

Review of EU, National and Regional Innovation Drivers

A report prepared for *emda*

B&W Consulting Limited

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Prepared by
B&W Consulting Limited
35 Park Row
Nottingham NG1 6EE

SUMMARY

The most successful economies of the future will be those that are able to respond quickly to rapid technological and market changes, promote enterprise, productivity and innovation.

At the Lisbon European Council meeting in March 2000, Europe's leaders committed themselves to a ten-year programme for economic reform to make the European Union the most competitive and dynamic knowledge-based economy in the world with more and better jobs and greater social cohesion. In the past five years important progress has been made in reforming the European Economy but future challenges remain substantial. In response to the Lisbon meeting, the UK Government published a range of white papers and policies to stimulate innovation and develop the knowledge-based economy in the UK. In July 2004, Government published a ten-year Science and Innovation Investment Framework which set out a long-term vision for UK science and innovation, together with the ambition that public and private sector investment in R&D should reach 2.5 per cent of GDP by 2014.

With the establishment of the regional development agencies in England and the devolved governments in Scotland, Wales and Northern Ireland, much of the responsibility for implementing these national and EU directives has fallen to these organisations. The East Midlands Development Agency (*emda*) is one of nine English Regional Development Agencies set up by the Government in April 1999 to drive up the economic performance of the regions.

The overriding objective for the region is that:

“By 2010, the East Midlands will be one of Europe’s top 20 regions. It will be a place where people want to live, work, and invest in because of:

- ***our vibrant economy***
- ***our healthy, safe, diverse and inclusive society***
- ***our quality environment”***

In support of *emda*'s wider objectives for the Region's economic progress the RDA established Innovation East Midlands (InnEM) to lead the development of the East Midlands Innovation Strategy and Business Plan with the aim to grow a long term, sustainable, innovation-led economy. InnEM's remit and focus is to drive forward an evidence-based strategy and plan that is right for the East Midlands.

The East Midlands has identified innovation as one of 10 strategic priorities, with the aim to ***“become a dynamic economy founded upon innovative and knowledge focused businesses competing in a global economy”***. Current innovation performance is mixed and consequently makes the region an ‘average innovation performer’. The available evidence shows that the following issues need to be addressed:

- Business investment in R&D is concentrated in a small number of R&D intensive companies;
- Many companies undertake very little or no R&D;;
- Expenditure on R&D from government and higher education in the region is below average;
- Turnover attributed to new or improved products is significantly below average;
- Productivity is generally below average and;
- The number of graduate level employees is below average

InnEM believe that to address these issues the region must:

- Encourage and build mechanisms to actively bring together the science and industry base with the aim to increase the rate and level of innovation across the region;
- Stimulate and support businesses, particularly SMEs, to advance the adoption of innovation with the aim to drive improved productivity and competitiveness;
- Foster the development of a supportive innovation environment with the aim of building an integrated network of innovative organisations and individuals and where innovation success is recognised and celebrated ;

- Ensure that creativity and design play an important role alongside science and technology in product and process innovation.

InnEM have set out a process, described in a Transitional Innovation Plan, that will result in an agreed medium to long term Innovation Strategy and Business Plan before Autumn 2006.

This review identifies and characterises innovation drivers in respect of their potential influence on enhancing business growth through innovation.

We would suggest that there are several drivers of innovation that need to be considered by InnEM when developing the innovation strategy and business plan. These would be:

- The consolidation of regional initiatives associated with innovation to produce a focused network of organisations with sufficient resource and critical mass to deliver the objectives of the innovation business plan;
- The creation of a network of knowledge hubs across the region. Each with a particular sector focus and based around a physical location. For example, BioCity becoming the hub for bioscience in the region. These hubs would act in a similar way to the North Carolina Biotechnology Centre, brokering relationships, being a knowledge centre, and championing the needs of business within the sector;
- Develop a specialist advisor or broker network. Using experienced individuals that can work with business to identify and then source the technology and knowledge required for their business growth and development;
- Establish an enabling fund to stimulate greater interaction between business and the science base within the region. Such a fund could be developed around a ‘proof of concept’ structure providing modest levels of funding with a simple

application process. However, there should be financial input from business, the HEI's and InnEM into the fund and allow the awards to be managed by the business partner;

