

University-Industry Collaboration: An issue for Ireland as an Economy With a High Dependence on Academic Research

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THE CIRCA GROUP
EUROPE

www.circa.ie

CIRCA Group Europe

- **Founded in 1991 – consultancy company in Innovation policy and RTD management**
- **12 Consultants, all with significant experience of European Innovation and STI issues and systems.**
- **Founder member of European Techno-Economic Policy Support network (www.etepe.net).**



CIRCA Group Europe

- **Examples of Current / Recent Projects:**
 - Development of Research Strategy for Institutes of Technology (2007-)
 - Use of the healthcare system to support healthcare companies and start-ups (2007)
 - Revision of Lithuanian R&D funding mechanisms and programmes (Lithuanian Science Council: 2006-'07)
 - Assessment of Industry Views on R&D Facility needs of Irish Universities
 - The Bio4EU project to assess the Consequences, opportunities and challenges of modern biotechnology for Europe. <http://bio4eu.jrc.es/>
 - Analysis of changes in publication & citation rates from publicly funded healthcare research
 - + client company projects



Presentation Outline

- The Context
- The Project Task
- Results



Background



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Features of Irish STI System

- Very low public investment in R&D before 2000
- Historically low industry R&D spend:
 - Among indigenous companies for historic & competence reasons
 - Among Multinational companies for tax reasons
- Current policy is to invest heavily in R&D capacity to:
 - Maintain attraction of Ireland for Multinationals: 1,000+ foreign cos. located in Ireland (employing 135,000+)
 - Develop high-tech indigenous companies
- But..... Only one major Applied R&D institute (Teagasc)
- Therefore high Dependence on HE Sector as a source of innovation



Table 6.5: Indicative Allocations of RTDI Expenditure 2000-2006

Research, Technological Development & Innovation			
	National € million	BMW Region € million	S&E Region € million
Industry	1,506		
Education & Science	698		
Agriculture/Food (incl UnaG)	171		
Marine	64		
Environment	32		
Total	2,471		

".... There will be a major accelerated increase in Research, Technological Development and Innovation (RTDI) investment with the objectives:

- to strengthen the capacity of Irish third level institutions and other research establishments to conduct research relevant to the needs of the Irish economy;
- to strengthen the capacity of Irish firms to assimilate the results of R&D into their products and processes, and;
- to provide support for sectoral research in agriculture, food, marine and the environment...."



2000 - 2006



BUILDING IRELAND'S KNOWLEDGE ECONOMY

*The Irish Action Plan For Promoting Investment
in R&D to 2010*



*Report to the
Inter Departmental
Committee on Science,
Technology and
Innovation*

“Ireland by 2010 will be internationally renowned for the excellence of its research, be at the forefront in generating and using new knowledge for economic and social progress, creating well paid jobs and improved standards of living and catalysed by a national pro-innovation culture ”.

