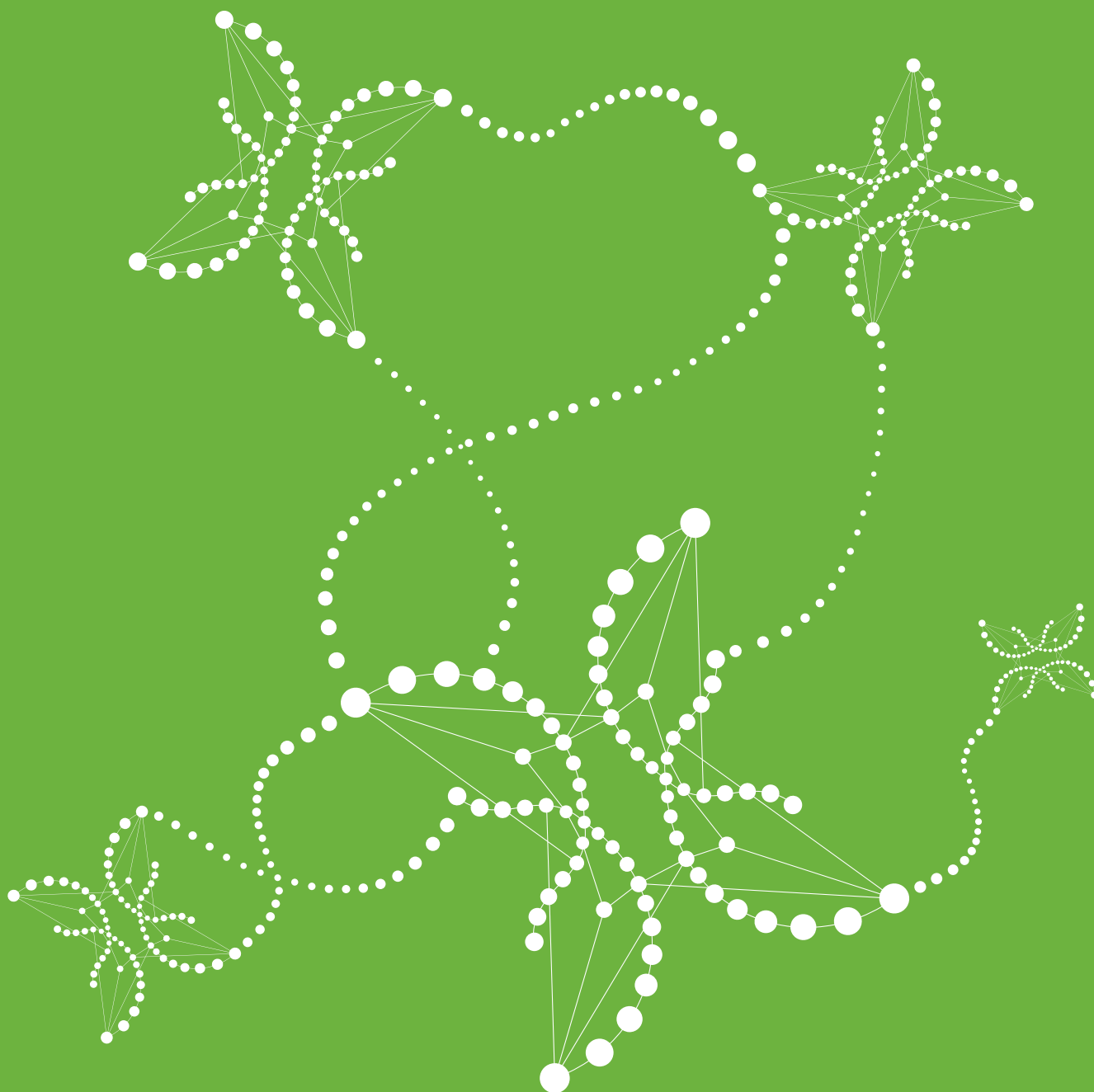


Leading Innovation

Building effective regional
coalitions for innovation

Paul Benneworth



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Foreword

There seems to be something magical about the world's most innovative regions. Over the past two decades, scholars have attempted to unpick the stories of Tampere, Palo Alto and Cambridge, and those accounts have been pored over by policymakers looking to emulate their success closer to home. But this has proved to be a challenging task: one size, it appears, does not fit all.

For regions without the extraordinary assets of Silicon Valley (what we term here 'ordinary' regions), making the leap from an old-economy paradigm to one based on innovation in services and high-tech industries can seem impossible. But it isn't. As we show here, it is made up of a series of smaller, more achievable steps. Two things stand out, however: this isn't a fast process; and it requires deep regional knowledge and strong regional leadership.

The case studies presented in this report showcase seven European regions that have successfully made the transition from ordinary to innovative region; and four UK regions that are somewhere along that journey. It concludes by presenting a guide to the 'regional innovation journey' and an analysis of the types of leadership that may be required along the way.

The report's conclusions hold important lessons for regional leaders and for central policymakers designing policies that need to be implemented at local level. Coming to these conclusions, however, is only the beginning of making the changes necessary to maximise the UK's capacity for innovation. That's why we'll continue our research programme here at NESTA and look to incorporate these findings into our expanding body of experimental practical work.

At NESTA, we like to work in partnership with outstanding research teams from some of the world's leading academic institutions. This time, we have benefited enormously from our partnership with KITE at Newcastle University. We and they look forward to your thoughts and comments.

Jonathan Kestenbaum
CEO, NESTA

December, 2007

NESTA is the National Endowment for Science, Technology and the Arts.

Our aim is to transform the UK's capacity for innovation. We invest in early stage companies, inform innovation policy and encourage a culture that helps innovation to flourish.

Executive summary

1. NESTA (2007) 'Hidden Innovation.' London: NESTA.
2. This criticism was voiced trenchantly by the House of Commons Science and Technology Committee in 2004: "There is nothing special in the soil of the so-called 'Golden Triangle'. If significant funds were, for example, made available to the new Bolton University, we have little doubt that it would attract the talent and create a research environment to rival the best" (S&TC 2004, p.7). See House of Commons Science and Technology Committee (2004) 'Seventh Report: Director General for Higher Education: Introductory Hearing' HMSO: London.
3. This would have considerable economic impacts on those regions; disposable incomes in the North East of England could rise by £100 per month if the wage gap with the UK average was closed (a consequence of a 17 per cent regional productivity gap).
4. The term 'regions' in this report refers to this technical definition of regions and does not imply any equivalence between various sub-UK governance arrangements. The 'natural region' for innovation is a space where physical proximity allows people to interact, helping produce better innovative outcomes. This 'natural' innovation region rarely corresponds perfectly with administrative regions. The UK contains a central, London-based Government that controls certain aspects of innovation policy that have impact UK-wide (such as taxation). The devolved administrations in Scotland, Wales and Northern Ireland have a further set of devolved powers that are important for innovation (for instance, business support and skills policy). Sub-national regions in England, Scotland, Wales and Northern Ireland also make decisions that impact on innovation.
5. See Tödting, F. and Trippel, M. (2005) One size fits all? Towards a differentiated regional policy approach. 'Research Policy,' 34 (8), pp. 1203-1219.
6. These are often centred around cities that have a critical mass in which the key ingredients of successful innovation – talent, finance, ideas and pathways to market – can be found. See Athey, G., Nathan, M. and Webber, C. (2007) 'What role do cities play in innovation, and to what extent do we need city-based innovation policies and approaches?' NESTA Working Paper. London: NESTA.
7. See Tödting and Trippel (2005) One size fits all? Towards a differentiated regional policy approach. 'Research Policy,' 34 (8), pp. 1203-1219.

