions and plans into investment rationales to support regenerative cities.

Keywords: investment framework, Net Zero, regenerative cities, retrofit, sustainability

## INTRODUCTION

The arguments concerning the need to decarbonise the built environment are well rehearsed, as is the assertion that the existing building stock requires deep refurbishment and retro fit to meet targets for net zero by 2050. The language of net zero relies on concepts of building certification, micro renewable energy generation, reduction of whole life carbon, improvements of operational carbon emissions, retrofit and refurbishment (Sturgis, 2019). These concepts are very usefully applied when identifying options for developing pathways to net zero and capital investment programmes for operations-side stakeholders but translate less well for real estate investor-side stakeholders. Investor side-stakeholders are responsible for overall budget allocation across their portfolios and tend to use measures which focus on asset value, potential "green premium" for rental and property balance. The language and guidance of net zero does not translate easily between operations-side and investor-side stakeholders. It is even harder to align these two silos in the case of developing portfolios of buildings and infrastructure in the context of regenerative cities.

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Although investors may be familiar with the concept that urban regeneration increases asset value, the adaptations required for developing regenerative cities lie outside standard investment criteria. Understanding how the language of net zero and regenerative cities translates across stakeholder silos is necessary to ensure progress towards sustainability commitments.

### *Research Problematic*

Real Estate investor-side stakeholders are aligning with various sustainable real estate investment frameworks to maximise "green premiums" from asset rental income. Such schemes and certifications require enhanced measurement and reporting requirements against progress made towards sustainability targets in a transparent and consistent manner. Portfolio investors are signing up to accreditation schemes which operations-side stakeholders (generally siloed from the investor-side) are responsible for meeting. To put it baldly, firms are signing up to targets towards net zero when on the investor-side there is little understanding apart of work required to upgrade buildings rather than to simply offload properties to enhance portfolio performance. These two silos of stakeholders can have contemporaneous conflicting priorities and measurement frameworks, with the investor-side being involved in a dynamic cycle of investment, improvement and divestment, while operations-side managers are concerned with efficient building management, certification compliance and reporting. Understanding these differences in priorities and how they can be negotiated to achieve net zero targets is important, especially so in the context for regenerative city development where the problems of silos and diverging priorities are multiplied. Using a co-creation of knowledge lens, this research explores how a leading sustainability consultancy developed a framework to translate the language of retrofit and refurbishment into the language of portfolio investment management. By drawing on concepts of knowledge creation and by using insights gained in the development of the framework, this research makes connections with the journey to net zero towards the development of strategies to facilitate the successful regenerative cities.

### *Navigating the Literature*

This review sets out the current landscape of research in this area and focusses on the language and guidance of net zero for investor-side and operations-side stakeholders, the uptake of schemes relating to progress to net zero and the application of knowledge creation guiderails for the two silos of stakeholders.

### *Zero Carbon Investment: to Net Zero Through Retrofit*

Investor-side stakeholders are increasingly drawn to adopt institutional frameworks to demonstrate their green credentials and leverage the resulting premium in asset value, reputation and competition (Broberg Piller and Nyoni, 2022;), with supporting research that reports on the material gains of such affiliations (Brounen and van der Spek, 2023). The GRESB framework (GRESB, 2022) is emerging as the front runner in this field and is being joined by other emerging schemes (e.g., SBTi scheme (SBTi, 2025)). These schemes focus on target setting, benchmarking and reporting, but at a very high level, with very little guidance on how exactly the targets of net zero by 2050 are to be reached. It is being recognised that using current rating systems as a proxy for environmental sustainability is difficult and that an increased focus on operational performance and emissions is desirable to facilitate the industry transition to net zero carbon (Coakley, 2023). This disconnect between investment discourse and climate action requires a rethink of models of investment strategies to respond to decarbonisation and the net zero movement (Fuoli and Beelitz, 2024). Recognising that moving net-zero policy and agenda forward is a wicked problem (Rittel and

Webber, 1973), and in a largely discursive analysis, Krainert (2025) signals that meanings of policy and initiatives are renegotiated at local levels. Whilst their research centres around policy level decisions, this translates to an understanding that this cross-silo communication increases complexity and difficulty. What is missing is research that focusses upon the relationship between the consultant and the investor side stakeholders in terms of creating ‘solutions’ into how these professionals can make long-term progress towards their net-zero targets and ambitions.