- How the regional university association can be empowered to deliver greater collaborative input and leverage of the science base to meet the needs of regional business and support regional innovation and economic development;
- The development of mechanisms to facilitate foresight of emerging and enabling technology developments and how the region can best maximize the benefit of these opportunities;
- The management of innovation infrastructure development across the region to ensure that an integrated and supportive innovation environment can be established around these infrastructural nodes;
- Consider the mechanisms to support graduate employment in more businesses to stimulate innovation management. This should build on the success of the Graduates to Business programme but aligned to the priority sector and technology areas for the region.

1. INTRODUCTION

The future economic prosperity and competitiveness of Europe and the UK is dependent on the effective transition from a traditional to more knowledge-dependent economy. Within the global market place, all governments are seeking to promote greater innovation, technology and knowledge adoption and exploitation by businesses. The developing economies, particularly China and India, are challenging the position of the more advanced western economies. In future the most successful economies will be those that can react quickly to technological advances and changing market demands and drive enterprises to assimilate and adopt new technologies and practices associated with innovation and enhanced productivity.

To compete effectively in the global economy, Europe must improve its capacity to innovate and increase levels of entrepreneurial activity, promoting investment in research and development and encouraging new and high-growth innovative companies.

2. DRIVERS OF INNOVATION

A range of factors have been identified that impact on the level of innovation across the EU, UK and at regional level. However, the key driver for innovation must be business demand. It is evident from the CBI Innovation Survey 2005, and the European Commission Special Barometer, Population Innovation Readiness report, 2005 that business recognizes that if they do not innovate they will not survive within the global economy.

While Europe has a range of aspirations to lead the world as a highly innovative and prosperous knowledge driven economy, there are several areas that must be leveraged if success is to be achieved. These are identified below and are the same at European, UK and regional level within the UK. This report considers each of these levers and provides a review of how they are being addressed at each of these levels and how they will impact on the East Midlands ambition to support business innovation within the region.

- Policy and regulatory environment
- Business investment in R&D
- Access to finance
- Accessing and leveraging the science base
- Stimulating entrepreneurship and the innovation culture
- Infrastructure for innovation

2.1 POLICY AND REGULATORY ENVIRONMENT

The EU, and member state governments are themselves key drivers of innovation. The regulatory framework adopted by the EU and members states can significantly affect the ability of companies to bring innovative new products to market. The EU still has a higher level of product regulation than its major competitors, making it more difficult for businesses to develop and sell innovative products into this market. The regulatory framework in Europe requires further reform together with reform of funding for research and development, the intellectual property regime, and to stimulate greater entrepreneurship across the EU. This requires particular focus on:

- Improving the regulatory framework in Europe to reduce administrative and competitiveness burdens on business
- Stimulating entrepreneurial activity, through actions to develop an enterprise culture in Europe and to increase access to affordable finance for new and innovative companies
- Promote research and development activity, including through a more efficient use of EU expenditure
- Reforming the intellectual property regime to enable better exploitation of research and diffusion of knowledge and;
- Encouraging greater take-up and effective use of ICTs across the EU.

In February 2005, the HM Treasury published 'Growth and Opportunity: Prioritizing economic reform in Europe. Within this document a range of measures were identified to support greater innovation within the EU and to stimulate greater levels of enterprise. The EU still has one of the highest levels of product market regulation which must be addressed. In January 2004, the Finance Ministers of Ireland, the Netherlands, Luxembourg and the UK launched an initiative to promote regulatory reform in Europe. A range of actions have been identified to reform regulation which will help to tackle market failures and allow intervention to underpin the operation of markets.

Regulatory reform could also help in stimulating entrepreneurial activity, and promote employment and growth. It is evident from data associated with the number of new start-up companies, that this is an area which remains untapped in Europe compared to the US and Canada.

