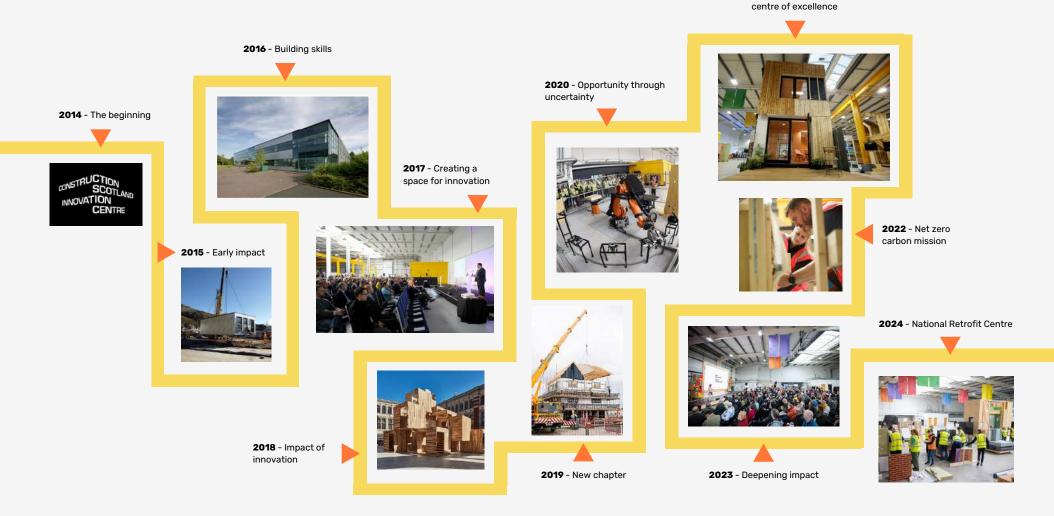
The story of BE-ST



and the net zero carbon built environment

2021 - Becoming a

Supported by



Administered by



10 years of BE-ST

Foreword

Marking a decade of BE-ST and celebrating the milestones of a transforming built environment.

Over the past ten years, BE-ST has worked hard to try to build an ecosystem that supports construction and the wider built environment to deliver transformational change, enabling innovation that delivers shared value for all stakeholders, and creates better places that benefit the citizens of Scotland. As we reach our ten-year milestone, we reflect on the journey so far, and look ahead to a future where long-term, whole place and whole life value-based decisions are prioritised, net zero carbon construction is embedded into standardised practices, and people, places and businesses thrive.

"BE-ST's journey so far has only been possible because of you – our stakeholders, partners, challengers, enablers, innovators, and dedicated team of change makers. Thank you for your support and engagement over the past ten years. Our collaborative work together has made a difference but it's far from over. Scotland's future generations expect, indeed demand, we continue with our mission to accelerate the built environment's just transition to net zero, and with your continued support and engagement, the next 10 years will be the decade we progress this mission further, and deliver even greater impact."

- Stephen Good, CEO



Climate markers in the last ten years

A timeline of the social, political and environmental milestones of the past decade, alongside those of BE-ST and the net zero carbon built environment.

2014

- China and the United States of America, two of the world's top carbon emitters, announce a joint commitment to reduce emissions.
- The Intergovernmental Panel on Climate Change (IPCC) highlights the urgency of addressing climate change in its 5th Assessment Report.
- Launch of BE-ST (formerly the Construction Scotland Innovation Centre (CSIC).

2015

- Edinburgh Napier University wins the Queen's Anniversary Prize for Timber Research.
- The Paris Agreement is reached.
- First projects at CSIC: projects with Transport Scotland, BRE Innovation Park, and the establishment of the Offsite Hub.

2016

- Arctic Sea ice reduced to its second lowest point on record.
- CSIC launches first skills programmes.
- Industry uses modern methods of construction on the UK's first 'Garden Hospital,' Dumfries and Galloway Royal Infirmary.



2017

- United States of America announced its intention to withdraw from the Paris Agreement.
- CSIC's Innovation Factory Launch.

