

LAMBERT REVIEW OF BUSINESS-UNIVERSITY COLLABORATION

SUBMISSION OF THE SCIENCE AND INDUSTRY COUNCIL OF THE NORTH EAST OF ENGLAND

1. Introduction

- 1.1 This submission is provided by the Science and Industry Council of the North East of England. The Science and Industry Council has been established at the instigation of One NorthEast, the Regional Development Agency, to oversee the *Strategy for Success* programme, and is explicitly concerned with improving business-university collaboration, in conjunction with Government. This programme is concerned with maximising the contribution of the North East of England's scientific and research base, which is largely located in the Region's Universities, to wealth creation and the development of the Region. The Council believes that the Strategy for Success is a developing example of best practice in University-Business relationships to achieve major economic goals.
- 1.2 The submission provided here encompasses a description of the Council, its objectives, composition and progress. It describes the Strategy for Success and the manner in which the Strategy brings together various stakeholders, particularly business and Universities. The paper also discusses key issues, which have been identified as affecting the development of Business-University relationships, and concludes with a series of observations and recommendations.
- 1.3 The Council welcomes this review. The Council believes that Business-University relationships are of central importance to the development of modern business, the North East of England and vibrant regional economies in general. The Council also believes that the regional dimension of Business-University relationships is of major significance to national policy objectives.

2. The Science and Industry Council

- 2.1 The Science and Industry Council was established in December 2001 at the instigation of One NorthEast, the Regional Development Agency for the North East of England. The overall purpose of the Council is to oversee the further development and implementation of the Strategy for Success programme, developed by One NorthEast in conjunction with regional partners. In addition, the Council enables high level communication between Universities, industry and the public sector through its members, and champions the role of science and technology in the Region, and wider afield. The Council's terms of reference are listed at Annex 1.

- 2.2 The Council comprises very senior representatives of Universities in the Region, science, engineering and technology based businesses (including multinationals and small and medium sized enterprises), and the public sector. The Council is chaired by Sir Ian Gibson, one of the UK's most respected industrialists, and includes three Vice-Chancellors. A full list of members is provided at Annex 2.
- 2.3 The Council has met every three months since its establishment, and has proven most effective. It has advised and guided on the implementation of the Strategy for Success programme, in the manner envisaged by One NorthEast. Further, it has quickly been accepted as an authoritative body in respect of science and innovation matters, by key stakeholders in the Region, including businesses and their representatives, Universities and local and regional government. The Council has also proven an effective forum for the interchange of views and information, between the three main stakeholder groups.
- 2.4 The Council was launched in the Region by the Prime Minister and Minister for Science in July 2002, and held a briefing for Parliament at the House of Commons in October 2002.

3. Overview of Strategy for Success

- 3.1 One NorthEast, in association with regional partners, has developed the Strategy for Success to achieve long-term structural change and sustainable regional development, by boosting productivity and international competitiveness through the effective exploitation of science, innovation and Research and Development, drawing upon the Region's Universities and wider research base.
- 3.2 The Region's Universities and wider research base is a key regional asset, able to generate new products, processes, and services in the Region's businesses, and to create an attractive environment for investment, growth and sustainable employment. The Strategy for Success is a major programme of activities and investment to capitalise on this asset in our Universities and businesses.
- 3.3 The Strategy for Success is developing five Centres of Excellence. The purpose of these Centres is to act as the focal point for the commercialisation of science in the Region. This commercialisation can be achieved by three principal routes:
- New companies spinning off from the science base
 - Transfer of technology to existing businesses

- Attraction of new businesses or investment to the Region to link with the science base
- 3.4 The Centres will act as the link between the Universities and commercial applications, through a range of activities, including the further development of a technology, the provision of proof of principle capabilities, the identification of commercial opportunities, the identification of market needs, assistance with Intellectual Property Management, and effecting technology transfer. The Centres explicitly seek to understand and take account of the needs of science and academia and the needs of business.
- 3.5 It is the view of the Council that science is the domain of business as well as academia. It is clear however that gaps between the two need to be bridged. Industry is more likely to invest in scientific research if linkage mechanisms are present. The Centres provide this link mechanism. The Centres will enable industrial needs to be incorporated into research planning as it is clear that in many cases the research outputs of Universities do not match with the knowledge requirements of regional businesses.
- 3.6 The Centres are a means of facilitating collaboration between various R&D groups within Universities and industry, thus achieving critical mass, as well as a greater understanding between providers and users of science.
- 3.7 The five Centres of Excellence are concerned with:
- New and Renewable Energy
 - Process Industries
 - Life Sciences
 - Digital Technology and Media
 - Nanotechnology, Photonics and Microsystems
- 3.8 Each Centre varies in terms of its specific activities and organisational form, reflecting the specific requirements and current status of the technology, the research base, and industrial needs. Centres have both physical and virtual elements. They are enabling University researchers to work alongside industrial developers. Further detail of each Centre is provided at Annex 3.
- 3.9 The five areas of technology have been identified on the basis of:
- research activity in the Region of existing or potential world-class strength.
 - the capacity to generate competitive products, processes and services in the Region's businesses.