A key criteria for stimulating entrepreneurial start-up activity is access to finance. The EU will consider how new instruments in the Competitiveness and Innovation Programme can provide an effective stimulus to increase risk capital investment opportunities. However, the knowledge-based economy is critically dependent on the strength of the research base in Europe and the levels of R&D being undertaken. In this respect the EU Framework 7 programme is seeking to have a maximum impact on Europe's global competitiveness. There are calls that this programme is focused on raising the EU's capacity to conduct the very best research and with greater emphasis on the research needs of business.

The level of investment in business R&D in Europe remains significantly less than that of our main competitors (EU 1.18% GDP, US 1.87% GDP, Japan 2.32% GDP, OECD data for 2002). In order to close this gap there is a need to focus greater attention on incentives to encourage private sector businesses to invest in R&D. The CBI Innovation Survey, 2005 identifies business administration and levels of taxation as a barrier to greater investment in R&D and innovation.

The ability to effectively protect and commercially exploit the intellectual property arising from the research base is essential to drive greater EU competitiveness. However, the European Patent Office is currently five times more expensive than the US equivalent for securing intellectual property rights and twice as slow at processing applications. This leads to a shortfall in innovation activity. Furthermore, many companies still rely on 'Know How' as their most important commercial proprietary information. Greater awareness of intellectual property is required together with incentives to support the adoption and embedding of new technologies and knowledge into business.

At a national level, the UK published the ten-year science and innovation investment framework in July 2004. In July, 2005 the first annual report was published detailing the progress to date on the objectives within the framework document. While progress is being made on all objectives there still remains a significant challenge in driving business R&D investment to the target levels identified by Government.

The CBI Innovation Survey 2005 continues to call for review and reform of the regulatory environment. They are seeking to reduce the administrative burden on companies seeking to invest in R&D and develop innovative new products. While employment legislation is identified as a barrier to business innovation, companies also identify business tax as a disincentive for investing in R&D. The reason for this is that most businesses appear to be funding most of the R&D from their profits rather than by using external R&D grants available from Government. As the UK regions now have greater control and responsibility for the administration of these funds it is critical they consider how they can maximize their use to support business innovation.

Furthermore, the Government departments are estimated to spend £125bn per year on procurement which represents around 10% of GDP and around 25% of public spending. The DTI 2003 Innovation report suggests that at least part of this expenditure should be directed to the procurement of innovative products and services, particularly from SME's.

2.2 BUSINESS INVESTMENT IN R&D

One of the central strands to building a more knowledge-dependent economy is to increase the level of business R&D. Increased competition and rapid technological change has led to a reduction in the typical life-cycle of products and services and is challenging the traditional relationships between customer and supplier, forcing businesses to innovate and become ever more responsive to change. However, average EU expenditure on R&D amounts to just under 2% of GDP, compared with 2.64 in the US and more than 3% in Japan. Investment by business in R&D is seen as the key to success. In 2002, EU business expenditure on R&D was 1.18% of GDP, compared with 1.87% in the US and 2.32% in Japan demonstrating the need for greater incentives to drive increased business investment in R&D.

Businesses fully appreciate that in the current economic climate it is essential to continue innovate to maintain and enhance market positioning for their products and services. The UK target is to increase business R&D to 2.5% of GDP by 2014 from a current level of 1.9%. However, there are worrying trends indicating that investment in Business R&D has now stalled and fresh incentives need to be considered. The Government has introduced a range of measures to stimulate business R&D including the R&D grant and the R&D tax credit. The Dti has reviewed and reduced the number of business support programmes and seeks to further reduce the administrative burden on business associated with using these programmes. The current review of the R&D tax credit is designed to allow businesses to have greater certainty and transparency as to how much credit will be received for a specific level of investment.