2018

- Greta Thunberg's first school strike.
- The MultiPly project used CLT manufactured at CSIC's Innovation Factory.
- Pope Francis publishes a letter emphasising the moral imperative to address climate change.



2019

- Scotland and Wales first nations to declare a climate emergency.
- Record-breaking wildfires in Amazon rainforest.
- The EU announces a commitment to achieve carbon neutrality by 2050.
- Scotland sets its net zero climate target for 2045.
- . The UK sets its target for 2050.
- CSIC Phase 2 officially begins.

2021

- The Glasgow Climate Pact at COP26.
- United States of America rejoins the Paris Agreement.
- Scotland's emissions have fallen 49.9% compared to 1990 levels.
- CSIC landmark projects: Transforming Timber, GenZero and NearHome, hosted at CSIC's built environment conference: BE@COP26.
- CSIC invited to be a United Nations Centre of Excellence for High Performance Buildings.



2020

- Australia faces one of its worst bushfire seasons on record.
- Lockdown measures lead to temporary reductions in global carbon emissions.
- Restart & Recovery Plans delivered by the Construction Leadership Forum.
- 'Increasing offsite housing construction in Scotland' published by industry, CSIC, and Scottish Government.
- Granton Waterfront Regeneration aims to build 3,500 net zero homes.

2022

- CSIC becomes Built Environment Smarter Transformation (BE-ST).
- BE-ST adopts new mission: Accelerate the built environment's just transition to net zero.
- The IPCC releases its 6th Assessment Report.
- BE-ST launches its new festival of built environment innovation: BE-ST Fest.

2023

- Global carbon dioxide levels reach a new record high: 420 parts per million (ppm).
- Supported by BE-ST and a wide range of stakeholders, the UK Government publishes 'Timber in Construction Roadmap' - commits to building new schools using GenZero blueprint.
- BE-ST hosts the International Retrofit Conference, the first of its kind in the UK.



2024

- Launch of the National Retrofit Centre at BE-ST.
- · BE-ST's long-term role as a national innovation asset begins.
- · World's first year-long breach of key 1.5C warming limit occurs.