This identification was made following an extensive review of the Region's research base undertaken by Arthur D. Little Ltd. in 2001 and 14 studies of industrial clusters in the Region (in addition to the substantive outcomes of these studies, the process by which they were undertaken, which involved extensive management and participation by the stakeholders, has been of significant benefit in the subsequent implementation of the Strategy). Extensive analysis has also been made of international best practice. Where appropriate, key features have been adapted to the context of the North East and incorporated into the design of the Strategy.

- 3.10 The Centres are supported by NorthSTAR, which provides access to finance, IPR development, and business development. NorthSTAR will develop further the North East Centre for Scientific Enterprise (NECSE) which is currently funded by OST, and is a partnership between Durham and Newcastle Universities. NorthSTAR will extend the coverage of NECSE to the Region's other Universities and businesses. It will improve the existing provision of professional and commercial services for technology development, and fill gaps in current provision, such as a proof of concept fund.
- 3.11 Strong progress has already been made with the development of the Centres. Shadow Boards have been formed drawing on industry and Universities, and these have developed business plans for each Centre. The RDA has allocated substantial expenditure items for each Centre (see Annex 4). Further investment is being sought from European Structural Funds, technology-specific national and European programmes and industry, as well as drawing upon mainstream University funding. This level of funding, concentrated on specific areas of activity, is substantial compared with levels of funding previously allocated for such activities.
- 3.12 Five Chief Executives of international standing have been recruited (see below), and these are now recruiting their teams. The Centres are being constituted as Companies Limited by Guarantee. The constitutional form of the companies has been developed to provide maximum autonomy to enable flexibility and the development of long-term sustainability, while providing sufficient safeguards for the public funding invested. The business plans being developed by each Centre all aim to achieve a financial position independent of the RDA within 5 years.
- 3.13 It is the view of the Council that this objective of developing science within the Region, to the benefit of wealth generation within the Region, can only be achieved to the maximum extent possible if the Centres are world-class, in terms of the quality of the science they are facilitating and the competitiveness of the activities they are giving rise to. This implies the need for world-class people and facilities. In order to recruit the five Chief Executives, an international recruitment programme was undertaken, with

internationally competitive remuneration packages being offered. Five exceedingly capable and respected individuals have been attracted, with significant academic and industrial experience. All are credible within academic science as well as being experienced with business at senior levels.

- 3.14 It is for these reasons of achieving international excellence that only five areas of science and technology were identified for development as Centres of Excellence (see above). Furthermore, as the detailed plans are being developed, it is becoming clear that development will be concentrated on activities within these broader headings, where the Region has a clear international position.

4. Key Issues Affecting the Development of Business-University relationships in the Regions

- 4.1 The Council believes that it has made significant progress over the last 15 months. However, there are a number of impediments which are limiting progress.

4.2 Fragmentation of Public Expenditure

There are a number of public policy programmes concerned with achieving objectives relating to the development and operation of effective Business-University relationships. Many of these programmes are not aligned and, as a consequence, the maximum return for public expenditure is not achieved. This observation applies to HEFCE and Research Council funding which is not necessarily aligned with regional spend, either that from the RDAs or such sources as European Structural Funds. In the North East, we are seeking wherever possible to achieve maximum alignment of those activities in our control, with other programmes. We are also aware that a dialogue has commenced between the RDAs and the Research Councils. However, it is clear that there is room for greater alignment. For example, within the Regions, there are significant resources available for capital expenditure, which could be complemented by Research Council funding for research activity.