The CBI innovation survey indicates that while these support programmes are important, most business investment in innovation is funded from company profits. Therefore, Government business taxation policy is an important factor determining the level of investment in business R&D. Companies have reported that on average 12% of their turnover is committed to innovation activities. Just over 50% of the companies surveyed

by the CBI have indicated that their expenditure on R&D will increase in the next 12 months. The CBI survey identifies that support grants tend to be considered incidental and that only around one fifth of the companies surveyed found it easy to access external funds for innovation. If there is to be greater stimulation of business innovation then access to external finance for innovation needs to be addressed.

2.3 ACCESS TO FINANCE

Access to finance remains a significant issue for European companies especially for new innovative SME's, as the availability of venture finance remains about half that available in the US.

The UK has around four million small businesses employing around 12.6 million people accounting for 58% of private sector employment. The Dti has reduced the number of business support products from 100 to nine focused on those areas where business need most support. In addition, the Government launched the Technology Strategy in 2004 to provide a business-led framework for identifying and supporting emerging technologies which could deliver significant economic, social and environmental benefit. A Technology Strategy Board has been established to give direct business steer to the Technology Strategy programme (worth £370 million over 2005-2008). This programme has already made the first calls for proposals worth more than £245 million. The topics include nanotechnology, renewable energy, advanced materials, computing and bioprocessing. The Technology Strategy Board will continue to drive business-led interventions on technologies and sectors where the UK has the most potential for future economic development.

The Small Business Research Initiative (SBRI) seeks to raise productivity and business innovation by providing R&D contracts to technology-based small businesses, helping to provide early revenue and a route to market for firms that typically face barriers to funding their early development.

In 2000, the Government introduced the R&D Tax Credit scheme to stimulate business investment in R&D. Latest information indicates that over 18500 claims have been made and more than £1.4bn has been provided in support. However, the programme has been criticized for being too burdensome on business and requiring businesses to invest in R&D without necessarily receiving support due to the nature of eligible expenditure. The programme is currently being reviewed and the Government is seeking to make the scheme less administrative and more transparent in operation.

At a regional level the RDAs have been given greater control of the R&D grant programme and have been investing their own funds to support the development of risk venture funds. While these allow the targeting of investment to technology-based businesses there is a requirement to consider if the investments in this niche market area can really leverage the necessary increase in regional GDP alone.

2.4 LEVERAGING THE SCIENCE BASE

The aspiration of Europe to become the most competitive knowledge-based economy is predicated on the ability of companies to rapidly adapt to changing markets and develop/adopt and integrate new innovative processes and products. However, a fundamental requirement is the strength of the research base within a region. World class research strength is a pre-requisite for continued knowledge creation and innovation. The European Union has recognized the need to continue to strengthen the research base across Europe and foster greater collaboration and entrepreneurship. The Framework programmes have succeeded in encouraging greater collaboration between centres of research excellence across Europe. However, the involvement of businesses, particularly SMEs within these programmes has remained disappointing. The reasons for this appear to be the rather cumbersome administration required on behalf of the companies and the apparent delays in companies receiving payment for participation. For companies that do participate, the rewards of successful programmes can be significant, allowing the

companies access to cutting edge technologies and intellectual property which can transform their businesses.

The Framework 7 programme is designed to continue the development of the research strengths across the European Union. However, there is greater emphasis being placed on innovation and the participation of companies within the programmes to stimulate greater adoption and exploitation of the intellectual property arising from the programmes.

Within the UK, the Government has recognized the central importance of the research base in driving innovation and the knowledge-based economy. The UK has maintained its position as second only to the US in global research excellence as measured by citations, and the UK science base remains the most productive among G8 nations. New measures to enhance this position have been introduced in 2005, including adjustment to the Research Councils performance management framework and a requirement on Government departments to consider science and innovation within their own areas of responsibility. The Government has substantially increased spending on science. Between 1997 and 2007 the science budget will have more than doubled, rising from £3.3bn by the end of the period. This has allowed the Research Councils to significantly increase the volume of funded research and invest in the scientific infrastructure.