Two challenges for innovation policy: 'hidden innovation' and 'ordinary regions'

Innovation policy faces two significant challenges in the years ahead: uncovering and supporting 'hidden innovation' (the kinds of innovations and activities not represented by traditional indicators¹); and increasing innovation activity outside the 'Golden Triangle' of Cambridge, Oxford and London² – in the UK's 'ordinary regions'. These are places that underperform on traditional innovation indicators and where economic performance over the last decades has been less than outstanding in relation to the rest of the UK.

This report deals particularly with the latter challenge. There continues to be a £32bn productivity gap between regions outside the South East and the UK average,³ and existing innovation policy might be indirectly contributing to this; it certainly could do more to shrink the gap. However, the fault is not entirely that of central government – the nations and regions of the UK must respond with well-developed and realistic innovation plans that play to their particular strengths.

*The UK, a mosaic of nations and regions*⁴

There are several different types of regional innovation systems within the UK, ranging from diverse service-based economies (such as the East Midlands), to old industrial regions (North East England), and dynamic metropolitan economies (North West England) to natural resource-based regions such as North East Scotland.⁵ This regional diversity reflects historical industrialisation, traditional cultures and varied political systems.

Every region has an innovation system,⁶ but some regions' systems lack so many assets that it is difficult to start stimulating innovation.⁷

Over recent years, there has been increased emphasis across Europe on using regional leadership to build on strengths and compensate for weaknesses. There are some regions now seen as being impressive and world-class, which thirty years ago were regarded as underdeveloped and lacking in potential.⁸ Places like Tampere in Finland, Thessaloniki in Greece, or Flanders in Belgium all successfully transformed themselves from being peripheral backwaters in their national economies into centres of innovation.

A journey of Stages and Critical Moments

The process that transforms an 'ordinary region' into an innovation-driven one is described in this report as a 'regional innovation journey', led by coalitions of regional actors.⁹

Any Regional Innovation Journey typically goes through five 'Stages':

- A. Gathering a cadre of enthusiasts:** a community of change-makers, focused on innovation, and with sufficient authority to deliver collective activities demonstrating its importance.
- B. Arriving at an agreed vision and strategy:** the partners jointly decide their regional strategic priorities and identify realistic activities that promise future change, capture people's imagination, and meet the interests of the main partners.

- C. **Piloting novel activities:** undertaking a small number of eye-catching projects aimed at generating wider interest and providing the various partners with a vehicle to drive shared interests.
- D. **Mainstreaming:** the results of the pilots generate enough interest to get the innovation agenda developed by the 'coalition' adopted more widely, hence attracting more resources and recruiting larger sets of partners to the innovation journey.
- E. **Renewal:** mainstreaming is not the end of the game. The continuous emergence of new challenges re-ignites a new cycle of coalitions, plans and actions and prevents stagnation.

The value of the Regional Innovation Journey metaphor is that it helps break down a daunting 'big bang' process into a series of smaller, more achievable steps.

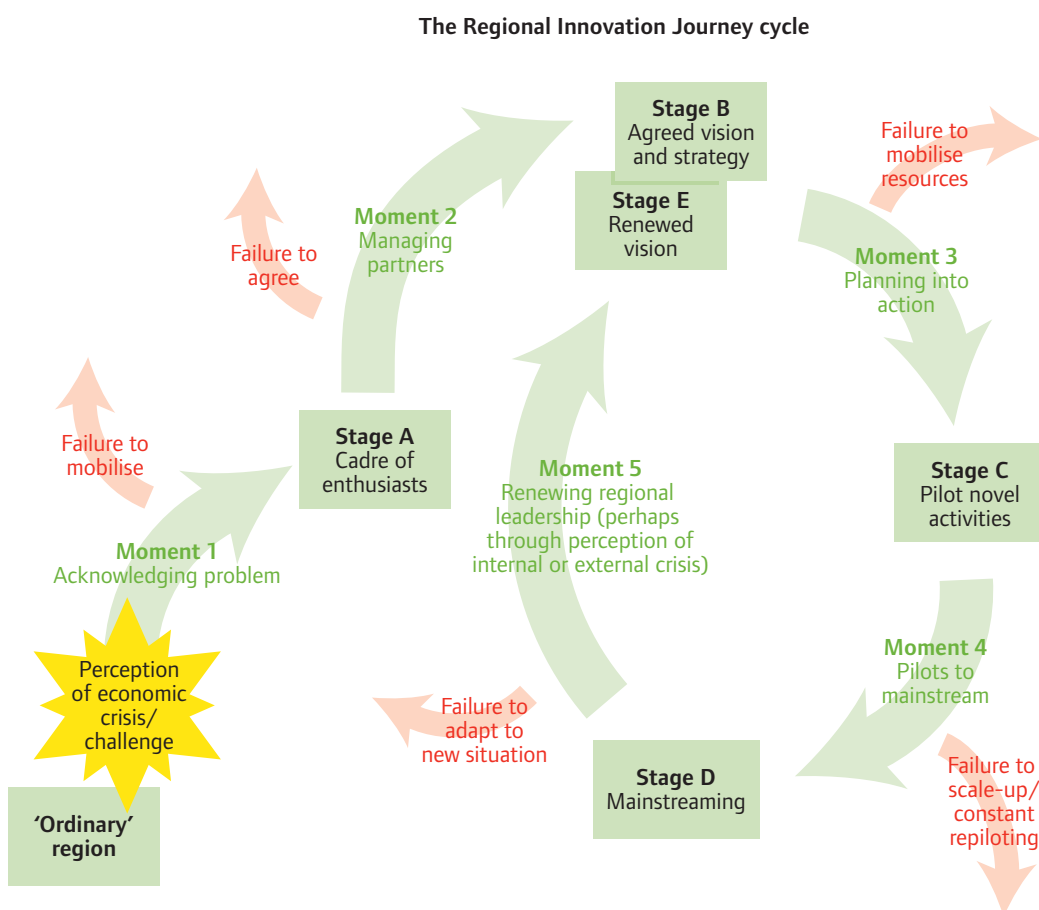
However, the transition from one stage to another is often not straightforward. Each stage is preceded by a 'Critical Moment', at which point simple forward progression is far from certain:

1. **Acknowledging the problem:** getting a small cadre of leaders to acknowledge the same problem involves many discussions, deliberations, debates and research. Given the 'soul-searching' nature of such exercises, there is a danger that this phase becomes too bureaucratic, or favours paper plans over producing real outcomes.
2. **Managing partners:** once a sense of shared vision about the nature of the challenges facing the region is established, differences might emerge in setting priorities for action. Moving from vision to an agreed plan of action poses the challenge for leadership to be inclusive and representative, but also effective and efficient in order to prevent 'too many cooks from spoiling the broth'.