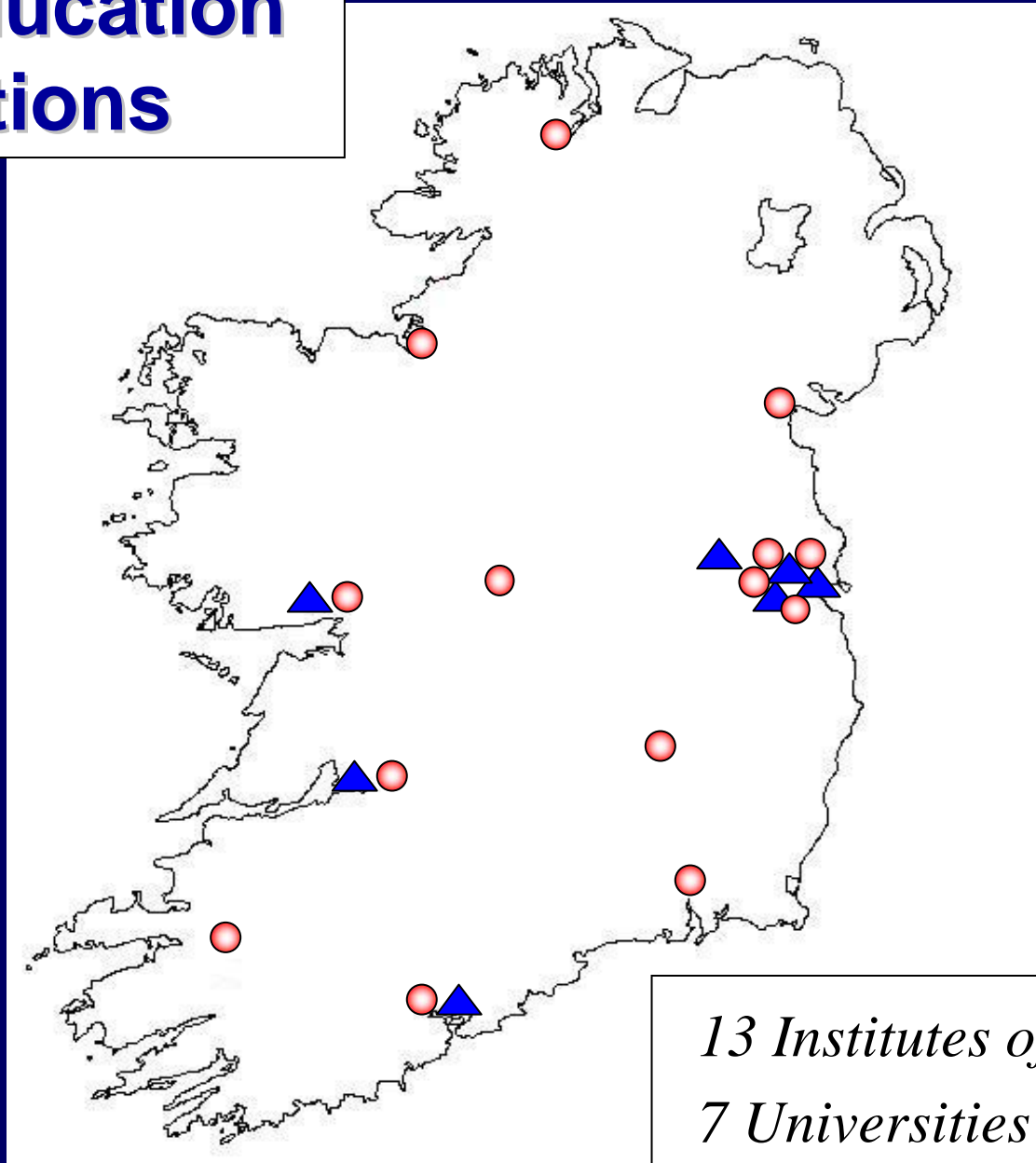


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