In 2004, the Spending Review allocated £70 million to the Research Councils Strategic Fund designed to address emerging strategic priorities. The Research Councils have also been directed to focus attention on larger programmes in strategic research areas that can benefit the economic development as well as the scientific development of the UK. This has included the requirement for greater industrial collaboration in large grant applications from universities to the Research Councils. In addition, Research Councils are now starting to contract directly with business for the provision of research.

The continued investment in the research base through the SRIF initiative has provided significant benefit to the Universities. Furthermore, the opening up of large research facilities to business is demonstrating some success. However, more needs to be done to

reduce the barriers to SME's using such facilities. The implementation of full economic costing by universities for their research activities may impact directly on the ability of SME's to contract with universities for research and development.

Universities and PSREs still offer the most effective way for SME's to gain access to the capital equipment that they require for innovation. However, there are still significant barriers associated with the effective exploitation of these resources by business for innovation.

Significant discrepancies in total public and private investment in R&D and innovation continue to exist among the regions. However, the RDAs have recognized the importance of science and innovation to economic growth and are increasingly reflecting this in their Regional Economic Strategies. The RDAs announced plans to spend £360 million in this area in 2005-2006, a 50% rise compared to 2003. The development of the Science and Industry Councils within the regions has supported the development of business-led innovation strategies that are supporting the development of coherent and integrated strategies for embedding innovation into regional economic development policies and initiatives. The Treasury has further augmented this activity by naming a range of Science Cities within the UK to further highlight areas of outstanding scientific excellence which should attract business interaction.

2.5 STIMULATING ENTREPRENEURSHIP AND THE INNOVATION CULTURE

There is substantial evidence to suggest that much of Europe's entrepreneurial potential remains untapped. This reflects a wide range of factors including cultural or social barriers, such as fear of failure or lack of appropriate skills; the existence of regulatory barriers to entry and business development; and lack of access to early stage and expansion risk capital. Policies to support and foster entrepreneurial activity must address these barriers and reflect a mix of national and community-led intervention.

The UK has responded to the need for greater entrepreneurship and the critical requirement for increasing the numbers of appropriately skilled and qualified people to drive innovation within new and existing business. The Science Enterprise Challenge initiative has been highly successful in stimulating greater entrepreneurship mentoring within the UK HEIs. Furthermore, there are encouraging signs of an increasing interest in science, engineering and technology at school and university level.

However, there is still a requirement to enhance the number of university graduates that are prepared to consider starting their own business. If the UK is to continue to drive the knowledge-based economy it is critical that this resource is tackled and that incentives are provided to support young entrepreneurs establishing enterprises.

Many regions identify that there is a difficulty in retaining graduates within the region in which they attended university. This is frequently associated with the level of innovative businesses operating within the region and the lack of appropriate employment opportunities for these graduates. Greater focus should be placed on programmes to stimulate graduate recruitment by businesses and greater opportunity for graduate enterprise within the regions.

Establishing an innovation culture within a region is a significant challenge. Innovation communities develop when all of the relevant stakeholders agree a vision and then use their own individual strengths to drive towards a single goal. Furthermore, it requires the effective integration of each of the drivers of innovation that have been identified, both soft and hard to ensure that once businesses have started along an innovation process they are locked into a pipeline of opportunity that delivers them to a more efficient and effective product or service.

2.5 INFRASTRUCTURE FOR INNOVATION

Central to the development of the knowledge-based economy is the availability of knowledge creation centres whether they are universities, research organisations or

government departments. However, to facilitate the effective exploitation of the intellectual property arising from the research base it is essential to maintain an investment programme for the capital renewal of research equipment and facilities. The European framework programmes have invested billions of euros in state of the art research facilities, research programme funding and capital development programmes. The programmes to invest in areas of significant socio-economic deprivation has transformed many of these areas into more prosperous communities.

There has been a significant drive to invest in the physical infrastructure associated with the support of technology-based businesses and this has included a significant expansion in the number of incubation centres and science parks across Europe. In the UK the Government has continued its programme associated with the development of innovation support through investment in science and innovation.

