

Chapter 3

Sub-National Efforts to Support Innovation in the North

Introduction

The role of sub-national efforts to support innovation is to both tailor strategies and instruments to the specific needs of the region and to fill any gaps in national policy based on the country-specific division of labour. Thus far, Regional Development Agencies (RDAs) have made great strides over the last ten years to support innovation in their regions through a number of instruments including innovation advisory services, centres of excellence, major innovation sites and helping firms access the local science base, among other instruments. However, given the nature of funding for innovation at the national level and limited sub-national fiscal autonomy, sub-national action to support innovation is rather limited in international comparison, resulting in a challenging environment within which RDAs and local authorities need to operate.

This chapter will explore the strategic planning for economic development generally and the innovation strategies in particular at the regional (RDA) level. It will then examine the instruments being used to achieve those strategic goals and the funding associated with those efforts. The role of sub-regional initiatives and their contribution to supporting innovation in the North, as well as pan-regional actions under the auspices of the Northern Way, are also discussed.

Regional Strategies

Regional economic strategies seek to orient public investment, innovation is one component

There are a range of strategies and plans that support regional economic development and innovation with different timeframes. Each RDA region has a ten-year Regional Economic Strategy (RES) within which priorities for innovation, enterprise support and other economic development issues are included. As discussed in Chapter 2, this planning process is expected to

change, subject to legislation, to integrate the spatial planning and economic planning into a Regional Strategy (RS). Local governments also produce economic and spatial plans. In fact, the integrated development (joined spatial and economic plan) has already occurred at lower levels of government, such as in the city of Sheffield. City-regions have also produced economic development strategies to support the Northern Way initiative and their strategies feed into the regional plans. In theory these plans all relate to one another but in practice it is very challenging to align so many plans, in particular with the different accountability measures set by the sponsoring departments.

While the economic and spatial strategies have a long-term perspective (five to ten years for the RESs and 15 to 20 for RSSs), the funding is based on a shorter-term three-year corporate plan cycle. Given that the regional level funding is entirely based on central government policy, there are obvious constraints of a limited time horizon and accountability via short-term reporting indicators for those spending priorities to different sectoral Government initiatives. Although RDAs have had a “single pot” of funds from Government since 2002, allowing much greater flexibility than in the past, there is nevertheless a need to satisfy the expectations of the range of Government departments contributing to the single pot.

The process for the development of a RES involves formal public consultation. The three-year corporate plans that specify the budget allocations are also subject to consultation. In the early RESs, there was concern that local consultation was less important than the guidance being provided from Government. In other words, that the RES responded more to what Government was expecting than to real local needs (Dundee/OVE Arup, 2000). Since then, the consultation process has become more important and gained visibility, not only among local authorities (which initially appeared to view the RES from the perspective of how much extra funding came to their locality) but also among non-government stakeholders.¹

Per the recent *Sub-National Review of Economic Development and Regeneration* (SNR), localities are being asked in the future to play an even greater role in scrutinising and influencing these regional strategies, but how this will occur in practice remains an open question. Each region is given the autonomy to determine the nature of this scrutiny process, within principles set by Government. It will be challenging to manage this process across regions with larger numbers of local authorities in a manner which facilitates effective strategies with the required degree of prioritisation, reinforcing the importance of an effective executive function for the RDAs. To assist in the co-ordination of this local involvement, local authority leaders are expected to organise themselves into forums.

The current set of RESs is underpinned by economic growth assumptions and targets at least as high as those applying nationally to address the long-standing gap in relative growth performance. A RES in theory helps to steer the work of all public sector actors within the region towards its goals. In practice, however, the degree of traction of a RES over Government agencies is limited. The RES must address regeneration, skills, social inclusion, enterprise support, transport, infrastructure, etc. (see Table 3.1.). Innovation is generally included as an integral part of the “business” categories of the plans.² The range of issues covered by the RES goes far beyond the public service agreement on which the RDAs are evaluated.

RDA budgets provide the primary lever for organising public support in the region – albeit covering only a small portion of the public funds that fall in the regions. As an illustration of the resource flows, NWDA has direct control over GBP 1.55 billion out of the GBP 45 billion in core resources for economic development and regeneration, or less than 3.5% of those resources over the last three-year corporate plan period (see Figure 3.1.). The ability of the RDA to leverage and influence local, national and EU level funding to achieve its goals is therefore vital. As discussed in Chapter 2, most resources allocated by the national level to support innovation, while in theory aspatial, in practice are disproportionately allocated to the South-Southeast of England where there is a greater existing concentration of innovation-related infrastructure.

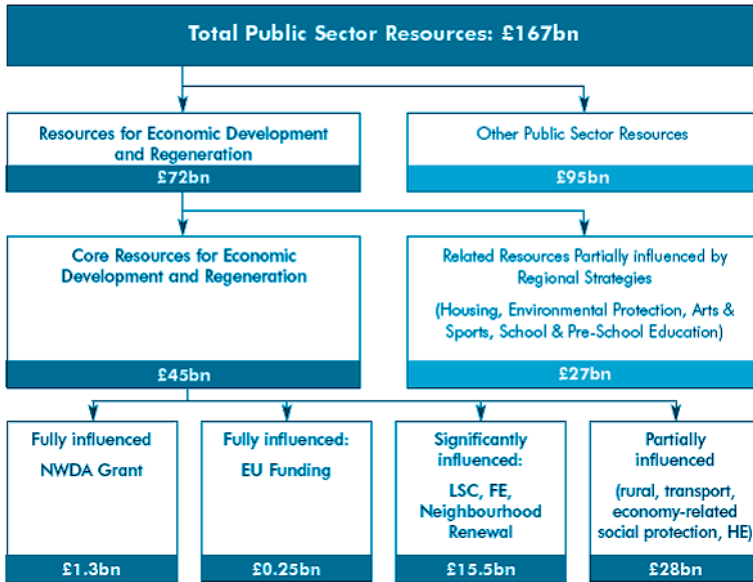
Table 3.1. **Objectives in Regional Economic Strategies**

Region	Objectives
North West (NW)	<ul style="list-style-type: none"> • Business enterprise (regional sectors, innovation, science/R&D, international competitiveness, ICT, sustainable consumption and production) • Skills and education (basic skills, sector skills, workforce development, workforce /leadership/ management skills, educational infrastructure for skills of future workforce) • People and jobs (job linkages, local employment, health, population change) • Infrastructure (transport, land use, housing, planning, energy, investment) • Quality of life (culture and image, community, environment)
Yorkshire and the Humber (Y&H)	<ul style="list-style-type: none"> • More businesses that last • Competitive businesses • Skilled people-benefiting business • Connecting people to good jobs • Stronger cities, towns and rural communities
North East (NE)	<ul style="list-style-type: none"> • Business (enterprise, business solutions, preparing for structural change) • People (skills, economic inclusion) • Place (strategic transformational regeneration; delivering a portfolio of high-quality business accommodation; enhancing the region’s transport and ICT connectivity; promoting, enhancing and protecting our natural, heritage and cultural assets)

Source: Latest Regional Economic Strategies of the three regions.

Figure 3.1. **Public resource funding flows in regions: Example NWDA**

Estimates for three fiscal years 2006/7 to 2008/9



Source: Northwest Regional Economic Strategy 2006-2016.

Innovation is only one of several RDA responsibilities and RDAs control only a modest share of the public funding to support innovation in the regions, albeit that share is greater in the North. As discussed in Chapter 2, the spending in regions on innovation is significantly less than the allocable science and technology (S&T) expenditures (mainly Research Council funding, but excludes considerable non-allocable expenses) that flow to the regions. In the North, the difference is smaller than in other regions of the country given the lower levels of national S&T expenditure in the region, the higher RDA budgets overall, and the choice of the RDAs in terms of the share of the budget that is chosen to allocate to innovation. With respect to the budgets under RDA control, the Northern region RDAs spent 14% (NW), 19% (NE) and 12% (Y&H) of their budgets on innovation, a higher share than four other English regions and less than two other regions (see Table 3.2.). Given that some areas of enterprise support are also supporting firm efforts to increase productivity, if you include the wider enterprise support figures the total budget allocations increase to 35% (NW), 44% (NE) and 33% (Y&H). On a per capita basis annually, that combined spending translates to GBP 22 (NW), 51 (NE) and 22 (Y&H). The

investments by RDAs in innovation are expected to contribute to increased productivity that will support economic growth and the share of RDA budgets for innovation is projected to increase over the next planning period.

Table 3.2. Average annual RDA spending on innovation and enterprise development

	(FYs 06, 07, 08)		
	NW	NE	Y&H
Innovation			
Total (GBP millions)	59	57	41
% of total budget	14	19	12
Per capita (GBP)	9	23	8
Enterprise			
Total (GBP millions)	92	73	72
% of total budget	21	25	21
Per capita (GBP)	14	29	15
Total RDA budget GBP (millions)	438	296	336
% in Innovation and Enterprise	35	44	33

Source: Lord Sainsbury of Turville (2007), *A Race to the Top: A Review of Government's Science and Innovation Policies*, HM Treasury, October 2007.

Innovation strategies: their origins

The process for developing a Regional Innovation Strategy and its importance for a region varies considerably across OECD countries. The attribution of responsibilities across levels of government, the articulation of national-regional responsibilities, and the spatial scale and economic configuration of the region all play a role. In federal countries like the US, Mexico, Germany, Switzerland and Canada, there are no national-level requirements for a specific innovation strategy.³ In countries that are more or less regionalised, there exists a range of requirements to develop a Regional Innovation Strategy. In Italy, for example, the Piedmont region has passed an innovation law that serves as a strategy. In France, the central government has been working with regions to support their development of these strategies given concerns from the European Commission that the strategies were too similar. The French central government is now working with regions to develop a guide to try to help regions define their specificities and measure progress. In Sweden, all regions develop a Regional Economic Strategy that includes areas of support for innovation, and national support for innovation and cluster projects is dependent on the prioritisation in these regional strategies. In the Netherlands, the regional

governments (provinces) are not required to develop a strategy, but in the context of the new Peaks in the Delta regional approach there is a need for prioritising actions on a wider spatial basis to support regional growth.

The UK Government officially encouraged RDAs to develop Regional Innovation Strategies around 2001. This does not mean that prior to this point there were not policies and programmes to support innovation in regions. The RDAs took over an innovation lead role that had previously been carried out through the Government Office network, where innovation projects were supported by EU funding. A Regional Innovation Fund was put in place to help finance the development of these strategies. All three Northern regions hired Arthur D. Little to provide an assessment of their research and science base to support the development of their strategies. The regions also used the support of a new institution, the Science and Industry Council, to help develop the strategy and its priorities (see Table 3.3.). The plans are presented to the overall RDA Board for approval but there is no other formal consultation with other stakeholders or reporting to Government required. Although the plans are clearly an important component of the overall activities of the RDAs, they are not required in the same way that a RES or corporate plan is.

Despite the prominence at the national level of addressing the productivity gap through innovation, the strategies of the RDAs themselves do not appear to be very high profile. The innovation strategies are available to anyone via the internet. They are embedded in the RES, thereby subject to the general consultation process for the overall strategy. There have been examples of some higher profile communications around the strategies. The North West Science Strategy, which itself had a separate consultation process, was launched with a leading national political figure and an audience of 250. The North East uses its innovation strategy as a vehicle to highlight its flagship initiatives such as the Newcastle Science City and the International Centre for Life, which houses teams from the National Health Service and Newcastle University. The Yorkshire Science Council has produced a lengthy video to explain the strategy, in part with a sample firm as it accesses the different services that are offered in the region as it grows from an idea for a product to its commercialisation, but it is not clear how widely this has been viewed.

Science and Industry (or Innovation?) Councils

Regional Science and Industry Councils (SIC) have a core role in the development of Regional Innovation Strategies. These advisory bodies, with no statutory powers, are the main source of S&T credibility for the Regional Innovation Strategies, mirroring similar bodies that exist at national level in

most OECD countries. They were created, on the one hand, to support policy formulation at the regional level and, on the other, to give a voice to regions with regard to national science policy decisions. The latter became an issue when the DIAMOND facility, a GBP 600 million investment opportunity, was located in the South, rather than the North's preferred location in the North West, triggering "bottom up" the development of the first SIC. The North East subsequently picked up this concept before the development of these councils became a nation-wide policy in England (Perry, 2007). In addition to an advisory role to the RDAs, they serve a clear lobbying role, by addressing letters to ministers or using their contacts to support regional initiatives. Table 3.3. outlines some of the basic facts about the three Northern SICs.

Table 3.3. **Science and Industry Councils**

	North West Science Council	Yorkshire Science	North East Science and Industry Council
Year founded	2001	2004	2002
Sub-groups/ Committees	By cluster <ul style="list-style-type: none"> • Nuclear • Biohealth • Aerospace • Chemicals 	None	By theme <ul style="list-style-type: none"> • Education and skills • Marketing and communications • Financing and access to funding • "Big ideas" Links to Leadership Councils <ul style="list-style-type: none"> • Process industries • Energy

Given the origins of these Councils and their composition involving a large number of HEI representatives, they have a strong science focus. In fact, the names of the councils are Northwest Science Council, Yorkshire Science, and Northeast Science and Industry Council. The science emphasis also mirrors the historical UK Government emphasis on science and research for innovation, an approach to innovation that has now broadened most notably via the *Innovation Nation* White Paper.

The institutional development of these Councils and engagement of their members is an ongoing challenge, with questioning regarding their role and mission still present. The Councils in the North have gone through different stages of development and learning, presumably as have the Councils elsewhere in England. The importance of having clear tasks to keep members motivated and engaged should not be underestimated. The use of Committee sub-groups, used by two of the three Councils, has served to

either bring in additional firm input (North West) or to allow them to become more comprehensive in their scope of topics through cross-cutting themes (North East). The role of the Councils is expanding. Not only does a SIC support the strategy of its own region, it is now asked to participate in the Northern Way's Innovation in Industry Steering Group and the new Technology Strategy Board Strategic Advisory Group.⁴ While these different bodies allow greater communication across regions, they also increase the workload for the Council.

The lack of diversity in the composition of the Councils poses challenges for supporting innovation more broadly. The problem is not as much diversity in the classic sense in terms of gender and ethnic background (albeit there is a lack of diversity on those dimensions), but rather in perspectives regarding innovation. The Councils are mainly composed of University Vice Chancellors or representatives of large firms. There is concern even among members of some SICs that HEIs play too large a role as a focus of actions and that firms need to be at the centre to reinforce a focus on innovation (which occurs in firms) rather than science. While members have a strong level of expertise of great value to the Regional Innovation Strategy, they are a limited sample of the kinds of actors involved in innovation in the regions. Incorporating SME and service sector perspectives is another major challenge in diversifying the approach taken by SICs. Given their current structure, there is no easy solution to incorporating these more difficult to capture perspectives.

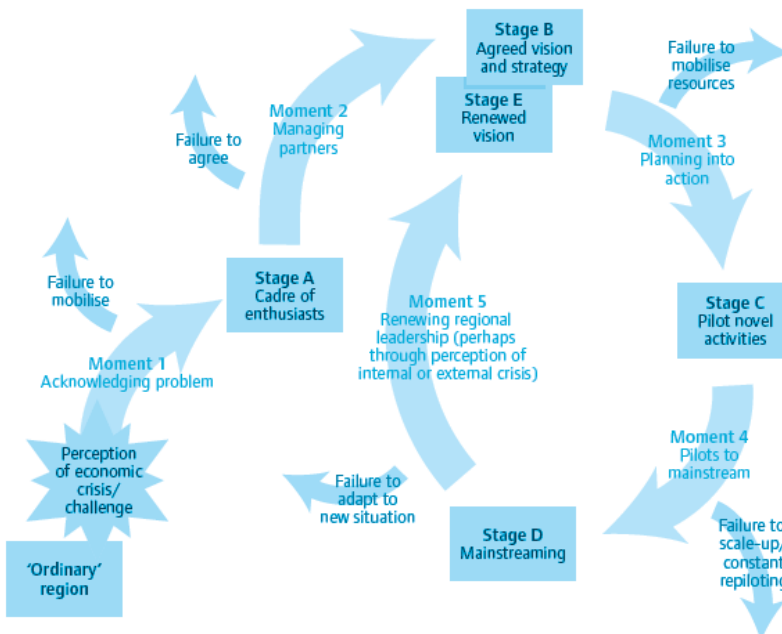
The innovation “journey”: how the regions got here

Perhaps more important than the administrative dimension of region-level innovation policy is what they are trying to achieve. Innovation strategy is anchored in the broader evolution of regional economies, and interest in innovation is linked to perceptions of the challenges and opportunities that are present in the region. Each of the regions has undergone significant economic transformations that have influenced the way innovation is viewed by key economic actors. This evolution in policy thinking alongside evolution of regional economies has been termed the innovation journey of the region – a process that starts with a realisation of the need for change and passes through different stages during which key actors accept the need to use innovation to drive growth (Benneworth, 2007).

The innovation journey of regions, within and outside the UK, has been characterised as part of an innovation ecosystem but with a series of critical moments in the on-going process (see Figure 3.2.). The journey is a cycle whereby attempts to develop an innovation strategy influence the way

partners think about innovation. Furthermore, the degree of experience in planning and the success in delivering innovation support serves as a basis for future support (Boekholdt *et al.*, 1998). Once there is some form of recognition that a problem exists, a group forms to develop an agreed strategy or vision. That strategy or vision is put into action, often with pilot projects to test the strategy. Those pilot projects that are successful are then mainstreamed. The cycle may begin again if there is a new perceived crisis warranting a change in strategy. Along each step of the process, there is a possibility of failure that prevents movement from one step to the next. There are examples of lagging regions (in their national context) that don't entirely follow the crisis model, and under these circumstances it can be even harder to achieve this common vision regarding what the problem is and how it can be solved. In some southern US states, for example, the problem was not a crisis *per se* but a need to develop a new approach to growth that was not based on low-wage jobs, but rather one that addressed the quality of that growth.

Figure 3.2. **Innovation journey: cycle**



Source: Benneworth, Paul (2007) *Leading Innovation: Building Effective Regional Coalitions for Innovation*, NESTA Research Report, December 2007.

