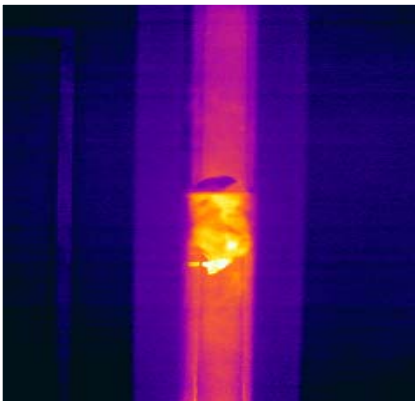


Research, Knowledge Transfer and Testing Facilities at Scottish Universities

Professor Sean Smith
Professor of Construction Innovation
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building performance centre

BPC Overview

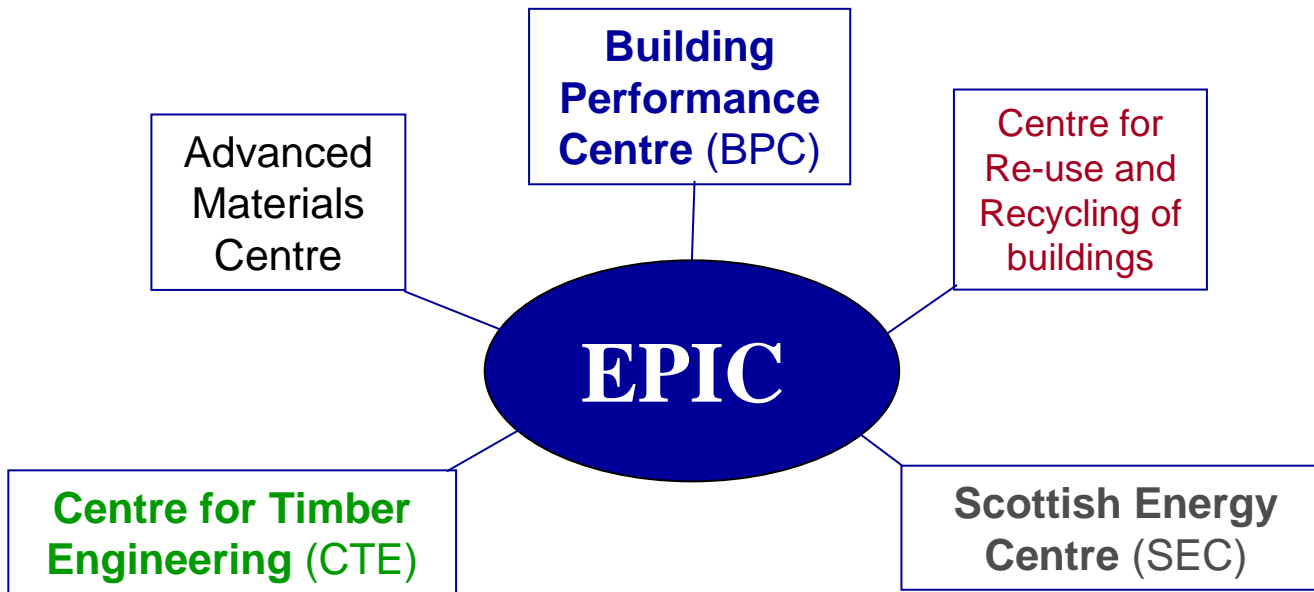


- R&KT with Government and Industry
KT with over 200 companies per year
Covering over 300 sites per annum
120,000 new homes/year use Robust
Detail designs assessed by BPC



EPIC - Partnership

EVALUATING PERFORMANCE OF INNOVATIVE CONSTRUCTIONS



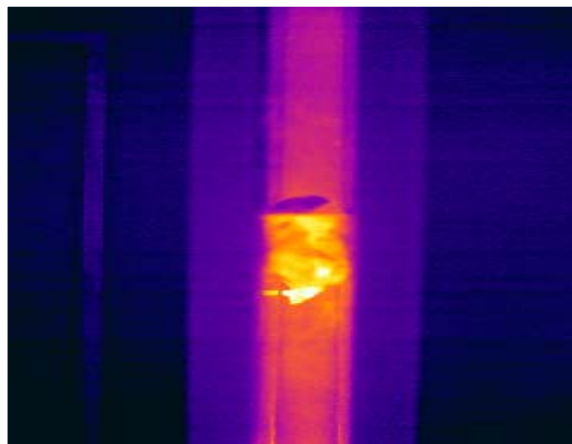
EDINBURGH NAPIER UNIVERSITY
Lead Academic Partner
Accessible for Universities and Colleges