£1.8B additional revenue

£3.15M total BE-ST investment in projects £69.7M total project value

£16.3M Investment from industry £39.2M

Investment from public sector











565

projects supported

238

new services to market

408

new products to market

292

new processes implemented

84

New international markets





15633





6.14MT

CO₂e savings

152

master's students funded

158

public services improved

5356

jobs created

6780

job roles enhanced through training



















2014 - The beginning

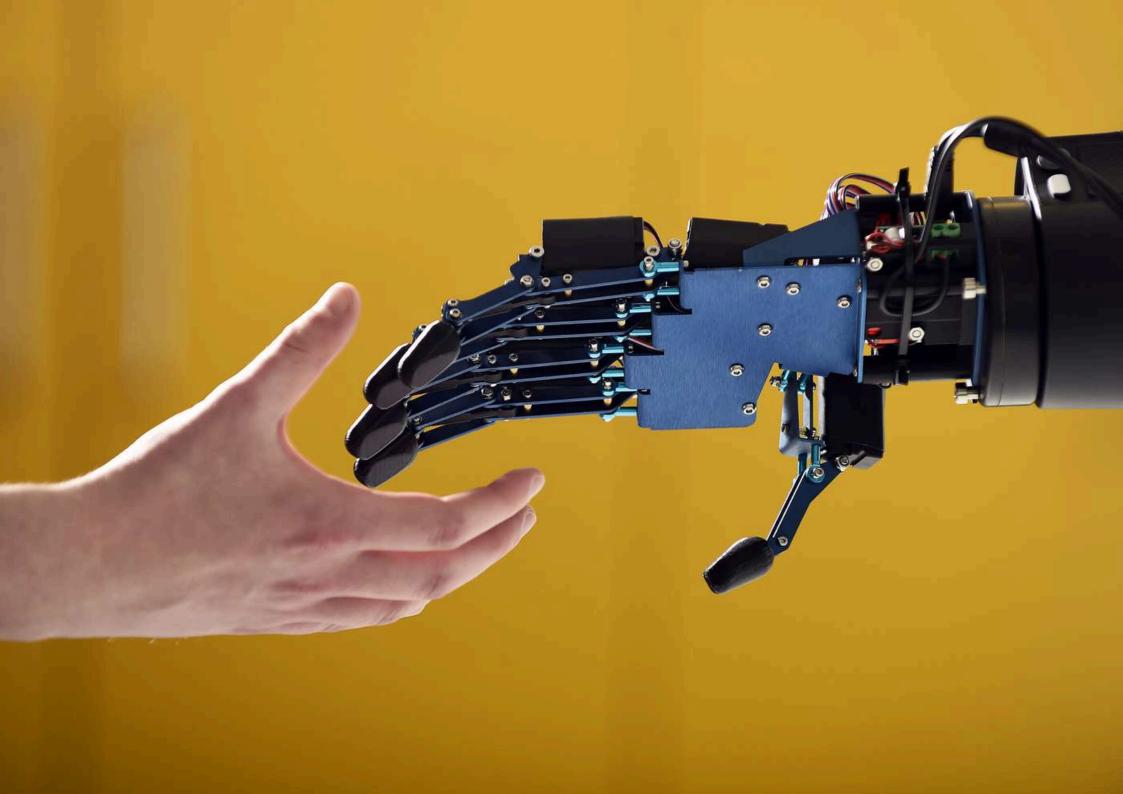
BE-ST began its journey as the Construction Scotland Innovation Centre (CSIC) following a successful bid led by the Construction Scotland Industry Leadership Group, in collaboration with a wide range of industry and academic partners.

We launched as one of eight Innovation Centres in Scotland, hosted by Edinburgh Napier University (ENU), as part of the Scottish Funding Council's Innovation Centre programme. Our mission was to drive transformational change by increasing the adoption of innovation, and we focused on doing this by enhancing collaboration between industry, academic, and public sector partners around the sector's most pressing challenges and opportunities. We knew the sector was already innovating each and every day (many of the initial CSIC team came from an industry background) and that this needed – and deserved – a greater focus from all stakeholders, to supercharge construction's innovation capabilities and ensure the sustainability of the construction sector in Scotland.

CSIC was officially <u>launched</u> on 7th October 2014 by Nicola Sturgeon, Deputy First Minister at the time, to an audience of 200+ industry, academic, and government leaders, future disruptors and change makers.

Our initial five year programme of work focused on 'Building an Innovation Culture' between industry, academic, government and public sector partners. In those early days, there was no Innovation Factory or Campus. We operated initially from the Lighthouse, then from offices at Port Dundas in Glasgow. As a new programme, we had to build momentum quickly. Fortunately, the leadership industry demonstrated in developing the Innovation Centre bid meant a number of early opportunities were identified. CSIC's mantra from the start was 'Collaborate to Innovate', so our team also capitalised on the established relationships with Scotland's trade, professional, and federation bodies, enabling CSIC to connect the dots, and build initial projects and programmes of industry-led and industry demand-driven opportunities.







2015 – Early impact

Shortly after the launch of CSIC came another quick win in 2015 with a successful bid to establish the Innovation Factory – a physical space for industry to innovate, collaborate, prototype and test the products, systems, and skills solutions of the future.

This was an important early win for our sector, as it created a UK first in terms of having a dedicated space to experiment, fail, learn, and apply solutions, off the critical path of live construction sites. Up until this point, the sector had to try to innovate within the restrictions of live construction sites, tight deadlines, limited risk appetite, and constrained costs. The construction industry desperately needed a safe space to experiment and trial future innovations, whilst also enabling greater collaboration where organisations in the private, public and academic sectors could share knowledge and exchange ideas, and train the workforce of the future.