#### *The development of Regenerative cities and links to the Net Zero through retrofit movement*

The concept of regenerative cities comes from the field of “future cities” (Dixon, *et al.*, 2018) and takes a step from the refurbishment towards the net zero movement. The concept requires radical re-evaluation of built environment development by co-prioritising social and environmental dimensions with economic measures (Girardet, 2014) and clear transition pathways and common languages (Schurig and Turan, 2022). Echoing issues of siloed language and understandings in the movement to net zero, Camrass (2022) identifies gaps around inconsistency of thought between different stakeholders and a lack of detail of specific engagement mechanisms to remove barriers to developing regenerative cities. The plethora of stakeholder silos engaged with the regenerative city movement will need to come together on interconnected projects with different priorities, timescales and rationales for funding and investment. This study of the process of translation of siloed understandings will inform understanding, and progress towards regenerative city development.

#### *Handrails of Knowledge Co-Creation*

Knowledge co-creation, as a framework, has gained attention in recent years as firms and organisations recognise the importance of cross organisational learning in innovations and competitiveness (Norstrom, 2020). Knowledge co-creation relies on the dynamic, iterative, synergetic exchange between different stakeholders to create innovative understandings and knowledge (Nonaka & Toyama, 2017). Whilst still evolving, key aspects of knowledge co-creation being mobilised include collaboration, mobilising context as a key variable, shared ownership, celebrating the diverse range of perspectives and, importantly, being iterative. The iterative nature of knowledge creation aligns with the processual school (cf. Pettigrew 1997) and becoming ontological traditions (cf. Tsoukas and Chia, 2002). Regarding the developing urgency and complexity of sustainable transitions, Oliver *et al.* (2021) highlight that our current knowledge systems are inadequate for sustainability transitions and is ripe for further study through knowledge creation.

This research presents a small scoping study, using a knowledge creation lens, to explore how organisational and individual knowledge can be translated to develop solutions for clients that allow cooperation and understanding that cautiously dismantles silos in organisations. By studying the development of common language between two sets of stakeholders (investor-side and operations-side) it begins a discussion of how this might be extended to the more complex issues of regenerative cities with multiple stakeholders and agendas.

## **METHOD**

A research partner, and global sustainability consultant (Carrera Consulting Inc - CCI) became keen to unpack and analyse the process they had experienced and provided the data source and context. The research partner and director at CCI identified two case studies of decarbonisation work and two other directors who were key to the

development process. Consequently, it was these two case studies and three directors that formed the data set. Semi-structured interviews were held with the three key directors who were decision makers with both formal and informal agency. The interviews explored knowledge creation between clients (investor-side and operations-side) and consultancy directors. Analysis centred on the integration of this knowledge into understanding challenges to both investor-side and operations-side stakeholders, and the development of new product offerings by the CCI.

The interviews were coded through NVivo using codes developed from knowledge creation literature (focussing on tacit and explicit knowledge of individuals and teams) and free coding of emergent themes (particularly absorption processes and understandings of need). In addition, relevant firm level documentation was reviewed and coded to add additional layers of understanding.

### *Case Studies*

Case study one is a campus type development comprising several mixed-use buildings. CCI was engaged to offer campus wide interventions and actions to aid in establishing a pathway to 50% reduction by 2030. The client had been a front runner in signing up to challenging net zero targets and had already invested in renewable technologies and low carbon energy sources.

Case Study two is an independent technology campus which aims to bridge the gap between academia and industry. CCI was engaged to carry out a net zero initiatives scheme report to establish a net zero Implementation Strategy. This client had a team of in-house experts, called "the intelligent client", which was used to develop an in-house approach to net zero but struggled to make headway in either agreeing the roll-out programme or securing funding for improvements.

### *Consultancy Directors:*

Director CCI1: worked with Case study 1 stakeholders and consultant CCI3. Specialising in building services and energy management, to develop a whole life carbon approach for energy reduction and decarbonisation initiatives.

Director CCI2: worked with Case study 2 operations-side stakeholders and consultant CCI3. Predominantly an electrical engineer, focused on developing continuing relationships with operations-side stakeholders.

Director CCI3: worked with both directors CCI1 and CCI2 and investor-side stakeholders in both case studies. With a background in sustainable innovation, sustainable business management and sustainable policy economics bringing a focus on outwardly reaching investor-side clients with a view to developing integrated zero carbon pathways.

### *Corporate Documents*

Three documents were reviewed: two client reports summarising recommendations for Net Zero Strategy Initiatives. The third document reviewed was CCI's internal document which developed a more generalisable approach to steering investor and operations-side stakeholders to a jointly owned net zero pathway.

## **FINDINGS**

Analysis of the data through the lens of knowledge creation unfolds a complex mixture of knowledge exchange and knowledge creation moments which results in knowledge co-creation both within client organisations and within CCI. The processes when taken together have been represented organically using a freehand

sketch (Figure1) and the following sections introduce the sketch and draw upon key quotes from interviews to support the knowledge exchange and creation processes.