HANGAR
17

New Construction Product Innovation Test Facility

BPAC: HANGER 17



New Construction Product Innovation Test Facility

BPAC: HANGER 17



Outline:

Scottish Construction Sector

Scottish University HE Sector

Facts and Figures

RAE 2008 – Construction sectors

Construction R&KT (Institutes and Centres)

Identifying Testing Facilities

Accessible and identifiable by industry and agencies

Scottish Construction Sector:

£13 billion sector (2005)

161,000 employees (2007/Q2)

41,000 enterprises

GVA per employee £45k (2004), 28% higher than average
Scottish GVA

Scottish University Education Sector:

£2.2 billion sector

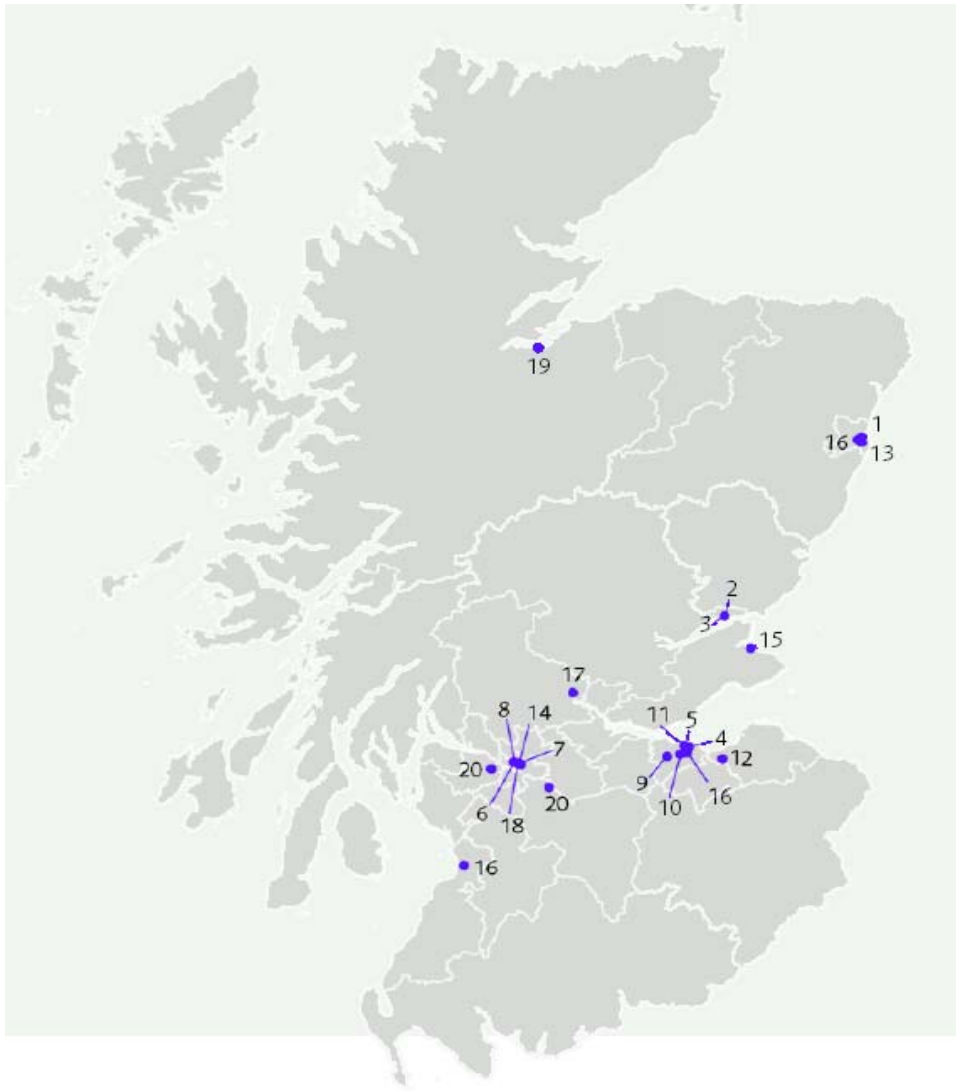
20 Higher Education Institutions (Articulation & Joint initiatives with 43 Colleges)

