

## Linking Business and Science: The Scottish Experience

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Lithuania May 2007

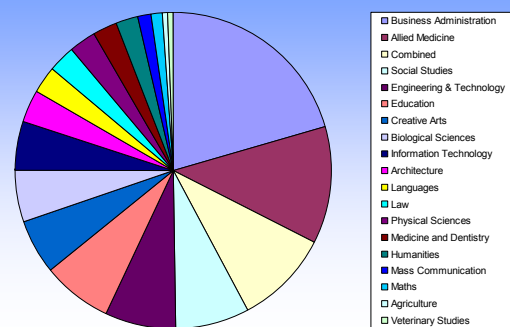
## Overview

- Background
- Why should Business link with Science ?
- How can Business link with Science?
- How does it work in Scotland?
- Challenges
- Summary

## Background - Scottish Higher Education

- Funded by Scottish Funding council
- £1.5 billion per year
- 20 Universities - Degrees
- 43 Further education colleges – National qualifications
- Total of 285,180 students in Higher Education in 2005-6
- 46% young people in full time education

## Background - Students in Higher Education 2005-2006



## Background - Robert Gordon University

	1999-00	2004-05	2005-06
Grand Total	187,380	224,390	234,220
Total HEI	187,380	224,390	234,220
Total FEI	72,005	52,315	50,960
Robert Gordon University	10,395	12,440	12,530

[www.scotland.gov.uk/topic/statistics](http://www.scotland.gov.uk/topic/statistics)

## Background - Robert Gordon University

- Wide Range of Courses
  - Business School
  - Faculty of Health and Social Care
  - Faculty of Design and Technology
- Strong applied aspects

### UKs top University for graduate employment

86.4% graduates good jobs  
1.9% unemployed 6  
months after graduation

## Background - Scottish Business 2006

- 265,640 businesses
- 2.5 million employed
- Mainly SMEs

	Numbers of employees		
	0 - 49	50 - 249	250 +
Enterprises	98	1	1
Employment	30	10	59
Million £ of Turnover	27	13	59

www.scotland.gov.uk/topic/statistics

## Why?- UK Government Policy

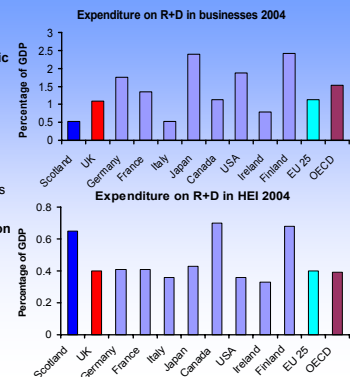
- Government Policy 2004-2014
  - Lambert Review 2003
  - DTI Innovation report 2003
  - Recognition of needs and challenges

## Why? - Scottish Executive Policy

- Framework for Economic Development 2000  
*'private enterprises will be the key driver of the new economy, increasingly focussed on the generation and application of knowledge and on innovation.'*
- 'The Executive will give priority to the approach to enterprise support, particularly: **supporting innovation and the commercialisation of research by business and industry**'
- Scottish Funding Council Corporate Plan 2006-9  
*Aim 5: 'to generate effective knowledge exchange that stimulates innovation and development in public and private sector organisations and enterprises'*

## WHY ? - R+D in Scotland

- Business R+D determinant of productivity growth and economic performance
- £584 million
- Employs 7,400 people
- Large companies ~ 72% R+D
- 50% staff - Scientists and Engineers
- Higher education R+D £610 million
- 12.8% UK total
- 0.65% Scottish GDP
- Top of UK regions
- 1st Quartile OECD countries



## Why?- Contributions to Scottish Economy

- Life Sciences - 590 companies
- Employ 30,000 people
- Growth 7-8% per annum
- Turnover £2.5 billion
- Add £1 billion value to Scottish Economy

## Why? - Research funding and IP

### Business links with Science

- Knowledge
- Know how
- Recruitment
- Equipment
- Tax benefits
- Innovation
- IP

