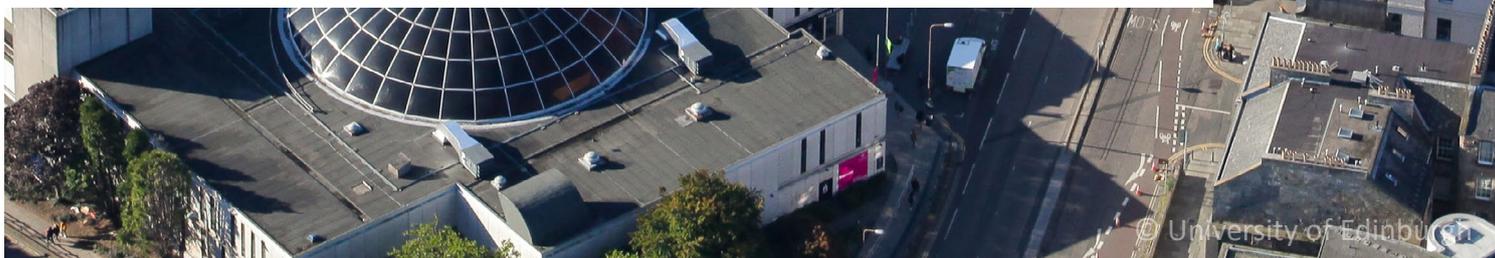


Climate Emergency Collaboration Challenge Project

August 2021

EXECUTIVE SUMMARY





This report is part of a larger Scottish Funding Council (SFC) project, under their Climate Emergency Collaboration Challenge. The project specifically explored how the University of Edinburgh as a client can work more collaboratively with our construction partners to deliver a zero-carbon built environment. It leveraged campus investments and relationships with Tier 1 Contractors to understand how client and contractor can work together more effectively to achieve better climate building performance outcomes.

A major aim of the project was to look for lessons which can be more widely shared across UK university estates, the public sector, and the construction sector as a whole.

Our engagement with the construction sector shows clients and contractors have, between them, the ambition, intent and capability to deliver better building performance and to reduce the climate impact of construction projects. However, we also found that optimal building performance is rarely delivered, and that current priorities in decision-making can often inhibit sustainability outcomes. Many reports, task forces and committees have come to similar conclusions. The challenges we still see in delivery show the complexity of the challenge needs actions to enable a new approach.

Findings and Recommendations

We present a series of findings from stakeholder workshops and one-to-one interviews as a set of recommendations for action. They emphasise the fact – now widely acknowledged – that the University’s zero carbon ambition can only be delivered through earlier engagement and closer collaboration with its commercial partners.

Recommendations are presented under four main themes:

- ◇ leadership, governance and finance;
- ◇ design and construct process;
- ◇ delivery competencies and skills; and
- ◇ forecasting and feedback.

Delivering zero carbon starts with senior management so the incentives of decision-makers need to be aligned with emission targets, as is already best practice in the corporate sector. Finance is critical to success, and our findings show the need for visibility of the true cost of carbon over project lifetimes and to build this into the whole decision-making process. Contractors routinely do this for other customers, and conditionality of funding presents the opportunity to drive adoption of the same approach.

Intended outcomes need to be clearly articulated, starting with a concise 'one-page' brief. The client must clearly articulate from the outset, and throughout the process, their desired and priority outcomes for the project. Priorities and how best to achieve them must be shaped by early collaboration and engagement with construction partners, and managed with relevant client knowledge from the start. A programme approach must be taken, to plan for the long term and realise opportunities from connecting projects and scaling investments across the estate and with other city partners.

There will need to be a presumption in favour of refurbishment, rather than new build. Sustainability and zero carbon must be locked in from the start and gateway processes must ensure they are retained throughout the entire design, construct, operate process and at the end-of-life phase. Circular business models will be part of zero carbon delivery, through the choice of materials, addressing both operational and embodied carbon. Competencies and skills need to be built collaboratively, with the application of digital technology and carbon accounting being two main strands. Feedback mechanisms will play a vital role in delivering effective solutions and in supporting the communication process, since a sound evidence base for future decision-making is vital both to meet 2030 targets and to keep on track to 2040.

Our project has also highlighted where progress is being made and can be built on; for example the conditionality of public funding on climate impact, revisions to the University of Edinburgh's business case, and the recent publication of net zero building standards for the public sector.