Research – Theoretical, Empirical, Fundamental, Applied

Knowledge Transfer – Consultancy, CPD, KTP

Outputs – Books, Journal Publications, Conferences

Outputs – Patents, Reg. Design, Partnerships, Spin-outs



- [University of Aberdeen](#)
- [University of Abertay Dundee](#)
- [University of Dundee](#)
- [Edinburgh College of Art](#)
- [Edinburgh Napier University](#)
- [University of Edinburgh](#)
- [Glasgow Caledonian University](#)
- [Glasgow School of Art](#)
- [University of Glasgow](#)
- [Heriot-Watt University](#)
- [The Open University in Scotland](#)
- [Queen Margaret University](#)
- [Robert Gordon University](#)
- [University of St Andrews](#)
- [University of Stirling](#)
- [University of Strathclyde](#)
- [University of the West of Scotland](#)
- [UHI Millennium Institute](#)

18 of the 20 funded HE Institutions

SCOTTISH FUNDING COUNCIL (SFC)

SFC Vision...

A more dynamic, entrepreneurial and internationally competitive Scotland, whose people are amongst the most skilled and educated of many of our competitors, and whose colleges and universities are world-class contributors to economic, social and cultural development.

Income of universities over last three years			
	2004-05	2005-06	2006-07
	£m	£m	£m
Funding Council grants	789	835	921
Tuition fees and education grants and contracts	398	433	467
Research grants and contracts	348	374	417
Other income	323	336	358
Endowment and investment income	29	35	43
Total income	1,887m	2,013m	2,206m

AIM 4: Internationally competitive research

to provide a high quality and internationally competitive research base

AIM 5: Effective knowledge transfer

to generate effective knowledge exchange that stimulates innovation and development

Facts & Figures: Scottish Universities & Research Centres

(Note: Scottish population 8.4% of UK)



Scotland has 0.1% (world population) but produces 1% of all research published output

18 per cent of the UK's total intellectual property revenues

13 per cent of the UK's total number of active spin-out companies under HEI ownership are based in Scotland

'R&KT' Interaction with industry:

Scottish University Average 9p / £1 of 'R' income

Up to 36p / £1 in our modern Universities (Edinburgh Napier / Glasgow Caledonian)

Government and public expect more interaction with our industry sectors/economy (Linking research outputs with Scottish industry)

RAE 2008: CONSTRUCTION SECTORS

<p>SCOTTISH UNIVERSITIES</p> <p>2008</p> <p>Research Assessment Exercise</p>	<p>Percentage of UK Submitted STAFF</p>	<p>4, 3, 2 <i>STAR</i> Rating</p>
<p>Architecture & Built Environment</p>	<p>19%</p>	<p>18%</p>
<p>Civil Engineering</p>	<p>20%</p>	<p>20%</p>
<p>General Engineering / Mining etc</p>	<p>18%</p>	<p>17%</p>

Pooling R&KT Resources:



13 Partnerships

8 have potential links with the Construction Sector

NOTE:

Very important that all 8 groups identify and realise their links and outputs with current AND future construction sector activities

Pooling R&KT Resources:

Glasgow Research Partnership (GRP)

JRI in Electronic, Communications and Power Systems

JRI in Environmental, Infrastructure and Transportation Engineering

JRI in Mechanics of Materials, Structures and Bioengineering

Edinburgh Research Partnership (ERP)

JRI in Energy

JRI in Integrated Systems

JRI in Civil and Environmental Engineering

Northern Research Partnership (NRP)

JRI in Civil Engineering

JRI in Energy and Clean Technologies

NOTE: These groups do not represent all construction and energy R&KT centres in Scottish Universities.

KT: Knowledge Transfer

Consultancy

CPD

Partnerships

Patents

Licensing / Spin-outs

Expert support / Advice

KT Company Placements

SEEKIT

KTP – Knowledge Transfer Partnerships

R&D Plus

Proof of Concept

SUPPORTING

Government Departments /
agencies

Industry Organisations

RSLs / HAs

SME Sector

Multinationals

Company Joint Ventures

Public sector bodies

Voluntary

Not-for-profit organisations

KT: Knowledge Transfer



Knowledge Transfer Partnerships

Accelerating Business Innovation

Knowledge Transfer Partnerships is Europe's leading programme helping businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills that reside within the UK knowledge base.

A Technology Strategy Board programme

www.ktponline.org.uk

Technology Strategy Board
Driving Innovation

The graphic features a dark background with a glowing orange and yellow circular shape on the left. It includes three small inset images: two people in business attire looking at a device, two people working with machinery, and a close-up of a £20 banknote. Several small white squares are scattered around the text.

