

Sustainable Construction Topic Support Network

Lucy Black, Head of Business Relationships

12.11.19



CONSTRUCTION
SCOTLAND
INNOVATION
CENTRE

**CSIC – “unique
collaborative support
at the heart of
transformational change”**

our role...



**champion
innovation &
connect Scotland's
construction
industry to deliver
transformational
change**

our mission...

**enable
industry
to exploit **global**
opportunities by
mainstreaming
an innovation
culture**

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Highlands and Islands Enterprise
Iomairt na Gàidhealtachd's nan Eilean



The Scottish
Government
Riaghaltas na h-Alba



Scottish Funding Council
Promoting further and higher education



Scottish Enterprise

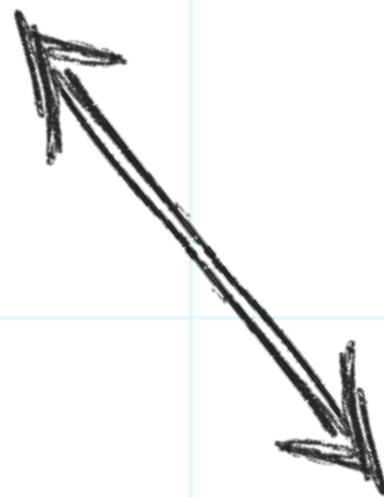
Innovation
Centres

Supported by The Scottish Funding Council,
Highlands and Islands Enterprise and
Scottish Enterprise.





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CENTRE**



our academic partners...

Universities
Scotland



+



colleges
Scotland



what is innovation?

innovation

is change

that unlocks

new value



PROGRAMME PRIORITIES



“What if we don’t change at all ...
and something magical just happens?”