8. There are many regions for which a claim has been made that they have undergone real regional renewal based on high-technology industries complementing their existing technological and knowledge bases. As well as those chosen for this study, other regions might include Aalborg (marine technologies), Saxony (optical electronics) or Voralburg (Austria).

9. Ibid.

Figure 1: The Stages and Critical Moments of the Regional Innovation Journey



3. **From a plan for action to action:** early successes must be generated to create a momentum for future shared activity, and to gain the trust from a wider range of leaders. A few (but well-planned) pilot projects are both necessary and effective in stimulating and encouraging further regional action. However, such small pilots should not set the level of ambition and become themselves the 'ends' rather than the 'means'. On the other hand, starting off with big projects and expensive initiatives might make implementation more difficult and riskier.
4. **From pilot to mainstream:** it is tempting for a coalition to become stuck in a period of perpetual piloting, thereby failing to grab the interest and attention of newer, larger players.
5. **Renewing regional leadership:** mainstreaming can quickly become a state of stagnation, if a series of successful innovation activities create a mindset that is resistant to change. Overconfidence might create a sense of complacency and hence prevent further development through new ideas or new partners. Innovation policies and arenas may be captured by particular interest groups, preventing other actors participating in innovation.

The right leadership for the right phase

There are two variables that differentiate between types of regional leadership: the size of the regional innovation system (which, of course, hopefully increases over time); and the dispersal of regional decision-making.

- The size of the regional innovation system (RIS) describes the number of actors engaged in the regional innovation journey, their sectoral origin and their relative independence of interest and thinking. For example, some regions might be characterised by a single strong sector (such as telecommunications), dominated by a single industrial player (such as Nokia) and supported by a local university (like the University of Tampere). The diversity in such a region is rather little. Other regions might boast several strong players across different sectors, like the North West of England.

- Dispersal of regional decision-making describes the degree of regional independence and autonomy including: the internal regional hierarchy; the regional political structures of accountability; and softer dimensions such as the extent to which powerful actors permit other actors' freedom of behaviour. For example, the city of Barcelona has considerable autonomy as the seat of the Catalan province, whereas English cities in general remain largely dependent on the central government in London.

Drawing an analogy with styles of musical performance, the size of the RIS can be considered as representing the talent and range of players, as well as the audience interests and sophistication. Dispersal represents how tightly the musicians are orchestrated to produce a harmonious outcome, as opposed to how much freedom individual musicians have to experiment and exercise their talents.

'Orchestral leadership' has a few conductors co-ordinating many innovators

In 'orchestral' regions, the central focus of the innovation journey lies in a small number of leaders 'conducting' a large and diverse cadre involved in innovation.

The 'barber shop quartet' is skilful, but for a small audience

The journey in 'barber shop quartet' regions is led by a few people, largely for the benefit of those few players – typically a small number of universities or multinational organisations.

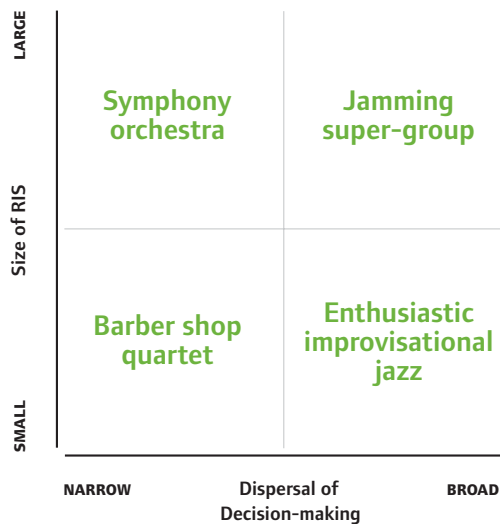
The 'enthusiastic improvisation' region has difficulties in finding a common tempo

'Enthusiastic improvisation' regions are those with relatively few leaders, but with a more general regional willingness for stimulating innovation policy – there is a lot of amateur leadership and very little collective achievement. A number of different activities may run in parallel, not always effectively co-ordinated.

The 'jamming super-group' region has to hold 'big names' together effectively

'Jamming super-group' regions are those with a successful innovation community with multiple and competing visions for innovation policy, alongside great depth in innovation capacities. When they function well, these regions make innovation appear effortless, even normal – like in Silicon Valley.

Figure 2: A 2x2 classification of regional innovation leadership styles



The UK’s ordinary regions face similar challenges on their innovation journeys

Strong self-interested actors add value to the regional innovation ecology

It can be hard for regional authorities to distinguish between competing claims from different actors about which activities public policy should support. Some actors such as multinational corporations, universities and public research laboratories have louder voices and more compelling stories to tell than others. However, their knowledge and connections may be vital to the regional innovation journey. Balancing investment in existing excellence with attractive potential is difficult.

Regional innovation strategies must not be judged by their covers

Turnover of ‘innovation strategies’ in the UK nations and regions has been curiously high. Sometimes new strategies are launched even before previous strategies have been implemented. This damages existing innovation support organisations which do not politically fit with new strategies.

Intelligent evolution is necessary to ensure that regional leadership is always fit for purpose

Relationships within the coalition must evolve to respond to changing external conditions. Some actors must voluntarily accept changes in their role and status along the journey to ensure that today’s innovative structures do not become tomorrow’s institutional inertia. Complex inherited structures can

tempt authorities to simplify institutional arrangements and to try and build a system from scratch. But some institutional continuity is also important – not least because of the residual learning accumulated over time, and because constant change can absorb enormous amounts of leadership time.

Central government needs to resist inadvertently supporting a vicious circle in ‘ordinary regions’

Policymakers understandably want to see a good return on their investment. This encourages ever-greater investment into high-performing regions and reduces public investment in less successful regions, locking them into a self-fulfilling equilibrium of low innovation and productivity levels.

Policymakers should focus more on investing in capacity-building, evaluating investment returns against other regions at similar positions in the regional innovation journey rather than the absolute scale and return of investments.

