Research, Knowledge Transfer and Testing Facilities at Scottish Universities

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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

Advanced Materials Centre
Building Performance Centre (BPC)
Centre for Re-use and Recycling of buildings
Centre for Timber Engineering (CTE)
Scottish Energy Centre (SEC)

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.

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)
<table>
<thead>
<tr>
<th>SCOTTISH UNIVERSITIES</th>
<th>2008 Research Assessment Exercise</th>
<th>Percentage of UK Submitted STAFF</th>
<th>4, 3, 2 STAR Rating</th>
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<tbody>
<tr>
<td>Architecture &amp; Built Environment</td>
<td>19%</td>
<td>18%</td>
<td></td>
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<tr>
<td>Civil Engineering</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>General Engineering / Mining etc</td>
<td>18%</td>
<td>17%</td>
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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.
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

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

<table>
<thead>
<tr>
<th>Centre</th>
<th>Contact Person</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
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KT relationships (examples)
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**
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:

- Climate Change
- EU Construction Products Directive
- STRUCTURE
  - FIRE
  - ENVIRONMENT
  - SAFETY
  - NOISE
  - ENERGY
- Technical Standards
- Sustainability

Universities can help Bridge the Gap

Similarly industry can alert Universities to their needs

Design
- Products
- Systems
- Processes
- Innovations
- MMC
Performance Assessment
- BS, EN, ISO, Eurocodes

Industry

Edinburgh Napier UNIVERSITY
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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