**CULTURE
CHANGE**



**BUILDING
SUSTAINABLY**



**DIGITAL
TRANSFORMATION**



**ADVANCED
MANUFACTURING**



**BUILDING
SUSTAINABLY**



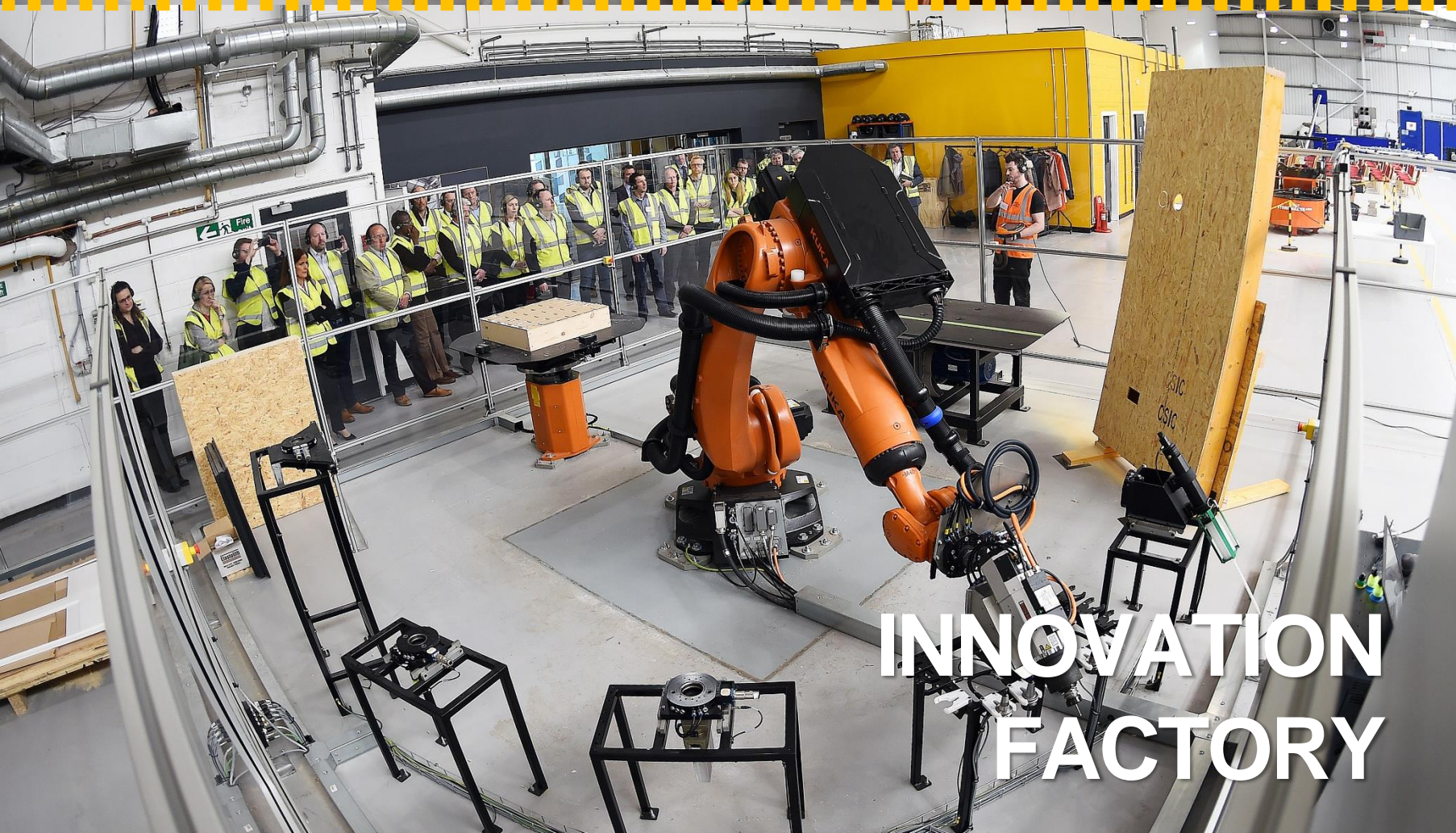
CORE ACTIVITIES



**CONNECTED
ECOSYSTEM**



**COLLABORATIVE
PROJECTS**



**INNOVATION
FACTORY**



**FUTURE
WORKFORCE**



CONNECTED
ECOSYSTEM

COLLABORATIVE
PROJECTS

INNOVATION
FACTORY

FUTURE
WORKFORCE



SEMINARS & WORKSHOPS



HACKATHONS



LIVE BUILDS



PRODUCT LAUNCHES



Newsletter

To receive the latest news, events round up, funding opportunities, case studies and initiatives from Construction Scotland Innovation Centre, sign up to our mailing list!

[Sign Up Here](#) >





The Innovation Factory



The background image shows a vast industrial workshop or factory floor. Several large yellow overhead cranes are visible, spanning the width of the space. The floor is filled with various pieces of industrial equipment, including what appears to be a large metalworking machine in the foreground and other specialized machinery in the background. The lighting is bright and even, typical of a large industrial building.

the UK construction
industry's first dedicated
digital manufacturing,
prototyping &
future skills
“centre of excellence”

Andrew Wolstenholme
Former CEO, Crossrail
Chair, UK Construction Leadership Council



open access facility

develop: space & support

Automation / AR+VR+MR / Advanced Analytics / Digital Processes
Robotics / 3D Printing & Scanning / Offsite Manufacturing

demonstrate: prototype & validate

Advanced Rapid Prototyping / More for Less / DfMA / Resource Efficient /
Automated Assembly / Mass Customisation / Lean

disseminate: skills, training & promotion

Collaborative / Academics / Upskill / Cross-train / CPD / Colleges /
Hackathons / BIM / Product Launches / Training Days / Seminars





IDEAS CAN HAPPEN
IN THE MOST
UNLIKELY PLACES



IDEAS CAN HAPPEN
IN THE MOST
UNLIKELY PLACES



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STONEMAKER.COM





IDEAS CAN HAPPEN
IN THE MOST
UNLIKELY PLACES



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IN THE MOST
UNLIKELY PLACES

STONE-MAKER.COM









Open Source Digital Designs





Offsite

Manufacturing

Home Grown Timber CLT Solutions



UK first CLT manufacture...