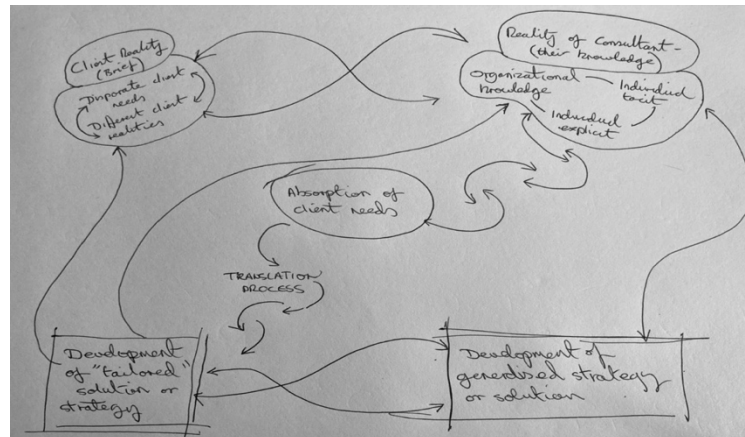


Figure 1: Representation of knowledge exchange and co-creation during the projects

### Client Briefing

During this seemingly simple stage of project initiation, it became clear that there were complex stores of knowledge and interrelationships between investor-side and operations-side stakeholders. Investor-side stakeholders were keen to commit publicly to sustainable targets, and this sensitised them to initiate zero carbon initiatives. The investor-side clients knew the headline requirements of the GRESB or equivalent reporting framework, but believed targets could be easily met by decarbonised energy supply. These stakeholders did not have the understanding regarding the impact of demolition and re-build issues on net zero targets.

“Certification for renewable energy is it as far as they're concerned, and they can get quite shirty when we explain to them about the differences between market and local sourcing for electricity.” [CC11]

“...they had to demonstrate value... money didn't appear to be an object because they had very publicly committed to their 2030 net zero target and if you walk around any buildings, it's everywhere... They're very proud of it... I guess at some point they'll be held to account to it.” [CC11]

“And so their view was we just knock them down, start again, of course, you know, there is a whole process you have to go through to demonstrate why that's not a good idea.” [CC13]

Operations-side stakeholders tacitly understood concepts of net zero, embodied carbon and operating carbon emissions. These stakeholders knew their assets in terms of their operating parameters and performance. Where necessary additional operations-side stakeholders brought in both internal and external consultants.

“Part of it was upgrading the space they wanted to move them into, but at the same time balancing that with, the carbon targets they were looking at as well.” [CC12]

The interactions and discussions when unpacking the different silos of client knowledge and needs show that the process of client briefing is not simple at all. When it comes to net zero pathways for real estate portfolio firms, there is not one client, and they have different expectations and understanding of the issues. Knowledge creation between the silos proved to be just as important as the process of translation lead by the consultancy.

### *Consultancy Knowledge*

The consultants' knowledge enabled them to understand that different stakeholders within the client organisation were interested in different factors within the same project, and this let them identify potential issues and solutions, and tease out the real client requirements. At the same time, the consultants used their prior knowledge of the client facilities and their operations to understand some of the complexities involved and how these might impact different stakeholder groups. It was the harnessing of individual and organisational knowledge - both tacit and explicit, which allowed the development of an understanding of the scale of the issues involved.

"They don't necessarily give you a clear brief about what they want at the start of the project. It evolves until you suddenly get to where the penny drops and it's like, oh, OK- that's what you want" [CCI2]

"One of the most difficult things was trying to Figure out what they what they wanted because literally there was three or four or five of them with different angles, which I think is the same with a lot of clients. People on the asset management team... the facilities management team who basically wants it simple and not complicated... people who look after the money- it sort of evolved into a much bigger master planning exercise for the site, and I think the Estates team saw the carbon reduction target is a good opportunity for them to say to the business we need to refurb." [CCI1]

### *Absorption of Client needs*

Based on their developing knowledge of different net zero angles, the clients voiced concerns and as their understanding of the intricacies involved, the consultants were able to piece together what the different client groups needed. Some key differences between the client stakeholder groups became apparent, particularly in terms of prioritisation parameters, capital cost and disruption. The consultants walked a tightrope between delivering a discrete set of change projects that would individually deliver carbon savings, but which if not seen in the context of a master plan would undermine the firm's commitments to net zero.

"By going through the stages of them not actually knowing what they wanted, or they all wanted different things, they all had different interests at different times. Actually, I tried to navigate that process. In actual fact, I use that in a positive sense to try to get the real need" [CCI1].