The trigger for developing a regional strategy emphasising innovation in several OECD region examples emanated from outside the region through an exogenous shock or a sector-specific crisis. The crises in the auto industry in the regions that include Turin (Italy), Gothenburg (Sweden) and Detroit/Southeast Michigan have led to initiatives that try to build a regional response based on reinventing the region's competitive advantages, in particular the innovativeness of local firms and labour force skills. The industrial restructuring of the Piedmont region (Turin) was forced by the reorganisation of the automotive industry and a sense that the region was entering a phase of decline that risked gathering momentum if the process was not stopped early on. When General Motors announced that the production of medium-sized cars would take place in existing plants either in Germany or in Sweden, the fact that lead actors were already co-operating in the Västtra Götaland region around Gothenburg enabled the region to reorient its investment strategy to build intellectual infrastructure and sophisticated R&D programmes as a rapid and visible response to this potential crisis. In other cases, the concern has been to revitalise or change the image of the region. In Ottawa, for example, the common goal of changing the city's image from one of a sleepy government town to a dynamic high-tech hub rallied local stakeholders. There was an agreed upon need to change the image of the city from a political capital to one with other economic strengths, especially in light of public sector job losses (OECD, 2007e).

For the regions in the North of England, there are examples of both catalytic events and more generalised economic decline. The situation of the North East, parts of Yorkshire and the Humber and parts of the North West exemplifies the transition away from heavy industry experienced by many OECD regions. By 2000, many of the traditional industries of the North such as shipbuilding, textiles, coal and steelmaking had largely or completely disappeared. Employment had already shifted into new or restructured manufacturing industries such as light engineering, electrical and electronic industries, chemicals and pharmaceuticals and consumer-oriented manufacturing, often within branch plants of UK- and US-owned firms. But recently these industries have also come under pressure, with significant off-shoring of less technologically-intensive manufacturing in some branches. This sense of ongoing transformation has been the overriding influence on public policy thinking in the regions for the past two decades. A key feature of political concern, also mirrored by concern among citizens, has been uncertainty about where the transition would take the regions. Nonetheless, even if the destination has not been clearly identified, the ongoing restructuring of the regions' economies has provided a focus for mobilising key actors.

The North West had a more specific catalytic event that provoked a sense of crisis and galvanised key actors in support of a regional approach to innovation. The Government decision in 2000 to not locate the DIAMOND light source in the region led to a strong reaction by the science and policy community in the North West. The Government is committed to excellent science and research, therefore the Research Council will fund the very best research and facilities wherever they are located in the country. The “crisis” raised awareness of the need for the region to take some control of strategic decisions where possible – this led to the creation of the first Science and Industry Council, later generalised throughout the country. The outcry from the region also led to a Government allocation of GBP 25 million to the region for science projects. In the North East, a turning point occurred in 1997, when the prior FDI successes that had in part a promise of R&D started to fail as major plants closed. In Yorkshire and the Humber, the current strategy is based on a response to general industrial decline combined with different policy pressures to develop regional innovation approaches (see Table 3.4.).

Table 3.4. **Innovation journey of Northern English regions**

	North West	Yorkshire and the Humber	North East
Nature of crisis	<ul style="list-style-type: none"> • Catalytic event around Government decision not to locate science facility in region 	<ul style="list-style-type: none"> • Industrial decline (slowly in some industries, rapidly in others) 	<ul style="list-style-type: none"> • Long-term industrial decline • Failure of FDI attraction policies in late 90s
Position in innovation journey	<ul style="list-style-type: none"> • Established sectors covered • Emerging sectors less well supported 	<ul style="list-style-type: none"> • Implementation phase 	<ul style="list-style-type: none"> • Implementation phase of strategy
Regional innovation leadership style	<ul style="list-style-type: none"> • Diverse innovation system • Small number of strong leaders 	<ul style="list-style-type: none"> • Dominated by Higher Education Institutions • Some grass-roots coalitions for specific actions (as opposed to strategy) • Rise and fall of successive special interests 	<ul style="list-style-type: none"> • Limited scope of strategy and actors involved • Maverick institutional entrepreneurs

Source: Benneworth (2007), *Leading Innovation: Building Effective Regional Coalitions for Innovation*, NESTA Research Report, December 2007.

In terms of stage in the innovation journey, all three are in an implementation phase. They have all come to respective agreements on the need to take action. In the North East and North West there is a sense of clarity with respect to the targets and actions among policy makers, although not necessarily the community at large. In Yorkshire and the Humber, due in

part both to a more recently constituted Science and Industry Council and a more broadly based strategy, the Regional Innovation Strategy is more of a framework than a plan. It has less of a sense of detail with respect to the region's innovation goals, expressed in the Regional Economic Strategy as a doubling of R&D spending to 1% of GVA, and to raise productivity (GVA per worker) by 25-30% by 2016. Some of the common challenges across the three regions in this phase are to cultivate new “voices” or perspectives on innovation, such as in the SME community, generally increasing the innovation activity of firms and preventing fatigue among those actors who have been involved for a while.

There is a need for more innovation champions in the process of strategy development and implementation for the RDAs in the North, in addition to the existing support from SIC members. The different mechanisms for plan development do not generally promote the more organic and creative forms of regional innovation dialogue, however there are examples of innovation champions outside of the RDAs.⁵ Within regions, there may be key City Council members that help drive some projects, but the need to balance the interests across an RDA territory diminishes the potential influence of individual local politicians. This kind of leadership is more likely to be effective at a city or city-region level.

Across the three regions, there is a diversity of regional innovation leadership styles but also a generalised problem of succession to find the next generation of leaders. In the North West, this leadership can be characterised as having a small number of strong leaders. Manchester is an example with long-term and stable leadership that has supported the innovation agenda, such as through Manchester Knowledge Capital (see later Box 3.4.). In Yorkshire and the Humber, over time there have been some different sets of actors involved in supporting innovation, in part from grass-roots efforts. While there is a prominence of HEIs in the innovation strategies and actions in the North, this is particularly notable in the innovation leadership in Y&H. In the North East, with a highly focused strategy and a more limited number of leaders (in firms, universities and the public sector), the innovation style is more restricted by the pool of available actors. For firm leadership, one of the challenges has been the fact that there are few headquarters in the region and the branch plant managers of the past had cycled through and are less committed to the North East.

UK regions are competing with some countries that have an advantage in terms of their ability to mobilise around an innovation strategy and support it financially. The benefit of the Science and Industry Councils is that they bring expert credibility to the strategy in the eyes of Government and the regions. However there are few political or other champions of the regional innovation strategies in the UK and the planning process tends to

discourage possible innovation entrepreneurs. There are few strong local political officials and no regional level political officials, with the exception of the Regional Ministers. Appointed for the first time in 2007, they have only a part-time regional responsibility and their role has yet to be developed. Thus far, none has played a specific role with respect to Regional Innovation Strategies. The relative lack of political engagement in planning development stands in contrast to some other regional examples, such as in the US where a governor or mayor can take very bold actions and even motivate the public behind those initiatives.

In addition to leadership, there are capacity challenges for sub-national actors to support innovation across OECD regions. In the UK, the rapidly changing roles of RDAs requires even further effort to support both innovation as a new field and how to do so in the changing sub-national context. There are some opportunities for learning exchanges among RDA staff in the North regarding innovation. At the national level the Regional Innovation, Science and Technology Group supports information exchange across all UK regions. Yorkshire Forward has been the most explicit about its desire to engage in different EU-related networks to learn from other regions on the policy side. Partly because of nationally-determined limits on their staff numbers, RDAs need to rely heavily on external expertise for both information and recommendations; however, the outsourcing doesn't facilitate the building up of analytic capacity within the RDAs which is an increasing part of their strategic role. To respond to the recommendations of the SNR, both RDAs and local authorities will need to support capacity building efforts. There are also different pockets of expertise in the North outside of the RDAs in the regions for supporting innovation that are not necessarily integrated into the overall innovation strategy approach.

Current strategies science-focused

The purpose of a Regional Innovation Strategy is simply to identify the problems in a systematic manner, determine how they can be addressed, and persuade others to work towards this common goal. The focus of the strategy therefore depends on how the region perceives the problem, its regional economic structure, its innovation ecosystem, and the possible solutions. These needs may be conceived of in terms of particular sectors or clusters that merit support for different reasons (weight in the economy, sector with potential for growth, uniqueness of niche in world markets, importance of technology for a range of sectors in the economy, etc.). The strategy may be a holistic perspective, focused on the general environment and flow of ideas in the region. It could also focus on particular innovation assets or sites around which the strategy seeks to catalyse action. The approaches in the three Northern regions are described in Table 3.5.

Table 3.5. Summary of regional science and innovation-related strategies

Region	Focus of strategy
North West	<p><i>Northwest Science Strategy 2007-2010</i></p> <ul style="list-style-type: none"> • Aims <ul style="list-style-type: none"> ○ Grow and maintain world-class infrastructure for the academic and industry base ○ Enhance the creation and exploitation of knowledge ○ Develop, attract and retain high quality people ○ Close the R&D funding gap between private and public sector ○ Promote the image of the Northwest as a vibrant hotbed of scientific endeavour • Foundations <ul style="list-style-type: none"> ○ Internationally excellent science base (region must retain and adapt science base already in place; alliances outside the region; centres of excellence; profile and perceptions of the Northwest science base must be raised) ○ Exploitation of science (business capability, physical infrastructure, knowledge transfer processes, enterprising people, flexible financing) ○ Skills (Regional Skills Partnership, Sector Skills Agreements, Sector Skills and Productivity Alliances, National Skills Academies, Foundation Degrees, Specialist schools—including Centres of Vocational Excellence) • Strategic pillars <ul style="list-style-type: none"> ○ Biohealth ○ Aerospace ○ Chemicals ○ Nuclear ○ Emerging opportunities ○ Strategic science sites
Yorkshire and the Humber	<p><i>Yorkshire Science: Regional Science and Innovation Strategy (Oct 06)</i></p> <ul style="list-style-type: none"> • Strategy of four key themes: <ul style="list-style-type: none"> ○ Growing the region's innovation culture ○ Developing a region-wide innovation environment ○ Targeted European engagement ○ Pan-Northern activity • Goals to achieve vision <ul style="list-style-type: none"> ○ create a culture for "open" innovation ○ promote innovation and stimulate enterprise ○ become a region of "innovation" good practice in the UK, across Europe and internationally ○ attract and retain people of the highest calibre to work in the region's universities, businesses and public authorities ○ create a region where the knowledge base, businesses and the political community work in enhanced harmony to deliver sustainable economic growth through innovation ○ to make social inclusion and environmental impact a priority • Examples of programmes include the national Manufacturing Advisory Service, the Centres of Industrial Collaboration, and the Science City of York • Strategy should support priorities in the Regional Economic Strategy that are: food and drink, advanced engineering and metals, chemicals, bioscience, environmental technologies, healthcare technologies

Table 3.5. Summary of regional science and innovation-related strategies (cont.)

Region	Focus of strategy
North East	<p><i>Strategy for Success 2001/ 2004</i></p> <ul style="list-style-type: none"> • A strategy based upon the exploitation of the region's research base to generate innovation, competitiveness and growth (significant funding for which came from European Structural Funds) • Identifies an approach to cluster development, based upon the exploitation of the region's research base through Centres of Excellence supported by a finance company (currently NStar but changing its name) and guided by the region's Science and Industry Council • Centres of Excellence to support clusters in the following fields: life sciences, process industries and new and renewable energy. The other centres for nanotechnology and digital/ media are no longer prioritised but the Science City of Newcastle has taken an increasing prominence in the strategy's focus. The centres are private companies.

Source: Current Regional Innovation Strategies for the three regions.

The challenge for non-leading or “ordinary” regions in any country (the majority of regions generally) is to develop strategies in light of fewer available innovation-related resources in the region and hence bigger gaps to fill. In a review of ordinary regions, the focus for policy intervention may need to be on the regional systems and capacity (a systemic failure) which the UK market failure approach doesn't take into account (Benneworth, 2007). In addition to the relative lack of assets, less-favoured regions need to address the lack of sufficient inter-linkages among actors (Rosenfeld, 2002). In another categorisation of regions into three groups, the policy mechanisms are more interventionist the lower the level of development. The regions categorised as global cities regions are deemed to warrant a policy intervention confined to the creation of innovation and investment-friendly framework conditions. Those regions with important innovation networks need a balance of market forces and policy intervention. In the regions with undeveloped potential, such as those with industrial districts or undergoing economic transformation, to break away from path dependency there is a need for more interventionist policies (Koschatzky, 2005). Within a UK context, this suggests that the traditional excellence-based allocation of innovation-related public resources towards the more favoured (leading) regions could be complemented by other measures.

While the definition of innovation in the different RDAs is not explicit in the plans, the focus is clearly on science-based innovation. The North West has the most science-oriented approach to innovation. This is perhaps due to the strength of the science-related infrastructure, research excellence in local universities, and the orientation of the regional Science and Industry Council. To address this, NWDA plans to publish a broader innovation strategy to complement the existing Science Strategy. The North East also

has a strong science orientation, building on the limited resources available, but this is due to a policy focus on science as the path to transform the North. The exception in theory, although perhaps not in practice, is the stated approach of Yorkshire and the Humber which purports to be more focused on the innovation environment broadly.

The national-level definition of innovation is expanding, leaving some room for RDAs to take bolder steps in terms of innovation. This national change, thanks to the influence of NESTA and the new national approach as outlined in *Innovation Nation*, expands the science-based approach in theory to the public sector, areas of hidden innovation, etc. Expanding the innovation focus, however, is an understandably difficult task for the regions. The nature of the actions to be taken in the context of this broader approach is less clear and measurable, although there will be national efforts via NESTA to develop new indices that measure other forms of innovation. Furthermore, given the lack of fiscal autonomy at the sub-national level, it is important to tap into national funding streams that are still oriented to the science-focused definition for major financing, although demonstration projects and programmes could easily be sponsored by RDAs.

One OECD region example that has taken the initiative to expand to a broader definition of innovation is that of Catalonia (Spain). While maintaining its effort to strengthen R&D in this region with a history of manufacturing, and moving towards Lisbon targets for investment, the regional government has opted to develop a broad society-wide innovation charter that will be built on a shared commitment from the public sector, private businesses, social partners and the research and educational communities. Current innovation policy is seen as being too distant from citizens and not sufficiently responsive to the region's challenges.

North West Science Strategy

The North West Science Strategy 2007-2010, as its name implies, seeks to support science in the region. The weaknesses noted for the region include the low level of public sector R&D development, the concentration of business R&D, the low rate of HEI R&D investment as a share of GDP (despite strong institutions in the region), and insufficient recognition of the region with science investors from outside the region and country. There is a general explanation of the strengths and weaknesses of the four strategic sectors where science has an important role (aerospace, bio-health, chemicals and nuclear). There is a stated principle that the projects funded should be transformational (meaning relatively high risk), albeit this does not necessarily mean transformational for the regional economy. There is a desire to create centres of excellence around the pillars but these do not yet exist. There is an accent on “strategic science and technology sites” that can

serve as hubs for innovation activity in the region. A series of summary appendices offers a helpful overview of: progress since the last plan, a SWOT analysis, some key facts and figures, skill priorities for the targeted sector, a summary of the strategic priorities, and priority sector action plans.

There is no formal evaluation of the prior strategy, however a decision was made to make the strategy more explicit and targeted based on the prior version and to document achievements. In terms of progress, there is discussion of additional research grants leveraged, increases in the number of firms or employment in the sector, specific programmes launched, etc. In the aerospace sector, as the strategy acknowledges explicitly, successes have been limited such as the decision not to develop a particular technology centre, or the challenges in working with the supply chain in aerospace, but it is not clear why.

There have been some important actions in parallel to the Regional Innovation Strategy that support the region's innovation system. Local actors in some areas in the North have been able to experiment and seize new opportunities that had a strong potential payoff. The development of Manchester Knowledge Capital to support innovation in the metro Manchester area is one example. The attraction of parts of the BBC to the area will be a huge asset for the media and digital industries firms to support growth and innovation. The local support for the Daresbury campus has also been highly valuable, and the facility is recognised as playing an important role within both the Manchester and Liverpool city-regions. The challenge will be to ensure that the positive benefits of these significant local assets support other parts of the region.

North East: Strategy for Success

The North East's Strategy for Success is the most "transformational" of the three regions in its aims relative to assets and in its high level of integration in the RES. The focus of the strategy is straightforward with five pillars (subsequently reduced to three), independent Centres of Excellence for each pillar, and a finance company NStar (proof of concept and co-investment funds). The Centres address a significant gap in closer-to-market, translational, scale-up and demonstration facilities, for which there was in effect no national funding. The strategy document itself is only a few pages. However, a more detailed competence background report was developed during its preparation. The restricted number of pillars and programmes resulted in a large concentration of funding towards the strategy (initial public funds committed of over GBP 200 million for 6 years starting in 2001). Since 2004, the strategy has also re-oriented considerable effort and resources, including the new European programme, towards specific "Innovation Connectors", particularly the Newcastle Science City,

and sites at Blyth in Northumberland, Wilton in the Tees Valley and NETPark in County Durham.

Reassessment of the Strategy for Success led to this further focus of the priority from five to three pillars. Those three pillars include new and renewable energy, life sciences and process innovation (chemicals).⁶ The ICT pillar, as represented by the Centre of Excellence Codeworks, was determined to be of lesser priority going forward due in part to the lack of critical mass in the sector. Given the enabling technology focus it was deemed more appropriate for the Centre to focus on providing specialist business support services for the firms than sponsoring and application of research. CENAMPS, the Centre of Excellence for Nanotechnology, Micro and Photonic Systems, is now incorporated into the Centre for Process Innovation (CPI) after a period of working under a joint Board. As part of a recent review by the OECD focused specifically on the Newcastle city-region, it was noted that this focus on radical new technologies as an innovation strategy needed to be complemented in the overall RES by other economic development measures to support the less technology-intensive and lower skilled sectors of the economy that account for a significant amount of employment and GVA (OECD, 2006f).

The North East reports several measures of success of their strategy thus far. In terms of indicators, they note a doubling of business R&D expenditure between 2002 and 2003. It is not clear how the strategy could have had such a massive impact so quickly, but it illustrates a more general point that the output indicators for RDAs raise issues about causality and the influence of public action. The region has also experienced growth in the rate of technology start-ups that places the region from one of the lowest to one of the highest in the country. Other successes include globally significant scientific breakthroughs, international funding and the attraction of major private and public research and prototyping facilities. The latter measure is perhaps one which could be the most attributable to the region's actions.

Yorkshire Regional Science and Innovation Strategy

The Yorkshire Science Regional Science and Innovation Strategy takes a very different approach from the other two regions and has a very broad innovation environment focus and is thus more of a framework. One of the reasons for this broad approach could be due to a desire to change from a formerly cluster-based focus. In the late 1990s, there was a strong public-private collaboration for innovation strategy development, in part due to the cluster focus at the time, however the current strategy does not appear to build on this prior work. The current strategy doesn't help understand the region's needs or assets in terms of science, technology or innovation or

how the existing cluster groups will link to the proposed innovation hubs. It purports that the region needs to have a radical innovations strategy but it does not appear radical in its current form as it is not fully clear what it will do.