AHEC V&A project delivered

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Robotic CNC



Robotic Bricklaying



Assembly Drones



Exoskeleton H&S Vest



Augmented Worker

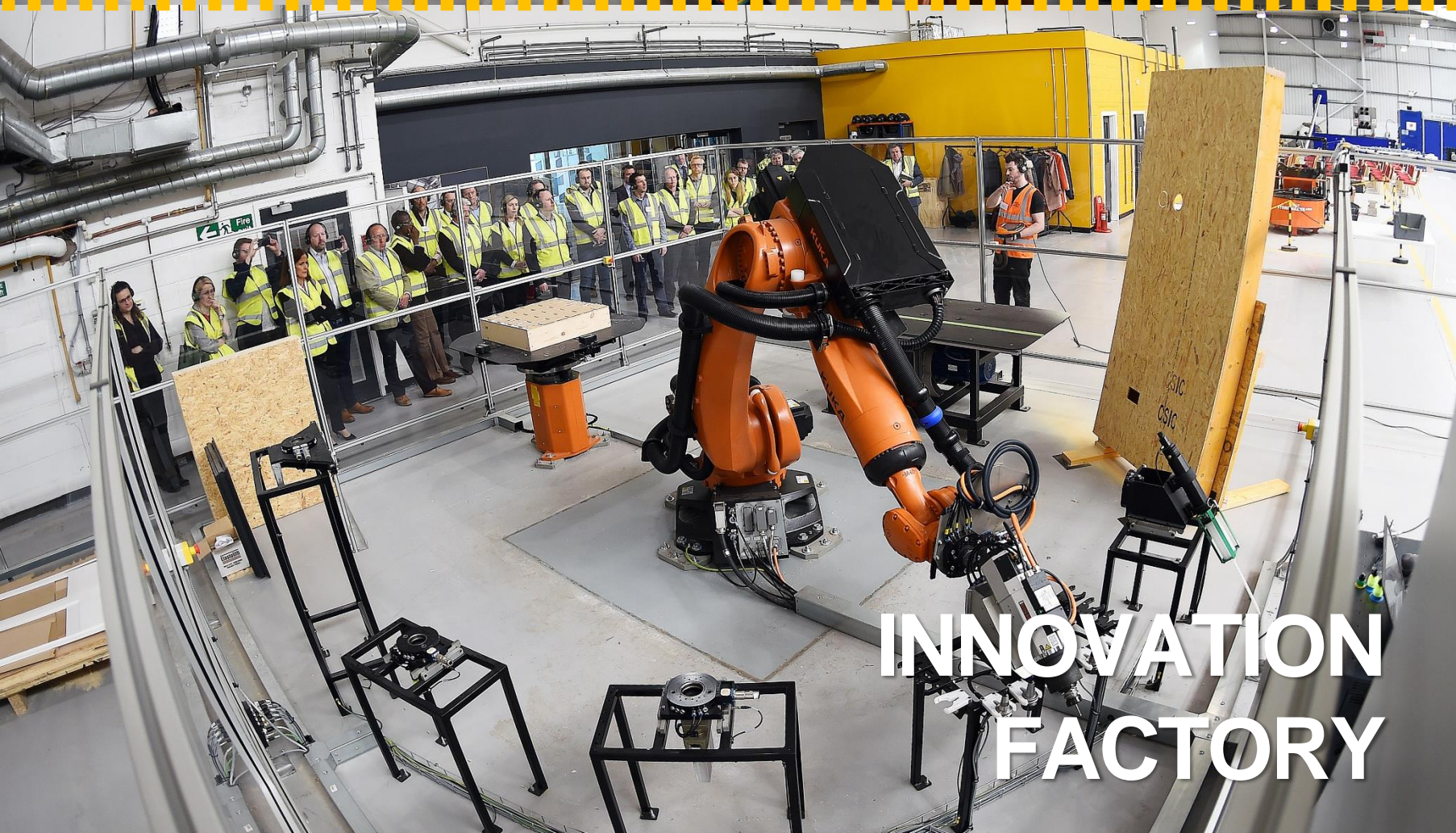




**CONNECTED
ECOSYSTEM**



**COLLABORATIVE
PROJECTS**



**INNOVATION
FACTORY**



**FUTURE
WORKFORCE**

CONNECTED
ECOSYSTEM

INNOVATION
FACTORY



**COLLABORATIVE
PROJECTS**

FUTURE
WORKFORCE

the K-Briq

challenge

70% of building materials will need to be recycled by 2025 and 0% to pass to landfill. Currently 120M tonnes annually produced in the UK.

project

The project is to assess the feasibility and testing of a novel building material made from 90% recycled material from pilot production through to delivery of a demonstration structure with on-going monitoring.

outcomes

- £11m increased turnover for lead partner and supply chain by year 5
- Creation of 20 high value jobs
- 5,355 tonnes of CO₂ per annum saved once 10m bricks/ annum produced

support

- Total Project Value £469,000
- CSIC Funding £214,000
- Project Duration 2 Years



tenement solutions

Challenge

Assessment of hard-to-treat house types in Scotland with regards to retrofit energy efficiency have identified a key challenge of developing a viable solution for tenement buildings which represent c20% of all homes in Scotland and have very poor energy efficiency.

Project

Aim is to establish a robust installation methodology for the use of superbead insulation to improve the energy efficiency of walls in pre-1919 solid wall buildings, and to test its thermal benefits.

Outcomes

- A new solution for hard to treat buildings on the market
- Significant commercial benefits for the lead partner and installer
- Supporting the fuel poverty agenda

Support

- Total project value £59,091
- CSIC contribution £23,143
- Project Duration 12 months



Recovered Toner Powder to enhance water resistance of precast concrete products