At the regional level, the RDAs have invested significant funds to support the development of the innovation infrastructure, including investment in incubation facilities and science parks.

3. REGIONAL INNOVATION

The wide regional variations in productivity, drivers of productivity and critical success factors for innovation mean that innovation interventions must be tailored to the specific challenges and opportunities in each region. When the RDAs were established, Government provided the Regional Innovation Fund to provided RDAs with flexibility to invest in innovation. Much of the funding was used to fund new incubator space and science parks, develop clusters and deepen knowledge of the regions strengths and weaknesses.

The RDAs continue to devote increasing resources to developing their own initiatives to stimulate and support innovation. However, a key role for the RDA is to ensure that national and regional resources are effectively integrated. They are now committing large

sums to supporting innovation and science, engineering and technology related projects. This amounted to more than £250m in 2002/03 and has continued to rise in subsequent years.

Greater control of finance has been passed to the RDAs in recent years. They manage a high proportion of the European Structural Funds of more than £10bn (2002-2006). The European Regional Development Fund (ERDF) is the fund that is most widely used by the regions to support innovation projects. In the first two years, the East Midlands Development Agency spent £9m on activities related to innovation and leveraged an additional £30m in ERDF in its Objective 2 areas.

If the RDAs are to draw up successful economic strategies incorporating improvements in their innovation performance, it is essential that there is a clear understanding of the specific roles and responsibilities of Central Government and the RDAs. It is also necessary that the RDAs have the expertise and sources of advice to develop and implement innovation elements of their regional economic strategies.

All regions recognize the importance of exploiting science and technology, but there has been limited capacity at the regional level in England to develop and implement appropriate policies or to establish a consensus on regional needs. The development of the East Midlands Science and Industry Council (Innovation East Midlands (InnEM)), in common with other regions is supporting the RDA in developing an integrated innovation strategy and business plan to support the objectives of the Regional Economic Strategy. The following key success factors for an effective Science Industry Council were identified in the dti innovation report 2003:

- Must align with the Regional Economic Strategy;
- Be business-led and focusing on the industry sectors or clusters important to the regions economy;
- Be founded on a clear and realistic understanding of the regions strengths and weaknesses;

- Be based on a coherent regional strategy for the development and use of the science base, linked to national priorities;
- Be operated in a way that all stakeholders share a commitment to the regional economic agenda and to work together in partnership to further that agenda;
- Be able to exert genuine influence, both regionally and nationally; and
- Be provided with appropriate implementation resource and support, ensuring that policy decisions are implemented effectively.

Central to the ability of the East Midlands to drive innovation is the provision of mechanisms to bring innovation, business support and skills development together. The restructuring of the directorates within EMDA is facilitating this process but it is essential that initiatives and new policies are not developed in isolation.

Clusters play a key role in driving economic growth and innovation across the regions. They provide the opportunity for companies to share best practice and for supply chain companies to work more closely on knowledge transfer and innovation by leveraging each others attributes. Direct intervention by the RDA's cannot force clusters to grow. However, the investments made by the RDA's in establishing cluster group networks has removed and reduced many of the barriers to business innovation.

However, there is evidence that UK business is not realising the full potential of applying creativity more widely. The Cox review was commissioned to look at how best to enhance UK business productivity by drawing on our world-leading creative capabilities. The review has consulted extensively with key stakeholders in producing its findings, including the creative industries, businesses in a range of others sectors, education institutions and regional and devolved bodies, as well as international contacts, and has received invaluable contributions from a wide range of individuals and organisations. The review indicates that UK business must give greater consideration to the application of design and creativity in product development. The review identifies that there is significant opportunity in this area for businesses to fully exploit the design strengths

within the education system to enhance business growth and economic development in the UK.

From the 1st April, 2005, RDAs were given a number of new responsibilities in respect of Business Links, the Haskins Review of Rural Delivery and Research and Development Grants. The RDAs have also been given responsibility for delivery against the Lambert Report recommendations, but without a specific allocation of funds to deliver this.