2015 also saw early innovation projects with Transport Scotland, the BRE Innovation Park, and Scotland's leading offsite manufacturers, coming together initially as the Offsite Hub, which would become Offsite Solutions Scotland, collaborating to drive the adoption of modern methods of construction across the country.

Through these early projects, we learned that bringing stakeholders together in the same room, around the same table was crucial to driving transformational change. Collaboration breeds more collaboration, and 10 years on it's rewarding to see the offshoots of success that were born in these early collaboration initiatives.

A standout moment in 2015 was the recognition given to our host institution, Edinburgh Napier University. The University won the <u>Queen's Anniversary Prize</u> for its innovative work in timber engineering, sustainable construction and wood science. This reinforced our positive relationship with the team at ENU and the value of the SFC Innovation Centre programme as a mechanism for bringing the very best of Scotland's academic expertise together with industry to deliver value for the construction sector.

Edinburgh Napier University continues to conduct world-class research to this day around innovative timber engineering solutions and has a well-deserved reputation internationally in this field.



"Over the past 10 years, BE-ST has developed into a valuable asset to Scotland and is making an international contribution to innovation for a zero carbon built environment. They are leading the way in the transition to zero carbon by creating green skills programmes for the future workforce and demonstrating new technologies for industry. BE-ST is a great example of the transformative power of collaboration between industry, academia, and the public sector. We are proud to have been involved with BE-ST from the start and to have provided the funding that has supported their remarkable achievements."

- Helen Cross, Director of Research and Innovation, Scottish Funding Council

2016 – Building skills

In 2016 we received the keys to 3 Watt Place at Hamilton Technology Park, the industrial unit that would become the Innovation Factory, where we are still based today. The task ahead was, thanks to funding support from Scottish Enterprise, to complete a refit of the facility, taking an empty shell and transforming it into the UK's first centre of excellence for construction innovation.

The objective was to deliver a purposeful and tailored collaboration environment for the construction and built environment ecosystem to come together to drive change, and to populate the building full of state-of-the-art technology and equipment that organisations could easily access for prototyping digital design and digital manufacturing solutions. We procured machinery for the digital factory space and established an office space for our rapidly growing team. We knew early on that transforming the workforce and developing new skills were key to enabling success in the sector. In 2016 we began to grow our skills offering, with the launch of BIM In Practice – the first of our skills programmes – aimed at building on the growing BIM revolution the sector had been undergoing. We supported programmes that leveraged the talent within the tertiary education and college sectors and, working with our universities, we welcomed our first cohort of master's students, funded through the Innovation Centre programme.



"It's been invaluable support from BE-ST. The fact that I was on the Scholarship Fund was incredible."

- Fionnghal Caldwell, Assistant Low Carbon Manager, Morrison Construction | BE-ST Scholarship Graduate











2017 - Creating a space for innovation

The renovation of the Innovation Factory concluded in 2017 and we opened the doors to the UK's first dedicated physical Construction Innovation Centre with a launch event in the middle of the factory itself.

Over 300 construction professionals, academic experts, government officials, agency stakeholders and key partners joined us to experience demonstrations, workshops, and hear from inspiring speakers. The building was officially opened by then First Minister Nicola Sturgeon and could not have happened without the valuable support of the Scottish Funding Council, Scottish Enterprise, and a wide range of industry partners.

"CSIC's Innovation Factory, the only facility of its kind in the UK, will offer businesses across the country access to cutting-edge technology and a state-of-the-art facility. We want to see more collaboration in the future, across the public and private sector, and I would encourage everyone to get involved and make the most of the Innovation Factory."







- Nicola Sturgeon, former First Minister





2017 provided the opportunity to invite industry through our doors to a live innovation facility, where we could move on from talking about innovation, to actually doing it. Organisations could get their hands on new technology, experiment, test, trial, and realise their ideas for the first time, and then take the innovative solutions they had developed, and scale these up on live sites, or invest in similar equipment in their own facilities, safe in the knowledge they had already de-risked their future investment. We saw steady take-up from industry - the demand for a facility like this was already becoming clear as universities and businesses were booking equipment and space months before we launched.