Challenge

The industry standard and state-of-the-art process of waterproofing concrete uses either vapour-retarding membranes or low-voltage currents to waterproof foundations. Both methods need constant maintenance to prevent water penetration.

Project

Feasibility study to investigate the potential use of modified toner powder as a permanent integral waterproofing solution at no further cost that also provides aesthetic benefits to the concrete.

Outcomes

- A review of pigmented and waterproof concrete markets, assessment of the commercial scenarios and alternative products and applications
- Feasibility & performance trials
- Increased revenue and workforce for lead company
- Significant Co2 reduction

Support

- Total project value £47,296



Moock Environmental
The Professional Toner Cartridge Recyclers



Scotland's first off-site manufactured Gold Standard housing development

Challenge

With Scotland facing an acute affordable housing shortage, the use of volumetric construction lends itself to providing affordable and sustainable homes within benchmark housing association costs.

Project

48 new modular homes were built offsite using SIPS volumetric techniques - a first for this scale in the affordable sector. Whole life cycle costing, building performance & post occupancy evaluation were carried out by CSIC.

Outcomes

Delivery of Gold Standard sustainable quality housing with high thermal performance built in a significantly reduced timeframe at an affordable cost. Conventional construction times could readily be reduced by 50% a unit.

Support

- Total project value £130,000
- CSIC contribution £61,000
- Project Duration November 2015 – April 2017



commercialisation of homegrown mass timber

Challenge

Engineered timber has seen significant growth in recent years, with Cross Laminated Timber (CLT) becoming commonplace as a construction method across the UK.