4 KTP Centres in Scotland

Supporting industry companies for innovation and growth

£220,000+ annual average increase in Turnover due to KTP projects

Scotland has won 12 UK National KTP Awards

WHO? - All business sectors, public organisations and not-for-profit

How much? - 35% to 50% grants

Time periods? – 12 months to 3 years



KTP Centres: Scotland

Scotland

East of Scotland KTP Centre	Judy Brown	0131 455 6541	judybrown@ktpcentre.com
North of Scotland KTP Centre	Robin Brown	01224 262278	r.d.brown@abdn.ac.uk
Tayside KTP Centre	Neil Stewart	07887 528999	Nei1Stewart@aol.com
West of Scotland KTP Centre	Elaine Wallace	0141 548 4442	e.wallace@strath.ac.uk

KT relationships (examples)



The **Concrete Centre**



University R&KT Institutes & Centres:

Snapshot of Institutes and Centres – Apologies: within presentation time scale not possible to present all

Many of these specialist centres are working to support the construction industry and government to address:

Climate change - adaption and resilience

Skills shortages

New construction methods

Energy efficiency

Sustainability – multiple sectors

Demographic changes

Forthcoming regulations and standards

Renewable energy

New technologies, systems and materials

Horizon scanning

Robert Gordon University

Advanced Materials and Biomaterials Research Centre
The Centre for Process Integration and Membrane Technology
Centre for Research in Energy and the Environment
The Renewable Energy Power Systems Subgroup
Environment for Peoples Research Centre

University of Highlands and Islands

Environmental Research Institute
DERC

University of Aberdeen

Institute of Energy Technologies
Institute for Rural Research
Aberdeen Centre for Environmental Sustainability
Centre for Transport Research

University of Dundee

Advanced Materials Centre
Centre for Remote Sensing and Environmental Monitoring (CRSEM)
Concrete Technology Unit (CTU)
Geddes Institute for Urban Research
Joint Centre for Scottish Housing Research

Edinburgh Napier University

Centre for Timber Engineering
Centre for Infrastructure Research
Scottish Energy Centre
RMP Acoustics
Building Performance Centre
Advanced Materials Centre
Biofuel Research Centre
Transport Research Institute

University of Edinburgh

Institute for Materials and Processes
Institute for Energy Systems
Institute for Infrastructure and the Environment
BRE Centre for Fire Safety Engineering
Scottish Environment Technology Network
CLARRC

Heriot-Watt University

Scottish Institute for Sustainable Technology
Energy Academy
Centre for Environment and Human Settlements
International Centre for Island Technology

Glasgow Caledonian University

The Centre for Research on Indoor Climate and Health
Caledonian Environment Centre
Sustainability Centre
Centre for the Built Environment
Scottish Construction Centre (also with Dundee University)

University of Strathclyde

Centre for Economic Renewable Power Delivery
Scottish Energy and Environment Foundation
Energy Systems Research Unit
Institute for Infrastructure and Transport Engineering
Institute for Energy & the Environment, Power and Energy Systems
David Livingstone Centre for Sustainability
abacUS & KRAFT

University of Glasgow

Mechanics & Materials Research Group
European Centre for Occupational Health, Safety and the Environment
Water & Environment Research Group
The Digital Design Studio
Mackintosh Environmental Architecture Research Unit

Measurement / Assessment / Laboratory / On-site

Acoustics, sound insulation, vibration

Advanced microscopes for material analysis

Air tightness, air quality and thermography

Energy efficiency and performance

Environment, contamination, reclamation, remediation

Fire resistance, smoke penetration, means of escape

Fluids, pipeworks, building services, system operations

Non destructive testing (NDT)