Furthermore, the factory enabled our technical team to get up to speed with the very latest of new technologies. They robotics. CNC embraced industrial offsite equipment and advanced manufacturing methods, and gained valuable insights from a range of international talent who were visiting the factory, all of which helped kick-start a new wave of factory-based programmes.

In 2017, we supported the first Passivhaus Standard comparative build with Dandara and Robert Gordon University. We partnered with Edinburgh Napier University, Offsite Solutions Scotland and CCG (Scotland) Ltd to support the delivery of Scotland's tallest CLT building. It was also the year our long-term relationship with Kenoteg began as we supported their early prototype manufacture of the K-brig, the world's first 90% recycled brick, on our Masonry Casting Press. These examples, amongst a host of others, highlighted the power of collaboration and having a physical space to "do" innovation.

"BE-ST has been a critical partner, joining up the landscape and delivering as part of flagship consortia. Without BE-ST we simply wouldn't have been able to connect as deeply with the ecosystem in Scotland."

- Dr Mike Pitts, Deputy Challenge Director, Innovate UK

2018 - Impact of innovation

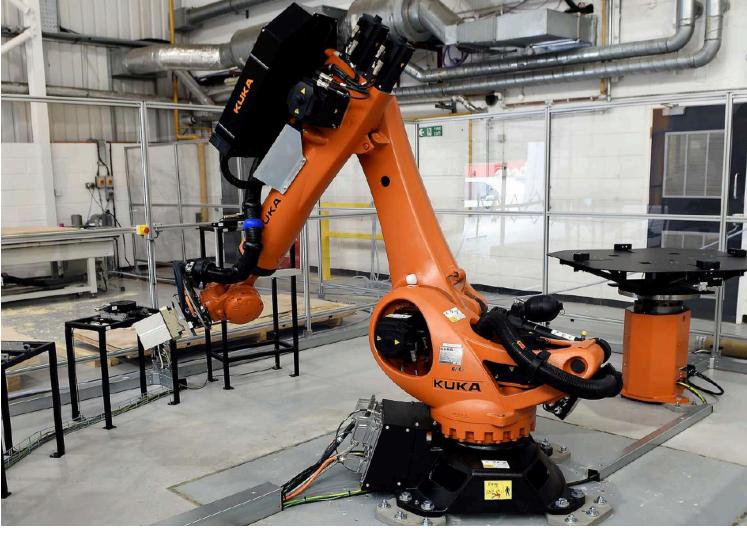
As we entered 2018, still moving at pace to support our collaboration partners drive change, we also had one eye on our initial 5 year phased programme of work which was due to come to an end in 2019, and as an organisation, we began planning for what would come next for the Innovation Centre. In our first phase, we supported more than 300 collaborative projects. These enabled businesses to realise approximately £750 million in additional turnover and supported the creation and retention of over 4,000 jobs.

A key evolution of our model, as we planned for the future, was to explore how we could scale up our one-to-one projects approach, into broader programmes with wider collaborations, as the data from phase one indicated these many-to-many type programmes were capable of delivering even greater impact. As the Innovation Centre transitioned into its Phase Two programme, our focus evolved to reflect the ambition to 'Mainstream Innovation', embedding the culture we had built across the sector as businesses matured their innovation activity and became more frequent collaborators with colleges and universities.



This year we also supported a number of exciting projects including MultiPly, an internationally acclaimed initiative utilising American Tulipwood CLT manufactured at the Innovation Factory on the UK's only CLT press, and we trialled Industrial Robotics with Scottish Highlands-based SME, Glulam Solutions. Additionally, we launched the Inclusive Value project led by Sir Robert McAlpine and supported by a wide range of partners, facilitating events and resources aimed at enhancing equity and inclusion. These projects showcased the breadth of innovation coming from the sector at the time, and helped CSIC establish a reputation for a range of valuable capabilities, in terms of our growing industry and academic network, our focus on driving value through collaboration, and the assets at the Innovation Factory. This laid the groundwork for the programmes that were to come next as part of Phase Two.