Delivering Better Outcomes: Key Findings

Our project has highlighted key areas where more effective collaboration between the University and its construction partners is needed to consistently deliver net zero outcomes:

Leadership, Governance and Finance

- The client's net zero outcomes must be clearly articulated into the projects and programmes from the outset, and project governance must ensure these outcomes are ***maintained throughout delivery***.
- ***Whole life costing should be used***, to make visible the true costs of operational and embodied carbon and allow better informed decisions about both capital and operational expenditure.
- ***Net zero outcomes will be compromised if the costs and risks are always placed with the client***. A collaborative approach can deliver better outcomes and long-term commercial benefit.
- Project incentives need to ***prioritise net zero outcomes*** for construction quality equally alongside time and budget.

Design and Construct Process

- Sustainability expertise must be introduced early enough to ***influence programme design and outcomes***. The procurement process should facilitate early collaboration and engagement with construction partners to determine the best way to deliver outcomes.
- ***Collaboration during the capital planning process*** is needed for input at programme level, and to ensure innovative projects are costed and brought forward to the estates programme.
- Contractor must support the client to embed net zero outcomes into the process, and ***be prepared to agree, acknowledge and share risks***.
- Client and contractor must ***adopt and share key sustainability principles***, including a presumption of refurbishment over new build, and the use of circular design and materials throughout.

Delivery Competencies and Skills

- The partnership of client and contractor must ensure the ***right knowledge and skills are present at all stages of the project***, and across all stakeholders, to ensure net zero outcomes are designed in from the start, and ***remain embedded*** in the project throughout.
- Sustainability skills must be embedded to ***ensure outcomes are not compromised during project management and delivery***. This must be supported by the development of knowledge and skills across all project stakeholders.

Forecasting and Feedback

- To ensure performance outcomes are met, ***building performance monitoring into the occupancy phase must be built into delivery contracts*** from the outset.
- There is a recognised need for clearer standards on a building's environmental performance. With no mandatory framework, ***an appropriate standard must be adopted*** by the partnership.
- Data and knowledge from performance monitoring must be collated and harnessed to ***influence future design***.

Priorities for Change

Our engagement across the component parts of the sector – bringing together clients and contractors alongside policy, advisory and leadership bodies – has confirmed that the delivery of better building performance outcomes is no longer truly a technical challenge. The technologies to design, deliver and manage better building performance exist, and are improving all the time.

The challenge now is to shift decision-making priorities and ways of working so that zero carbon outcomes are prioritised, and the skills, knowledge and technologies that exist in the sector are fully harnessed and more widely shared to build capacity and capability across clients and contractors in the sector.

Our recommendations for action focus on supporting that capacity building journey by improving processes to facilitate collaboration and knowledge sharing, and most importantly by changing the priorities for decision making and embedding them throughout development and delivery of the estates programme. Embedding zero carbon outcomes and knowledge as early as possible has emerged as the clear priority, and our recommendations highlight those areas for immediate action we believe most effectively support this.

Recommendations for Action

A more collaborative approach must be client-led, building a foundation to use the expertise of contractors to deliver better outcomes. Our engagement suggests the need for capability, capacity and culture improvements to drive better design and delivery. To embed these into process and practice, we recommend a number of key actions for universities and public sector organisations to show climate leadership:

Leadership, Governance and Finance

Clients and contractors must embed zero carbon outcomes across all stages of programme governance:

- ***Adopt net zero carbon targets ahead of buildings standards and establish internal governance mechanisms using emissions*** as a steering mechanism.
- The ***incentives of decision-makers should be aligned with emission targets***, with delivery against zero carbon targets reflected in staff incentives and rewards.
- ***Appoint zero carbon champions*** throughout the organisational structure.

Design and Construct Process

Processes must change to ensure an embedded focus on climate outcomes throughout projects, in particular business case priorities and processes for procurement and contract management:

- ***Develop business case processes to reflect total emissions costs*** including operational carbon, applying whole life costing, and using internal carbon pricing mechanisms to prioritise projects.
- ***Collaboration must begin early enough to inform the capital planning process*** and shape the development of an integrated and connected estates decarbonisation programme.
- ***Establish processes to support early engagement*** to bring delivery expertise and experience into projects at an earlier stage, supporting design input and enabling transferability of project assets.
- ***Prioritise climate outcomes clearly in a concise one page brief*** for new projects.
- ***Enhance zero carbon baselining processes*** in collaboration with contractors, to establish carbon baselines, track progress of projects and set higher standards in future projects.

- **Embed emissions targets in procurement strategy** of each built environment project, incentivising contractors and supply chain using smart performance indicators.
- **Enhance contract management**, feedback and review processes to **ensure zero carbon outcomes are locked in**, in particular to gateway and business case reviews.
- **Integrate sustainability into Value Engineering process during construction**, assessing carbon and circularity alongside cost, to ensure contractors maintain zero carbon outcomes in the final product.
- Act ahead of legislation and **establish a mechanism to engage early with innovation**, stimulating circular business models through choice of materials for refurbishment and new build projects.