Changing policy to build regional capacity for innovation

There are common ingredients for national, regional and local partners

Any innovation journey must be closely tailored to the conditions of its region. Different situations require different types of support from government, and regional innovation will

be influenced by a range of policies, not just those explicitly concerned with innovation. The most effective journeys have been those that have effectively integrated policies such as education, economic development and infrastructural investment to create more supportive environments for innovation.

Balancing cross-regional priorities

Within a region, some sub-regions will benefit most from better innovation policy, and it is therefore essential to balance local interests to create a regional consensus. This will require an explicit explanation of how all sub-regions will benefit from particular policy measures, with some creative thinking about how the benefits can be spread out, and how the strengths of one sub-region can help others.

Central and national policy should explicitly allow for regional variation

The UK's public policy approach sometimes can create artificial barriers to regional partnership.

As the government moves to a more active innovation policy (as signalled in Lord Sainsbury's Review), there will be a temptation to set detailed priorities for regions. A Regional Innovation Journey (RIJ) approach suggests that national government would be better to outline the UK's priorities, ask nations and regions to reflect on how they could support those priorities, and then (where necessary) modify the priorities in the light of regional capacity.

To keep track of the way in which regions are contributing to overall objectives, central government should develop a 'UK innovation monitor' to reflect and consolidate the achievements of each nation and region.

Building up business voices is vital to effective innovation journeys

Public bodies are just one element of any innovation system: no Regional Innovation System can function without effective business contributions.

Businesses have vital knowledge and understanding, which help to better co-ordinate each RIS. Businesses are also essential partners on the regional innovation journey because they can help spread new ideas and approaches into the region. Those regions that found ways to embed particular lead business users in their journeys found it easier to address emerging problems and increase the take-up of particular instruments and activities.

'Intelligent regions' have more than a highly skilled workforce – they also have highly skilled policymakers

There is now a pressing need in all regions to develop a community of innovation experts who can help RDAs, local authorities and other bodies to develop a more supportive environment for regional innovation. This community must be trained in developments in the business, theory and practice of innovation policy.¹⁰ This training must be prestigious, externally accredited and valued by employers, drawing on existing programmes such as Masters courses in Public Administration.

There is no single ideal leadership style

There is no such thing as a 'best' style of leadership for innovation – the style reflects regional endowments and culture which are not easily manipulated or changed by short-term public policy instruments. However, regional leaders need to have a greater understanding of their innovation leadership style to better tailor their policy approaches to 'what works best' regionally.¹¹

Regional leaders do not have to be at the 'regional' scale

Regional leaders in our journey are critical to motivating a coalition of individuals to work together collectively to improve the capacity of regions to innovate. This does not mean that regional leaders always wear a chain of office inscribed with the word 'region'.

Within the UK, political leadership is often likely to emerge outside the regional level – elected representatives are only found at a district, county, constituency or national level. Public bodies such as universities, executive agencies and research laboratories may be 'in a region but not of the region', and must define their own reasons for involvement in a regional innovation journey.

Policymakers must respect that the real regional leaders are those who identify with a shared self-interest, commit to the coalition and work hard and motivate others to collectively address the problems experienced in the course of that journey.

A continual process of learning and development

At every stage of a regional innovation journey, policymakers must be open to change and guard against institutional inertia. But they must be ready to build strong coalitions that challenge prevailing orthodoxies and enable the innovative capacities that lie within every

10. This echoes the finding in 'Hidden Innovation' that actors "responsible for innovation [policy] must therefore include a highly skilled strategy and policy unit" (p. 26).

11. The Scottish Intermediate Technology Institutes are a good example of this, as they were trying to encourage a more diverse way of working within the Scottish innovation system with more collaboration between universities and firms in three identified key areas. They were given the security of ten years of funding which has enabled them to survive short-term problems and to start to have a chance to realise their potential.

region to emerge. Equally, they should avoid seeing new strategies as equivalent to real change, or losing the lessons from what has gone before. This report has shown how cities and regions across Europe have risen to that challenge – their lessons should be learned carefully as regional policy evolves.

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- Yorkshire and the Humber: Catherine Hodgson

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Leading innovation

Building effective regional coalitions for innovation

1. Innovation policy is crucial, but currently focuses on science-based innovation in the South East of England

1.1 Innovation is important to the UK's economy and society

Innovation – the successful exploitation of new ideas – lies at the heart of economic performance in the knowledge economy.¹² Future growth in standards of living will be dependent on countries' ongoing capacity to develop new products and services which serve new and emerging markets.¹³

Consequently, innovation has been identified by HM Treasury as one of the five drivers of the UK's productivity.¹⁴ Moreover, innovation is increasingly important in addressing contemporary social challenges, such as global warming, security/terrorism, and an ageing population.¹⁵

1.2 UK innovation policy focuses on 'visible' innovation

UK governments since the mid-1990s have promoted innovation to drive productivity growth and improve business competitiveness.¹⁶ Innovation is traditionally measured using indirect 'proxy' variables that approximate to the inputs for innovation, such as expenditure on research and development (R&D) or patenting activity.¹⁷

The UK performs comparatively weakly in international comparisons based on these variables, continually ranking below competitors such as Germany, the US, Japan and France.

Since 2000, Government policy has focused on addressing this perceived gap between the UK's performance and those of major

competitors.¹⁸ The UK has invested in excellent science, technology and innovation activities to increase their economic and social impacts¹⁹ whilst supporting 'technology transfer' and other initiatives aimed at speeding knowledge transfer from universities into industry.

Since 1997, Government expenditure on Science, Engineering and Technology (SET) has more than doubled.²⁰ UK central Government has introduced R&D tax credits for businesses, increased expenditure on university R&D, and all of the UK Nations have encouraged better university/business interaction.²¹ There has also been much non-Whitehall activity – the devolved administrations in Scotland, Wales and Northern Ireland and the English Regional Development Agencies (RDAs) have all developed their own science, technology and innovation strategies.²²

1.3 Two challenges: supporting 'hidden' innovation and innovation outside the 'Golden Triangle'

Innovation policy faces two significant challenges in the years ahead. The first is to find ways to support 'hidden innovation', the kinds of innovations and activities not represented by traditional indicators and which do not sit easily with policymakers' preconceptions.²³

The second is to understand and support innovation activity outside the 'Golden Triangle' of Cambridge, Oxford and London.^{24, 25, 26} Because government support for innovation is so focused on the 'Golden Triangle', it (perhaps inadvertently) contributes to the £32bn productivity gap between these regions and the UK average.²⁷ Moreover, since innovation creates important 'spillover effects' and is therefore a self-reinforcing process, this