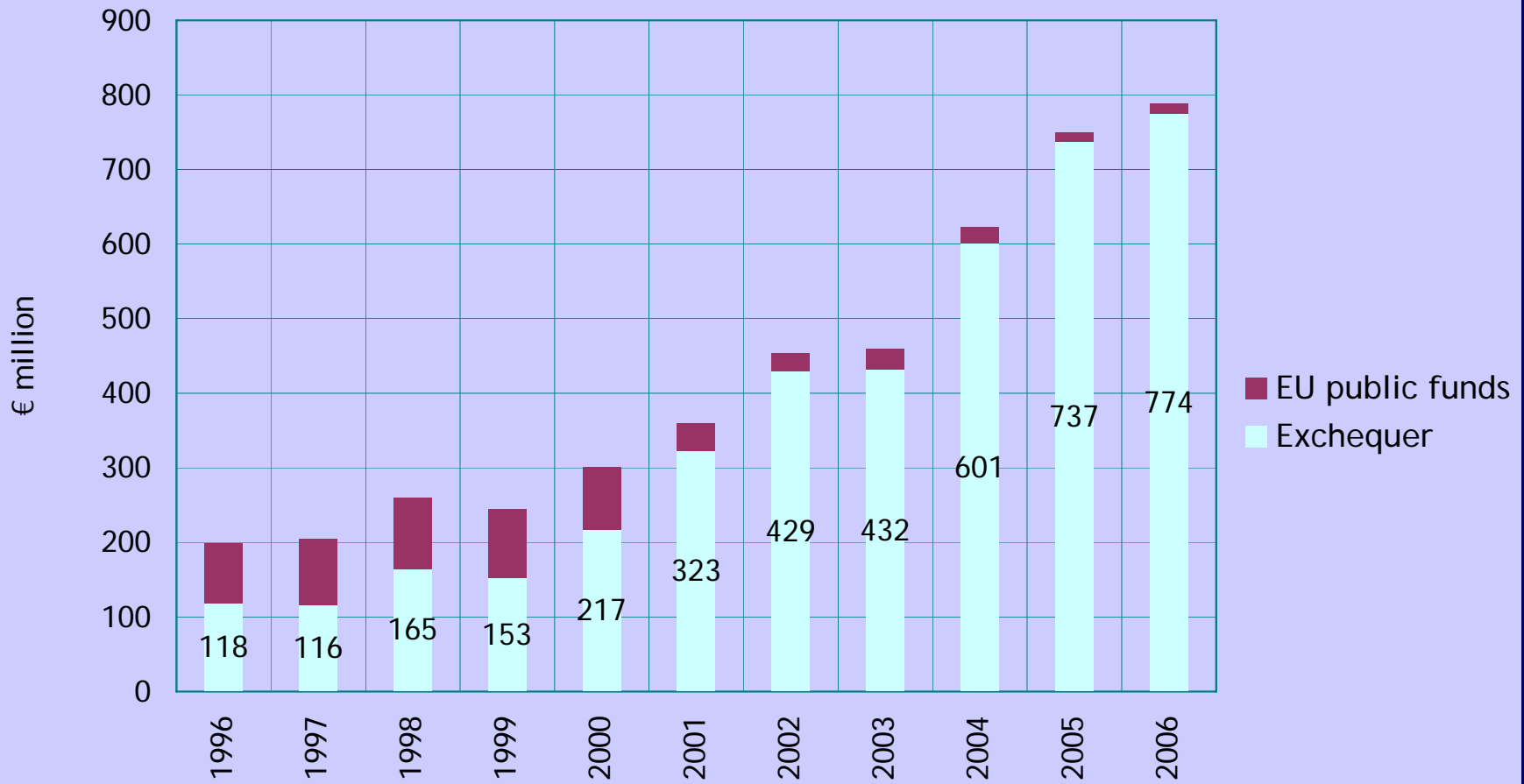
Report by a high-level Inter Departmental Steering Group - 2004