There have been studies to help identify the region's innovation assets; it is simply that the written strategy does not make this explicit.⁷ There is also an action plan in development to implement the strategy, albeit the strategy was finalised over 1.5 years ago. The Appendix explains how the Regional Economic Strategy items can fit with the goals of the RIS, but this is more of a retro-fitting summary given the timing differences. One interesting point that receives considerable emphasis in this region's strategy, and not in the others, is the importance of engaging in EU programmes. In fact, this RDA is the only one to have a full-time staff member focused on innovation based in Brussels to support this EU engagement agenda.

One of the lessons learned from an earlier innovation strategy for Yorkshire and the Humber was to be better targeted in terms of priority areas and interventions. Another concerns targeting of instruments. A study in the region indicated that only 7% of their funding for innovation went to the creativity part of the “creativity, design, exploitation” model, implying that there was insufficient effort on stimulating demand from firms through culture change. There is also a growing concern among actors responsible for the strategy that the higher education institutions may be playing too prominent a role in the innovation strategy and instruments supported by the RDA and therefore there needs to be a greater focus on firms.

Sectors, pillars, clusters and platforms: what to support for innovation?

The regional innovation strategies seek to support innovation in priority sectors for the region. The innovation strategies (at least of the North West and North East) use a different terminology, such as pillars. The choice of pillars is based on where the RDAs perceive a strength, or in some cases a possible strength in the future, in either an academic expertise or firm base. The term pillar itself is interesting for its imagery which connotes strength and verticality, as opposed to something more transversal or interactive like a cluster or platform. Both regions even graphically represent their strategy with the vertical pillars.

In terms of sectoral priorities, there are many commonalities across the North, and even across the UK (see Tables 3.6. and 3.7.). The concept of supporting clusters at the regional level was in fashion earlier in the decade and has since become less of a policy focus more recently in terms of

strategy. In practice, there are still cluster “champions” and other sectoral or cluster groups in the RDAs that liaise with firms in those areas. The accent on priority areas warrants continued support, in particular for identifying where support for innovation can be targeted. In the national landscape, there is no overarching priority cluster or sector strategy; rather there is a broad focus on channelling efforts and resources towards emerging technologies with strong commercial application or potential to solve societal problems. As such, the strategy is more about technologies than traditionally defined sectors or industries. Technology Strategy Board funding goes in this direction, though with some large sector-specific initiatives, notably in aerospace. BERR does have sectoral-based programmes but there is a strong aversion at the national level to “picking winners.”

Table 3.6. Sectoral priorities in economic and innovation strategies

Sector	NW	Y&H	NE
Digital and creative or new media industries	X	X (tech-based), mainly digital	X (mainly creative)
Food and drink	X	X (tech-based)	X
Advanced engineering and metals	X (competitive sector)	X (tech-based)	--
Process	--	--	X (tech-based pillars)
Chemicals	X (strategic sector)	X (tech-based)	X
Aerospace	X (strategic sector)	--	X
Defence	--	--	X including Naval
Auto	X (competitive sector)	--	X
Bioscience	X (strategic sector)	X (tech-based)	X (tech-based pillars) • Stem cells and regenerative medicine
Healthcare technologies	X (strategic sector)	X (tech-based)	X (tech-based pillars) • Ageing and health
Energy and environmental technologies	X (competitive sector) • Nuclear (strategic)	X (tech-based)	X (tech-based pillars) • New and renewable energy • Nuclear • Oil and Gas
Tourism	--	X (innovation)	--
Financial /business Services	X	X (regional significance)	X
Construction	--	X (regional significance)	--
Logistics	--	X (regional significance)	--

Note: Items in **bold** are also a focus of the regional innovation strategies. For Yorkshire and the Humber, the innovation strategy priorities are not explicit in the document but it is assumed that it supports the region’s priority sectors.

Source: Economic and science/ innovation strategies of the three regions.

The Regional Economic Strategies across England have had a high degree of commonality with respect to priority sectors (Table 3.7.). For example, out of the nine English regions, eight have given a priority to biotechnology or health sciences in their strategies, which the Regional Innovation Strategies generally seek to support. This is not only a problem for the UK. For example, three-quarters of the US biotechnology industry is located in just five urban centres, even though 41 out of 50 US states have established significant funding programmes to spur development of the life sciences industry (Cortright and Mayer, 2002). This kind of duplication is perhaps in part necessary. If there is to be a change in the path dependency of regional trajectories, there will be new players that emerge. On the other hand, this begs the question about the efficiency of public investment in supporting those sectors where the cost of achieving critical mass is very high.

However, within these broad priorities, regional authorities do recognise clear niches which reflect specific regional strengths. The niches in the North in the different sectors listed should be made explicit for national and international audiences. There are a number of documents that have been commissioned by RDAs for various purposes that seek to map these niche competencies but this has not been communicated to national policy makers in a clear way. As a result of the Technology Strategy Board alignment requirements across all RDAs (see Chapter 2), there is an increasing discussion across the country on these different specific areas of expertise that should be prioritised in national resources allocation.

Table 3.7. **Priority clusters identified by UK Regional Development Agencies**

Shaded areas indicate priority

Cluster	North East	Yorks.	East Mids.	Eastern London	South East	South West	West Mids.	North West
Biotechnology								
ICT								
Creative industries								
Advanced engineering								
Food/agro-food								
<...>								
Manufacturing								
Textiles								

Source: Adams, Jonathan and David Smith (2004), *Research and regions: An overview of the distribution of research in UK regions, regional research capacity and links between strategic research partners*. Higher Education Policy Institute, March 2004.

As the challenge for the North is to be visible both nationally and internationally, there needs to be mechanisms for these strengths to be recognised. There is no national system in the UK for denoting particular regional strengths given this hesitancy for “picking winners.” Nevertheless, UKTI, Technology Strategy Board and RDAs need to work together in promoting UK (regional) assets/strengths to an international audience.

The Technology Strategy Board makes visible via the internet the different areas of expertise and business-university collaborations that it seeks to support, albeit the text is more focused on explaining policy than promoting UK assets to an international audience. While there are multi-disciplinary Innovation Platforms that mix competencies to achieve a common goal of addressing a particular societal challenge, these platforms are national (virtual) and don't have a spatial dimension.

UKTI supports the regions through trade development, R&D advisors who bring regional strengths to the attention of inward investors, and international marketing that highlights R&D capabilities. UKTI's region websites provide general information but then refer to RDA websites for details. The regions are therefore responsible for promoting their innovation assets together with UKTI. Although with so many different centres and areas of excellence in each region, each with a different branding, the credibility of these regional designations is harder to market internationally.

Another aspect that is less straightforward is the analysis of global trends for the sectors being supported and how the innovation strategies support firms in this context. The general view of the *Sainsbury Review* was that the Technology Strategy Board should take a lead role in monitoring industry and technology trends, and that other actors including the RDAs should share in this intelligence. However, the RDAs need some capacity of their own. A better understanding of the global context for firm needs would serve to better inform how these efforts might be directed in a manner that is sustainable and adapts to global trends. Examples of radical changes in the seafood industry in Yorkshire and the Humber and the chemical industry in the North East illustrate this point. Increased opportunities to interface with firms strategically on such issues would support the Regional Innovation Strategies. This information is revealed in part from the work with cluster contacts of the RDAs and in sub-committees of the Science and Industry Councils focused on particular sectors or pillars. However, it is difficult from the existing procedure to know whether investment in, for example, a stem cell clean room facility is a worthwhile capital investment on the global stage.

In terms of determining the priorities for action in the strategies, it is important to keep in mind the nature of the innovation needs in each of the

“pillars” supported, however described. The type of policy support and instruments are linked to these types of innovation. For example, if the innovation is related to an input, such as an advanced material, then policies may want to focus on maximising linkages with other sectors. The advanced materials sector is a strength in the North, particularly in Yorkshire and the Humber. In the process industries, for example, a lot of the current work is on recombinant innovation, therefore again linkages with other sectors are vital. The strategies do not get into these specifics *per se*, and it is not clear that the targeting of innovation instruments is designed to meet those specific needs.

Expectations for HEIs very (too?) high

The strength of higher education institutions (HEIs) in the North is a core innovation asset. They are a stable and easily identifiable partner. They are also well-embedded in the region and therefore easy to interface with in terms of public initiatives. They play a leading role in key public and quasi-non-governmental organisation committees and councils, which reinforces the higher education focus in innovation. In fact, across the North there are 33 HEIs with a staff of 73 000, an annual income of almost GBP 4.2 billion and they train over 570 000 students.

Regional Innovation Strategies and programmes are generally focusing on HEIs because they are the main recipients of public innovation-related funds. Furthermore, as recent research in the UK has shown, there is a “tipping point” in terms of the clustering of R&D intensive firms. Unless a threshold of research excellence is reached, the clustering effect is not observed (Library House, 2007). The relevant questions for the strategies is whether they seek to simply capitalise on what is present in the region or serve in some way to help bring a particular area of research competence closer to that tipping point.

In terms of policy support to HEIs by regional and local governments, the different goals and time horizons should be borne in mind. HEIs are institutions with their own relationships, lobbies and self-interest in obtaining research and other funds. As many of these institutions are already convinced of the importance of trying to work with firms, their active engagement is increasingly assured. HEIs are also highly organised in a range of different consortiums and groups to support their different interests at national level and within regions (regional higher education associations).⁸ HEIs are being asked by Government as well as regional and local actors to be more engaged on many fronts for regional development.

There is a strategic over-emphasis on these “supply side” institutions for increasing innovation activity. The strategies should emphasise firms and overcoming the barriers that firms face. Accessing new knowledge and

technical support from HEIs is only one aspect of business needs. The output measure that the RDAs are using for their innovation strategies is often private R&D investment, which can only partially be addressed by HEIs. There are few studies on the demand by firms for the centres, advisory services, collaborations with universities, etc. While there is clearly work to do to stimulate this demand, this needs to occur for the firms to want to access the supply of services linked with HEIs. Some of the HEI advisory service programmes are seeking to stimulate this demand. In the past, approximately half of RDA business support budgets have been channelled through business-university collaboration projects relevant for science and innovation (ODPM, 2006).

The lack of diversity of institutions in the innovation landscape in the North is another reason for this over-reliance on the research-oriented HEIs. In Germany, there are institutions that carry out research, those that educate students, those that support further education (including unions, chambers of industry and commerce), and those that support knowledge and technology transfer. While the regions in the North are not able to change the overall structure of actors in the national innovation system, supporting the specialisation of responsibilities by type of institution could at least move more in this direction. Greater recognition of the value of what the *Sainsbury Review* referred to as the more “business-facing” universities (former metropolitan universities) may be needed. The climate in the UK is encouraging them to emulate the more research intensive universities instead of building on their uniqueness. Taking an example from Germany, the Fraunhofer Institutes, Steinbeis Universities and Transfer Institutes are highly respected for their applied focus.

Regions in the North could consider the creation of alternative institutions to HEIs in their innovation strategies. Regions that are not the leading hubs like the North suffer not only from an institutional thinness but also a lack of specialised service providers. The North East, for example, made a conscious decision to develop Centres of Excellence in the region that were separate from universities to increase the diversity of institution types and build critical mass in specific technological areas. There are lessons to be learned from those Centres that have proven most successful. The investments in Yorkshire and the Humber in the now Regional Technology Network are another example of these public investments resulting in durable alternative institutions. Such entities also have the opportunity to bring in more business leadership to support innovation. Examples of this kind of strategy are seen in many OECD countries, including the well-known examples of privately run Centres of Competence in Finland and Norway.

Linking the skills, training and education agendas with innovation needs

An innovation strategy cannot cover all topics, but should hit the key drivers, and one area that is particularly important for a successful regional innovation system is human capital. Insufficient educational attainment and skill levels are a challenge generally for the UK to support innovation, and this is even truer for the regions in the North. Furthermore, the North is a net exporter of students in part because of the need for graduates to minimise risk by going to the larger labour markets outside the North. The North West and Yorkshire and the Humber strategies do mention the importance of skills, notably as a foundation for the innovation system. The strategy in the North East does not explicitly mention skills but it is an area of focus for the Science and Industry Council and cluster (pillar) level actions.

There is an unusual mix of skills strategies as the skills agenda is managed by a number of other institutions and, despite different reforms, skills remains a highly complex and intractable issue. These institutions are outside the direct domain of the RDAs, and hence the RDA innovation teams, but there are numerous public sector attempts to co-ordinate. Local Learning and Skills Councils are responsible for initiatives targeted to: 14-19 year olds, adult learners and employers. They receive funds from Government and cover a geographic area smaller than a Government Office region. In the current reforms to skills provision in England, the Learning and Skills Councils are being abolished in favour of another delivery mechanism. There is also a Regional Skills Partnership in each region to support collaboration between the RDAs, the Skills for Business Network, the Learning and Skills Councils, Business Link and Job Centre Plus, among others in support of an employer-centred approach that also raises demand for higher skills. The various cluster-related efforts may take up the issue of skills, as could Sector Skills and Productivity Alliances. There are 25 national-level Sector Skills Councils that comprise an Alliance of Sector Skills Councils. Government is also seeking to promote more regional co-operation for skills via the new “University Challenge”, encouragement of RDAs, HEIs and Sector Skills Councils to work more closely together and Regional University Enterprise Networks.

On paper at least, the alignment of strategies to support innovation with skills appears to concern the priority sectors in the strategies and frequently with a focus on the lower end of the skills spectrum. This is understandable in the UK context as the performance targets for RDAs and the different skills bodies are focused on the lower skilled and this is where public money is directed. There are funding gaps when there is a need to retrain workers that stay within the same qualification level. The policy rationale for funding skills by level in the UK is that the lower end of the skills spectrum should

be mainly publicly funded, that the middle range should be a mix of public and private employer funds, and that for high skills it is the individuals who benefit most from the investment and thus should finance it (HM Treasury, 2006a).

While the innovation strategies strategically over-emphasise the role of HEIs in support of firm innovation through technology transfer, they appear to underestimate the primary role of universities in training the future high-skilled labour force. The North is actually a net exporter of students, and demographic projections anticipate a decline in the number of young people in the region relative to the national average. Therefore graduate retention and attraction of skilled labour both become increasingly important. Furthermore, firms reported that general business skills gaps are a problem, a measure the Northern Leadership Academy seeks to address in part.

Service-related sectors: the perennial challenge

Supporting innovation in the service sector is not a priority in the innovation strategies. While the economy of the North of England has a slightly larger manufacturing component than the South (albeit slightly smaller than the Midlands), the service sector remains the largest in terms of employment (between 76-78% across the three regions versus a UK average of 78% and an OECD region average of 70%). Additionally, many areas of the North are characterised by a high percentage of employment in public services, a theme which is also not addressed in the innovation strategies and is also dependent on direction from central government.

Policy actors in the North, as elsewhere in the UK, are seeking opportunities to support innovation in areas of the tertiary sector important to the region. Two stated areas of importance in the North include financial services and creative industries. Both are deemed important not only for the employment they are generating, but also for the image building effect that these industries can have. Both sectors are clearly present in discussion of the new regional economies of major northern cities, yet neither has a prominent place in innovation strategies. The financial services cluster in Leeds, for example, is an important regional asset. However, support for innovation in services is not discussed in the Regional Innovation Strategies. The move of parts of the BBC to the Manchester area is a highly significant event to support the media and creative services sector. But while it will undoubtedly create a buzz and help to anchor the creative industries sector in the North West, how it can be supported through the current strategy is not clear.

The needs for innovation in the service sector are different from those of manufacturing firms, as documented by studies and firm-level data on innovation practices. *Innovation Nation* stresses the need for an enhanced

service innovation policy, though offering few concrete policy ideas it proposes strong support and institutional incentives to promote innovation in the public sector. Work by NESTA and BERR is also exploring the service innovation agenda, with in-depth studies on certain sectors. The European Commission will soon prepare a Communication setting out a European Strategy in support of service innovation. OECD work on services has noted that success for large service firms is often based on: a) open markets, b) innovation and ICT and c) work organisation and human resources (OECD 2005b). Furthermore, studies of innovation in knowledge intensive service activities (KISA) show that such firms serve as sources, facilitators and carriers of innovation (OECD 2006c). As illustrated in Table 3.8., there are different possible policy levers for supporting innovation in KISAs. (For another listing of possible policy approaches in services, see Table 3A.1. in Annex.) Ultimately, the enabling environment for innovation in services, especially a skilled workforce, has one of the greatest impacts on the success of many service sector areas.

Table 3.8. Policies for innovation in knowledge-intensive service activities

Policy-related dimension	Examples of innovation policy measures
Direct policy intervention targeting businesses/organisations	<ul style="list-style-type: none"> • Securing service development-related private and public financing, grants and tax credits for businesses • Transfer of enabling technologies that can support the role of KISA in innovation
Indirect policy intervention targeting non-business actors within the innovation system	<ul style="list-style-type: none"> • Securing the skills base needed by service innovators • Widening the focus of RTOs towards non-technological innovations
Development of framework conditions facilitating the role of KISA in innovation	<ul style="list-style-type: none"> • Opening up of new markets for service providers • Cutting down the regulatory burden • Financing for the use of external KISA • Good practice development, standards for service quality • Cultivating services related to innovation culture
Development of existing innovation policies, more service-friendly	<ul style="list-style-type: none"> • Adopting the broad innovation concept, acknowledging the value of process innovations (technological and organisational), and product innovations (goods and services) • Adapting financing and assistance criteria so that services-related innovation projects get better access to existing policies • Training and skills development in service-related innovation for actors executing the innovation policy
Development of new policy measures targeting issues that are central to the development of KISA and services-related innovation	<ul style="list-style-type: none"> • Networks and customer interaction as innovation platforms • Developing organisations that are more capable of using internal and external KISA

Source: OECD (2006), *Innovation and Knowledge-Intensive Service Activities*, OECD Publications, Paris.

The lack of a service sector focus can be explained in part by the lack of easy to identify areas of public intervention where there is a policy rationale. Given this difficulty, the types of interventions to support different areas in the service sector are often focused on regulatory and procurement issues. As discussed in Chapter 2, there are other forms of failure with respect to innovation systems generally, and they are even more applicable when addressing possible policy options to support service sectors.