Project

The project aims to fully understand the feasibility and therefore potential costs, benefits and constraints of a mass timber manufacturing facility within Scotland for using Scottish timber

Outcomes

- Understanding production capacities of mass timber for the construction industry
- Develop processes and testing of models, focusing on using homegrown materials
- Integration of full Scottish supply chain, from forestry to delivery on site, through a Mass Timber Alliance, Structural Timber Association and Offsite Solutions Scotland

Support

- | | |
|-----------------------|---------------------------|
| • Total project value | £93,000 |
| • CSIC contribution | £50,000 |
| • Project Duration | June 2019 – December 2020 |



construction on peat – feasibility study

challenge

Economic development in Scotland is constrained by a shortage of affordable housing. Prime locations exist but many areas of rural Scotland are covered with peat, presenting enormous construction challenges. Current methods to build upon peaty soils favour excavate and replace which is financially and environmentally costly.

project

The proposed work will unlock innovative options for building foundations, especially in the use of timber piling, as a means of enabling the responsible use of peat sites for housing development and to validate this approach with existing technologies.

outcomes

- Verify the adoption of innovative solutions for construction on peat through research
- Feasibility study to inform a Part 2 project to undertake Field Trials in rural Scotland

support

- Total Project Value £ 75,498
- CSIC Funding £ 19,948
- Project Duration Aug '19 – May '20



**SIMEC LOCHABER
HYDROPOWER 2 LIMITED**



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ECOSYSTEM

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PROJECTS**

INNOVATION
FACTORY



**FUTURE
WORKFORCE**

CSIC skills programmes

**Postgraduate
MSc
Programme**



**TIGH
GRIAN** LTD

**BIM in Practice
Programme**



**College
Innovation
Programme**



Future Equipped - FE Colleges Pilot

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13 of Scotland's 27 FE Colleges