12. As defined by the Department of Trade and Industry (DTI). Department of Trade and Industry (2003) 'Innovation Report: Competing in the Global Economy, the Innovation Challenge.' London: DTI.
13. This is central to the New Growth Theory developed over the last 20 years, which notes that productivity growth has increasingly become driven by investment in knowledge capital rather than traditional productive factors such as land, labour and machinery. See Solow, R. (1994) Perspectives on growth theory. 'Journal of Economic Perspectives.' 8 pp. 45-54; and Temple, J. (1998) The new growth evidence. 'Journal of Economic Literature.' 37 (1) pp. 112-156.
14. HM Treasury (2000) 'Productivity in the UK: The Evidence and the Government's Approach.' London: HM Treasury.
15. It has also been argued that new models of innovation (such as 'disruptive' or 'open' innovation) are necessary to address these large-scale challenges, which are very different to the sort of problems that policy communities are accustomed to accommodate. See Willis, R., Webb, M. and Wilsdon, J. (2007) 'The disrupters: Lessons for low-carbon innovation from the new wave of environmental pioneers.' London: NESTA.
16. See for example Department of Trade and Industry (1994) 'Competitiveness: helping business to win.' London: DTI; Department of Trade and Industry (1998) 'Our competitive future: building the knowledge driven economy.' London: DTI; and Department of Trade and Industry (2000) 'Excellence and opportunity – a science and technology policy for the 21st century.' London: DTI.
17. Innovation activity is commonly measured according to a standardised set of variables set out in the Oslo Manual first published in 1987. This has been adopted by the Organisation for Economic Co-operation and Development (OECD) and become extremely influential in policy circles. The EU Lisbon agenda target to make the EU the most competitive global economy by 2010 has been quantified in terms of raising the standard Oslo manual indicator Gross Expenditure on R&D (GERD in GDP) to a level of 3 per cent. See OECD (2005) 'Organisation for Economic Co-operation and Development, OECD Science, Technology and Industry Scoreboard 2005.' Paris: Paris.

18. In August 2000, the Government began publishing comprehensive and comparable time series data for R&D expenditure in its statistical bulletin 'Economic Trends' which has allowed R&D activity to be used as a meaningful performance indicator for economic policy.
19. See Department of Trade and Industry (2001) 'Opportunity for all – a White Paper on enterprise, skills and innovation.' London: DTI.
20. See Department of Trade and Industry (2005) 'Science Budget Allocations 2005-06 to 2007-08.' London: DTI.
21. See Department of Trade and Industry (2003) 'Competing in the Global Economy: the Innovation Challenge.' Report of the DTI Innovation Review. London: DTI; Lambert, R. (2003) 'The Lambert review of business university collaboration.' London: HMSO.
22. House of Lords Select Committee on Science and Technology (2003) 'Report 5th Inquiry: Science and the RDAs: SETting the regional agenda. HL 140 I. London: TSO; see also HM Treasury (2007) 'Review of Sub-national Economic Development and Regeneration.' London: HM Treasury.
23. See NESTA (2006) 'The Innovation Gap: why policy needs to reflect the reality of innovation in the UK.' London: NESTA; NESTA (2007) 'Hidden Innovation: How innovation happens in six 'low innovation' sectors.' London: NESTA.
24. This situation might arise either because policymakers do not regard what is being undertaken as significantly innovative or because particular indicators do not capture what is going on in particular sectors. See NESTA (2007) 'Hidden Innovation: How innovation happens in six 'low innovation' sectors.' London: NESTA.
25. The mid-1990s Regional Technology Foresight programme focused on disseminating national panel reports (based on prevailing national conditions) rather than seeking to develop and respond to likely scenarios in those regions where the conditions and markets were significantly different from the national situation. See Charles, D. R. and Benneworth, P. S. (2001) Are we realising our potential? – joining up science and technology policy in the English regions. 'Regional Studies' 35:1, pp. 73-79.

lack of support for wider innovative activity could create a vicious circle of declining performance, increasing inequality across the UK.²⁸

2. Innovation takes place within supportive systems

Evidence emerged in the 1980s of national differences in innovation performance.²⁹ The idea of the National Innovation System (NIS) was developed to explain why these differences occurred – countries had developed different systems to support their leading technological sectors, some more effective than others.

In successful countries, these sectors developed close relations with local markets. National policymakers supported their competitive

efforts, and national university systems specialised in teaching and research activities that met their needs.³⁰ A well-functioning NIS provided 'institutional coherence', supporting those sectors' competitiveness which, in turn, reinforced local support for those activities.

The NIS concept subsequently became very influential amongst technology and innovation policymakers, notably the OECD.³¹ However, innovation systems are not only national in scope, but can emerge wherever firms develop ongoing relationships with other actors more easily to access the resources necessary for innovation. So, in reality, innovation systems emerge at international,³² regional and city levels, within particular sectors and around particular firms.³³

It is because innovation systems exist at so many levels that a particular place's

An important question of terminology: The definition of a 'region' in the UK context

The UK contains a central, London-based government that controls certain aspects of innovation policy that have impact UK-wide (such as taxation). The devolved administrations in Scotland, Wales and Northern Ireland have a further set of devolved powers that are important for innovation (for instance, business support and skills policy). Sub-national regions in England, Scotland, Wales and Northern Ireland also make decisions that impact on innovation.

The term 'regions' in this report refers to this technical definition of regions and does not imply any equivalence between various sub-UK governance arrangements. The 'natural region' for innovation is a space where physical proximity allows people to interact, helping produce better innovative outcomes.

The edges of this 'natural' innovation region are rarely coterminous with administrative boundaries. Some small countries may themselves be natural 'regions' for innovation. There are also a number of cross-border innovative regions, such as Öresund across Denmark

and Sweden, and the Eindhoven-Leuven-Aachen triangle (Germany, Belgium and the Netherlands).

Based on this definition, there are several sub-UK arrangements which might be natural innovation 'regions', including the devolved administrations of Scotland, Wales and Northern Ireland.

In the UK, sub-central governance structures already make important decisions about innovation policy:

- Wales developed the first sub-UK innovation strategy, shifting focus from subsidising employment creation to stimulating innovation in manufacturing supply chains by helping fill knowledge gaps.³⁷
- Scotland adopted a 'clusters' approach in the mid-1990s, focussing business support on addressing low rates of new firm formation in a targeted set of leading Scottish sectors.
- English administrative regions have developed 'regional science policies', mapping their science base and identifying where strategic scientific investments could produce economic successes.³⁸

innovation system will be shaped by a range of local, regional, national and international drivers, policies and relationships. This inter-relationship also means that changes at one level can be driven by changes in another – the UK's focus on the 'Golden Triangle' demonstrates neatly how a national innovation system can be driven by the success of a particular sub-national system. Likewise, local systems that have innovative strengths 'out of step' with the prevailing national system can encounter difficulties in attracting national government investments despite their genuine innovative strengths.