4.3 Institutional Mismatch

It is clear that a number of the principal institutions engaged in Business-University relationships activities have differing objectives, in general legitimately so. The most clear example is the undertaking of research, often for non-commercial purposes, within Universities, and the requirements of industry. This can lead to research being undertaken in areas which do not match with the requirements of industry. Even where research is being pursued in areas sought by industry, there is often a gap in the form of the research output produced by the University and the form required by industry. This mismatch may also apply at the level of the

Region. In many cases, the research outputs being produced by the Region's Universities differ from the knowledge requirements of the Region's industries.

4.4 Fragmentation of Research Activity

A further form of fragmentation relates to the research activity between Universities. This is clearly the case at the regional level and a key objective of the Strategy for Success is to achieve greater critical mass by bringing together complementary activities of the Universities through the Centres of Excellence. We recognise that the achievement of greater critical mass of research is an objective of Government. However, we are concerned that the proposal to create 6* research departments, as proposed in the Higher Education White Paper *The Future of Higher Education*, may not be the most appropriate route in its entirety. Rather we would recommend a range of approaches for achieving such critical mass, including concentration through such mechanisms as Centres of Excellence.

4.5 Capacity within Institutions

The development of effective Business-University relationships is constrained by limitations within relevant institutions. Largely this relates to lack of knowledge and understanding of the full extent of issues relating to Business-University relationships. Within Universities, there remains limited understanding of the needs of business, although there are strong exceptions and this is improving. Similarly with businesses, although there are examples of good practice, many companies do not understand how to access University research.

4.6 Spurious Regional/National Conflict

It is often suggested that national activities which seek to support Research on a national basis are incompatible with a regional strategy for Business-University relationships to achieve balanced regional development. We reject this argument as spurious. As noted previously, we do not seek to support activity that will not be world-class. We argue that activity that is not world-class will not enable the Region to be competitive in a global market. We suggest that world-class activity can be supported in all Regions to national benefit (for example, by avoiding increasing problems of congestion and labour costs), while at the same time supporting regional development.

5. **Conclusions and Recommendations**

- 5.1 The Council believes that the Strategy being developed in the North East of England by the RDA and partners, and overseen by the Council, will address some of the critical issues facing linkages between Universities and the research base, and industry.

5.2 There are a number of key features of our approach, which we believe to be of particular importance:

- The focus on world-class excellence.
- The concentration of resources on a limited number of technologies, which meet the world-class standard, and are based on existing strengths in the Region.
- The establishment of new institutional mechanisms, Centres of Excellence, to bridge the gap between Universities and industry.
- The achievement of critical mass in research and development, through the Centres of Excellence.
- The attraction of internationally proven individuals to lead and develop key activities.
- The creation of a Science & Industry Council comprising senior representatives of Universities, industry and the public sector, to guide development and to enable communication.

5.3 In addition, we would make a number of further recommendations to improve policy in the UK:

- Develop integrated approaches to funding Science, Engineering and Technology, which take explicit account of regional expenditure.
- Improve the linkages between research and regional industry by continuing to build on such mechanisms as HEIF and other regional initiatives to enable improved technology transfer, and incorporate the needs of regional industry into decisions affecting research activity.
- Pursue critical mass in research and development, but not necessarily through 6* departments. Collaborative mechanisms such as the Centres of Excellence offer an alternative approach.
- Introduce programmes to enhance the understanding of Science, Engineering and Technology and Business-University relationships by policy makers.
- Recognise the potential advantages that can be achieved through a regional approach to Science, Engineering and Technology and Business-University relationships policy, which enables regional development and is nationally co-ordinated so that national objectives are met.
- If Science and Industry Councils are to be established in each Region, it should be possible for Regions to work together with national policy and funding bodies to identify strengths and build complementary world-class excellence in each Region.

ANNEX 1

Science & Industry Council Terms of Reference

- Guide and advise One NorthEast in the development and implementation of the Strategy for Success;
- Promote the Strategy to other partners and relevant parties;
- Act as an influential voice for science and technology to attract public and private investment to the Region;
- Foster productive partnerships between industry, commerce, policy makers, support organisations and Universities and Colleges;
- Determine the structure and composition of the management structures of the Centres of Excellence and NorthSTAR;
- Establish the terms of reference and scope of activity of the Centres of Excellence and NorthSTAR;
- Determine the business plans and strategies of the Centres of Excellence and NorthSTAR.