Tunstall

Enabling independent living



Honeywell



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expanding skills programme

**Postgraduate
programme**

**BIM in
Practice
Programme**

**College
Innovation
Programme**

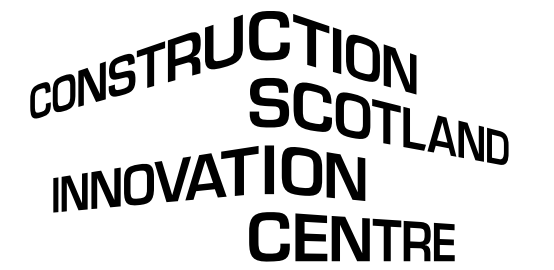
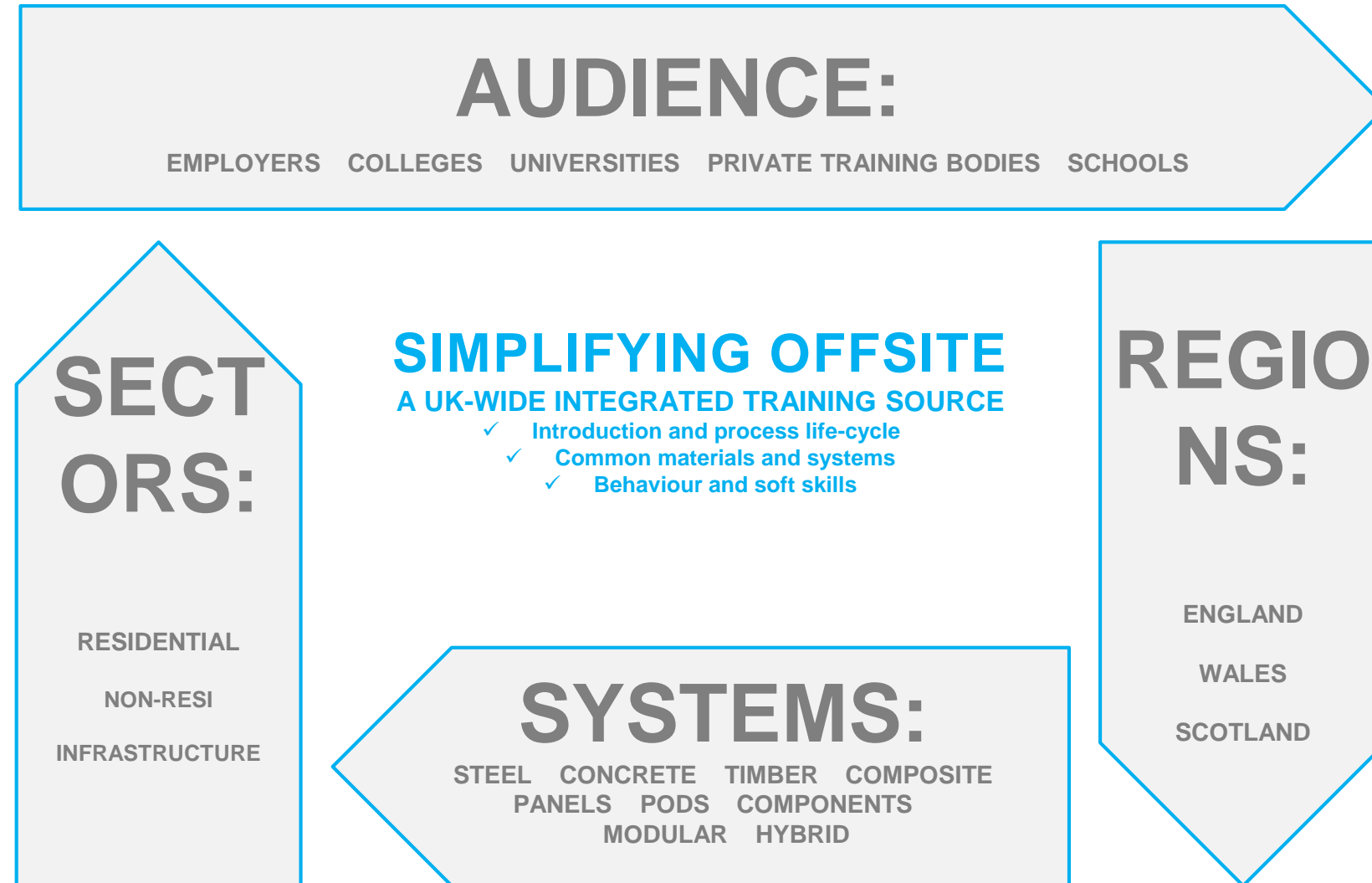
**Immersive
Learning
Programme**

**Offsite
Training
Programme**

**Digital
Skills
Programme**



£700k CITB Improving Offsite Skills Programme



£1.4m CITB Immersive Learning...

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CWc
Canolfan Arloesi Adeiladwaith Cymru
Construction Wales Innovation Centre

citb

Building deconstruction / Working at height/scaffolding
Surveying/drones / Wood/paint spraying machines



LOVELL

NEVIN of EDINBURGH
DECORATORS OF DISTINCTION



**CSIC, open to
collaboration...**

hello@cs-ic.org



+44 141 212 5250



www.cs-ic.org



CSICinnovationfactory



@CScotIC



construction scotland innovation centre



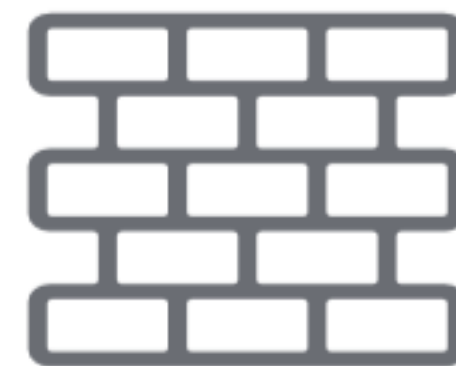
**3 Watt Place, Hamilton International
Technology Park, G72 0AG**