To counter this trend, we need to consider a less centralised approach. One potential model is the 'regional innovation system' (RIS) – a network connecting regional knowledge producers and users.³⁴ A well-functioning RIS will typically involve a range of interlinked actors connected through intermediaries. The nature of the actors and the linkages between them will vary depending on the global networks in which the concepts and ideas are produced and the global markets where products are sold.

It is often the case that innovators within a certain territorial space have to share and compete for scarce resources such as skilled labour, tacit knowledge and flexible production systems – the so-called 'untraded interdependencies'.³⁵ Thus, in the last 15 years, regional authorities have become a more important supporter of innovation for local businesses and organisations. Their role, however, has varied between places, as they faced different economic structures, cultural predispositions, institutions and political environments.³⁶

3. The time is right for effective regional innovation policy

3.1 UK innovation policy is now at a crossroads

Since 2000, the UK Government has significantly increased the resources going into science, innovation and regional economic development. In the June 2007 reshuffle, there was even a Whitehall department created with specific responsibility for the innovation agenda – the Department for Innovation, Universities and Skills (DIUS).³⁹ Many UK Government experiments have sought to ensure that these resources effectively

stimulate business innovation. But there is now a drive to streamline these activities.

The Department for Business, Enterprise and Regulatory Reform (BERR) has begun a Business Support Simplification programme (BSSP), to reduce the number of business support schemes in England from 3,000 to fewer than 100. Meanwhile, the increasingly important Technology Strategy Board (TSB), which has a remit to improve co-ordination of innovation policy,⁴⁰ was given an additional £100m a year in CSR 2007, including commitments from Research Councils and RDAs to support strategic regional innovation activities.

3.2 The UK's nations and regions have important roles to play in the UK innovation agenda

In this new public policy environment, regions have a vital role to play in influencing how central and national policy impacts on their regions. Regional partnerships will need to understand their own economic conditions to use national policy prescriptions to get the best out of their regions.⁴¹ More importantly, these regional bodies must make a strong case to government about the beneficial impacts their regional policy approach is having for their region, for other regions, for nations and for the UK as a whole.⁴²

3.3 Innovation policy in the UK has focused on 'widening the winners' circle'

The UK clearly benefits greatly from having so much world-class innovation clustered in the 'Golden Triangle' regions, and policy has therefore logically concentrated on supporting innovation there.

However, this conurbation has more in common with similar innovative megapoles in New York and California than with outlying areas of the UK.⁴³ By contrast, the areas outside this 'Golden Triangle' can be thought of as 'ordinary regions', with strong innovative potential but without the world-class activities that have uniquely built up in and around London.

Yet, several 'ordinary regions' outside the UK have developed successful innovation structures, with industrial champions leading regional innovation activities, strongly supported by policymakers and research organisations.

26. This criticism was voiced trenchantly by the House of Commons Science and Technology Committee in 2004: "There is nothing special in the soil of the so-called 'Golden Triangle'. If significant funds were, for example, made available to the new Bolton University, we have little doubt that it would attract the talent and create a research environment to rival the best". See House of Commons Science and Technology Committee (2004) 'Seventh Report: Director General for Higher Education: Introductory Hearing.' London: HMSO.
27. This would have considerable economic impacts on those regions – disposable incomes in the North East of England could rise by £100 per month if the wage gap with the UK average was closed (a consequence of a 17 per cent regional productivity gap).
28. Boschma, R. A. (2005) Proximity and innovation: a critical assessment. 'Regional Studies.' 39, pp. 61-74.
29. See OECD (1997) 'National Innovation Systems.' Paris: OECD.
30. See Lundvall, B.A. (1988) Innovation as an interactive process: from user-producer interaction to the national system of innovation. In G. Dosi (ed.) 'Technical Change and Economic Theory.' London: Pinter.
31. The OECD has internalised the idea of the national innovation system in their analyses of innovation policy, and is now starting to talk more of the importance of regional innovation systems. See OECD (2006) 'OECD Science, Technology and Industry Outlook 2006.' Paris: OECD.
32. Chris Freeman undertook a comparative analysis of the US and the USSR post-WWII NISs that highlights the differences between 'capitalist' and 'communist' innovation systems, explaining how in the USSR there were very strong barriers to civil entrepreneurship that hindered using scientific benefits for social improvement. See Freeman, C. (1995) The National System of Innovation in a historic perspective. 'Cambridge Journal of Economics.' 18 (1), pp. 5-24.
33. See for example Brazyck, H.-J., Cooke, P. and Heidenreich, M. (2003) (eds) 'Regional innovations systems - the role of governance in a globalised world.' London: UCL Press; Cooke, P. and Piccaluga, A. (eds) (2004) 'Regional economies as knowledge laboratories.' Cheltenham: Edward Elgar.

34. This is based on the ideal RIS type offered in Cooke, P. (2005) Regionally asymmetric knowledge capabilities and open innovation: exploring 'Globalisation 2' – a new model of industry organisation. 'Research Policy' 34, pp. 1128-1149.
35. See Storper, M. (1995) The resurgence of regional economies ten years later: the region as a nexus of untraded interdependencies. 'European Urban & Regional Studies' 2 (3), pp. 191-221.
36. The Sainsbury Review noted that: "Regions are the building blocks of national innovation capacity" (para. 2.14). See Sainsbury (2007) 'The race to the top: a review of Government's science and innovation policies.' London: HM Treasury.
37. Cooke, P. N. (1995) New wave regional and urban revitalisation strategies in Wales. In P. N. Cooke (ed.) 'The rise of the rustbelt.' London: ICL Press.
38. This started when the Government announced in 2000 that a new high-technology physics laboratory would be located in Oxfordshire in preference to Cheshire. A group of North West politicians, unions and business leaders lobbied government and were granted £25m to fund excellent science projects to support regional clusters. Following that decision, all English regions have followed the same process. See Perry (2007).
39. NESTA (2007) 'Innovation Policy at the Cabinet Table.' London: NESTA.
40. This is set out in Chapters 4 and D4 of the PBR. "The Technology Strategy Board is delivering a national, business-focused innovation strategy across all areas of the economy" (p. 215). It is not clear from the context whether this refers to all geographical areas, or only across all sectors. See HM Treasury (2007) '2007 Pre-Budget Report and Comprehensive Spending Review.' London: HM Treasury.
41. This is something that the current regional institutional arrangements in England are very effective at delivering. The 2000 ODPM Green Paper 'RDAs as strategic drivers of economic change' signalled that RDAs would be given this role, and the creation in 2002 of the Single Programme Budget (the so-called 'single funding pot') created this opportunity.