www.circa.ie

Higher Education Institutions



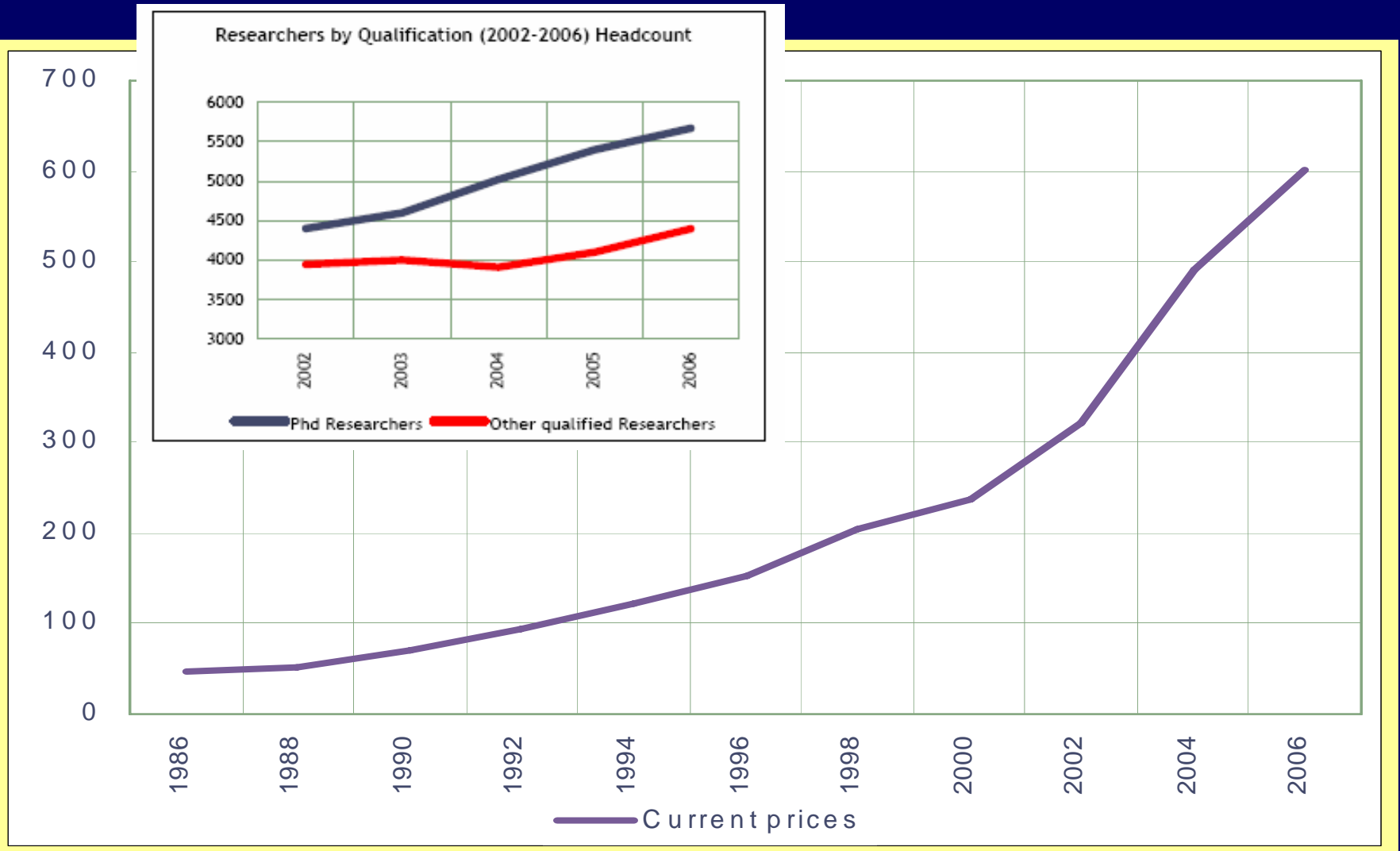
13 Institutes of Technology ●
7 Universities ▲



Public funds for Research and Development,
1996 - 2006 (constant prices)



R&D expenditure performed in higher education sector (HERD) 1986-2006 (current - €m)



The Project



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Enhancement of Research Collaboration between Enterprises and HE Institutions

Project conducted for Forfás (www.forfas.ie) – Irish Agency for Industrial and STI Policy

Background Support for the Advisory Council for STI (ACSTI)

CIRCA team included:

- Brendan Wafer
- Mike Fitzgerald
- Prof Denis Gray, Univ. North Carolina
- Dr Wolfgang Polt, Joanneum Institute, Vienna