Another reason for the lack of attention to service-related sectors is that such actors are not typically involved in the science-focused innovation discussion. The Science and Industry Councils tend to focus more on science than innovation in general. There are some priority sectors in the Regional Economic Strategies but not in the Regional Innovation Strategies, such as creative and media or financial services, within which innovation could be supported. To identify concrete policy actions, the North West Universities Association (NWUA), for example, is running a HEFCE-funded project to develop innovation platforms in non-science research disciplines. Research is being undertaken in two pilot projects to identify the most effective mechanisms for knowledge transfer mechanisms to support innovation in the construction and finance/professional services sectors.

In the North of England, RDAs could seek to complement the recommendations of the recent NESTA report on services in addition to other new initiatives (see Box 3.1.). As discussed earlier in this chapter, a broader innovation focus in regional strategies and institutions (such as the Science and Industry Councils) is a strong step towards promoting innovation in services. The use of the Northern Leadership Academy and other vehicles to support advanced management skills for innovation in a service sector field is one possibility. The range of innovation advisory services already offered in some of the Northern RDAs could include specialists for prioritised services sectors. Ideas for knowledge transfer may flow from the current demonstration project of innovation platforms with NWUA that could be expanded on a larger scale.

Box 3.1. Taking services seriously: NESTA policy recommendations

A May 2008 report on services in the United Kingdom by the National Endowment for Science, Technology and the Arts (NESTA) had the following policy suggestions for the UK overall:

How innovation policy could do more to stimulate and support the innovation that matters to services:

- Support innovative people and not just firms (notably advanced management, which is neglected by the current focus either on low and intermediate skills or higher level science, technology, engineering and mathematics skills)
- Recognise that innovative firms integrate, not just invent, technology
- Stimulate innovation in existing sectors, not just emerging sectors and technologies
- Widen knowledge exchange between universities and firms to include the arts and social sciences, not just science and engineering
- Measure innovation in services, not just advanced manufacturing

Policy recommendations:

- An ambitious objective should be established to help drive the realisation of the broader vision presented by the DIUS White Paper
- Assess the impact of introducing a Learning Tax Credit for small firms
- Establish an Innovation Advisory Service to advise firms on the effective exploitation of technology for innovation (akin to the national Manufacturing Advisory Services)
- Ensure that planned mini-Knowledge Transfer Partnerships for shorter-term projects between universities and firms include disciplines relative to services firms
- Establish industry-led review groups for five services sectors (the value of which was demonstrated by the recent BERR-NESTA Innovation in Services project)
- Measure innovation in services equally to innovation in advanced manufacturing

Source: Abreau, Maria, Vadim Grinevich, Michael Kitson and Maria Savona (2008), *Taking services seriously: How policy can stimulate the 'hidden innovation' in the UK's services economy*, NESTA Research Report, National Endowment for Science, Technology and the Arts, London.

Beyond cities: innovation and rural areas

Attention to “rural” areas within the RDAs is generally managed by dedicated rural staff. In the past, rural was considered a separate area of programmes. More recently, the Department for Environment, Food and Rural Affairs (DEFRA) has encouraged rural staff to seek to mainstream the needs of rural areas into the work of other departments across the RDA. Furthermore, the perception of how to conceive of rural areas is changing somewhat as the spatial focus for economic development in the North is increasingly based on city-regions. The investments of RDAs are being framed in these terms. Rural areas are either outside of those city-regions (like Cumbria in the North West or parts of Yorkshire and North Yorkshire), or in the outer fringes of the city-regions. Finland, a country with vast remote areas, has nonetheless used a city-based approach to link urban and rural areas in their support of regional competitiveness (see Box 3.2.). Supporting innovation in rural areas is an even more difficult task than in city-regions.⁹

Box 3.2. City-based support of rural areas in Finland

Finland has approached regional specialisation and regional competitiveness through a couple of core programmes that are designed to support overall national competitiveness.

The *Centres of Expertise Programme* (CoE) is one of the four Special Programmes derived from the Regional Development Act. The centres are designed to develop regional innovation systems using the triple helix of university, industry and government. The Centres seek to capitalise on local assets and know-how and have a high-technology focus when appropriate (sophisticated technology is not a goal *per se*). The Centres promote collaborative public-private projects, often using a local technology centre or science park to house them. The programme has evolved significantly. The most essential change compared to the previous model is the encouragement of stronger national and international collaboration. There are 13 Competence Clusters and 21 Centres of Expertise.

The *Regional Centre Programme* (RCP) seeks to strengthen the linkages between cities and their neighbouring regions in 34 regional centres and one network pilot project. The stated objective is to “develop a polycentric regions structure based on a competitive capital city region and a network of regional centres, ensuring that all regions continue to be viable and enabling more even economic growth throughout the country.” Each region must include at least one centre that offers a competitive location for various types of businesses and a diversified local labour market. In addition, each region must include successful smaller urban areas, strong municipal centres and rural areas with effective networks of businesses both within the region and beyond.

Box 3.2. City-based support of rural areas in Finland (*cont.*)

From the perspective of rural policy, some observers had criticised the CoE and the RCP for promoting centralisation and competition among regions, leaving rural economies beyond commuting range to decline. To address these spatial considerations, changes to both programmes have proven helpful. In the latest version of the Centres of Expertise programme, there is a focus on “clusters” rather than on locations. Secondly, as the Regional Centre Programme did not cover all municipalities, there is now “seed money” of the regional section of the Special Rural Policy Programme to support the rural areas outside the Regional Centre Programme.

Source: OECD (2008), *OECD Rural Policy Review: Finland*, OECD Publications, Paris.

There is no specific mention of rural areas in the strategies of the three regions, but the renewable energy and nuclear sectors, priority sectors in the different regional plans, are industries that are often located in rural areas. In that sense, actors in some rural zones could be explicitly supported by the innovation strategies. However, the firms in these sectors themselves may not think in terms of rural areas and seek to have any particular linkages or spillovers with the local communities – there is less of a sense of engagement in the local buzz compared with an urban context.

In a report by the Rural Advocate to the Prime Minister, innovation is highlighted as one of the themes for boosting rural economies, many of which are found in the North (CRC, 2008). The analysis of the challenges is based on the five drivers of productivity discussed by Government as experienced in rural areas. It finds that the two most significant weaknesses in rural areas are investment in innovation (in part because investment in innovation in the UK is viewed in terms of science and not as much in people, ideas, the public sector, etc.) and, although firms in rural areas are just as likely to innovate as their urban counterparts, they suffer from weaker infrastructure and drivers and a lack of specialised service providers. There are notable parallels in these comments with sentiments in many parts of the North more generally. The recommendations of the report offer some lessons for the Regional Innovation Strategies, including efforts to address innovation in sparse or remote areas such as through a proposed Rural Innovation Initiative or partnership as well as the identification of strategies for innovation-related programmes, like Knowledge Transfer Networks, to engage more effectively in rural areas.

Innovation instruments

The distribution of national versus regional responsibilities for supporting innovation is framed in part by a nation’s constitutional framework. Generally, the greater the level of decentralisation in the

country, the wider the range of innovation instruments used at the regional level.¹⁰ The English regions, with flexibility on spending, do finance a range of innovation support instruments (see Table 3.9.). As is common in centralised country contexts (see Introduction), there is no sub-national influence on the regulatory framework. However, the national level does not directly share support for innovation poles and clusters outside of the research funding streams, therefore regions alone must finance such instruments that one would expect to receive greater national-level support based on examples of other centralised countries. The RDAs do not typically fund R&D research *per se*, but the North West RDA more actively supports R&D centres than the other two regions. To varying degrees the RDAs support technology transfer, innovation advisory services, innovation networks and innovation “places”. While they also support financing instruments for innovation, these instruments are typically managed by separate RDA teams.

Table 3.9. Instruments to support innovation in the UK by source of funds

Instruments	EU	National	RDA	Local
Regulatory framework				
Competition-restraining product market regulations	X	X		
Intellectual property rights		X		
FDI restrictions		X		
Employment protection regulations		X		
Capital gains taxes		X		
Bankruptcy legislation and procedures		X		
R&D investment				
On-going financing of R&D performed in public research or higher education institutions	X	X		
Seed funding/projects to support R&D centres		X	X	
Public subsidies for private R&D spending		X		
Tax advantages for private R&D spending		X		
Technology transfer and other innovation advisory services				
Programmes with HEIs	X	X	X	
Innovation advice and guidance			X	
Innovation networks and collaboration				
Support of cluster initiatives	X		X	X
HEI links			X	
Innovation support networks			X	
Innovation "places"				
Science parks, science cities, and similar initiatives		X*	X	X
Centres of excellence, technology hubs			X	
Incubators for high-technology firms		X	X	X
Public research facilities		X		
Financing				
Public venture capital funds		X	X	X (rare)
Investment readiness business support			X	
Investment fairs			X	

R&D investment

The North West has directly supported science via the North West Science Fund. The fund has financed six university-based projects thus far. Each project involves more than one university and all have a link with industry through a cluster network or specific industrial partners.¹¹ It should be noted that stem cell research, one of the areas funded, is a major area of investment by the North East RDA as well via its Centre for Life. The other Northern RDAs do not have a specific science fund for R&D projects or support centres unless there is a greater technology transfer component.

Innovation advisory and business support

Instruments to support innovation advice and guidance to firms in the North have taken the form of innovation advisory services to individual firms, more structured broadly based programmes and university-centred services. In addition, there are national programmes, like the Manufacturing Advisory Service, that support firms across the country for innovation adoption in manufacturing processes. Yorkshire and the Humber developed a programme for Innovation Promoters to provide innovation advice to firms. The programme is being modified and re-launched as the Innovation Specialist Service. The new programme will work with Strategic Cluster Champions to target support. The North West is launching an innovation advisory service that will be included in the range of business support options available through Business Link. As the primary gateway to public support for business, the emerging system in all three regions is placing increasing emphasis on the Business Link network, which in the past has enjoyed a mixed reputation. The improved quality of that engagement with firms is therefore crucial to the effective delivery of regional support for innovation, particularly for smaller firms.

In the North East, innovation-related advice is channelled through the North East Productivity Alliance (NEPA) to improve productivity in manufacturing firms. Established in 2001 and chaired by the private sector, NEPA has a broader sectoral approach, with experience in 10 sectors of relevance to the North East. NEPA has established four different programmes: NEPA Best Practice, NEPA Workforce Development, NEPA Digital Factory and NEPA Engineering Fellows. NEPA works in conjunction with the nationally-sponsored Manufacturing Advisory Service (MAS) programme with NEPA focusing more on larger firms and MAS on smaller ones.

There are quite a few initiatives to support knowledge transfer/innovation advisory services from higher education institutions. Actors in all three regions benefit from the longstanding national

programme Knowledge Transfer Partnerships. Now overseen by the Technology Strategy Board, this programme allows firms access to a Knowledge Transfer Partnership consultant that may come from either an HEI or a research organisation to support business needs in terms of innovation solutions or qualified staff to guide new projects.

Each of the three Northern regions has developed its own programmes with the support of the regional higher education associations and a contribution of EU funding, but with very different degrees of success. In the North East, *Knowledge House* has been in place since 1995 and links firms to the region's universities for developing ideas and solving problems through collaboration, consultancy, training and research. It also offers financial assistance to fund some small-scale collaborative projects. It has successfully continued operations despite having changed its financing and business structure several times. *KnowledgeRICH* in Yorkshire and the Humber has a similar model, providing a free brokerage service connecting businesses with a technical challenge to a network of experts in the region's leading universities. *KnowledgeNorthWest* ran from 2000-2006 with a similar format and a budget of GBP 2.3 million over the life of the project. The lessons from these experiences should be shared. For example, an evaluation of *KnowledgeNorthWest* noted that the costs to the universities of the brokering was high and that an intermediary organisation was needed for contact with SMEs (NWUA, 2007).

There is some clutter in the landscape of basic innovation advisory service delivery, and in some cases concern about service quality. As discussed in Chapter 2, the Business Support Simplification Programme explicitly aims to address the clutter in the services provided through the Business Link gateway.¹² There are two or three sets of entry points for innovation advisory services in any given region through the national programmes through Business Link, RDA-sponsored initiatives or through the University Associations. There may be comparative advantages to each of these different entry points but from a firm perspective it is confusing and increases the level of transaction costs. Some degree of duplication is unavoidable given different funding streams and institutions; however, perhaps a better cross-referral across the programmes (some already do so on their websites) or indications of their distinctiveness in the landscape of programmes would be useful.

The Centres of Industrial Collaboration (CIC) in Yorkshire and the Humber is a core initiative in the region to support university-industry collaboration to improve commercialisation activity. The programme was modelled after a similar initiative elsewhere in the UK. There is no equivalent programme in the other two regions in the North, however the N8 centres (described in a later section) appear to seek to perform similar tasks

but perhaps with a greater contract research than advisory role. There was a conscious effort to support a label effect for the Centres. The programme has received GBP 11 million from the RDA to set up 15 centres and after three years of initial funding (approximately GBP 300 000 total per centre) there are 12 that are self-sustaining and continue to operate. Each centre has an administrative structure with a dedicated Commercial Manager, a Centre Director and a Scientific Advisory Board. As of 2006, CICs are reported to have worked on more than 1 500 projects with business, grossed more than GBP 38 million of income and created or safeguarded 1 400 jobs.

The Centres of Excellence concept in the North East is one of the more unique initiatives to support innovation given their structure, high level of funding and boldness. To support the Strategy for Success, five Centres were created, each receiving GBP 30-40 million over that period. The legal structure of these centres required considerable hurdles for approval to overcome state aid rules. This was a strategic choice by the RDA to diversify the kinds of institutions in the region that relies heavily on HEIs to fill the gap. An early evaluation found several positive findings at that stage (Hodgson and Benneworth, 2004).¹³

Innovation “places”

In all three regions, there is a desire to have visible innovation sites both to enhance economic impact by co-locating key actors but also as an important symbol for the region. There is a value to such landmark projects for several reasons. They promote critical mass and reduce the transaction costs associated with a wider dispersion of resources. They also serve as a focal point for regional identity. They provide an opportunity for alignment of local, regional and sometimes national resources as well as a concrete role in marketing of the region. Having a location on or near such sites serves firms in both tapping into the “local buzz” and also in terms of credibility for working with other firms, seeking financing, etc. The success of the Daresbury Innovation Centre for tenant firms is particularly noteworthy (see Box 3.3.). In terms of supporting momentum, the success of a few key projects is also important to inspire future actions.

Given the infrastructure costs of such major sites, the challenge for the regions is proving that such a massive investment has measurable rewards. In the long term, that output is growth in the regional economy. However, there can be other intermediate output goals in the short to medium term. Across OECD regions, the results of these significant investments (in major research facilities or other technopoles) are mixed, in part due to the insufficient links with the local economy and the often the long time frames needed for the investments to pay off. Even the often cited Sophia Antipolis in southern France, which received considerable public funding, took

decades before it truly became a success, in part because it was built in a location with no industrial or university tradition and also because once the multi-nationals left it took time for endogenous development to occur. Overall, technology park-type locations appear to have performed best in three types of regions: 1) old industrial regions, which within the framework of industrial reconversion have sought to create technopoles as a way of changing their overall image; 2) urban locations offering economies of scale and a strong concentration of high-technology-based activities; and 3) new industrial regions, where initiatives have capitalised on the emergence of dynamic companies, particularly in high-tech sectors, in areas with little industrial tradition (OECD, 2005a).

In the North of England, the RDAs have invested in a few major innovation sites that serve as key elements in their efforts to transform their economies (Box 3.3.). As outlined in Table 3.10., some of these sites have received considerable RDA funding, but within a few years they have also leveraged funds from EU, national and even private sources. Successes related to the effective alignment of resources and the fact that they are all building on existing infrastructure or regional competencies. Where the locations in the North have not all been as successful is in the linkages with the local economy. The long-term impacts of the Daresbury Campus in the North West, initially the location of a national science facility, are the subject of an upcoming study by national and regional stakeholders so as to better understand the time dimension of major public investments in science facilities and the resulting dynamics for the local economy.

Table 3.10. **Financing of selected innovation sites in the North**

Region	North West	Yorkshire and the Humber	North East
Site	Daresbury Science and Innovation campus	Advanced Manufacturing Park	CPI/ Wilton Centre
Origin and evolution	Site of national synchrotron, designated in 2006 one of two national science and innovation campuses	Site of former open cast colliery	Former complex of ICI (construction dating back to the 40s)
Year RDA investment began	2003	2002	2004
RDA funds to date? • share from innovation budget (purpose) • share from other budgets (purpose)	GBP 50m - 100%	Approximately GBP 23m capital and revenue A further GBP 10m in investment has been made in the Factory for the Future	CPI - GBP 2m per year revenue funding NEPIC - GBP 1.4m revenue funding over 3 years

Table 3.10. **Financing of selected innovation sites in the North** (*cont.*)

Region	North West	Yorkshire and the Humber	North East
Other public funds leveraged <ul style="list-style-type: none"> • amount of local contributions (for what purpose) • amount of national public funds (purpose and source) • amount of EU funds (purpose and source) 	UK Govt allocation of GBP 50m for science projects to Daresbury EU funds GBP 7m infrastructure STFC has committed to developing 2 further Technology Gateway Centres around super-computing and sensor detection systems on the campus Cockcroft Institute has raised GBP 30m in R&D grants	In total, ca. GBP 50m RDA funds, GBP 21m ERDF, GBP 6m DTI and GBP 9.5m private investment has been invested in land, capital and revenue	GBP 23.4m capital funds in place from RDA, EU & BERR (Also includes funding for National Industrial Biotechnology Facility of GBP 7.2m)
Private funds leveraged <ul style="list-style-type: none"> • own revenues raised • real estate development • funds for other purposes 	65 High technology companies have moved in to Daresbury, raising GBP 11m in investment finance with a combined turnover of GBP 10m Real estate development: potential for additional GBP 25m to be leveraged	This is a joint venture with UK Coal, sharing land and infrastructure costs 70:30	GBP 23m raised to undertake collaborative R&D projects with companies incl. GSK, Unilever, AZ
Problem to solve and expected impact on region	RDA investment was to act as a catalyst to develop a campus where basic scientists and entrepreneurial businesses are co-located in order to create jobs, knowledge-based firms and the economic regeneration of the area This vision was developed following the Government decision relating to the DIAMOND light source and the need for a regional response and vision for the future development of the Campus	Vision emerged from decline of South Yorkshire's traditional industries of coal and steel. Aim was to build on skills and knowledge in advanced manufacturing combined with material research expertise 1 st tenant of AMP – the Sheffield University's Advanced Manufacturing Research Centre has delivered GBP 19.4m in increased sales for local companies, GBP 25m in direct wealth created and over 70 new jobs created	Aim is to nurture and support world-class process industry sector in the region. Maintain existing companies and attract new investment - increasing GVA and numbers of technology jobs. Wilton site previously home to ICI who began scaling back operations in late 1980s. Centre was sold in 1999 and now managed as business and technical centre with multiple tenants. Cluster organisations established to create network of chemical companies
How success is measured	Short-term occupancy of Innovation Centre Long-term development of the master plan and expansion of campus and link to Daresbury Business Park	Stimulating growth efficiency, innovation and profitability in manufacturing and advanced materials sector. Engagement with regional and international businesses	Wilton Process Industries Cluster aims to increase regional process industries GDP from GBP 8.8bn to GBP 13.3bn by 2015

Box 3.3. Select important innovation sites in the North of England

The Daresbury Science & Innovation Campus appears to have the highly effective combination of a science campus with active high-technology start ups. In terms of the innovation centre, what stands out is the inclusion of a number of highly skilled serial entrepreneurs who serve a mentoring role with the less experienced firms and a peer support role among themselves. The effectiveness of this network is also related to the high technology level of the firms. The selection mechanism for firm entrants as well as the impressiveness of the new facility is a reassuring signal to potential investors and clients that has a noticeable impact. The Centre also serves as a focal point for public programme delivery, such as monthly UKTI visits. The strategic location, in between Manchester and Liverpool on major road networks, is yet another advantage. The value of all of these factors is what has led firms to actually relocate from Leeds or Wales into Daresbury. The RDA has already invested over GBP 50 million and the latest private investment is GBP 25 million to develop 200 000 square feet.