Series projects

PHASE 1 ENQUIRIES **936**

SUPPORTED PROJECTS **299** to date **207** completed



PHASE 2 PROJECT PIPELINE

147 enquiries
this quarter

48 projects already
in development

Investment from industry &
other project partners
(in cash & in kind)=

£14.87M to date



Total Project value: **£18.32M** to date



impact



£829M
additional revenue

£7.89M
cost savings

3274 jobs safeguarded



2600 jobs created



Total CSIC cash
to projects
(academic buy-out)

£2.58M

144 new products
to market

116 new processes
implemented

126 new services
delivered to market

53 new business
models implemented



71

MSc students funded to date

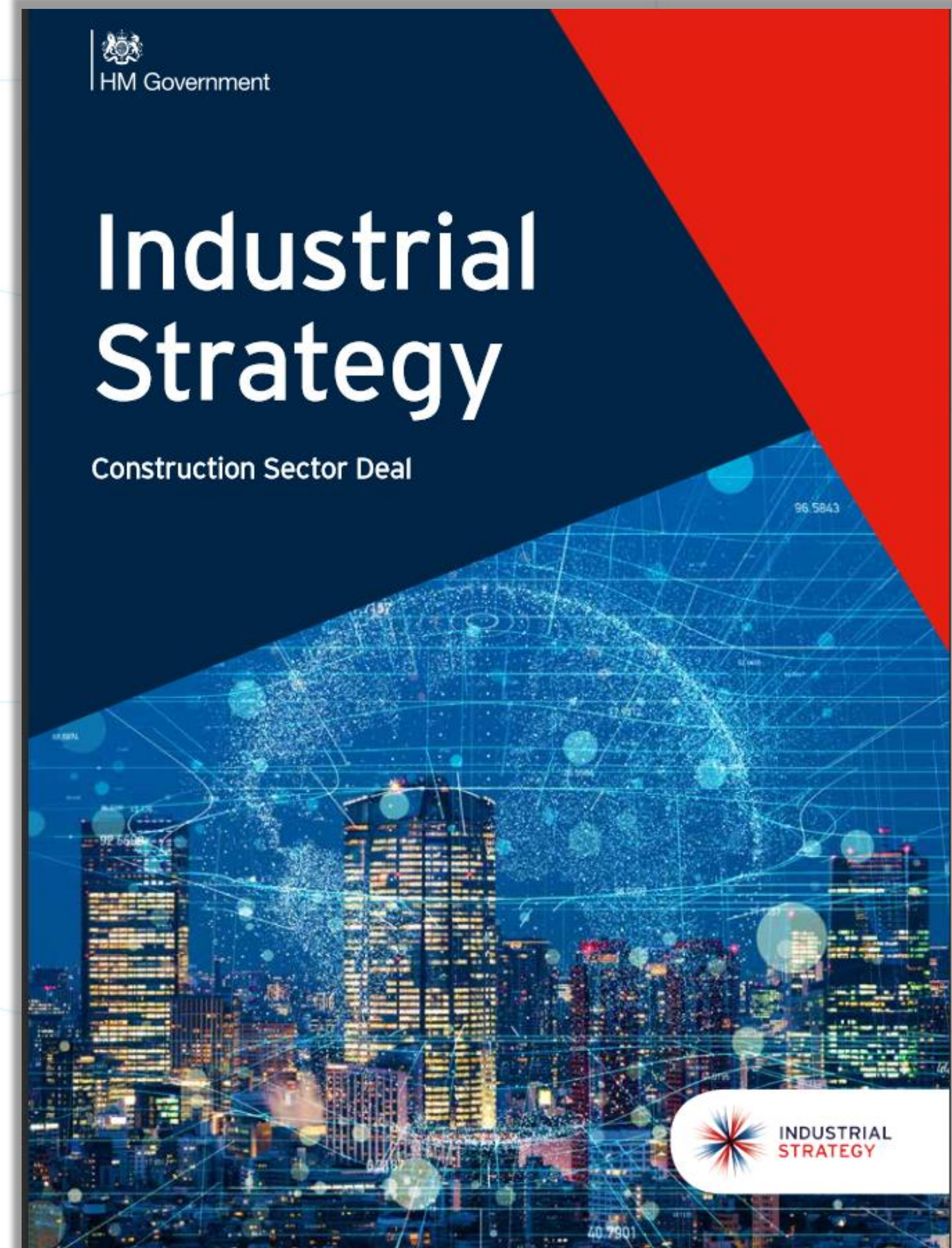
£170m Sector Deal

Transforming Construction

- Design Better (digital)
- Build Better (manufacture)
- Operate Better (energy)



Construction
Leadership
Council



£36m ISCF funding towards Active Building Centre programme

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The Active Building Centre's vision is to transform the UK construction and energy sectors through the deployment of Active Buildings, powered and heated by the sun, contributing to both vehicle electrification and decarbonisation.