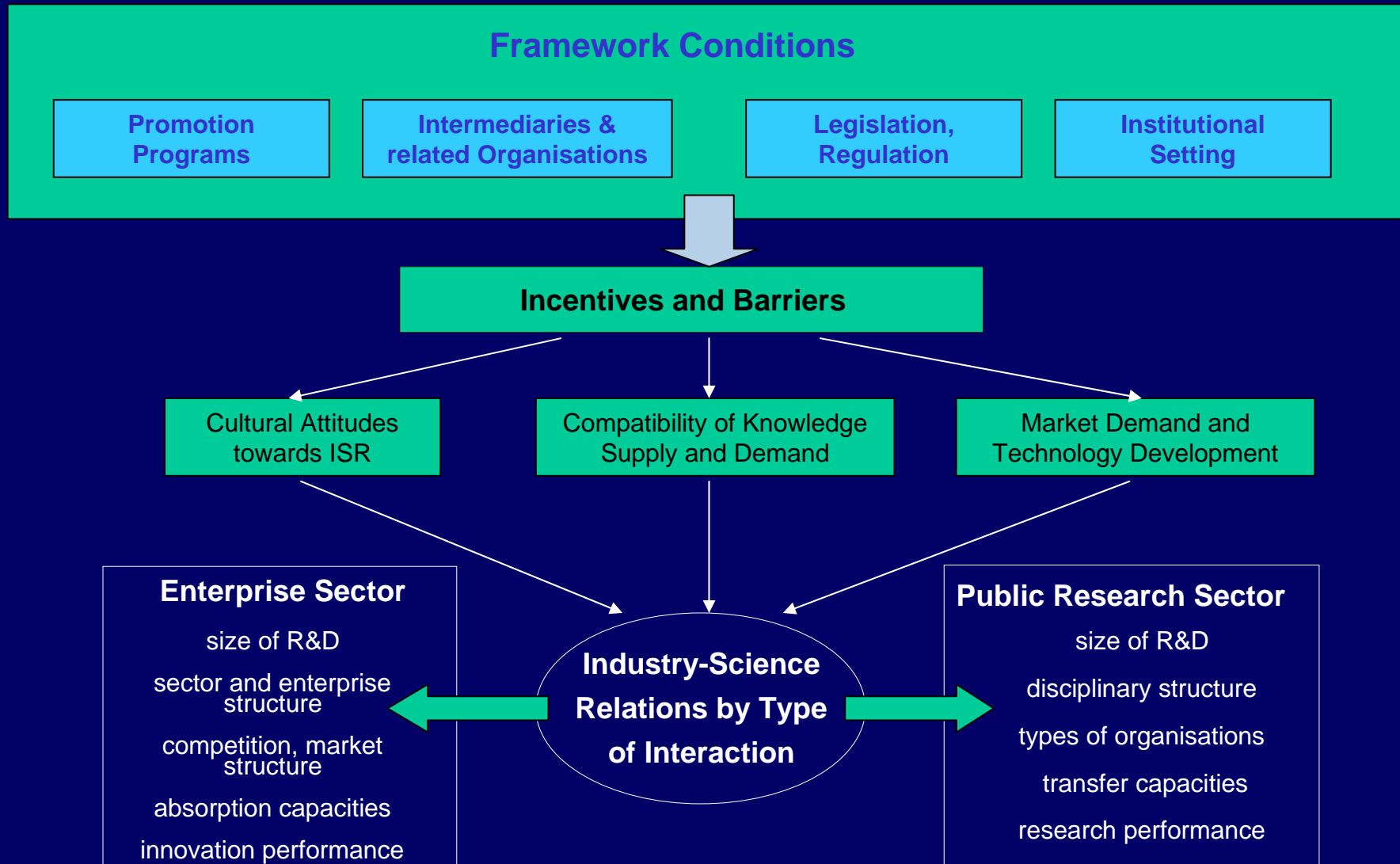


Objectives

- To provide an assessment of the current status of HE-Industry collaboration through the views of industry and HE players.
- To propose improvements to the process of interaction between Higher Education (HE) and Industry.
- To identify and assess practical measures which might be used to promote collaborative R&D in an Irish context.