ANNEX 2

Membership of the North East Science & Industry Council

Council Members

Sir Ian Gibson	Chair - Science & Industry Council
Professor Janet Bainbridge	EPICC
Charles Bragg	Procter & Gamble
Professor Sir Kenneth Calman	University of Durham
Mike Collier	One NorthEast
Bob Coxon	ICI
Professor Christopher Edwards	University of Newcastle
Professor Kel Fidler	University of Northumbria
Richard Maudslay	House of Hardy
Lord David Puttnam	NESTA
Chris Thompson	Express Engineering
Professor Gordon Edge	Scientific Generics
Michael Stephenson	Helena Biosciences

Observer

David Slater	Government Office North East
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One NorthEast Secretariat

Neil Mundy	Director of Integration
Chris Pywell	Head of Strategy for Success Team
Dr. Caroline Gladwell	Science & Industry Council Policy Manager
Gillian Durkin	Strategy for Success Executive

ANNEX 3

Centres of Excellence

New and Renewable Energy (NaREC)

The North East of England provides ready access to world-class capabilities in the marine, offshore oil and gas, power generation and renewable energy sectors. The Region has innovative companies developing new technologies, and world-class research in our Universities. The Region has pioneered the development of Renewable Energy, such as the Blyth Offshore Wind Farm and the EEST Wave Testing Facility.

Process Industries

The key objectives of this Centre are to:

- Develop a self-sustaining capability in technology and management necessary for the regeneration, diversification and growth of the Process Industries;
- Provide a demand-led management process that will enhance and enlarge the contribution of the Universities through improved focus and effectiveness of programmes in both applied research and education;
- Effect a major improvement in the commercialisation of relevant technologies (in partnership with NorthSTAR), and to support emergent businesses through to full scale manufacture.

To ensure delivery of the above, the initial thrust of the Process Industries Centre will be directed to prove excellence in two related areas:

- Advanced Manufacturing and Process Design
- New Product Development in Material Properties

The prime purpose of the Centre will be to deliver Applied Research in both of these areas. Industry-sponsored programmes will be established to build on the international capabilities of Universities in the Region and beyond.

Nanotechnology, Photonics and MicroSystems

This Centre is based on a strong and developing partnership between Universities in the Region and the private sector. Independent studies have highlighted the internationally competitive position of Newcastle University in biomedical nanotechnology, nanobiotechnology and process intensification, and of Durham University in polymer science, molecular electronics and photonics. Research strengths across all five North East Universities include:

- Biotechnology: protein chaperones, DNA delivery, protein and tissue engineering, drug delivery

- Sensors: environmental, chemical/gas, biological, inertial
- Materials: thin films, coatings, nanoscale functional characterisation, failure analysis
- Spintronics, molecular and bio-devices, molecular wires, self-assembled devices, organic LEDs

Nanotechnology developments are very closely related to those in the Photonics and Microsystems fields.

Life Sciences

The main purpose of CELS is to develop a globally competitive technology exploitation and commercialisation focus in the North East, thus generating new businesses and jobs. The key objective of CELS is to identify the key areas of regional scientific excellence and the parallel platform technologies synergistic to their development.

A strong and broadly based bioscientific research portfolio currently exists in the Region with activities spanning medical, agriculture and environmental areas. Scientific hotspots have been identified including ageing and health, oncology, human development, and plant biotechnology. Complementary to the development of these hotspot areas is the need to identify and develop enabling technologies such as bioinformatic tools.

Digital Technology & Media

DigiCoE will bring together the Region's existing strengths in its Universities and companies to create world-class capabilities. It will enhance this capability by research and training. It will launch new products and services, bringing together the converging technologies of digital hardware, software and media content.

The Region's digital community is committed to implementing inclusive, transparent and proactive activities which will enable our digital industries to grow in technical, business and creative expertise, creating world-class excellence, wealth and jobs.

ANNEX 4

Core One NorthEast Strategy for Success Expenditure Forecast

Strategy for Success Budget		2002/03	2003/2004	2004/2005	2005/2006	2006/07	Totals
Science and Industry Council	Total	0.2	0.35	0.35	0.35	0.35	1.6
NaREC	Total	1.6	4.095	7.267	5	5	22.962
Cels	Total	2	3.02	5.03	4	4	18.05
Nano	Total	2.87	1.35	1.4	4	4	13.62
CPI	Total	0.245	2.3	3	4	4	13.545
Digicoe	Total	0.6	2	3.745	4	4	14.345
Northstar	Total	0.25	1.384	3.1	3.1	3.1	10.934
Infrastructure	Total (Cap only)	5	6	12	14	16	53
ERDF (Indicative assumption)		0	6	12	14	16	48
Total		12.52	26.499	47.892	52.45	56.45	196.056