The Manchester Science Park does not have the same degree of innovation-related support as the new Daresbury Centre. Started in 1984 in a period of decline for traditional industries, the Park is owned in thirds by the City of Manchester, the universities in Manchester and a consortium of local business. There are 100 tenant companies with 1 000 employees and approximately 40% of the tenants have been there for over five years. There are free business support services but it appears to serve a bit more of an industrial park than science/innovation campus.

The Advanced Manufacturing Park (AMP) in the Sheffield city-region was initiated in 2000, with its first anchor tenant in 2003, on the site of former coal mines. The facility is a manufacturing technology park that includes an Advanced Manufacturing Research Centre with international reach, the Innovation Technology Centre with office space and support services, and other contract research providers and firms. Technologies at the AMP centre on materials and structures, covering metallic and composite materials typically used in precision industries including: aerospace, automotive, sport, environmental and energy, oil and gas, defence and construction. RDA as well as EU funds contributed to the site. After six to seven years of investment, private developers are now investing in the site.

The New and Renewable Energy Centre (NaREC) was established in 2002 as a Centre of Excellence as part of One Northeast's Strategy for Success. It has been funded by over GBP 30 million of investment from One NorthEast, the North East's Regional Development Agency, and the European Regional Development Fund. It is located in Blythe along the coast on the site of former dockyards. NaREC serves as a research and development platform for new energy technologies that includes development, testing and consultancy services. It also supports the transformation of innovative new technologies into commercial successes and has a special legal structure to do so. While it co-operates with higher education institutions, it was set up separately specifically to diversify the range of institutions in the North East. It has speciality niches in particular with marine renewable energy given its wave and tidal services as well as wind energy testing facilities, high voltage and photovoltaic testing facilities. The site also seeks to attract foreign investment and firms who will take advantage of the assets of the Centre and has recently attracted a large firm involved in wind energy to locate there.

Innovation finance

In the North of England, there is venture capital funding available (albeit less is directed to the North relative to other parts of the country) but there are some specific gaps. The problem often cited was the availability of investment-ready projects (*i.e.*, the demand side). In all three regions it was reported, either in sessions with firms or other research, that the financing gap is more in the scaling up phase, as early-stage funds are readily available. However, it was also reported, even by those who had or have worked in the venture capital industry, that the investors out of London were biased against the North, which could be summed up by “If your investment near London fails, that is the nature of risk. If your investment in the North fails, it proves you should never have invested there in the first place.” The investors based in Manchester were reported to be less likely to have this perspective. In two regions, the need for tax changes or general availability of business angels was cited as a gap.

All three regions have some sort of early-stage venture capital type fund, hence expanding the supply of finance in that range. The same is true for a large number of OECD regions. The Regional Venture Capital Funds were established in each of the nine regions of England to support SMEs with up to GBP 250 000 initial investments. In addition, the RDA in the North East supports NStar Equity Investors which specialises in early-stage high-growth technology opportunities with two funds: a GBP 10 million Proof of Concept Fund for pre-seed stage of investment (up to 90 000) and a GBP 23 million Co-Investment Fund that specialises in high-growth investments of up to 1.5 million and will lead or participate in syndicates. In 2007, Yorkshire and the Humber launched Yorkshire Concept, a GBP 6 million fund (half from the RDA, half from the universities) to support academic researchers, staff and students demonstrate the commercial viability of their expertise and to support the creation of spinoffs. This programme follows from a pilot project that had been financed by the national Higher Education Innovation Fund.

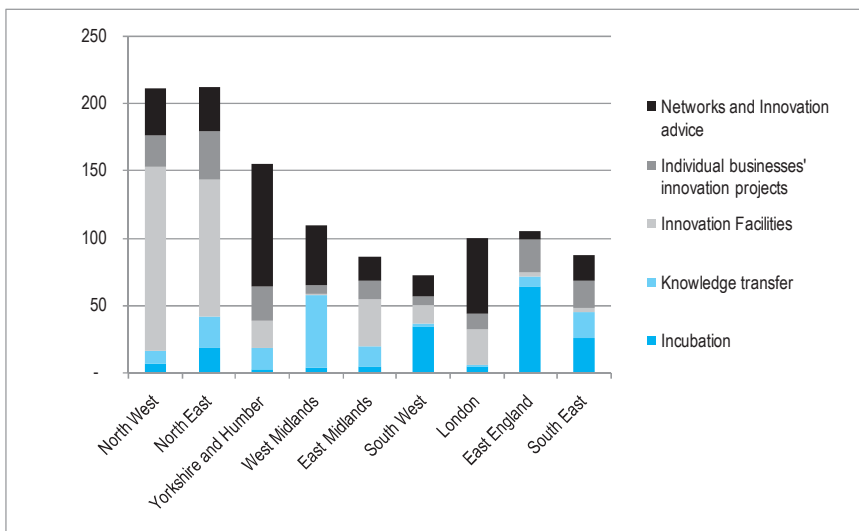
Spending on innovation instruments

There are obvious variations in the nature of RDA spending for innovation by category across the North and the rest of England. Both the North West and North East spent a significant portion of their innovation budgets over the last Corporate Plan period on innovation facilities, much more as a share and absolute value than any other region in England (64% and 48% respectively) (Figure 3.3.). A discussion of the investments in some of these major innovation sites is found in Table 3.10. as several have received considerable RDA investment. Yorkshire and the Humber stands

out as spending a higher percentage of its budget on networks and innovation advice, 59%. The only other RDA that comes close to this share of spending on the same category is London at 56%. A slightly different analysis of RDA innovation spending from an earlier time period revealed that about 20% of spending was for incubation, about 19% for knowledge transfer, and about 16.5% on innovation projects.

Figure 3.3. **RDA innovation spending by category**

GBP millions (sum of FY 05/06, 06/07 and 07/08)



Source: OECD calculations based on HM Treasury data.

The transaction costs to the programmes within these spending categories should be considered carefully by the RDAs. In some programmes the funds are distributed across a wide range of sites that each require considerable start-up costs, including consultants for business plan development, evaluations of spending, programme monitoring, etc. While a detailed review of spending on individual programmes is beyond the scope of the review, it is likely that if this criterion were more actively considered there may be a greater concentration of resources in specific programmes or sites that have a higher chance of achieving the transformational impact that the regions are seeking with their innovation strategies.

The allocation of RDA funds can play an important catalytic and signalling role to Government for alignment of resources across levels of government; the problem is the insufficient number of mechanisms for such alignment. The aforementioned Technology Strategy Board example concerns alignment on existing project proposals, but there are also examples where RDA funds are used strategically as a signal to Government of priority projects for the region outside of a specific national programme. For example, two sets of university mergers in the North West (in Manchester and Cumbria) both attracted GBP 10 million each of Higher Education Funding Council for England funding with investments of even greater sums on the part of the RDA.

As a benchmark, one can look at the spending on some key programmes to support innovation by regions across OECD countries. The challenge for mapping spending on innovation and comparing across countries is the lack of a universally accepted definition of what should be considered innovation spending. For example, calculations of regional spending on innovation with EU Cohesion policy funds is rather broad and includes not only research, technology, development and innovation (RTDI) but also entrepreneurship (including self-employment), ICT services to business and citizens and labour market relevant human resources expenditure (EC, 2007a).

To give a sense of perspective, a number of spatially based innovation networks or centres are supported across OECD countries (see Table 3.11.). While these are national-level budgets or national budgets with regional co-financing, they illustrate that many of these major innovation-related programmes receive significant resources. The *Pôles de compétitivité* programme had a three-year estimated public budget of 1.5 billion EUR to come from different agencies and ministries as well as through tax breaks. The amounts were spread across 67 clusters in the country, however given a financing priority for the few poles labelled “international”, that investment can reach millions of EUR per year per pole. The Korean Innovative Cluster Cities programme allocates EUR 150 million over four years to seven locations, an investment of between EUR 4-6 million per year per location. These examples come from countries with a more centralist approach to industrial planning than the UK, but they share a more centralised government structure and some clear challenges with planning and super-regions (Ile-de-France and Seoul respectively). In Italy, the Technological Districts with EU funding received approximately 50-60 million EUR per district over several years (OECD, 2007a).

Table 3.11. Per region spending on specific innovation programmes

Country	Programme / Policy	Primary instruments	Overall programme budget	Avg. annual spending per cluster	Co-financing (in addition to programme)
Broader spatial programmes					
Canada	NRC Technology Cluster Initiatives	Innovation (collaborative R&D, specialised R&D services and infrastructure, industry development)	342 million EUR over first 5 years (includes three five-year funding rounds)	Approximate range from 1.2 to 8.4 million EUR	yes (may be national or provincial sources)
France	<i>Pôles de Compétitivité</i>	Innovation (collaborative R&D); engagement of actors (development of cluster initiative)	1.5 billion EUR over three years	approximate estimated average 26.7 million for international clusters, 1.9 million for regional	yes
Italy	Technological districts	Innovation (collaborative R&D)	n.a.	Expected of 50-60 million EUR per district over the period	Private sector co-financing
Korea	Innovative Cluster Cities	Entrepreneurship and innovation (collaborative R&D, business services to existing and start-up SMEs)	Approximately 150 million EUR over four years	Approximately 3.6 million EUR in first year, up to 6.3 million EUR in later years	25% co-financing by private sector for technology projects
Netherlands	Key Innovation Areas	Instruments flexible, mainly: engagement of actors (cluster initiative and programme development) and innovation (joint R&D, research centres, SME technology support)	Approximately 200 million EUR per year (minimum of five years)	Will vary, but in the tens of millions per cluster annually	private sector contribution required
Specific Instruments (Centres of Expertise, large scale collaborative R&D projects)					
Finland	Centres of Expertise	Entrepreneurship and innovation (collaborative R&D, business services to existing and start-up SMEs)	1999-2005 totalled 46 million EUR (Approximately 8 million EUR 2003, 9.4 million 2004)	from 150 000 to 900 000 EUR per CoE (overall average approx 400 000)	50% regional government
Norway	Centres of Expertise (NCE)	Entrepreneurship and innovation (collaborative R&D, commercialisation assistance, incubators, internationalisation to become global players)	Approximately 4 million EUR first year, 6 million second year	Approximately 600 000 to 700 000 EUR	Minimum of: 25% private business / knowledge actors; 25% local or reg. gov't
Sweden	VINNVÄXT	Entrepreneurship and innovation (collaborative R&D)	n.a.	Approximately 800 000 EUR per year over 10 years	50% regional co-financing

Source: OECD (2007), *Competitive Regional Clusters: National Policy Approaches*, OECD Publications, Paris.

The sub-regional level

Limited but increasing scope for local action

The place-based dimension of innovation has been documented in the literature to operate and produce benefits that can occur at many levels. Those levels include that of a cluster, metropolitan area or larger region. This variable geometry is not easy to address. The role sharing across levels of government should therefore be based on which factors that support innovation are most susceptible to influence at which level (including the local level) within a country's governance context. In some circumstances there may be a need for entities that map better to these functional areas, whether public or private, and in other circumstances the existing context may allow for the design and delivery of policies that can take into account this more localised ecosystem footprint.

The North's economic geography suggests that the RDA regions in the North do not necessarily map to a regional innovation system (see Chapter 1). Furthermore, typically the core of a regional system is one or several urban areas in close proximity. The nature and footprint of a system will depend on the functional linkages across actors. In one typology of UK cities/city-regions where there is notable innovation activity, the distinction is made on the number and inter-relationships of innovation actors: strong hubs with strong linkages (e.g., London); strong hubs with weak links (e.g., Manchester, Birmingham); or weak hubs with strong links (e.g., Cambridge, Dundee) (Athey *et al.*, 2007). In terms of innovation performance, these urban areas vary on a number of parameters (those listed above being one example) that policy approaches would need to consider, regardless of which level of government or other institution plays what role in innovation support.

Metropolitan areas around the OECD are taking an increasingly active role in supporting innovation systems. Many of these local efforts tend to be bottom-up approaches with the goal of promoting the competitiveness of the city-region (OECD, 2006b). Generally in OECD countries, the tools used at the city or city-region level concern spatial planning aspects for facilities (science parks, incubators), cluster networking support and special programmes with higher education institutions. With larger metropolitan regions, that support may be more extensive given the greater scale and revenues available.

As a policy trend, some cities and city-regions in the North are including the concept of innovation as a priority area of action. Historically, even back in the 1980s, local authorities have had some form of remit for innovation

promotion and the enterprise agenda. The focus was not on the broad business environment as much as specific projects such as technopoles and business parks as additional funding (usually EU) became available. Today, the Sheffield city-region, for example, has listed innovation as one of its priorities. The reported focus there appears to be on business support. In Leeds, there are efforts to create innovation spaces in local institutions that will serve a cluster, business support and technology transfer role. Manchester Knowledge Capital is perhaps the most notable initiative in the North with a broad city-region level approach to supporting innovation (see Box 3.4.). Science Cities, discussed later, are one of the most prominent locally-based innovation-related initiatives and are active in Newcastle, York, and in Manchester in combination with Manchester Knowledge Capital. These city-region initiatives are partnerships, working in close collaboration with the RDAs and the Northern Way, and in the case of Science Cities, with the additional national-level designation.

In the UK, the scope for independent local action to support innovation is more limited than it is in other countries. Most of the strategic decisions that have an impact on the economic component of competitiveness are decided above the city level. These entities include central government departments and (for innovation, economic diversity and skills) the RDAs (OPDM, 2006). This may be why a recent study noted that English cities in particular have been successful in the regeneration agenda (where they receive considerable funds from the Department of Communities and Local Government, CLG), but compared to European peers they do not necessarily master the other key supports to competitiveness (drivers include innovation, economic diversity,¹⁴ skills, connectivity, place quality and strategic capacity) (COMPETE, 2007). Furthermore, local authorities raise less than 5% of total taxes in the UK, one of the lowest rates of OECD countries (OECD, 2008c). The lack of incentives for localities to promote an attractive environment for business is increasingly recognised and is the subject of the Local Area Business Growth Incentive (LABGI) scheme (see Chapter 2).

One challenge for locally-initiated support at a city-region level is the lack of a clear counterpart for leading that action. Local authorities in the UK are generally under-bounded; therefore in most cases they cover only a small part of a functional area that serves as an innovation system. The Core Cities group has done research for Government on the city-region concept (ODPM, 2004) and this has continued to gain ground through the Northern Way and CLG (CLG, 2006, HMT/BERR/CLG, 2007). Part of the development of the Northern Way strategy and programmes (for the area that maps to the three Northern RDAs) was based on economic strategies of

the eight constituent city-regions. Support for this greater accent on functional regions has also been suggested by the OECD (OECD, 2006f).

Efforts to promote co-operation across a functional area are likely to also serve sub-regional efforts at promoting innovation. This may be done through better identification of local needs, strategy development or project delivery. Multi-area agreements are a new vehicle for joint action across municipalities generally. However, they are only a mechanism for collaboration that works if there is already a strategy in place to guide those actions. There are sub-regional divisions within the RDAs and in some cases lead entities that co-ordinate across these jurisdictions, or there are simply sub-regional offices of the RDA itself, that support the development of joint strategy and action that could have an innovation support component.

In the North, the Manchester city-region has the longest history of co-operation which serves as a valuable example. Long-term political stability, strong leadership and an under-bounded Manchester City also contribute to its effective city-region collaboration. It should be noted that the footprint of the city-region for Northern Way purposes is a bit larger than the current 10 local authorities who collaborate most closely in this arrangement. As previously mentioned, leadership and co-operation in the city-region is also one of the drivers of its success. Other city-regions are organising themselves through different infrastructures, and through the Northern Way initiative there is an opportunity for sharing of best practice and peer reviews of progress.

Going forward, the SNR advocates a greater role for the local level in the development, scrutiny and delivery of regional strategies. What does that mean for innovation? The role for the local level is not yet determined. At a minimum, the RDAs in this new process can serve a strategic resource alignment role with city-regions, and for those city-regions with capacity, sub-contracting delivery when appropriate. Given the limited resources for most cities or city-regions, the actions that can be taken would need funding from other levels of government or considerable private sector mobilisation. In large metropolitan areas, like Manchester, there may be capacity, scale and resources for supporting innovation. In perhaps smaller-scale locations but with a very clear focus, such as Tees Valley, there are also opportunities for the local level to fully rally behind key initiatives and be effective at concentrating local efforts and attracting additional resources. In other areas the requirement for a more significant role for the regional tier in both identifying and funding projects is stronger.

Box 3.4. Manchester Knowledge Capital (M:KC)

Established in 2002, Manchester Knowledge Capital has a small Executive Team that reports to a high level, predominantly private sector Board at quarterly meetings. Leading partners in the organisation are the ten participating metropolitan authorities, four local universities, and several public sector agencies. Part of the success of the initiative may be attributable to the entity's ability to attract external attention and resources which builds momentum and can support co-operation. The three main programmes it oversees are:

Science City – Adding fuel to the knowledge economy by increasing levels of business R&D and making companies more competitive and innovative – by establishing Innovation Partnerships, encouraging public engagement with science and technology, and developing an innovation ecosystem that nurtures growing businesses.