A Conceptual Model of Industry-Science Relations (ISR)



Variables in effectiveness of HE-Industry performance

Characteristics of the major actors: structure and performance of enterprise sector determines the demand. Structure and performance of the HEI sector determines knowledge supply capacities.

Framework conditions: The nature of public supports, legislation and regulation, institutional attitudes and practices will determine the barriers and incentives to interaction.

Interaction practices: There are many formal and informal channels of interaction. Different companies and sectors have their preferences

In summary, effective collaboration requires a matching of research competence and interests of HE, and commercial interest, resources and translational competence of industry



Project Phases

1. Consultation with relevant organisations re current practice and activity
2. Focus Groups with academic researchers and industry
3. Review of International practices & models:
 - **In USA**
Prof. Denis Gray, North Carolina State University
 - **In selected EU countries** (Denmark, Austria, Finland & Belgium)
Dr. Wolfgang Polt. Joanneum Institute, Austria
4. Brainstorming Meeting



Academic Focus Groups (x 4)

Group	Attendees
Researchers involved in industry collaboration	14
Researchers not currently or never involved in industry collaboration	8
	22



Industry Focus Groups

19 companies - 3 groups

- Companies chosen as (a) representative of major industrial sectors, (b) active in R&D performance and (c) experienced in HE collaboration
- Healthcare: mainly medical device and pharmaceutical companies
- ICT: software, communications and electronics companies. Recruited by Irish Software Association, ICT Ireland and direct invitations
- Others: food, engineering and specialty products companies



Discussion Points in Focus Groups ..1

What issues would need to be addressed for you to increase your level of collaboration by 20%?

Motivation – what's in it for you / costs / benefits?

Role of funding mechanisms?

To increase collaborative research between Higher Education institutions and Industry, what practical things might be done by:

- (a) Higher Education institutions?
- (b) Industry?
- (c) The State?

Optimum time available for HEI-Industry collaboration?

.....



Discussion Points in Focus Groups ..2

Which of the following Models would best suit you and encourage you toward greater HEI-Industry collaboration?

A	University Research Team with Principal Investigator (PI)
B	Research Network (Virtual Institute)
C	Collaborative Research Centre (small 200k - 500k per annum)
D	Research Institute / Centre
E	Independent Research (and Training) Centre on University Campus
F	Independent Research & Technology Transfer (TT) Centre on or off University Campus



The Findings



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Major Findings

Virtually unanimous Industry view that collaboration with Irish HE is difficult, and that opportunities for interaction are being lost.

Consistent view, from academic researchers and industry, that HE institutions have not created an infrastructure or management system which is effective in supporting industry collaboration.

Academic researchers widely perceive industry collaboration as unattractive in relation to other forms of research interaction.

Part of the lack of attraction is the perception of uncertainty as to whether HE managements value industry collaboration, or take such activities into account in career progression decisions.



% income from Industry dropping sharply

College A - Industry Research income 2001-2005 (€000)

	2001	2002	2003	2004	2005
Total Research Income	23,752	42,045	52,029	58,590	64,690
Research income from Business & Industry	1,094	2,077	1,593	2,334	1,282
% income from industry	4.58	4.73	3.05	3.98	1.98

College B - Industry Research Income, 2001 – 2005 (€000)

	2001/02	2002/03	2003/04	2004/05
Total Research Income	26,796	32,258	46,005	57,909
Research grant income with Industry involvement	1,794	1,538	1,346	1,925
% income from industry	6.7%	4.8%	2.9%	3.3%

Recent HERD data (2005/06) show industry income as 2.5%



University Management View

- Universities acknowledge that researchers do not favour industry research, but do not perceive a problem
- ‘Industry’ activity is generally interpreted as spin-off activity rather than support for existing industry
- Colleges are increasingly unwilling to engage in research where they do not own the IP
- Several colleges preparing guidelines to discourage academic researchers from involvement in low-tech and service projects – implications for SMEs