4. DRIVING INNOVATION IN THE EAST MIDLANDS

The current EMDA RES identifies three key drivers of success to deliver the region's ambition; Climate for Investment, Employment, Learning and Skills, and Enterprise and Innovation. Through single pot allocation and the provision of funds to the Sub-Regional Strategic Partnerships, emda is making strong progress within each of these areas. The EMDA Corporate Plan, 2005-2008 identifies how the available funding will be allocated across these three priority areas and the SSP allocations. The Regional policy is developed within the context of national and European policy.

A wide range of national policies have influenced emda's strategies including the Knowledge Economy White Paper, 2001, Dti policy document 'Investing in Innovation' and the White Paper 'The Future of Higher Education'. EMDA has invested directly and through the SSPs in a plethora of initiatives to stimulate innovation and business R&D within the region. These investments have been made in line with UK Government and EU policy and directives. While many of the initiatives have been successful it is likely that rationalization and consolidation of the initiatives should be considered.

The region has particular strengths in biomedical sciences, advanced engineering, environmental technologies, and the creative industries. The regional universities have been building their research capabilities and capacity in these areas over a number of years. Many have established strong and productive relationships with businesses in these

sectors. However, while there are strong relationships with larger businesses there is still a general failure to effectively engage with regional SMEs.

Emda's role is primarily as a catalyst, working with each of the regional stakeholders to engage their strengths in driving innovation and economic development. Success in achieving an innovative, knowledge-driven economy in the region will be critically dependent on the following factors;

- Driving greater collaboration between the regional stakeholders to deliver the regional economic objectives.
- Improving technology and knowledge transfer between business and the science base.
- Enhancing business cluster development through effective knowledge exchange vehicles.
- Providing greater access to finance to support business R&D and the development of new technology-based businesses
- Stimulating greater business-led and business-focused research at regional universities.
- Fostering entrepreneurship and organic business start-up
- Investing in infrastructure for innovation
- Encouraging greater opportunity for graduate employment within innovative businesses.
- Using regional technology and knowledge advisors to support technology foresight activity, broker business – university relationships, and identify technology gaps in the regional science base.

However, there is still some difficulty in establishing the metrics by which the impact of these drivers on regional innovation can be assessed. The high level impacts used by the RDAs have been recognized as failing to adequately capture the innovation component to economic development. Therefore, it is important that the metrics for innovation are

clearly determined by InnEM and understood when assessing the success of an innovation strategy for the region.

The RDA must balance the National and EU policies with customized intervention to support regional economic growth and development. The East Midlands region has a strong research base distributed among the regional Universities and also the public sector research organisations such as the NHS and British Geological Survey.

We interviewed representatives from PERA and from the British Geological Survey to discuss the drivers of innovation within the East Midlands. We also interviewed a representative from the CCLRC to determine whether the impact of national policies and innovation drivers were different in the East Midlands compared to other regions. The outcome of these interviews indicated that the same policy and innovation drivers were common to all regions in the UK. Therefore, the development of the innovation strategy and business plan for the East Midlands should be developed along similar broad areas to the other regions. However, it is critical that the region identifies with its particular niche strengths rather than being too broad in its sector focus.

The region already has the necessary components to drive innovation and economic development. However, these components are not necessarily aligned correctly to support and drive innovation in the region. Furthermore, it is likely that further enabling mechanisms are required to stimulate business demand for innovation and new technology and knowledge from the research base.

Many of the initiatives that have been established in the region, particularly those funded through the universities have been supply driven rather than demand led. To develop a coherent strategy it is necessary to ensure that demand is assessed and where necessary stimulated and the initiatives seek to fulfill these demands.

The Sub-regional Strategic partnerships are developing their own innovation strategies and these must be drawn from the regional strategy and business plan. There is

significant potential for disconnect in this model if the regional strategy is not implemented by the SSPs correctly.

The regional networks, EMSEN, EMIN, and the NTIs are providing significant support for innovation and should be considered to be pillars within the regional strategy. The creation of similar initiatives should be avoided and where possible consolidation for sustainability of these organisations should be considered.