3.4 Weaker Regional Innovation Systems can be improved by regional leadership

Two prominent examples of successful 'ordinary' regions are Flanders in Belgium and the Tampere city-region in Finland. In Flanders (Box 1⁴⁴), regional governments rode a wave of awakening Flemish identity to build new institutions designed to deliver a further industrial revolution for an otherwise largely manufacturing economy. In Tampere, city authorities seized on the absence of universities to embark on a region-wide development strategy revolving around the creation of new institutions for Higher Education and advanced research (Box 2).

There are different types of regional innovation systems within the UK, ranging from diverse service based economies (e.g. the East Midlands), to old industrial regions (e.g. the North East), and dynamic metropolitan economies (e.g. the North West) to natural resource-based regions such as North East

Scotland.⁴⁵ This diversity reflects historical industrialisation, traditional cultures and varied political systems.

The innovation systems in these 'ordinary regions' – as with all less well-functioning such systems – are often less effective than those in knowledge-based regions where blue skies thinking is turned into commercially valuable products and services.⁴⁶ Every region has an innovation system,⁴⁷ but some regions' systems lack so many assets that it is difficult to start stimulating innovation.⁴⁸

Even where knowledge actors (such as universities, knowledge-based enterprises, or R&D institutions) are present, problems may arise where there are poor internal connections between knowledge producers and exploiters.^{49, 50} An effective regional innovation system requires good internal and external connections; and improving those connections improves the quality of the RIS.

Box 1: Flanders (Belgium) – 'The Third Industrial Revolution': creating a new spirit of innovation

Flanders is the northern, Dutch-speaking region of Belgium, with a population of 6m, making it the largest of the three Belgian regions. It is far more prosperous than the southern Walloon region, which suffered greatly from de-industrialisation in the last half-century. The capital city region of Brussels has prospered with a strong multi-national service sector. Flanders has been highly successful in its industrial transition, with a GDP 123 per cent the EU average, GERD in GDP of 2.08 per cent and unemployment of 5.4 per cent. This transition developed from earlier growth in mass production industries (chemicals and consumer manufacturing).

From the 1980s onwards, the newly created Flemish regional government actively promoted innovation and technology as the basis for a Flemish revival. In 1980, Flanders experienced an economic dip as part of a wider global recession. Regionalisation freed Flanders from subsidising industrial decline in Wallonia, and the new regional government launched the 'Third Industrial Revolution Flanders' (TIRF) policy. TIRF

argued that new technologies were not (as unions believed) destroying new jobs but were creating them. The programme identified three technology areas suitable for support: micro-electronics, biotechnology and advanced materials. Cluster groups were formed, and those clusters remained central to Flanders' innovation strategies, investing in supportive university research activities to strengthen the economic base.

However, TIRF also emphasised the personal dimension of the changes, by creating new employment opportunities for the engineers whose rising unemployment was a significant political problem for the government. Between 1983 and 1989, the Flemish government organised a technology fair in Flanders every two years, 'Flanders Technology International', to convey a positive upbeat message around technology to the electorate, and to draw support for the investments being made in the three cluster areas at a time when manufacturing sector jobs were being lost. The TIRF set the Flemish government on its current innovation-driven course.

More information on Flanders is presented in case study 1.

All the UK's 'ordinary' regions are missing some innovation system elements, or suffer from poor internal relationships and underdeveloped external connections. However, external and internal connections can be developed by bringing together local partners to create new innovation infrastructures which can also attract external investments.⁵¹ Tampere exemplifies this (see Box 2): local elites attracted a new regional university which was later to become the basis for an internationally renowned ICT and mobile communications cluster.

3.5 Institutions in ordinary regions are learning how to promote innovation

Although some UK innovation policies have supported businesses in ordinary regions (notably the highly regarded SMART awards⁵²) these policies often have less impact than in core regions, because there are fewer users able to make use of them.

As a result, a number of regions and devolved administrations have pioneered innovation policy experiments, from which communities of policymakers, innovators and business support agencies have been able to learn. However, what works in a particular region is highly dependent on factors specific to that region such as its universities, culture and political decision-making structures.

3.6 Sub-central innovation policy is not a well-developed policy field in the UK

Innovation systems in ordinary regions can be improved by creating connections between regional actors, especially between leaders. These, in turn, can work together to help attract and anchor outside investors. Because sub-central innovation policy is not a well-developed policy field in the UK, the practicalities and challenges of forming leadership coalitions around innovation are not always well-understood.

Box 2: Tampere (Finland) – from textiles town to university-driven excellence

Tampere, in southern Finland, emerged as one of Finland's leading industrial centres from the 19th century due to its abundant hydro-power resources. In the post-war period, the Finnish government decided to expand higher education nationally at a number of strategic sites, and Tampere's 'rival' city, Oulu, was granted a university. Tampere received this news badly, and town managers set about attracting new higher education institutions to Tampere. Branches from an extension college and Helsinki's technical university were established: by the early 1970s, Tampere had two universities, one general (UTA), the other technical (TUT).

These two universities were important in Tampere's further development; TUT maintained close connections with regional companies during the 1970s even though national policy blocked formal university/business linkages. In the early 1980s, Oulu established a business park, and once more, Tampere responded in kind, establishing its own science park in 1986. TUT's close connections with regional companies provided a fertile source of

new businesses for the science park; by 2001, 145 companies employed 3,000 staff. A Technology Centre with specialised entrepreneurial staff became a distinctive focal point for the science park.

In the early 1990s, the newly-created National Technology Agency (TEKES) launched a Centres of Excellence programme investing in strong regional technology. Tampere's programme was based on three strands – mechanical engineering/ automation, ICT and healthcare – reflecting its proven commercial success with the science park.

The presence of a Nokia R&D centre employing 4,000 engineers with close links to the university underscores the many kinds of success which followed the successful attraction of the two universities to the region. Doing so made the region visible to national policymakers, who used their Centre of Excellence programme to invest in the region. Tampere is now acknowledged nationally as one of Finland's strongest innovation regions.

More information on Tampere is presented in case study 2.

42. This gap has been established through HMT's Productivity series, particularly 'Productivity 3: a review of regional productivity.' See HMT-DTI (2001) 'Productivity in the UK: 3 The Regional Dimension.' London: HM Treasury and DTI.
43. See Budd, L. (2006) London: from city-state to city-region? In Hardill, I., Benneworth, P., Baker, M. and Budd, L. (eds) 'The rise of the English regions?' London: Routledge.
44. The examples presented in the text are drawn from eleven case studies for this project drawn from a mixture of expert consultation, primary research, literature reviews and focus groups. Seven international case studies examined ordinary regions that had successfully addressed problems in their regional innovation systems; four UK case studies looked at ordinary regions undergoing the same process. Overviews of the 11 case studies are presented in Appendix 2.
45. See Tödtling, F. and Trippl, M. (2005) One size fits all? Towards a differentiated regional policy approach. 'Research Policy' 34 (8), pp. 1203-1219.
46. See Cooke, P. and Piccaluga, A. (eds) (2004) 'Regional economies as knowledge laboratories.' Cheltenham: Edward Elgar.
47. These are often centred around cities that have a critical mass in which the key ingredients of successful innovation – talent, finance, ideas and pathways to market – can be found. See Athey, G., Nathan, M. and Webber, C. (2007) 'What role do cities play in innovation, and to what extent do we need city-based innovation policies and approaches?' NESTA Working Paper. London: NESTA.
48. See Tödtling, F. and Trippl, M. (2005) One size fits all? Towards a differentiated regional policy approach. 'Research Policy' 34 (8), pp. 1203-1219.