Manchester is my Planet – Formerly the Manchester Green Energy Revolution, this programme is a partnership between the local authorities of the Manchester city-region and Sustainability Northwest to convince large organisations, businesses and households to radically reduce emissions and secure economic benefit through the innovations developed to do so.

Innovation Investment Fund – is an initiative aimed at catalysing innovation across the Manchester city-region. The founding investors are NESTA, the NWDA, Manchester City Council and the Manchester Knowledge Partnership. Their aim is simple, to make Manchester one of the most innovative cities in Europe. The Innovation Fund, launched in early 2007, aspires to reach a total of GBP 9 million before 2010 and supports projects in five categories:

- ***Understanding Innovation.*** Increasing the level of understanding of Manchester city-region's innovation ecosystem. This work will help to capture and analyse the current state of Manchester's innovation economy and its potential; providing a model of understanding that can be replicated by other cities.
- ***Inspiring Innovation.*** Galvanising stakeholders and the people of Manchester behind a unifying vision; boosting aspirations, inspiring and encouraging a culture of innovation and enterprise; increasing engagement with ideas, creativity and knowledge and generating new networks and opportunities for interaction.
- ***Embedding Innovation.*** Ensuring that the stimulation of innovation and creativity becomes an integral part of how the city-region develops. Using challenges and other opportunities to involve innovative local companies in major capital investments such as Oxford Road or mediacity.uk.

Box 3.4. Manchester Knowledge Capital (M:KC) (cont.)

- **Ideas to Investment.** Stimulating business growth through enhanced access to the support and finance required by innovative people and SMEs; developing the market offer that the city-region can present to the investment community both nationally and internationally to stimulate greater private sector activity.
- **Communities of Innovators.** Creating novel and interactive innovation generating groups; connecting innovators in Manchester with innovators around the world. This is about exploring the “chemistry” of innovation, getting the right environment for innovators to spark ideas off each other.

Source: www.manchesterknowledge.com/ and presentations to the OECD.

Science Cities: nationally inspired, locally developed

Three designated in the North of England...

There are six nationally-designated Science Cities in England: three in the North (Manchester, Newcastle and York – see Box 3.5.) and three in the Midlands and Southwest (Nottingham, Birmingham and Bristol).¹⁵ While each Science City is pursuing its own strategy, the six cities have formed a Science Cities Development Group to promote knowledge exchange among themselves as well as with public and private sector partners and at annual Summits held in each City. It has commissioned independent research on the value-added of the designation and engages with national government on innovation policy initiatives, their impact and method of delivery.

The broad aim of the Science Cities programme is to link public investment in science and urban revitalisation with business and innovation at the sub-national level. It is intended that the Science City designation will strengthen university, city, and business partnerships to achieve this aim. No specific funding is allocated to the Science Cities programme, nor is any Government department responsible for its oversight. Furthermore, the selection was made without clear criteria, the cities that were designated being thought to have the capacity to achieve the aims.¹⁶ The aspiration is that by designating these locations as Science Cities, local stakeholders will be motivated to develop their own partnerships, strategies and resources to leverage science, technology and innovation-driven economic development and promote innovation-embedding initiatives.

Box 3.5. Science Cities in the North of England

Manchester Science City is implemented as one of the programmes of another economic development and innovation partnership organisation, Manchester Knowledge Capital (M:KC). This is a metropolitan-wide organisation of Manchester local authorities, universities, the RDA, the health authority, business representatives, and other organisations. Accomplishments of the Manchester Science City are reported to include attracting a National Health Service technology adoption centre to Manchester, assisting in acquiring funds (from the Northern Way) for equipment for aircraft impact research, attracting funds (also from the Northern Way) to support a new Manchester cancer research centre, and extensive public participation in the Manchester Science Festival.

Three leading activities of the Manchester Science City are:

- ***Innovation Partnerships***, involving universities, industry, trade associations, and public agencies. These partnerships aim to identify gaps and opportunities and stimulate innovation activities in Manchester. Partnerships are being pursued in four areas: future of healthcare, design for sustainability, personal broadcasting and clean aviation.
- ***Real World Science***. Public engagement activities to increase awareness and interest in science, including a Science Festival and other public events.
- ***Innovation Ecosystem***. Efforts to improve physical infrastructure, partnerships, finance, attractiveness to talent and related measures.

Newcastle Science City (NSC) is implemented through a partnership of the city council, Newcastle University, the RDA, and business, with a private-sector led NSC Board. NSC's major strategies include:

- ***Investment in Science*** to strengthen world-class research capabilities in the region. Four research areas have been targeted: ageing and health, energy and environment, molecular engineering, and stem cell biology and regenerative medicine.
- ***Commercialisation***. Strengthening and co-ordinating support initiatives to commercialise science and develop new business in the city.
- ***Education and Public Engagement***. This includes activities to raise awareness of science in the city and encouraging young people to pursue science careers.
- ***Physical Space***. Developing attractive environment and facilities for science and business, including in central Newcastle in locations related to the university campus and medical facilities, the International Centre for Life, and the redevelopment of an old central city brewery site as a research and innovative business complex. Projects are also planned in other areas of the region, including Durham and Teesside.

Box 3.5. Science Cities in the North of England (*cont.*)

Newcastle Science City's reported accomplishments to date include the purchase and planning of the old brewery site (which is clearly a complex, long-term project), strategy development involving the university and other partners and project development. In the latter category, NSC reports involvement in a series of core projects, including support of R&D centres (including an Institute of Stem Cell Biology and Regenerative Medicine, Institute of Ageing and Health research labs, and a Centre for Nanoelectric Characterisation), research equipment procurement, and a science excellence fund, for a total of GBP 43.5 million through to March 2007. Of this additional funding, 44% (GBP 18.9 million) was provided by the RDA (One Northeast) to sponsor research with potential commercial outcomes. NSC has also been associated with the development of several other R&D centre projects as well as bids to attract additional national R&D programmes and funds to Newcastle and the Northeast.

Newcastle Science City has unveiled plans to establish a commercial entity to focus additional efforts on research commercialisation and technology-oriented property development. This would provide greater flexibility to work with public and private partners to attract and make investments, sponsor R&D commercialisation and support start-ups. The new organisation would seek to foster collaborative projects that would overcome barriers associated with linear models (where university R&D is rarely taken up by the private sector), raise funding and take equity positions. It would not seek to duplicate services (such as incubation) already provided by others in the region.

Science City York was established in 1998, not only predating but also serving as one of the models for what became the national Science Cities initiative in 2005. Science City York is organised as a company limited by guarantee with the University of York and City of York Council as its two main stakeholders, with the RDA represented at board level. Support is provided by an advisory board and by staff drawn from the RDA (Yorkshire Forward) and the business and the university communities. Science City York is pursuing five key strategies:

- ***Business Development.*** Fostering the attraction and development of technology-based businesses. Science City York operates as a portal to proof of concept and technology growth funding and technical assistance to start-up, early-stage, and existing technology businesses in York and the North Yorkshire sub-region.
- ***Human Capital Development.*** Working with education and industry partners to ensure that the area workforce has the knowledge and skills to match employment opportunities and sector-specific needs.
- ***Partnerships.*** Promoting public-private partnerships to create the infrastructure necessary for knowledge-driven economic development.

Box 3.5. Science Cities in the North of England (cont.)

- **Sector networks:** Development and management of networks in bioscience and healthcare (including environmental technology), IT and digital and creative industries sectors.
- **Public Understanding.** Promoting public understanding of science and technology. Activities include an annual York Festival of Science and Technology, Science Cafés (Café Scientifique), and public science workshops (Science Bite Size Tasters).

Science City York targets research and innovation activities in the clusters of bioscience and healthcare, information technology (IT), and the creative industries. It facilitates and links with three other entities: Bioscience York – a regional network of 80 bioscience businesses and about 50 other organisations (including research organisations) established in 1995 to support bioscience business enterprise and start-ups; IT & Digital York – a network for business support in the information, communication technology, electronics, software and other digital industries operating since 1998 (as ICT York and e-Science York) and re-launched in 2004 under its current name as network of nearly 150 businesses, freelancers, and other organisations; and Creative York – a network of about 100 business and other organisations which seeks to foster the growth, conservation and heritage of film, TV, music, communications, design, and other media business in York and North Yorkshire. In addition Science City York also provides specialist business support and advice to science and technology companies in the region. Services include business planning, mentoring and proof of concept funding, which are provided by Science City York “Business Promoters”. Science City York states that it has helped to create over 80 new technology companies and 2 800 new jobs since 1998 and aims to create a further 15 000 new science and technology jobs in York by 2021.

...with very different characteristics in international comparison

Although there is no universally agreed definition, in general a science city can be regarded as a delimited spatial area where science, technology and innovation is actively used to promote economic and business development. But the term has been very broadly applied to include: individual technology-oriented sites and buildings; prominent regional high-technology locations which have developed organically and where public intervention has been diffuse or loose; and explicit government-initiated efforts to foster science cities, including ambitious attempts to foster new agglomerations of scientific capability.

In terms of international comparisons, it is evident that the English initiative does have elements that are seen in other science cities around the world, but in its entirety is similar to none of them. There are also elements in other science cities not (yet) seen strongly in the English Science Cities. There are a number of significant points of contrast (see Table 3.12). One of the strongest contrasts between the English Science Cities and many other national examples is the far more modest level of public support available. It is project by project (rather than part of a larger plan), and in most cases has to be individually negotiated. The English Science Cities initiative has explicit regional development goals, including bolstering science and innovation outside the South East and linking with urban and regional regeneration (brown-field development), while most others are established in locations which are either the capital city or in leading economic and R&D regions with a greater presence of major research institutions, extensive international networking and a strong venture capital presence. Although the idea for Science Cities in England came from Government, it plays a very minor role compared to other examples. The major accent on public science education is a distinguishing component of the English initiative. In most other cases internationally, the science cities are unique ventures and not part of a network as in England.

Table 3.12. **Science Cities: an international comparison**

	Science Cities	Daedeok	Silicon Valley	Zhong-guancun Science Park	Hsinchu Science Park	Tsukuba	Kista	Oulu
	UK ¹	Korea	US	China	Taiwan	Japan	Sweden	Finland
Green-field location		●	○		●	●		
Regional development goals	●	●			●	●		●
Dominant national role		●		●	●	●	●	
Dedicated public investment		●		●	●	●	●	
National programme	○				●			
Major research institutions	●	●	●	●	●	●	●	●
National R&D leader			●	●		●	●	
Partnership models	●		○		●		●	●
Flexible network models	○		●	○	○		○	○
Orientation to innovation	●	●	●	●	●	○	●	●
“New Argonaut” links			●	●	●			
Strong venture capital presence			●					
Public science education	●							

Notes: 1) Northern England Science Cities of Manchester, Newcastle, York; 2) ● = Strongly present; ○ = partially present. More ●'s or ○'s denotes that more factors are present, not that more factors leads directly to better outcomes.

Progress and future possible scenarios

The devolved and experimental nature of the Science Cities initiative is refreshing. One of the most promising aspects of the Science Cities is its flexibility, and the opportunity it provides not only for each city-region to chart its own Science City course, but also to gain insights from other Science Cities through collective exchange and learning processes. There is also the possibility that Science Cities can become more than a brand, instead also leading to fundamental changes in research capabilities and the leveraging of research for innovation. They may also serve as demonstrators for specific initiatives.

However, it is important to probe the extent to which the programme is likely to meet the ambitious goals and aspirations that have been set for it, especially within the North. In none of the Northern Cities can it be said that the Science City is a path-breaking initiative: projects and activities being pursued as yet do not sum to step-wise changes in development trajectories, despite ambitious goals. However, this is not surprising, given the lack of dedicated resources and the need to negotiate on a project by project basis. While in several cases resources have been forthcoming (as in the case of Newcastle), significant transaction costs are involved. It remains to be seen whether the Science Cities initiative will be sustainable over the long term.

The designation of Science City has appeared to have the most catalytic impact in Newcastle, particularly in the area of regeneration. In Manchester, the designation has been incorporated into the existing reputation and programmes of Manchester Knowledge Capital, and has value locally through the opportunity to refresh the Knowledge Capital strategy, and strengthen links with national Government. The Science City in York was already in existence many years prior to the designation in 2005 as an initiative developed and funded by the City of York in partnership with the University of York and York businesses. The impact has been to create a number of sector network development initiatives in the bioscience, ICT and creative sectors around a common brand, and with a subsequent expansion (facilitated by RDA funding) to provide specialist business support for science and technology businesses in these sectors in York and the greater North Yorkshire sub-region. These variations speak both to the differing value of the designation across regions but also the flexibility with which the designation can be tailored to local needs. There are a number of interesting themes to explore in more detail with respect to Science Cities, including the additional leveraging of resources through branding, the impact of the particular programmes associated with the various Science Cities, the interesting role for local authorities in this venture, the links between innovation and urban regeneration, and acting as testing grounds for UK policy, among others.

In terms of opportunities for improvement, particularly in the North, there are several possible routes, only a few of which are discussed here. The learning and exchange role could be expanded to other cities in the North of England that are also pursuing similar strategies (even if not designated a Science City by Government) could be invited to join a learning consortium. The budgetary cost of this is marginal while the potential learning benefits are large. Another option is to enhance local strategic embedding of the Science City concept, and focus resources where strategic embedding is deepest. Methods to enhance strategic embedding might include significant additional multi-year Science City matching development funds, although, first making sure all stakeholders are aware of and commit to the prioritising of their Science City programmes is essential. Not all of the current Science Cities may wish to make this commitment, and there is an opportunity for other Northern cities (for example, Leeds, Sheffield, Teesside and Liverpool) to consider adopting similar approaches. This would involve a level of multi-year funding (since multi-year strategies should be developed) that could be manageable at the local and regional level. Finally, there could be a case developed for dedicated strategic plans and resources. If the intent is truly to develop world-class Science Cities in the North which can match the capabilities, attractiveness and dynamism of international competitors, then dedicated strategies and resources are surely required. This would require substantial new national funding for Science City development in the North, in addition to regional and local commitments.

Innovation Partnerships: a national designation under development

One of the core proposals in the regional section of *Innovation Nation*, the national innovation strategy, is that of Innovation Partnerships. The idea is based on the experiences of the Science Cities, a concept of national-level designation that had no prescriptive requirements and no national funding (see above). The form of such partnerships is currently undefined and will be clarified by fall 2008. The White Paper does not explain what the problem to be solved is or the opportunity to be seized by an Innovation Partnership. The current direction is towards a model that would focus on partnerships with public sectors actors, not firms, at the core. This approach could be promising to address the need to better understand public sector innovation through demonstration projects and serve as a vehicle for cultivating local public sector innovation entrepreneurs.

Based on the experiences with Science Cities, an experimental initiative,¹⁷ there are a number of key questions that the UK could ask itself in development of this new policy. First, what is the national interest in such partnerships if these could be developed by RDAs as they see the need, or

not? Is there a label effect sought by the designation, as a national-level label may carry more weight than a regional one? If the goal is to reward competence to attract resources, then a competitive selection process with clear criteria is the most effective way to ensure a legitimate label effect. Is it truly a path-breaking new mechanism or does it simply add another organisational layer to a landscape already replete with multiple overlapping intermediary organisations and extensive public sector to public sector negotiations? In part, the answer to this depends on the responses to related questions: are the selected partners motivated to make this experiment work and how will this be gauged? Will it be possible for the Innovation Partnerships to negotiate the resources necessary to implement their plans?

Pan-northern support of innovation

The Northern Way plays an increasingly strategic role

The Northern Way was created in 2004 at the impulse of Government as a vehicle to support the North in efforts to reduce the output gap with other parts of the UK. It is structured as a partnership between the three Regional Development Agencies in the North but works also with local authorities, universities and the private sector. The Northern Way's Growth Strategy was supported by a fund of GBP 100 million (50% from Government, 50% from the different RDA budgets), allocated to collaborative projects in ten different investment priorities including skills, transport, innovation, clusters, entrepreneurship, etc. There have been many questions about the the Northern Way in terms of its role and impact (Goodchild and Hickman, 2006), (OECD, 2006f). It appears to have had the most public success and concrete impact in terms of transportation, particularly in illustrating the need for greater national-level investment in the North, and in supporting the city-region concept at the national level.

Since 2007, the Northern Way has revised its approach to be more strategic than programme oriented. The budget provided by the RDAs for the next three-year period (FY 08/09-10/11) is GBP 45 million, to support an ambitious policy research programme (match funded by GBP 3 million from Government) and collaborative demonstration projects, including in the innovation field. This revision has resulted in a change in roles and priority areas. The refocused priorities for action fall under three categories: transportation, attracting private investment and innovation. There is also a stronger emphasis on providing an evidence base for policy with respect to the North, and in influencing national policy in areas of distinctive interest to the North. The split of the funds is approximately GBP 5 million allocated

for the research component and GBP 15 million for the innovation-related activities (approx. 5 million per year).

Within the innovation area, there are currently three areas of pan-Northern focus but the nature of possible collaborations is still to be developed. One focus is on common sectors across the North: energy and environmental technologies; creative and digital industries; healthcare science and technologies and medical devices; and advanced materials and engineering. Another goal is to support the three Science Cities and other innovation hubs located within the North. A third focus is the N8 research consortium. The Northern Way's strategy for innovation is under revision by the newly established Innovation in Industry Steering Group, therefore these three areas of focus or vehicles to support them may change in the near future.

Logic of pan-regional collaboration

There are several pan-Northern problems with respect to innovation, and actors within the North are considering what kinds of pan-Northern solutions are really appropriate. As with any collaboration, there needs to be a clear rationale for the participants to see the value in working together. The spatial scale is of course relevant, and ultimately the benefits need to outweigh the costs, notably transactions costs for co-ordination. In general, pan-regional co-ordination to support innovation could be relevant to address a range of different problems. A listing of these rationales and their relevance to the North are outlined in Table 3.13.