Structural and lifespan properties of materials

Resilience and absorption

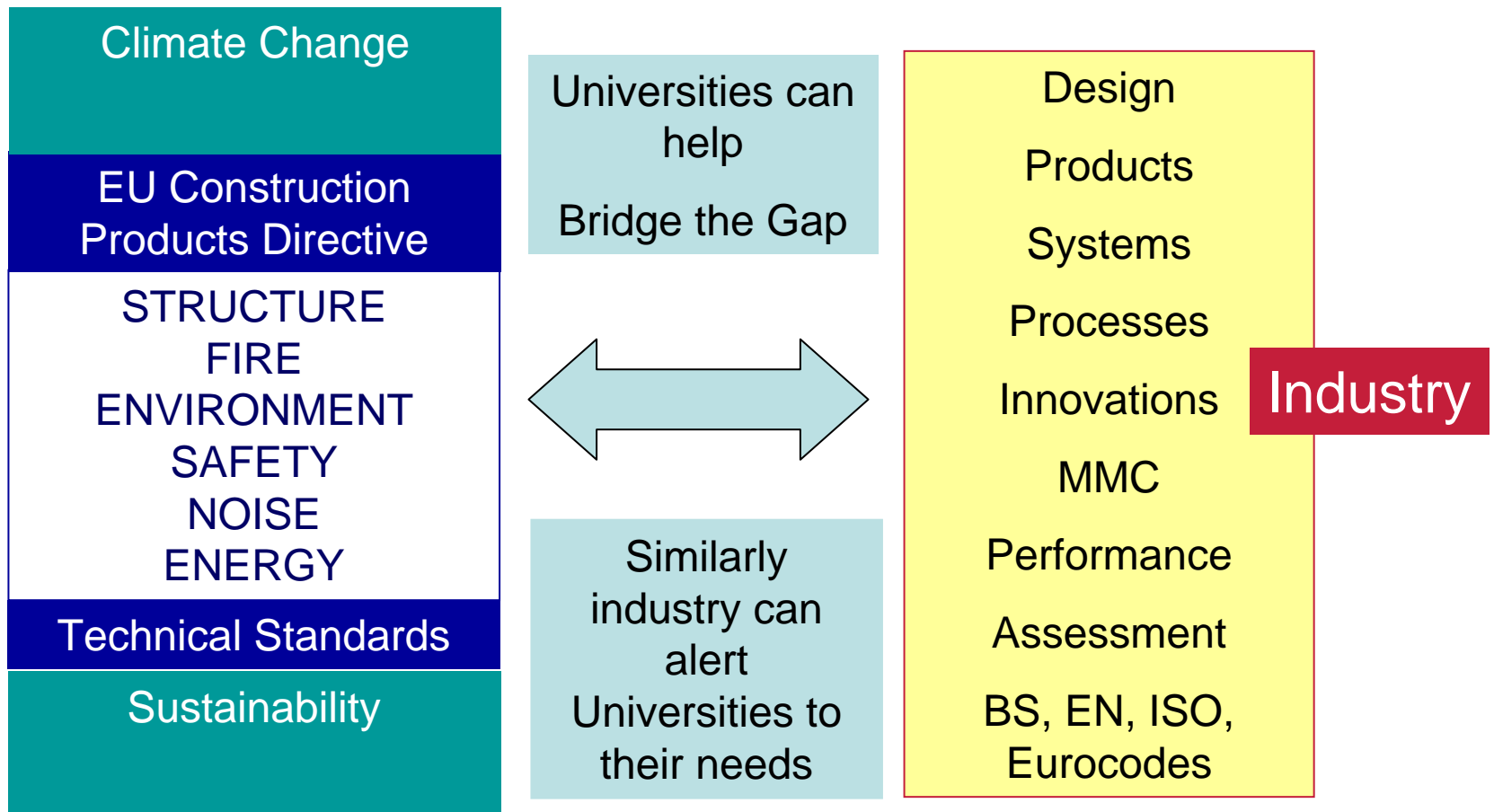
Solar, PV, CHP, Fuel cell, Wind, Wave, Tidal, Microhydro

Waste, recycling, re-use, renew, zero-waste

Modelling / Prediction / Robusting / Horizon scanning

TECHNICAL STANDARDS:

Industry will need to meet and surpass technical standards and building regulations. Also address other key issues:



3-Way Bridge (Universities, Industry, Gov/SE):

Universities need to work with industry and Scottish Enterprise more.
Gov / Scottish Enterprise needs to assist Universities link to industry
(Knowledge Transfer Networks are helping)

Centralised web portal of key R&KT Centres and Institutes, portal of key testing facilities accessible for industry to search

Search tool and descriptors arranged by e.g. Technical Standard, Product Sector and/or Physical Parameter (industry terminology)

Experts in Universities should be more clearly identifiable/locatable by Industry, Industry sometimes unaware of experts so close, Industry should always be observing new Proof of Concept funded projects on SE website

Universities should fully evaluate the possible KT income output before the KE publishing output

(Win for Industry, Win for Universities, Win for Scottish Economy!)

SUMMARY

Significant R&KT Centres with expert staff

Low carbon economy – Scotland potentially well placed (more outputs req.)

Interface does provide links www.interface-online.org.uk

Online web link service for Construction sector is needed

BUT

Will need accelerated action linking Institutes / Centres with industry

Construction sector facing significant issues over the next decade

More reward for KT activity from Government

“New Horizons” funding stream from SFC may assist

Better acknowledgement by Universities of KT activity - incentives

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