Synopsis of Focus Group/ Brainstorming views

Industry View	HE View
<p style="text-align: center;">Incentives</p> <ul style="list-style-type: none"> ● Outsourcing or expanding R&D ● Involvement in 'blue sky' research, allowing best mix of applied and blue sky element ● Access to funding mechanisms – eg Framework Programmes ● Leverage of knowledge ● Access to specialised equipment ● Extended networking opportunities with other companies ● Access to staff for recruitment 	<p style="text-align: center;">Incentives</p> <ul style="list-style-type: none"> ● Leveraging funds for research ● Exposure of students to industry and possible employment ● Obligation to society/development of jobs and economy ● Understanding of new technologies and issues enriches teaching ● industry partners for EU Framework and national programmes. ● Personal gain, grants for students, patent potential or travel grants ● Access to important facilities and equipment.



Synopsis of Focus Group/ Brainstorming views

Industry View	HE View
Barriers	Barriers
<ul style="list-style-type: none"> • HE governance - poor process for industry interaction, low support by management; negotiations and bureaucracy are slow & difficult. (The <i>'he shouldn't have told you that'</i> phenomenon). • Limited state supports • Confidentiality / lack of secure facilities • Difficult to identify appropriate experts • Easy availability of competitive services outside Ireland • IP policy. unrealistic policies & terms - <i>"academia are obsessed with the contractual issues involving IP."</i> 	<ul style="list-style-type: none"> • Lack of internal support – policy unclear, bureaucratic, not supportive, • Impediment to career progression... <i>lack of Recognition... you don't get promoted for HE/Industry research.... People don't respect you for it either.</i> • Time pressure – already heavily committed, particularly on teaching • Constraints on publications • Large projects require more HRI internal resources, often creating enemies • Lack of understanding of industry • Lack of relevant opportunity



Critical Issues for 'Less Intensive' HE Collaborators

Issues and perceptions associated with industry

- **Major focus on students**
- Concern that industry can be fickle and that it is a less reliable source of funding for student research.
- Concern about publications needed for career advancement. Working with industry seen as less likely to result in publications, or may prevent publication.
- Perception of demanding timelines in industry R&D and a lack of information as to the specific requirements of industry.



Brainstorming Meeting

- Designed to provide creative inputs on the practicality and usefulness of the measures.
- 26 representatives of Industry, HE sector and funding agencies
- Discussed outcome of earlier analysis
- Rated the factors and the proposed initiatives



Initiatives Proposed and Discussed

1. Standard US University Consulting Practice
2. Small Business Innovation Research Program
3. Small Business Technology Transfer Program
4. Industry/University Cooperative Research Centres
5. Kauffman Foundation Campuses
6. San Diego's Connect Program
7. Innovation Voucher Program (NL)
8. 150% tax deduction on HE-related R&D activities (DK)
9. K-Program – Competence Centres (AT)
10. Christian Doppler Gesellschaft (AT)
11. Technology Clinics / TUPAS (FIN)
12. TUPAS (New Technology Clinics programme) (FIN)
13. K.U. Leuven University R&D (BE)
14. FIRST PhD Enterprise International (BE)
15. Doctoral Studies for Employed Persons (FIN)
16. Innovation incubator - The Innovationsmiljøer (DK)
17. Impulse Programme “Scientists for the Economy” (AT)



Recommendations

Funded HE institutions should define the role of industry research in their research strategy...

..they should differentiate between their role in the creation of start-ups, and their role in servicing the needs of existing industry.

State agencies should develop further programmes to cater for the collaboration needs of industry. Several of the measures identified in the study are proposed.

...practical measures required to improve mutual understanding between industry and the HE sector. These include **Communications Officers** within (Industry Associations) and Irish Universities Association (IUA) to promote interaction

... a high-level forum should be jointly established by (Industry Associations) and IUA to improve interaction and understanding between their mutual constituencies.



Final Report by ACSTI



Can be downloaded from www.sciencecouncil.ie