Table 3.13. **Rationale for pan-regional collaboration in the North**

Rationale	Application in the North
Functional area greater than the region	The relevant actors (firms, universities) span across regional boundaries. This is not quite as clear for the North given that the linkages across regions are not always strong but there are different axes of activity based on proximity and transport lines
Common problems	The three regions suffer from challenges in terms of: <ul style="list-style-type: none"> • Image • Skills • Industrial base (few large multi-nationals outside of parts of the Northwest) • Need for capacity building in the field of innovation
Increases critical mass	Increasing the number of firms, the size of the labour pool, the resources for innovation, etc.
Increases specialisation/complementarity within the territory	Strategic choices made to increase the level of specialisation among firms, universities and other actors in fields of expertise or market niches

Table 3.13. **Rationale for pan-regional collaboration in the North** (*cont.*)

Rationale	Application in the North
Economies of scale for joint action	In project implementation there may be economic benefits in terms of cost savings or a need to amortise the cost of a large facility that could be of shared need or have positive spillovers. Another area where there could be economies of scale is in research or analysis of themes of common interest
Overcomes institutional barriers or constraints	While there is a certain degree of RDA spending flexibility, the institutional processes are very rigid. This could allow the Northern Way to finance demonstration projects that are not integral to RDA strategies but are nevertheless important, or to incorporate more voices in the innovation discussions that are not engaged by current planning procedures
Opportunities for cross learning and overcoming the myopia of proximity	Increased opportunities for information exchange without being as large as a national scale. Given the extensive day-to-day obligations of the different teams, learning from actors beyond the immediate region can have a benefit

Examples of pan-regional co-ordination to support technology and innovation vary in terms of breadth and depth of collaboration (see Table 3.14.). Within the UK itself, the three RDAs in the greater London area are working conjointly on some innovation projects to better match services to the functional economic area. The Southern Technology Council in the “lagging” southern US spans a very large area (much larger than European countries) and tends to focus on information sharing, investment promotion and image/culture change to address common challenges. While the region has 20% of the US population and US GDP, it only has 9.5% of private R&D investment (SGPB, 2008). Nordregio is a European centre for research, education and documentation on spatial development in Scandinavia that has supported research and capacity building for regional innovation issues to address common challenges across those countries, even though they do not focus on joint projects *per se*. The Science and Technology Councils of Shanghai municipality and two neighbouring provinces are working to develop joint platforms to allow actors from across borders to participate in joint projects, which in the past has been inhibited by a lack of harmonisation in eligibility criteria (such as whether certain firms are classified in the same way across regions as a high-technology firm and hence eligible to participate) among other barriers. In this Chinese case, the primary motivation for collaboration is to support a functional region beyond administrative boundaries.

A number of other pan-regional co-operation arrangements with an innovation focus concern sectoral or cluster-specific focus and consequently a smaller spatial scale than the North of England. Medicon Valley in the Oresund (Denmark and Sweden) seeks to combine the resources of the two

into an increasingly linked functional area in support of biotechnology. In Stockholm, the small size of counties resulted in an artificial barrier to the development of the biotechnology sector present in several counties in the metro Stockholm area. The nature of public funding by county lines further contributed to the disruption rather than the linking of these resources.

Table 3.14. Examples of pan-regional collaboration to support innovation

Name	Scale	Focus	Instruments
Greater South East	Spans 3 RDAs of London, East England, and Southeast England	<ul style="list-style-type: none"> • Building on strong connectivity and critical mass 	<ul style="list-style-type: none"> • Joint innovation programmes • University business fellows and technology transfer programme • Innovation research map • Research excellence directory • Joint business support and knowledge networks in area of common strengths
Southern Technology Council (US)	Southern US states Alabama – Arkansas – Georgia – Kentucky – Louisiana – Mississippi – Missouri – North Carolina – Oklahoma – South Carolina – Tennessee – Virginia – West Virginia	<ul style="list-style-type: none"> • Information sharing • Investment promotion • Image/culture change 	<ul style="list-style-type: none"> • Publications such as “Innovation with a Southern Accent” to highlight facts about the South and areas of technical competency • Periodic theme meetings
Brainport – Eindhoven area (Netherlands)	21 municipalities that span parts of two Dutch provinces (much smaller scale than North of England but other parallels in terms of approach)	<ul style="list-style-type: none"> • Promoting the region as a knowledge hub internationally • Advocating to central government the importance of this region • Supporting business and technology efforts 	<ul style="list-style-type: none"> • Promotes the region as an attractive location to bring in high skilled labour • Support of High Tech campus with open innovation model • Knowledge transfer activities
Co-ordination across Bureaus of Science and Technology	Shanghai municipality with neighbouring provinces of Zhejiang and Jiangsu	<ul style="list-style-type: none"> • Supporting science and technology projects jointly for large economic zone • Mobilising greater national funds for research projects of joint interest 	<ul style="list-style-type: none"> • Harmonisation of policies for actors to engage across administrative boundaries

Scenarios for pan-regional action with the Northern Way

As the Northern Way shifts from a programme delivery to a strategy role, the range of options must fit this new organisational model and illustrate a clear value added to garner greater support for the Northern Way, both within and outside the North. Given the different areas of specialisation across city-regions, the North could also consider supporting greater specialisation in areas that could facilitate conditions for innovation. In the Randstad area of the Netherlands, there are four cities each with an identifiable role (see Box 3.6.). However, attempts to collaborate too much across a large area have proven very challenging, hence a focus on collaboration within each of the two “wings”. Furthermore, joint actions that could support innovation, such as greater complementarity among the area’s seven universities, have proven too difficult to achieve.

Box 3.6. Pan-Regional lessons from the polycentric Randstad, Holland

The Randstad is commonly understood to be the urban area in the western Netherlands, comprising the largest Dutch cities (Amsterdam, Rotterdam, the Hague and Utrecht) as well as several medium-sized cities. There are no official boundaries for the region and it remains an almost abstract concept for policy, nevertheless it contains 42% of the country’s population and approximately half of the national income.

Two entities have developed to focus on pan-regional co-operation. The Delta Metropolis Association is a public-private foundation created in 1998 by a professor of Delft University and four aldermen in charge of urban planning in the four major cities. It includes chambers of commerce, provinces, business associations, water associations, etc. and serves as a lobby group with a focus on transport. The Regio Randstad was created in 2002 as a deliberative body comprising only government representatives of the provincial and city governments. It works on themes of international competitiveness and quality of life and as a representative of the region to the EU and central government.

In terms of pan-regional co-operation, what has proven most successful in the Randstad is not co-ordination across the entire area but rather within two “wings” that link more than one city-region (North Wing and South Wing). Here the connectivity and relationships were easier to develop and proved more successful. The general focus for regional action has been on transport and spatial planning. In terms of innovation, for example, while there are seven universities in the area, efforts have not been able to reduce the significant amount of duplication across them to achieve greater complementarity.

Box 3.6. Pan-Regional lessons from the polycentric Randstad, Holland (*cont.*)

The Randstad programme of central government stresses the joint responsibility for implementation of the actions. Instead of trying to change government structures, such as creating a Randstad province, it aims at finding governance partnerships that will be able to achieve results. A new way of creating political commitment for implementation is organised by proposing responsible duo's per project. These duos consist of one government minister or state secretary and one regional politician. These duos are made responsible for the progress on the particular project. There are 33 projects formulated.

Source: OECD (2007), *OECD Territorial Reviews: Randstad Holland, Netherlands*, OECD Publications, Paris.

Creative and targeted evidence base

The first area where the Northern Way could play a key role is in building an evidence base – already a clearly stated priority. Research that has a public good aspect (on themes of benefit to all three regions) has clear value added as RDAs are increasingly viewing part of their role to be to build the evidence base to persuade Government. A note of caution regarding the evidence base is that in the UK this evidence is generally framed to respond to the Government's market failure approach only. At the national level, NESTA has played a key role in building an evidence base for central government innovation policy. They have, in particular, been supporting an expansion of the innovation focus beyond science, increasing the availability of indicators and reinforcing the concept of place in the national debate. Strategic collaboration with NESTA on key themes for the North is one vehicle for supporting that mission.

There are greater opportunities to learn from the different initiatives within the three RDAs in the North that can build an evidence base of cases of success stories and learning. For example, the lessons learned from the different approaches of centres of excellence across the three RDAs in terms of those that are university based (like the Centres for Industrial Collaboration in Y&H) or separate institutions (Centres of Excellence in the North East) could have a valuable role in informing RDA policy across the three regions on a very practical level. This kind of information sharing and joint evaluation with staff from across the three RDAs could serve a capacity building role as well.

Changing perceptions of the North to national and international audiences

The evidence base will also serve the North's needs for interfacing with Government on issues concerning innovation for the three regions to change perceptions at national level. While each region, and its regional Science and Industry Council, will continue to pursue their initiatives individually, the power that three regions can have exerting pressure on national policy is an opportunity that cannot be ignored. However, care must be taken so as not to be perceived as a substitute for the existing RDA relationships with Government or as a way for Government to delegate difficult prioritisation decisions to the Northern Way.

The Department for Innovation, Universities and Skills has made a specific commitment to work with the Northern Way as part of its Public Service Agreement commitments. While there is no funding associated with this, it does offer the Northern Way an opportunity to engage with Government on innovation in a formal way. This may also facilitate greater sensitivity to the needs of the North, and in some ways regions generally, at the national level.

National and international perceptions of the North of England and its industrial past do not valorise its existing assets and offer. There are already attempts for pan-Northern actions in offices abroad to support foreign direct investment, albeit Yorkshire Forward has withdrawn from these initiatives. Ottawa (Canada), for example, has been successful in bringing its firms to the attention of venture capitalists in California through organised events. Additional areas of support could include other awareness raising events, for example to the venture capital community. This could also support another of the three Northern Way priorities, attracting private investment. It has been noted by local actors that the North undersells its existing assets.

Capacity building: public and private

There exist capacity building needs for all three RDAs as well as sub-regional actors in the field of innovation, as is true for the majority of OECD regions. As a first step, learning from each other in the three regions has value added and this has only begun in the field of innovation. There is a tendency to engage consultants, which outsources the competencies that could be built up internally. Evaluation teams from across the three RDAs, perhaps with consultant support as a facilitator, could serve to effectively inform the RDAs on their respective activities and increase the knowledge and skills of RDA staff.

As many of the projects need private sector leaders, there is a need for development of innovation champions. As discussed above, the current process for strategy development is not compatible with engaging the younger and often dynamic future leaders. The different committees, such as the Science and Industry Councils, are composed of members that could be characterised as having a “mentor” profile more than an “entrepreneur” profile. The Northern Way could play an interesting role in leadership development outside of the current planning systems used by RDAs while at the same time thinking about cross-Northern interests. NESTA has established a programme in this direction to cultivate innovation leaders.

Supporting key sectors across the North

The four key sectors of priority for the Northern Way cover particular Northern strengths but also the same sectors prioritised generally by other English regions. There are several consulting reports commissioned by the RDAs that seek to identify strengths. However, across these four sectors, there is no clear mapping across the North that clarifies what the areas of competence are and where they are housed. A greater understanding of these potential areas for greater complementarity or critical mass would seem a pre-requisite for sector-based support. For example, the actors at NaREC are involved in a sector of priority for the North overall, but their linkages are more with actors outside of the North and UK than within the North.

Actions to support the North’s interests at a pan-Northern level would seem to best make sense if they meet an area of pan-Northern expertise. As there is more regional alignment with Technology Strategy Board priorities, RDAs are now trying to map their projects onto the various programmes (Knowledge Transfer Networks, Innovation Platforms, Key Technology Areas and Key Application Areas). If there are some that could be of greater pan-Northern benefit, then it would make sense for the Northern Way to take a lead in the advocacy role on behalf of the RDAs.

The risk for the Northern Way in terms of sector support is that it falls back into a programmatic role that divides the money across too many small projects with transactions costs. There is a regional distribution pressure with respect to the funding since all three RDAs contribute. Unless there is a visible pan-Northern benefit, the RDAs might as well just have used their respective contributions to fund a range of small projects themselves. There may be very large-scale projects for a particular sector that would benefit all three RDAs despite the location in only one region. The partial BBC move to the greater Manchester area, for example, is one of the rare occasions where the RDAs that don’t have jurisdiction over the location nevertheless see a positive spillover for their region. But that kind of positive benefit to

such a large territory is likely only to come from a major and rare investment or opportunity.

N8 research partnership

What is the N8 seeking to achieve?

The N8 research partnership, launched three years ago, is a grouping of eight of the North's leading research universities targeted to enhance research capabilities, university-industry links and innovation in the North of England (see Box 3.7.). It was established in 2005 by the leadership of the respective universities in conjunction with the Northern Way's strategy to narrow the output gap between the North and South of England and to promote science and innovation in the North. The broad aims of the N8 include: increasing the visibility of the North as a world-class research location, improving regional competitiveness in attracting research sponsorship and research infrastructure, fostering new or additional university collaborations in research themes of significance to the North and accelerating the transfer and commercialisation of research to assist regional business development. There is notable symbolic value to the N8 concept as a way to counter-balance the universities of the Golden Triangle and a strategic potential to address long-run innovation opportunities.

Box 3.7. What is the N8 thus far?

The N8 is a grouping of eight leading research universities in Northern England. The constituent universities are the universities of Durham, Lancaster, Leeds, Liverpool, Manchester, Newcastle, Sheffield and York. Taken together, these eight universities represent a significant set of regional assets, including sponsored research of over GBP 780 million annually, more than 8 000 academic staff and over 160 000 students. This compares favourably with the combined research income, staffing and students in the so-called "Golden Triangle" of Southeast England of the universities of Oxford and Cambridge, Imperial College and University College of London, as well as with major state-wide university systems in the United States.

A chief executive for the N8 was appointed in October 2005. At that time, five research themes for N8 collaboration were announced in ageing and health research, energy research and development, foresight for sustainable water use, molecular engineering and regenerative medicine. It is indicated that these research themes were identified based on university strengths, discussions with industry and potentials for impact and commercialisation. In August 2006, a corporate entity, N8 Limited, was established to manage N8 research funds and shared intellectual property developed through N8 research collaborations. The RFQ indicated that each of the five research themes (now identified as

Box 3.7. What is the N8 thus far? (cont.)

“virtual research centres”) had received a grant of GBP 323 000 for planning and development and that a consultant was sought to further help the centres in business planning and to organise a selection process whereby two of the five centres would receive additional funding of GBP 2 million. The centres were expected to develop business plans by November 2007, with decisions about which two of the centres would receive additional funding anticipated in January 2008. From the beginning, leadership co-ordination among the eight universities has been through a Pro-Vice Chancellors group.

The goals of the N8 (or those ascribed to it in public announcements) are ambitious and broad. They include to:

- apply research excellence to the industrial and social needs of UK plc in innovative and imaginative ways, providing more effective routes to realising the Government's plans;
- combine research excellence across the North and develop increased commercial activity;
- deliver fresh impetus to innovation with the potential to make a significant economic impact across the North; and
- match and complement the research power of the Golden Triangle of Oxford, Cambridge and London, leading innovation and boosting the economy.

In terms of innovation impact, the N8's most promising strategic potential may well be to address long-run innovation opportunities where added research collaboration by multiple universities will increase the chances of advantage or benefit to the North and which will result in capabilities that would not otherwise be present. In most cases, specific immediate innovation needs (of business) most probably can be met through existing arrangements, given the many schemes and programmes for technology transfer already on offer. In a few cases, there may be a tactical fit with immediate innovation opportunities where co-ordination among institutions will lead to the identification of expertise in one part of the region that might be useful in addressing a technological challenge in another part. But it would surely not lead to the desired major leveraging effect of the N8 if the alliance mostly focused on immediate opportunities.

There are other university research alliances in the North (for example, the White Rose University Consortium, comprising the Yorkshire universities of Leeds, Sheffield and York) and elsewhere in England (for example, a group of nine West Midlands universities collaborating around ICT) (Tysome, 2007). Other university research alliances are found around

the world. Of several that the N8 could be compared with, perhaps one of the most insightful is the Georgia Research Alliance (GRA) in the US state of Georgia (see Box 3.8.).

**Box 3.8. The Georgia Research Alliance (GRA):
Boosting technology in a lagging region**

Concerned about weaknesses related to the state's capabilities and attractiveness for technology-oriented economic development, the state of Georgia established the GRA in 1990. GRA is a non-profit, public-private partnership involving six leading research universities in Georgia, state agencies and private sector business representatives. The six universities are: University of Georgia, Medical College of Georgia, Emory University, Clark Atlanta University, Georgia Institute of Technology and Georgia State University. The GRA channels investments in strategic and emerging technological fields within the research universities to support eminent scholars, new research laboratories and equipment, research and innovation centres and technology transfer. A core aim of the GRA is to create pools of entrepreneurial scientific talent and research capabilities that can build up the state's research profile and stimulate the commercialisation of technologies by companies in the state. Since 1990, the state has invested more than USD 400 million (GBP 263 million) in the GRA (through tax revenues and bond proceeds), an annual average investment of about USD 26.7 million (GBP 17.5 million) annually. To date, nearly 60 eminent scholars have been appointed at GRA universities. It is estimated that since the GRA started, the state's investment has leveraged about USD 2 billion in new R&D funds (from the federal government and private sources), attracted 120 new university researchers, stimulated 100 new high tech companies, and added more than 2 000 private-sector high-tech jobs.

Compared with the GRA, the N8 is substantially under-funded (by an order of magnitude). But it also has fewer strategic tools. For example, while the N8 has developed strategic research themes, it has no direct ability to influence or add to capabilities to attract additional world-class researchers to its region, to alter the incentives for researchers to commercialise or to get new R&D going. The N8 to date appears to have a greater interest in co-ordinating shared intellectual property than the GRA. For example, while N8 has established a corporate structure to deal with shared intellectual property, the GRA has left intellectual property arrangements to the existing technology transfer offices (TTO) of member universities. The N8 shares with the GRA a minimal central administration, but the N8 board is exclusively comprised of university leaders, compared with the public-private board that oversees the GRA. The presence of high-

level private sector and foundation representatives on the GRA board adds credibility, private sector input and “clout” to the organisation. It is also not clear that the N8 has the long-term stability of political commitment and funding given to the GRA.