The Active Building Centre's mission is to create an independent national centre, to convene industry, academia and government to enable the deployment of Active Buildings.



Prifysgol Abertawe
Swansea University



ISCF – Collaborative R&D...

£3.6m ISCF funding for Transforming Construction Collaborative R&D project



Digitally integrated, manufacturing and
assembly based housing sector



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L&Q



AIM-CH ambition

To deliver offsite construction for the same cost as masonry
& is faster, more productive, safer & higher quality



**DFMA and
Standardisation**



**Off Site
Manufacturing
with Integrated
suppliers**



**On Site Lean
Assembly**



**Homes for
Sale or Rent**



increasing offsite affordable housing in Scotland



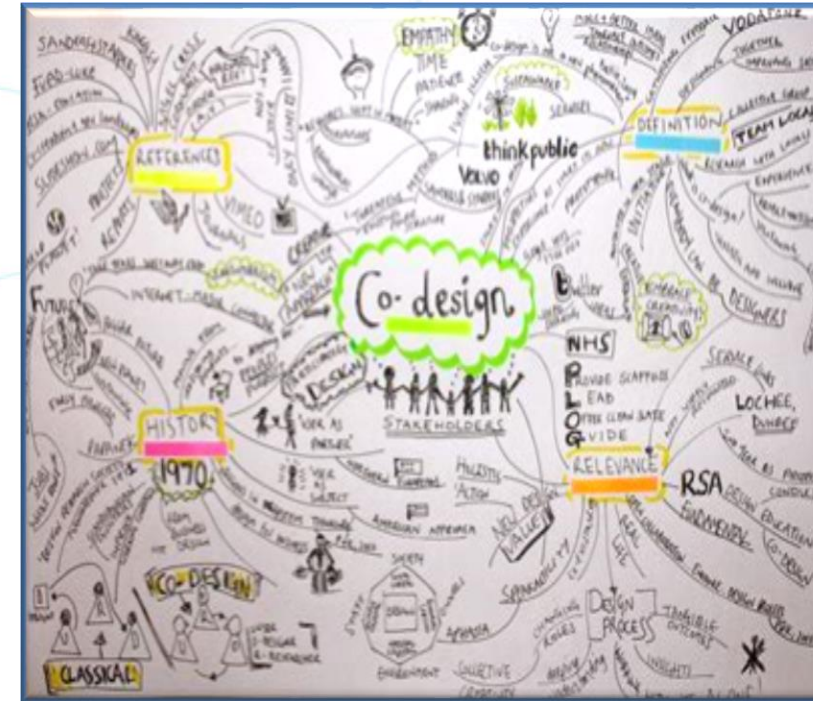
Step 1

Evidence
base for
policy
- quantified



Step 2

Evidence –
current
market
capacity



Step 3

Co-design of
new delivery,
procurement &
policy options



The Scottish
Government
Riaghaltas na h-Alba



Scottish Enterprise

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THE GLASGOW
SCHOOL OF ART

Expanded Offsite Hub

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SCOTLAND