The regional university association, EMUA should be empowered to help drive collaboration across the regions universities to deliver aspects of research that are responsive to the needs of businesses. This may require additional funding to be made available to support the organization. However, it would be possible to consider how universities use their HEIF-3 funds in a more concerted way within the region to develop strong and productive relationships with business, particularly SMEs.

Investment in infrastructure has been seen across the region, with the development of new incubation facilities and science parks. Here again it will be important to identify how this regional network of facilities is supporting innovation and regional economic development. At the present time there are several new science parks being planned within the region. However, it appears that each may be being developed without consideration of similar developments and how they may work together as a regional driver of innovation.

The RDA has invested in the regional venture fund and the Lachesis fund. These funds are being successful within their investment areas. However, there is a need to consider what other finance could be made available to support technology and knowledge transfer. The KTP scheme is successful at promoting HE-business interaction but there may need to be a proof of concept, or enabling fund established to encourage greater business interaction with the science base within the region. Many businesses are funding R&D from their own profits and this is tightly coupled to their business plans. Risk is a significant concern for small business and mechanisms that spread the risk or reduce the

barriers to engaging with the science base would be potent drivers of technology and knowledge transfer and business innovation.

Our discussions with regional research and support organisations identified a common need for specialist brokers to support the interaction between business and the science base. An international comparison of technology transfer in other countries conducted by Christine Adams in 2004 reported that where specialist advisors or brokers had been introduced there was a significant increase in the effectiveness and efficiency of technology and knowledge adoption by business. However, these individuals work on the demand rather than supply side of the equation.

The most successful overseas regions for technology and knowledge transfer and business innovation have the following characteristics:

- An overarching national framework, with regional delivery
- A well-defined role within a knowledge transfer system, which leads to smooth, non-competitive interactions with other organisations
- Input from industry, government and knowledge creation centres with appropriate funding streams to leverage the science base to meet business needs
- Industrially-credible people acting as champions at the top of the organization
- A long-term view and long-term funding
- Evaluation of the effect on industry rather than numerical target-setting
- Ability to consider opportunities for emerging and enabling technology development
- Consider the mechanisms to support graduate employment in more businesses to stimulate innovation management.

In conclusion, we would identify that the East Midlands has invested significantly in the components required to drive innovation and economic growth. The RDA has invested in areas directed by national and EU policy and taken time to consider innovative mechanisms to stimulate entrepreneurship and enterprise within the region. It is now

critical that InnEM draws these components together and forges a strong partnership between business, universities and government organisations to drive more effectively innovation in the region.

5. RECOMMENDATIONS

We would suggest that there are several drivers of innovation that need to be considered by InnEM when developing the innovation strategy and business plan. These would be:

- The consolidation of regional initiatives associated with innovation to produce a focused network of organisations with sufficient resource and critical mass to deliver the objectives of the innovation business plan.
- The creation of a network of knowledge hubs across the region. Each with a particular sector focus and based around a physical location. For example, BioCity becoming the hub for bioscience in the region. These hubs would act in a similar way to the North Carolina Biotechnology Centre, brokering relationships, being a knowledge centre, and championing the needs of business within the sector.
- Develop a specialist advisor or broker network. Using experienced individuals that can work with business to identify and then source the technology and knowledge required for their business growth and development.
- Establish an enabling fund to stimulate greater interaction between business and the science base within the region. Such a fund could be developed around a ‘proof of concept’ structure providing modest levels of funding with a simple application process. However, there should be financial input from business, the HEI’s and InnEM into the fund and allow the awards to be managed by the business partner.

- How the regional university association can be empowered to deliver greater collaborative input and leverage of the science base to meet the needs of regional business and support regional innovation and economic development.
- The development of mechanisms to facilitate foresight of emerging and enabling technology developments and how the region can best maximize the benefit of these opportunities.
- The management of innovation infrastructure development across the region to ensure that an integrated and supportive innovation environment can be established around these infrastructural nodes.

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