Table 3.15. **Comparison of N8 and Georgia Research Alliance**

	Georgia Research Alliance	N8 Universities
Established	1990	2005
State / regional population	8.8 m	14.3 m
University R&D (sponsored)	c. USD 1.2 b (GBP 786 m) / year	More than GBP 780 m / year
Total universities in region	36 public / 40 private	c. 35 (universities & campuses)
Universities in the programme	six	eight
Prime benchmark region	Research Triangle (NC)	Golden Triangle (SE UK)
Research themes	Biomedical research Electronics and ICT Nanotechnology, new materials Environment & energy Traditional industries	Ageing and health research Energy R&D Sustainable water use Molecular engineering Regenerative medicine.
Management structure	GRA President GRA Board (6 university presidents & 19 corporate / foundation)	Chief Executive Office N8 Board (8 VCs) Research Strategy Committee Other advisory groups
Programme initiatives	Eminent Scholars (58) Research labs & equipment Research & innovation centres Technology transfer Venture capital development	Virtual research centres
Total funding to date	USD 400 m (GBP 263 m) / 17 years	GBP 6 m / 3 years
Average annual funding	USD 26.7 m (GBP 17.5 m) / year	GBP 2 m / year
Term of the programme	Indefinite	3 Years
New R&D leveraged	USD 2 billion / 18 years	Unknown / 3 years
Shared IP function	No	Yes (N8 Limited)

Progress thus far and future possible scenarios

There are several possible benefits to the North associated with the N8. They include increased visibility of the universities to attract additional funding, new research collaborations and added take-up of N8 generated research. However, the research-intensive universities of the North already have visibility (although more is always desired), there are already research collaborations among faculty in the N8 universities and multiple

mechanisms already exist for university-driven technology transfer and commercialisation in the region.¹⁸

While an evaluation is not possible, the question may be asked as to whether the N8 is on a trajectory to meet the ambitious goals that have been set for it. Among the initial claims for the N8 was the assertion that it “promises to be one of the largest ‘research pooling’ exercises relevant to economic development in the UK.” On the face of it, based on evidence to date, it is not apparent that the N8 is on a trajectory that will give it the scale it needs to have major impacts on regional economic development. The actual investment in the N8 initiative is small with high transaction costs relative to the added resources made available.¹⁹ There is limited public visibility of N8 research initiatives. Moreover, it is also not apparent that any of the new research collaborations that have been promised through the N8 research centres are adding significant value to the research landscape or capabilities of the North, as they appear to be combinations of pre-existing centres. What does seem to be the trajectory being put in place is an initiative that will add in small ways to patterns of regional research collaboration. There also appears to be an emphasis on technology transfer mechanisms rather than ensuring that additional world-class research with regional innovation implications is leveraged. In summary, the N8 appears to be an initiative that is useful but not fundamental, with the potential to fall rather short of the ambitious goals set for it.

This is a useful juncture to take stock of where the N8 is headed. Possibly it is going in the right direction, but that needs to be better explained and communicated; or, alternatively, some review and course adjustment might be helpful. In terms of the future path of the N8 and opportunities for improvement, there are several possible scenarios, and some are not mutually exclusive, and other strategies can plausibly be developed. They include:

- ***The N8 is limited to the current level of funding*** - GBP 6 m over three years, and after the end of this term, continues as a loose collaboration of leading Northern research universities which manages to secure, from regional or national bodies, similarly modest levels of ongoing funding to maintain its co-ordination activities and to serve as an umbrella organisation for thematic research centres. Under this trajectory, the N8 will likely be a useful organisation with moderate added value for research or innovation, but would be unlikely to have major regional, national or international impact.

- ***Ambitions by the N8 itself and of others are scaled back.*** The N8 becomes primarily an exchange mechanism and advocacy organisation for the North's leading research universities. The universities could be expected to cover the costs themselves, without additional Northern Way funds. The Northern Way could then reprogramme any further funds available for regional universities into more focused initiatives and projects that build up targeted research and innovation capabilities (rather than added consultancy and planning).
- ***The N8 (and/or the Northern Way) refocuses its strategy less on top-level university co-ordination and more towards rising young entrepreneurial researchers.*** For example, rather than targeting multiple large research themes with small amounts of money, the N8 could establish a scheme advertised throughout the UK and internationally to attract leading young entrepreneurial scientific and technological researchers to the North. By bringing top young innovative researchers to the North, this would add directly to regional research and innovation capabilities at the N8 universities in ways that the current strategy seems less likely to do.²⁰ It would take a period of years for the accumulated effects of attracting more leading young researchers (who would likely then attract more resources) and building the region's research recognition to be fully evident. Higher levels of funding would increase the scale and possibly the pace of the effect.
- ***The N8 maintains its current goals, but is substantially increased in scale,*** with the ability to undertake long-term initiatives and fund (to a meaningful level) strategic collaborative research with regional innovation potential. This might mean a funding increase to the N8 by an order of magnitude, with no increase in central administration. Collaborative research between selected N8 members and leading international universities would be encouraged, i.e., it should not all be internally focused. This strategy, if it truly resulted in substantial new resources, would likely raise conflicts with other non-member research universities in the region.

Conclusion

The English Regional Development Agencies are given a mandate to improve productivity (GVA per hour worked) and to close the gap in economic growth rates (GVA per capita), among other goals. To achieve them, the RDAs in the North have been given a single pot of money that is estimated at less than 5% of the public funds flowing to the region overall

for regeneration and economic development purposes. Of that amount, approximately 12-19% of the budget has been spent on innovation instruments and sites, and a further 21%-25% on enterprise that may include some innovation-related components. Innovation is one piece of the support to firms in regional economic strategies.

While innovation is an important priority for RDAs, given their broad remit it is only one of many priorities competing for attention. The non-political approach to regional planning (economic and innovation) along with the need for more innovation strategy champions makes it difficult to take innovation higher on the agenda of actors in the region, including firms, political leaders and the general public. The degree of mobilisation, dynamism and commitment to the strategies is related in part to the more or less catalytic events surrounding their development, each region's innovation journey. In the North West, a government decision created a sense of crisis that served to bring actors to the table, raise attention, clearly identify strengths and create institutions. In the North East, while the sense of crisis was less present and it was more a problem of general economic decline and the lack of R&D spending (due in part to the lack of publicly funded R&D establishments or many firm headquarters), the region has taken a bolder step with transformational ambitions to a knowledge-economy backed by serious financial commitment. In Yorkshire and the Humber, the formal strategy in its current form and institutions were developed later than the other two regions which likely contributes to the strategy being less clear or bold than the others.

In terms of strategy content, the science focus reflects the UK context, the origins of the push by Government for innovation strategies, funding streams for innovation and the strong influence of higher education institutions. There are opportunities to expand the concept of innovation given the recent broadening of approach at the national level, but this will require creativity in projects and funding streams given the current funding and policy framework. There is a desire to expand the work to services but the current strategies and institutions do not support this.

There appears to be a strategic over-emphasis on HEIs to increase innovation in firms and support the innovation system more generally, particularly when aspirations are compared to current practice. Efforts could be focused on trying to increase the critical mass of research excellence on the one hand, and better serving the needs of technology transfer, but this does not necessarily need to occur through the same institutions. The ambitions for the N8 initiative appear to be overly optimistic based on the model and current level of funding and direction, albeit this is a very early stage in the process, but there are different scenarios for future development. It is also important to recognise the main role of universities, educating the

future work force, as the skills agenda is focused on the low-skilled component of the work force. RDAs may also consider supporting the diversification of institutions in the innovation system landscape beyond HEIs for several reasons.

The innovation instruments cover a range of programmes as well as investment in facilities, where the North tends to spend a greater share of its innovation budget than other RDAs. The transformational effects of these symbolic and large investments may require longer-term measures of success. It would appear that the system in the UK results in a proliferation of programmes with high transactions costs, and this should be considered in the funding of the different instruments by RDAs.

The city-region area may better map to a functional regional innovation system than an RDA level region, but the governance structures at the city-region level pose additional challenges for local action. UK cities are noted for their low fiscal autonomy, few incentives for promoting economic development and the fact that most strategic decisions affecting competitiveness are taken at other levels. Nevertheless, city-regions are seeking to play a more active role in supporting innovation and are stating this in planning documents. Some are even at an advanced stage in their thinking and action, like Manchester. In the context of the *Sub-national Review*, the role for the local level in innovation is not yet clear. However, with an increasing role in strategy oversight and implementation, RDAs will need to progressively support building capacity at the local level for implementing innovation-related projects that make sense at the spatial scale (networking and facilities at a minimum).

The Science Cities experiment has offered some very interesting lessons in local engagement and the combination of regeneration with science and science education (areas where the UK Science Cities distinguish themselves in international comparison). However, it is observed in Northern cities that they are unlikely to meet the expectations of a step-wise change in development trajectories. While in several cases resources have been forthcoming, as in the case of Newcastle, significant transaction costs are involved with the project-by-project funding negotiations. Part of the problem is that the RDAs who could support broader funding for projects like Science City are subject to shorter-term performance indicators for public spending.

The proposed national-level Innovation Partnerships programme is under development but with a likely focus on public and non-profit sector institutions, an area previously neglected in the UK's support of innovation, that could be fertile ground for new demonstration projects and learning. Based on the experience of Science Cities, it would be important to clarify

how this programme will address a clear need for the UK that requires a national initiative, without national funding, that does not involve considerable transactions cost for partnerships to find funding, and does not add another organisational layer to a landscape already replete with multiple public sector institutions.

Pan-regional collaboration makes sense only where there is a clear rationale for joint action. The challenge is that regional actors have agreed that innovation is important, but it is not obvious what that joint action should be. Given the privileged position of the Northern Way (explicitly recognised by DIUS in a Public Service Agreement), it can serve an important role for the region on the national stage. Some of these opportunities for action include a creative and targeted evidence base (which could support the common needs of the three constituent regions), capacity building in the public and private sectors, demonstration projects and more effectively telling the North's "story" with respect to innovation. Supporting projects in key sectors across the North will require careful analysis given the difficulty in finding specific common needs with benefits to all three regions, or if not that it is accepted that one region may capture more of the positive spillovers of the investment than the others.

Notes

1. In the North East an even larger process of consultation was developed for the latest RES via SHiNE (Shaping Horizons in the Northeast). Five full-time staff for 14 months was employed to engage over 1 000 stakeholders to increase the diversity of inputs via interviews, workshops and presentations. An evaluation of SHiNE noted that the process resulted in: an assessment of short-comings of the prior strategy, revelation of the key themes for the next strategy, generation of some more radical proposals that, even if not included in the RES, at least pushed the boundaries in regional thinking. The consultants that facilitated this consultation process then spun-out a new business model (OECD, 2006f, OECD, 2008b).
2. The North West RES refers to the Northwest Science Strategy under the Science/R&D strategy, with the responsible party being the Science and Industry Council. In the North East strategy, the subcategory of business entitled “preparing for structural change” includes the elements of the Strategy for Success with the focus on the core sectors and the associated projects of the RDA to support that innovation strategy. Yorkshire and the Humber’s RES mentions innovation in the context of Objective 2, competitive businesses, albeit due to timing the RIS does not receive explicit mention.
3. In North America, such strategies can be a more bottom-up initiative driven by private, not-for-profit regional development agencies. While many of these agencies started mainly by offering services to small firms or managing real estate operations related to economic development, some now have various local tax revenues at their disposal and have expanded their activities to include innovation-related measures such as working with universities, managing science parks and incubators, and offering research fellowships in applied research fields.
4. The expanded national mandate has not been met with additional funding.
5. Such champions include the Business Leadership Team in the North West, the Goldman Visiting Professors at Newcastle University in the North East, and the Regional Technology Network in Yorkshire and the Humber.

6. For NaREC, the New and Renewable Energy Centre, one of the barriers was getting more firms involved given the high barriers to entry for participating in the centre (Hodgson and Benneworth, 2004). An initial review of the Strategy for Success by the Northeast Assembly noted that while it was too early at the time to make a true evaluation, one of the comments was the evaluation's support of a bolder strategy that moves away from low-skilled labour (Northeast Assembly, 2004). This report was, however, not a critical evaluation but more of a progress report.
7. These documents include A Science Capacity Review in 2002 by Arthur D. Little, a Science and Innovation Footprint in 2005 by Yorkshire Science and Mapping Innovation Capabilities in 2007 by SQW Consultants.
8. The three organisations in the North are Universities for the Northeast, Yorkshire Universities and North West Universities Association.
9. A recent NESTA report outlines three types of innovations relevant for rural areas: innovations generated in rural areas but applied in non-rural areas, innovations generated outside of rural areas but that are applied in rural areas, and innovations of a universal quality that have strong impacts on rural life (Mahroom *et al.*, 2007).
10. Generally in centralised countries, the regions tend to have primary responsibility for knowledge transfer and technology diffusion to enterprises. Shared responsibilities with the national level tend to cover governance capacity, innovation poles and clusters and support for start-ups and firm growth. Those responsibilities exclusively in the national domain are generally the innovation-friendly environment and the support for applied research and development (Technopolis *et al.*, 2006).
11. They include: Northwest Composites Centre (four universities that will work with the Northwest Aerospace Alliance), National Centre for Zoonosis Research (two universities and agencies with a multi-disciplinary focus to include policy), the Northwest Laser Engineering Consortium (two universities), Northwest Stem Cell Centre (one main university – with links to others – and two NHS Trusts), UK Tissue Regeneration Centre (two universities, NHS and five industrial partners), and finally the Fourth Generation Light Source (national laboratory and two universities).
12. The Business Link Network will provide business support products that are undergoing streamlining in the national Business Support Simplification Programme that will reduce the number of products from approximately 3 000 down to 100 that fit in 17 product areas, two of which are considered to be directly innovation related (Innovation Collaborations and Innovation Finance). The Innovation Collaborations category is in the form of finance to assist collaboration to develop and

exploit new ideas for increased knowledge exchange and technological diffusion between business and knowledge base institutions. The second is Innovation Finance, which is finance to assist a business to develop and exploit new ideas in the form of grants or loans for single UK-based businesses, mainly SMEs. The other instruments that are considered to give wider support for innovation include many of the programmes in the North. These families include: business expertise for growth, business collaboration offers (support networks for clusters as well as shared support environments, like the Y&H Centres for Industrial Collaboration), skills offers (including the leadership academies) and debt finance/risk capital (like the NStar Co-investment fund).

13. First, it has formalised connections to form a well-developed network. Second, there is concern that the NaREC model, which required equity stakes from firms to receive assistance, made the Centre inaccessible to many. A third criterion for evaluation, deepening the research base, was not possible to assess at the time but the Centre has served to deepen the research base (Hodgson and Benneworth, 2004).
14. Another report on UK cities states that analysis suggests that specialisation is more likely to enhance economic performance than diversity (ODPM, 2006).
15. The Northern set of cities was announced by the Chancellor of the Exchequer in 2004. The second set of cities was announced by the Chancellor in 2005.
16. According to one of the prominent regional leaders of the current initiative, Science Cities was announced unexpectedly by Government and “as a label came out of a brainstorm at number 11 [Downing Street]”. Cited in “Northern negotiator,” *Regeneration and Renewal*, 9 March 2007.
17. In contrast to classical policy design processes where evidence is collected and objectives and plans formulated prior to implementation, the English Science Cities initiative arguably presents an example of “discursive” project experimentation built on local empowerment within a broader framework. The premise of this approach is that complex public problems cannot be solved at once or from the top, but require step-by-step local activities which are continuously reviewed, discussed and modified in interaction with regional and national stakeholders. This experimental approach to policy making has been viewed as analogous to collaborative production in industry (Sabel, 1996). This facilitates learning about what works (and what does not) and in turn using these insights to inform subsequent interventions and activities.
18. An analysis of publication records in the Web of Science, Science Citation Index indicates that the median proportion of co-authorships

between any N8 university and the other seven is 12.9% of all published articles during the period 2003-2007. By institution, the proportion of all articles co-authored with other N8 authors (2003-2007) is as follows: Durham 10.3%; Lancaster 20.3%; Leeds 11.3%; Liverpool 13.3%; Manchester 12.7%; Newcastle 13.2%; Sheffield 9.4%; and York 14.7%.

19. Moreover, of the GBP 6 million, one-third appears to have been allocated to planning and business development, leaving GBP 4 million to be shared between two selected centres. Assuming the two awards are allocated over three years, the actual net new funds amounts to about 0.2% of annual N8 research income. This is too small to have a notable system-wide effect.
20. Current academic salaries for such young researchers are typically much lower in the UK than in the USA. See the Technology Review 35 top innovative technologists and scientists under 35 for examples of the quality of young researcher that would be targeted. www.technologyreview.com/tr35/index.aspx?year=2006.

Annex 3.A1

Table 3A.1. Services innovation: EU policy areas

Policy Area	Type of policy (horizontal/deepening/broadening/targeted)
Encourage service sector firms to use intellectual property	<p><i>Deepening/ Targeted</i></p> <ul style="list-style-type: none"> • Attention to credence goods, where reputation is fundamental/ Brand awareness and trademarks registration • Sub-sectors with R&D component • SMEs
Public procurement (demand)	<p><i>Horizontal/ Deepening</i></p> <p>Indirect effect from policies in other areas:</p> <ul style="list-style-type: none"> • Creating a financial market-availability of credit • Reduction of regulatory burden to create conditions for firms to tap foreign demand • Clear regulations and creation of standards • Incentives for firms to compete/control of market power
Improve supply of qualified personnel	<p><i>Horizontal/ Targeted</i></p> <ul style="list-style-type: none"> • Private household as employer/ family policy measures supporting female labour force participation • Vocational training, training abroad, language, intercultural skills • New services skills
Improve use of and access to public science	<p><i>Horizontal/ Deepening/ Targeted</i></p> <ul style="list-style-type: none"> • Knowledge intensive business services • Incentives for public sciences to invest in research with intangible results that could be commercialised by the services sector
Support foundation of start-ups	<p><i>Horizontal/ Targeted</i></p> <ul style="list-style-type: none"> • Knowledge intensive business services • Internationally attractive conditions for venture capital • Availability of financing for start-up formation, development and investment in innovation activities
Improve support of innovation programmes for service sector firms	<p><i>Horizontal/ Deepening/ Broadening</i></p> <ul style="list-style-type: none"> • At EU level, development of common service markets and the accompanying measures
Reduce regulatory burden	<p><i>Horizontal/ Broadening</i></p> <ul style="list-style-type: none"> • Look at sub-sector level as regulation may be sub-sector specific • At EU-level, common ground for regulations and standards
Improve financing	<p><i>Horizontal/ Targeted</i></p> <ul style="list-style-type: none"> • Policy likely to benefit all sectors, not just services

Source: van Cruysen, Adriana and Hugo Hollanders (2008), *Are Specific Policies Needed to Stimulate Innovation in Services?* Final version for the Workshop “Towards a European Strategy in Support of Innovation in Services”, Workshop of DG Enterprise and Industry, 4 February 2008.

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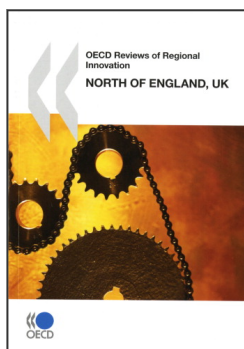
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