2019 - New chapter

In 2019, the Scottish and Welsh Parliaments declared a Climate Emergency, and soon after, the whole UK followed suit.

2019 also marked the official beginning of our Phase Two journey. Enterprise agencies Scottish Enterprise and Highlands and Islands Enterprise joined SFC as core funders of the Innovation Centre programme, and although our core funding from these key agencies increased, the Innovation Centre was developing a blended funding model, with about 30% of our funding now coming through other, non-government routes like collaborative bids and commercial activity.

The 'Climate Emergency' declarations planted the seed for a renewed focus as we initiated a review of our purpose and principles with the intent of consolidating our mission focus and associated value measures. For Phase Two, we drew our focus to four main themes: building sustainability, embracing advanced manufacturing, fostering cultural change, and enabling digital transformation.

We recognised that these themes were deeply interconnected, embedded across a lot of the work we already supported, and were critical to transforming the built environment and delivering value to the communities and citizens it serves. Reflecting on the experiences gained over our first phase, we learned the sector benefits from visible examples to follow. In the words of our past Chair Andy Outram, "The sector can't be what it can't see," therefore we redoubled our efforts to focus on knowledge exchange and disseminating outputs. Moving forward, we aimed to apply this to the landmark project AIMCH and a range of people-centric projects, including with Arbnco and the University of Strathclyde on sensing wellbeing in buildings, the Integra House in partnership with Robert Gordon University, and the Gannochy Healthy Housing Development. Following the 2019 launch of our Future Skills Strategy, FUTUREquipped brought together colleges, Innovation Centres and industry partners to explore better ways we can work more closely together to drive innovation across Scotland's skills ecosystem.

"The sector can't be what it can't see."

Andy Outram,
Past Chair of BE-ST
Governance Board











2020 - Opportunity through uncertainty

In 2020, the world underwent significant changes and challenges in the wake of the COVID-19 pandemic and, unsurprisingly, CSIC did too.

Like many other organisations, we had to adapt to new ways of working. This shift presented unique challenges for our partly factory-based operation. However, we viewed this period of instability and uncertainty as an opportunity to enhance our support for the industry.

In response, we launched <u>i-Con</u>, a programme offering grant funding for projects aimed at rapidly developing solutions to pandemic-driven challenges right across the sector. Additionally, we collaborated on the COVID-19 Restart & Recovery Plans with the <u>Construction Leadership Forum</u>.

Through these efforts, we sought to contribute to the industry's resilience and growth during challenging times. 'Increasing offsite housing construction in Scotland' was published, supported by a wide range of industry academic research partners, the Scottish stakeholders. Government, and ourselves. Offsite Ready helped spread the awareness of modern methods of construction deeper into Scotland's colleges and universities. The climate and nature crises, and driving sustainability, continued to play an underpinning role in our work. We continued to innovate and champion sustainable solutions. Over 500 built environment stakeholders joined Scotland's Countdown to COP26 that focused on sustainability across multiple sectors, in anticipation of Glasgow hosting COP26, which had been postponed to 2021 due to the pandemic.

"I particularly admire BE-ST's positive approach to engagement with Scottish Government, industry and academia. I've seen the focus that BE-ST places on the opportunities of the transition and on workforce development, diversity and inclusion. We'll need that positive, well-informed approach to deliver real change across the country."

- Chris Stark, CEO, Carbon Trust







2021 - Becoming a centre of excellence

In 2021 we were formally recognised for our commitment to sustainable and energy-efficient buildings and infrastructure by becoming an international exemplar as we joined the United Nations Economic Commission for Europe's (UNECE's) network of International Centres of Excellence for High-Performance Buildings.