### Science links with Business

- Research funding and/or staff
- Compounds/equipment
- Focus/ Rationale
- Career/ employment
- Funding

Risk Reduction

Assessment Targets,  
Funding

## How ? – Linking Business and Science

### 4 main models

- Open Science model
- Licence model
- Interaction model
- Spin off model

After Capart 2005

## How?- Key issues

- Communication
- Context
- Capacity
- Capability



**CONFIDENCE**

## How? - Communication

Science should address the needs of Business

Role for National Science Strategy

## How – Communication

### Scottish Executive

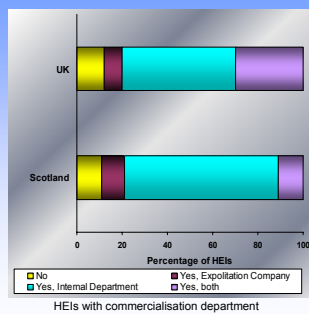
#### Robert Gordon University

#### SEEKIT Project

- Funds Technology translators
- Links between SMEs and RGU staff
- Matched funded consultancies
- Database
- Builds SME confidence and networks
- Leading to longer term collaboration

## How ?- Capability

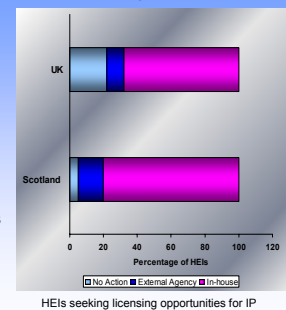
- 395 staff in all HEIs
  - 49% engaging with business
- Consultancy
  - income £18,568
  - mainly SMEs
- Collaborative research
  - 2,954 contracts,
  - value £62 million
    - £4.2 million from SMEs



## How ? - Capability

### 2003-2004

- IP licensing
  - cost ~ £1.7 million
  - Income £4.2 million
    - £4 million from non SMEs





## How ? Direct Industry Links Robert Gordon University

- Industry Scholarships
- Work placements
- Sponsored PhDs



## How ? Direct Industry Links Robert Gordon University



- Collaboration
  - SiGEN Ltd- design small scale energy systems based on hydrogen and renewables
  - Robert Gordon University - research projects and expert support
  - SiGEN - projects for undergraduate and postgraduate students

## How ? – LINK

- **LINK**
  - Academic/Industry Linked programme - pre-competitive
  - 140 projects funded with 180+ companies
  - Combined DTI commitment of nearly £29m
  - Wide Range of Areas
  - 50% Matched funding Government

**Rowett Research Institute and Meat and Livestock Commission**

**Problem:** Eating Quality of Meat

**Solution:** Information on factors causing variability

## How ?- Knowledge Transfer Partnerships

- **Knowledge Transfer Partnerships**
  - Industry driven -knowledge, technology and or skills from Academia
  - KT via projects undertaken by person working in the company.
  - Partnership part funded by a govt for academic costs
  - Increased profits - 2005/06 after project av 1 annual profit £291k.

**QuanteX Wellbore Instrumentation/Robert Gordon University**

**Problem:** Need for reliable digital communication system

**Solution:** Working with School of Engineering



- Simulation model
- Prototype high performance communications for downhole and subsea use
- Evaluated performance of prototype

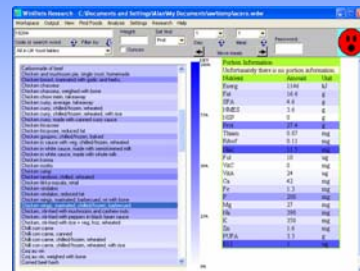
## How ? – Collaboration with Industry

### Wyeth Translational research programme

- Centre of Excellence in Dundee – 50 jobs -120 over 5 yrs with collaborative network in 4 Universities and NHS Scotland
- £50m for clinical/biomedical research
  - £33 million Wyeth, £17.5 million Scottish Enterprise
- Support for translational research