"We took some time to get to the bottom of what they really were trying to do - I don't think they knew. They sort of resisted looking at the master plan for a long time." [CCI2]

### *Development of a tailored solution*

The key moments of knowledge co-creation and translation occurred during the phase of absorbing the client needs and developing a framework for shared stakeholder understanding. The new framework for translation involved two co-created pieces of work (one for each client) to translate the impacts of a pathway to net zero initiative so that all stakeholders can understand and prioritise the programme of projects. This became a five-step matrix process of ranking projects with a traffic light system according to operational savings impact, cost impact, implementation downtime, payback period, and project dependencies. The consultants understood that these ranking priorities may vary from client to client.

Without this framework, when being presented with a bewildering and often seemingly disconnected array of refurbishment and improvement projects, investor-side stakeholders find it difficult to prioritise capital expenditure allocation. Net zero carbon looks at embodied and operational carbon and reducing both in the context of building refurbishment and upgrade can result in a plethora of potential capital

projects. ESG reporting requirements rely on targets and benchmarks to monitor progress and simple reporting on operational and project performance, but quantifying these parameters is not straightforward. Even more complicated is the development of a long-term roll out plan of projects which support net zero commitments which extend to a twenty-five-year timeframe.

“So, like there's about 29 initiatives there. and they all went off in their own little teams to have a look at the benefits ... so they're all doing their own assessments-just gathering information of what was already and what could be the pros and cons of that particular initiative, but without services knowledge or understanding construction, and also then being able to look at all these initiatives and say well, which one takes priority?” [CCI2]

“It was probably the same raw materials but just put together and presented in a different way and it could vary from whoever you were talking to. One of them was more interested in the moves...one of them was more interested in the master plan...one of them was more interested in the energy. The way you presented it, just needed to be geared towards who they were” [CCI3]

#### *Development of a generalisable framework*

A further piece of work was done to incorporate this framework into a more generalised method which could then be tailored to each client: the five step process involved: identification of potential net-zero initiatives is created, including energy efficiency upgrades, renewable energy installations, and operational improvements, assessing each initiative against the five pillars of operational savings impact, cost impact, implementation downtime, payback period, and project dependencies using a scoring system (e.g., low, medium, high, developing a viability index by combining previous scores according to the client’s priorities. Prioritisation was based on the viability index which prioritises initiatives based on their combined technical and financial impacts and clearly places each intervention on the roadmap to net zero.

“Net zero is very asset based. It varies depending on the asset. You can't have a blanket approach and that was the initial mistake that everyone made is like everyone's gonna go down to that certain net zero level. That'll offset back to the grid, and we'll all be net zero.” [CCI3].

“Numbers and that's a problem when you start evaluating interventions based on numbers, you're not doing it on what they're supposed to be.” [CCI2]

“You need the whole master plan. You need to understand. Each phase of their importance. So that it's the jigsaw also come together to give you that full picture of meeting their net zero goals.” [CCI3]

A key aspect of the consultants' work was the reflection and feedback which occurred through the processes. The consultants frequently discussed points of new knowledge and explicitly applied them to future work. This iterative process underlined that there is unlikely to be a single, fixed view of net zero, but rather one that might flex with business necessities, given context and reason. Thus, aligning this research with the processual, becoming ontological tradition (Tsoukas and Chia, 2002).

” With hindsight, is knowing exactly who our audience is and what level of knowledge they have and their roles and responsibilities. Who holds the purse strings? [CCI2]

Findings suggest confused rationales and vocabularies between investor-side and operator-side stakeholders, and conflicts between development and investment which cut across debates around the transition to net zero and this confusion dilutes the ability of firms to meet their net zero targets. The client doesn’t have a unified voice, with mobilising context as a key variable and the idea of shared ownership being important.

## REFLECTIONS

This section reflects on how the empirical work contributes to debates on sustainable transitions and knowledge creation. The language of net zero relies on concepts of both operational and building performance metrics, but also in understanding the wider impact of large, interrelated project priorities which play out over long periods of time, and which have impacts on investment targets, operational savings, cost, downtime, payback period, and project dependency. The single framework developed by CCI as a shared framework of priorities and understandings, is perhaps a small step to supporting Oliver *et al.* (2021) in their assertion that new knowledge frameworks are needed for successful sustainability transitions.

Both silos were predisposed to consider that the path to net zero only required finding alternative greener energy sources. Zero carbon initiatives were understood by using different metrics in different silos. There was confusion amongst client stakeholders of what they wanted, how that made sense to each of them and what form of consultant guidance was required. CCI's synthesized metrics concerning operational savings impact, cost impact, implementation downtime, payback period, and project dependencies provided meaningful interpretations of zero carbon pathway projects for both silos of stakeholders. This augments Fuoli and Beelitz (2024) call for new models of investment strategies to support the transition to net zero.