Delivery Competencies and Skills

Programmes must be developed to build skills and competency throughout the project lifecycle:

- Roll out **capability building packages to everyone involved in estates decision-making, and train those using and maintaining buildings** to operate in line with zero carbon targets.
- Draw on **academic expertise** to develop capabilities of staff and contractors.
- **Share lessons learned on zero carbon built environment** internally and externally, supporting the sector and Scotland to meet zero carbon targets.

Forecasting and Feedback

We must make better use of modelling and monitoring to improve performance outcomes:

- Use **modelling techniques to provide accurate estimates of energy** use and other outcomes, and make gathering data part of **active building management to test against digital models**.
- Undertake **Post Occupancy Evaluation for all projects** to test actual performance against designed outcomes and targets, and ensure results inform decision-making.
- Shared knowledge of **previous experience from all stakeholders must inform** development of new briefs.
- Reporting to funding bodies should **routinely include progress and impact against net zero targets**.
- Disseminate local, regionally, nationally and internationally to advance good practice and knowledge of construction and operation.

University of Edinburgh: Leading the Collaboration Journey

Our report uses 2030 Scenarios to show how the journey to better building performance enabled by closer collaboration with our construction partners can be delivered, if we start now.

Collaboration on Climate Outcomes: Early Changes

The University has already committed to this journey, and is instigating changes in how it designs and delivers projects to facilitate better collaboration and deliver better outcomes. These aim to ensure that marketplace design, contractor competencies, and emerging 'real time' experience and technology influence design decisions early in the process. In particular:

- As a client, the University of Edinburgh **accepts the implications and significance of setting reduced life cycle costs and carbon reduction as key priorities over capital outlay.**
- Our **current delivery processes, procedures and procurement routes are changing** to reflect the context of emerging skills, knowledge, technologies and innovation.
- We are **updating our business case process to prioritise building performance outcomes** and climate.
- We are **changing our procurement process to facilitate earlier engagement** of partner expertise earlier into a collaborative design process.
- We will **incorporate performance modelling into future projects** to help us better understand and overcome any performance gaps.
- A **'sign off' point must be incorporated in the design process to mitigate late change**, driven by emerging sustainable design advancements.

Collaboration Challenges

We also recognise that adoption of these changes brings challenges to work through collaboratively with both colleagues and construction partners. The most immediate we anticipate are:

- A mind-set shift has to happen in setting key project parameters, from a position of starting by setting capital outlay to the reduction of lifecycle costs and carbon emissions.
- The fundamental cost assumptions for early-stage budgeting and costing, based on building type and size, are no longer fit for purpose.
- This will mean more uncertainty around budget and pricing, a need to share risks and for governance and decision making throughout the project lifecycle to retain climate outcomes as a priority.
- Early estimates and budget advice will have little or no precedent, particularly for bespoke construction projects such as research laboratories and testing facilities. Despite these uncertainties, early estimates are essential to bring projects forward into the capital planning process and to shape an innovative and effective estate decarbonisation programme.
- Commissioning design input separately means there is no guarantee of supplier continuity from design into delivery.

The University is committed to collaborating with suppliers on overcoming these challenges.

Collaborating for Success

Collaboration is vital. The lessons learned from the project emphasise the need for a mature strategic dialogue between leading clients and major contractors, to be led by the public sector in Scotland. The construction industry has consistently signalled its willingness to engage in delivering low carbon solutions. It is now up to leading clients to seize the opportunity to benefit from the innovative solutions such collaboration offers.

While our project suggests the University must take the lead in creating a collaborative environment, giving contractors confidence in client commitment to sustainable outcomes and enabling them to draw fully on the expertise of the sector, it has also shown that contractors must respond in kind. The client should be confident that contractors are eager and willing to participate in that process, and that certain aspects will become more contractor-led as projects progress to construction. This means sharing knowledge, risks and benefits in an enabling approach which will support long term sustainability and business outcomes, balanced against short term costs and returns, particularly when enabling and costing innovation.

By collaborating effectively, the opportunity for universities and contractors is to lead the construction sector in demonstrating how sharing of skills and knowledge can deliver net zero outcomes, and to show how the sector can both lead and benefit from the transition to a zero carbon economy.

This project was led by Jamie Brogan, Climate Partnerships Lead, Edinburgh Climate Change Institute, with expert support provided by Barbara Morton (Sustainable Procurement Ltd), Ranald Boydell (Country Architecture) and Karen Ridgewell (Architecture and Design Scotland).

Read the full report on the [ECCI website](#).