The programme provided recognition of our provision of education, training and support for local industries in alignment with the UN Framework Guidelines for Energy Efficiency Standards in Buildings. Glasgow's 2021 hosting of COP26 was the year's flagship event and, for us, it presented an amazing opportunity to showcase Scotland's low and zero carbon built environment innovation to the world as we hosted a two-week festival of sustainability in construction. Eight hundred visitors to the Innovation Factory engaged around this mission. The festival fostered international collaboration and delivered a legacy of meaningful action. The event showcased many of the innovations our industry and academic partners were involved in delivering for the first time, including the UK's first two-storey homegrown mass timber home, a cornerstone of our Transforming Timber programme, which also included NearHome and GenZero.



"BE-ST has been a game changer for Scotland. It has elevated our ability to create climate-responsible construction productively, made us front and centre to driving future net zero carbon forms of MMC and ensured we have international relevance building upon the legacy of COP26 in Glasgow."

- Robert Hairstans, NMITE and Edinburgh Napier University





The Low Carbon Learning programme was also launched in 2021 with the Passivhaus in Practice programme, which saw huge interest and uptake from industry and has since grown to become the largest training offering we provide to the sector. Low Carbon Learning has supported:

- 1582+ trained in-person
- 6521+ who have accessed online learnings
- 60+ practical training events
- 158 accredited
- 204 jobs safeguarded

"It's great to get hands-on interactions with materials and start to understand their actual applications and the number of details that go into designing sustainable buildings."

- University of Strathclyde Architecture Student

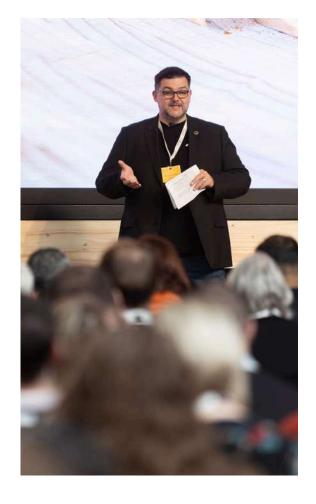
The success of these programmes has enabled us and our partners to leverage wider UK, EU and international collaboration opportunities – and continue to drive forward Scotland's growing reputation as a leader in net zero carbon built environment transformation.

2022 - Net zero carbon mission

2022 was a transformational year for the Innovation Centre. It was the year the Construction Scotland Innovation Centre became Built Environment – Smarter Transformation (BE-ST) and our core mission focused on accelerating the built environment's just transition to net zero.

We rebranded as BE-ST, not because we thought we were the 'best', but because 'BE-ST' better reflected our broadened focus on the built environment. Not just construction, but also the campaign we hoped many in the sector wanted to get behind and support: The smarter transformation of the built environment. The acronym BE-ST reflected collective desire to do our best and strive for the best outcomes. This transformation allowed BE-ST to extend its reach beyond Scotland to include an evolving international community, while fostering collaborations across the globe.

The imperative to transition towards a sustainable built environment operates within our planet's resource limits and fosters an economy that ensures equal outcomes for all citizens sits at the heart of our work. To unify the industry around this mission, we held the UK's first festival of the zero carbon built environment at the inaugural BE-ST Fest '22, in our new A Lab building, which we acquired with the support of our host institution and the Scottish Government. The event welcomed over 400 built environment stakeholders for a day of transformative discussions and knowledge exchange.



"It's amazing to see how many different people or people from different backgrounds we've got here... We've got a complete overview of the construction industry. And that's what we need. We can't have siloed thinking - the crossover between all these people is what's really important."

- Catherine Cosgrove, Chair, Scottish Ecological Design Association (SEDA)











2023 - Deepening impact

In 2023, BE-ST looked towards our next phase (Phase Three), in the Infrastructure Investment bid. The plan reiterated our renewed mission and the philosophy behind how we deliver transformation.

The Construction Leadership Forum published the <u>Transformation Action Plan</u> to drive action, setting out a series of positive outcomes for the construction sector and where transformative change will be required to realise the vision.

BE-ST Fest '23 grew from the previous year, by extending itself to host the first International Retrofit Conference and an awards ceremony in addition to the main summit, that celebrated best practice in the sector.