Pathways to achieving net zero portfolios are long and rely on consistent application of the plan as each improvement is incremental and relies on inter-project dependencies in achieving the goal and timescale. Typical decarbonisation pathways may extend ten to twenty-five years into the future. During the usual cut and thrust of annual budget reviews and portfolio assessment, this prolonged rollout plan can become disrupted by more short-term business considerations and market developments. Traditional budgeting cycles run from bottom to top with limits and caps being applied top down, often resulting in a mismatch between discrete capital expenditure proposals for decarbonisation and improved operational efficiency and investor concerns over portfolio balancing and positioning and Without an approach to renegotiate strategic choices at local levels (Krainert, 2025), it is very easy to lose sight of the integrated roll out of projects needed to achieve long term net zero goals.

Co-creation hinges around stakeholders coalescing around a particular issue or problems and working together to use their individual and organisational knowledge to develop solutions or new ways of working. In the case of the net zero pathways the gulf between silos is wide with very different metrics and drivers applying to decision making. Operations-side professionals tend to be concerned with compliance to regulation, capital expenditure, operational expenditure and asset management. This scoping study supports (Nonaka & Toyama, 2017) in understanding that the process of knowledge creation is also to do with developing knowledge of each group, by demonstrating a willingness to hear different views and to translate these for different groups. Our graphical representation of the translation process resonates with literature on project organisations, inter-organisational learning and transitions to net zero and gives particular importance to the process of active listening and translation between different stakeholder groups within the transition process.

This scoping study represents only a microcosm of decision making and knowledge creation surrounding the adoption of net zero investor-side targets by only two organisations. The sample size of organisations and pool of actors are small, but they reflect the day-to-day world of net zero project roll-out and decision making based on

the knowledge and understanding of different silos of built environment professionals. However, it demonstrates that further research should explore the language and understandings of different stakeholders involved in firms' commitments to net zero.

### *Summarising Thoughts*

Within the context of transformational changes required to develop regenerative cities, these findings underscore the need to develop frameworks to understand co-created knowledge. Such frameworks can be mobilised to help translate sustainable actions and plans into investment rationales to support regenerative cities.

The research set out to gain a better understanding of how key stakeholders from either side of the built environment are rising to the challenges associated with net zero transitions. Consultants and investor-side clients are proactively working together to tackle the changing landscape around net zero and broader sustainability issues. Given the dynamic challenges and the unique requirements of investor-side clients, off the shelf strategies or solutions from consultants are falling short. This is evident through the two case studies offered, demonstrating the collaborative opportunities being practiced across the sector. The research resonates with the conceptualisations of sustainability, regenerative cities, net zero and retrofit as a wicked problem and the ontological traditions around becoming. Sustainability literature (including net zero, regeneration, and retrofit) is dominated by metrics, regulation, policy and standards, with the necessary skills and capabilities required only more recently being recognised as a challenge. These 'soft skills' are vital in co-creating knowledge between stakeholder businesses, helping to navigate the choppy waters of sustainability, net zero and regenerative cities. This research also has resonance with seminal earlier research by Duffy and Worthington (1972) which looks at business needs and building design in the round.

The reality of the case study projects shows the iterative nature of co-creation and feedback by the stakeholders. Some stakeholders might believe that they are enacting such an approach, yet may inadvertently start with a set of assumptions, language and terminology that do not fit this wicked problem paradigm, and which hinder more nuanced and shared understandings of necessary strategies. For practice and the sector, the implications of this research stress the importance and difficulty of developing the core processes of absorption of the client needs across the stakeholder organisations and of translating those different needs to a cohesive and tailored solution that satisfy all parts of the stakeholder firm. Within the context of complex agendas of net zero and regenerative cities this is a difficult area with client needs being ill defined and often conflicting. This underlines the importance of bringing these different needs into view in a language that is understood by all stakeholders. This scoping study illustrates that given the scale and the complexity of the challenges discussed; far more research is required, covering the associated and interlinking levels, i.e. multi-level perspective and in terms of breadth and depth within these levels. By focussing upon one consultancy and two case study projects here, the research has shown the lack of understanding about practice, and the literature has few studies that focus upon these fine-grained nuances of co-creation between stakeholders.

## **ACKNOWLEDGEMENTS**

The authors would like to acknowledge the Harold Samuel Research Prize and the financial award that made this research possible. Authors are also very grateful for the in-kind contributions of the industry partner in offering their time so freely.

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