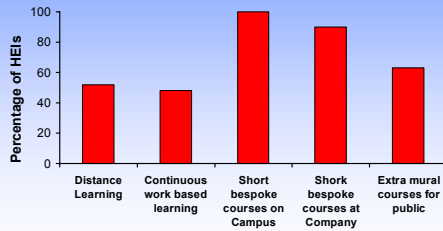


## How?- Direct Links Research based products - Windiets



Dr Alan Wise

### How? – Direct Links –Courses Provided by HEI in Scotland



From: Higher Education - Business and Community Interaction Survey 2003-2004

### How ?- EU funded Collaboration

- Framework Programme
  - Quality Pork Genes
  - Academic partners
  - Commercial Partner

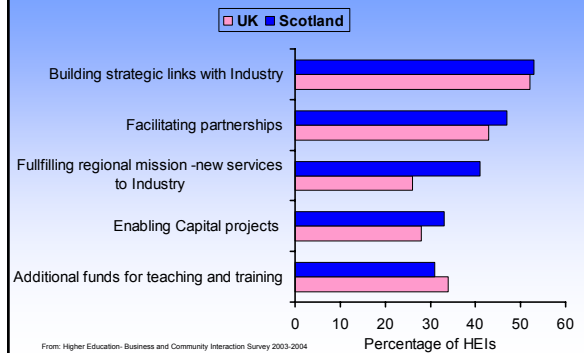
### How? – EU FP 7

- Research for the Benefit of SMEs  
**€ 1336 million** for FP 7 ( 2007-2013)

1. Supporting SMEs outsourcing research activities
2. Developing and coordinating support to SMEs at national level
3. Support measures

[http://cordis.europa.eu/fp7/capacities/research-sme\\_en.html](http://cordis.europa.eu/fp7/capacities/research-sme_en.html)

### How ? - Role of EU and UK Govt Economic Regeneration Programmes



From: Higher Education - Business and Community Interaction Survey 2003-2004



### How? - Licence Model

Nitrate selective membrane for use in food and environmental situations

Licensed to FLUKA



Dr Paul Kong

### How ? Incubators and Business Parks

- Sizeable network
- Often linked to HEIs
- Various owners
- Business support

## Successful Scottish companies Spin offs and developments

Many examples across Scotland

- Robert Gordon University
  - Video Labs
  - B1 Medical
- Aberdeen University
  - Haptogen
- Rowett Research Institute
  - Sirco

## Challenges - Funding

- Government funding
  - Review identified need to bridge funding gap
  - £178m by 2007-2008 for collaborative R+D and KT Networks
- Enterprise Funding
- Venture Capital

## How ? Proof of Concept Fund

The Proof of Concept Programme focused on funding gap

### •Aims

- improve level and quality of commercialisation by funding early stage development
- facilitating exploitation of technologies
- contribute to knowledge-based economy
- Fund helps to improve IP position by:
  - extending applicability of IP
  - underpinning the validity of IP claims
  - demonstrating utility and commercial value of IP

## Challenges - Licence model

- Cost of Patent protection
- Making contact with Commercial partner
- Speed of response
- Quality of IP package
- Valuation of IP
- Role of other agencies

## Challenges – Motivation of Scientists

"People respond to incentives; all the rest is commentary"  
- Steven Landsburg, *The Armchair Economist*

- Management
  - Best scientists - administrators
  - Mavericks
  - Role of 'citation index'
  - Recognition of innovation
    - Support staff
    - Liability cover
    - Rewards to Inventors Schemes
- Incentives not penalties

## Summary

- Links between Business and Science are vital for economic growth
- Science strategy needs to consider business
- Communication, context, capability and capacity are key issues and give businesses confidence
- There are a number of ways to achieve partnerships
- Central funding is very important
- Motivation of the scientists is essential
- There are a lot of opportunities