The UK Government also published their <u>Timber in Construction Roadmap</u> – with commitments to build six schools using the GenZero blueprint. An example of our work being adopted by the Government is a hugely positive vindication for the net zero construction mission.

"We need collective solutions. Collective solutions need collective networks to come together and work together."

- Rufus Grantham, Founder, Living Places













2024 - National **Retrofit Centre**

BE-ST's 2024 began with a visit from and sharing these challenges, solutions Humza Yousaf MSP, then First Minister. Council's future infrastructure support as we explore what good might look like. model for Scotland's innovation centres. National Retrofit Centre located at the breach of the 1.5C warming **Innovation Campus.** Shortly thereafter, it was confirmed that Edinburgh Napier University, as the host institution for BE-ST, was awarded £1.2M in grant funding from the Scottish Government's Salix Public Sector Heat Decarbonisation Fund, to retrofit the A Lab building on BE-ST's Innovation Campus. This has presented a fantastic opportunity for BE-ST to take on the role of a construction client, providing an opportunity for us to trial and support various innovative approaches to retrofitting buildings of this type, and explore the challenges and the complexities that come with retrofitting a large-scale, multi-use industrial building,

and learnings in real-time with our to announce the Scottish Funding community of partners and stakeholders

and to officially launch Scotland's 2024 saw the world's first year-long highlighting that climate impact is happening now and we must move at pace to mitigate as much as possible.



"The thing that excites me most is the impact the centre's having within the construction industry. For example, BE-ST has facilitated five of the biggest Tier 1 contractors from **Scotland** working across together to learn how to build Passivhaus. And the feedback I had from one of them was not only are they building really good buildings, but the staff are happier thev're because focusing on quality. They're collaboratively working teams. They've got much more pride in their work. And what a wonderful positive spin-off, from doing the right thing in terms of building, to then giving the right kind of feeling to your emplovees."

- Nicola Barclay, BE-ST Chairperson











Looking forward to the next ten years

As we look to the future, we ask: How do you envision the next ten years?

At BE-ST, our vision includes:

- Creating a built environment that achieves net zero carbon emissions.
- Driving economic growth across sectors through a productive and sustainable construction industry and built environment ecosystem.
- Safeguarding existing jobs and businesses while creating new green jobs and enterprises.
- Enhancing supply chain capability and resilience through deeper integration and collaboration.
- Supporting talent attraction, improving educational pathways, fostering entrepreneurial activity, and building a highly skilled workforce through innovative learning models.
- Encouraging inward investment and enabling businesses to export.
- Maximising the impact of academic collaborations and increasing business investment in innovation, research and development, and knowledge exchange.

- Eradicating fuel poverty, addressing health inequalities, and creating better living environments for Scotland's citizens.
- Ensuring the efficient use of public investment.
- Promoting the attraction and retention of diverse talent.
- Enhancing connectivity and engagement among key stakeholders involved in decarbonising the built environment and within Scotland's innovation and business support ecosystem.



In 2019, Scotland and the UK set ambitious net zero climate targets. However, five years on, some targets have been missed and others retracted altogether. Despite this, our commitment to reduce the sector's impact on the climate as quickly, effectively, and fairly as possible remains resolute.

In marking the first 10 years of our journey, we acknowledge that BE-ST is an enabler, a facilitator, a connector, a dot-joiner of opportunities across the sector. We will play our part and, in the next 10 years, do new things we've never done before. But the really challenging work is undertaken by all those businesses, researchers, informed clients, and skills enablers who drive transformational change every day. And going forward, know that BE-ST will be by your side enabling, facilitating, connecting, dot-joining, and doing more 'doing' to help us all deliver against the mission of accelerating the built environment's just transition to net zero. The success we've enjoyed over the past 10 years has been in collaboration with you, our partners. Ultimately, the future of our built environment, and the kind of society it supports, is in our collective hands.

We look forward to sharing that challenge with you over the next 10 years.







BE-ST