Since 1998, piecemeal early experiments have been reinvigorated by devolution.⁵³ Consolidating this experimental phase involves using local experiments in sub-central innovation to bind together local and external partners to create more permanent improvements in the regional innovation infrastructure.

European experience shows that the extent to which local innovation coalitions can be mobilised depends on both local perceptions and opportunities for collaboration. These mobilisations evolve over time as successful developments become the foundation for more ambitious activities. For example, Scania (southern Sweden) started its journey towards an effective regional system with many fragmented actors, but over time has developed a more integrated 'bottom-up' system (see Box 3).

The case studies undertaken in this project identified two common factors for ordinary regions seeking to develop better-functioning innovation systems. First, actors need to identify a shared interest which can form the basis for the local community to work together. Second, there must be concrete projects that regional actors work upon, through which they learn how to collaborate more effectively, and which create shared innovation resources.

In the UK's ordinary regions, there are barriers preventing both these features from developing. Regional firms and universities may prefer to work with partners outside the region or may lack time to work together on shared projects, because their available spare time is focused on ensuring that their own innovations succeed in a weakly supportive environment.

Regional innovation may also face economic and political impediments. Cities may argue

49. Internal fragmentation may be defined as barriers between the effective interaction of innovation activities within a region, such as sectoral mismatch between firms and universities, imbalanced perceptions and absorptive capacity. External dislocation occurs when the region is cut off from wider knowledge networks such as academic research or business innovation networks. See Moulart, F. (2000) 'Globalization and Integrated Area Development in European Cities.' Oxford: Oxford University Press; Fontes, M. and Coombs, R. (2001) 'Contribution of new technology based firms to the strengthening of technological capabilities in intermediate economies.' 'Research Policy.' 30, pp. 79-97.

50. Nauwelaers, C. and Wintjes, R. (2002) 'Innovating SMEs and Regions: The Need for Policy Intelligence and Interactive Policies.' 'Technology Analysis & Strategic Management.' 14 (2), pp. 201-215.

51. Yeung, H. W. (2000) 'Organising "the firm" in industrial geography I: networks, institutions and regional development.' 'Progress in Human Geography.' 24 (2), pp. 301-15.

52. The SMART award provided proof-of-concept funds to SMEs seeking to develop a high-technology product or process. SMART awards were easily absorbed by firms because of their simplicity – they had no additional requirements and a relatively small administrative burden once approval had been given. There was also an explicit effort made to ensure that regions with fewer high-technology businesses received proportionally more, with the North East and Wales having highest success rates, and London the lowest. See PACEC (2001) 'Evaluation of Smart (including SPUR): DTI Evaluation Report No. 3.' London: DTI.

Box 3: Scania (Sweden) – An integrated bottom-up innovation system

Scania (*Skåne*) is the southernmost county in Sweden, and is a strategic site for the Swedish agriculture industry, reflecting its relatively temperate climate. Scania is also Sweden's strategic gateway to continental Europe, and its post-war development reflected these national demands. Scania developed a large shipbuilding industry in this period, which by the late 1970s was in crisis.

The local city of Lund – already home to a university since the 17th century – was to become home to Scandinavia's largest university. Its growth was supported by the creation of the IDEON science park in 1984 as a response to the shipyards' decline. IDEON sat next to a number of large firms' research laboratories including Astra and Ericsson. This science park expanded over two decades to include two new 'estates', including one specifically suitable for biotech activities.

IDEON's success in Lund encouraged policymakers to expand the approach across the region. At first, all innovation support activity was focussed on that one site, creating a community of interest in high-technology entrepreneurship, both

entrepreneurs and support services. When the Swedish government created regional Technology Bridge Foundations, the Southern Sweden foundation was located in IDEON; this established an advice service, a seed capital fund (*Teknoseed*), and a patent advice business, whilst the university and IDEON were jointly developing a business incubator. IDEON became the centre of a local innovation system supporting the conversion of high-technology business ideas into operational companies.

However, as the regional innovation coalition grew over time, it created its own problems, most notably inter-agency competition, where similar agencies regarded themselves as competitors rather than as jointly working to benefit innovative businesses. To address this problem, in 2003 the Chancellor of Lund University joined the city government and IDEON to form a city innovation forum. This forum has developed eight strategic projects with diverse agencies working collaboratively. The projects fill gaps in the city innovation system, whilst joint working on the projects helps to reduce competitive pressures between the university, city and innovation support services.

More information on Scania is presented in case study 3.

over which of them should benefit as economic crises demand immediate employment generation. Or there may simply be a general impatience amongst regional partners over the slow progress in realising long-term outcomes.

Mobilising a regional coalition behind innovation requires the initial identification of projects that meet three criteria:

- **Tantalising:** promising future change addressing perceived regional problems.
- **Emblematic:** attracting people's imagination and appearing significant enough to address regional problems.
- **Achievable:** Offering sufficient shared self-interest and being close enough to existing regional capacities to be quickly deliverable.

Finding a project that meets these three criteria ensures that the coalition helps to create new internal connections, improving the regional innovation system. Failing to find one may result in the project failing and the coalition fragmenting, perhaps setting regional innovation back further than it was before the project began. To maximise their success, these projects must also attract external investors and create new external regional connections.

4. Building an effective regional innovation system is a journey, not an event

Ordinary regions may face substantial challenges in stimulating innovation. These challenges can seem so daunting that it may seem that only a 'big bang' will begin to address them. Regional actors often feel that external stimuli are necessary to begin this chain reaction. This can produce an inertia that makes ordinary regions unable to develop effective innovation systems. However, many ordinary regions have successfully made the transition. Studying their experience shows that what appear to be 'big bangs' are more often an evolutionary series of small, achievable steps which build up into more significant change.

4.1 A journey of five Stages

These successful regions can be regarded as having undergone a 'regional innovation journey', in which new economic evolutionary paths emerge. This idea draws on Van der Ven et al.'s idea of the 'innovation journey', developed to explain how innovation takes

place in large-scale organisations attempting radical, disruptive innovations.⁵⁴ Their approach (based on empirical studies of business innovation projects) is to recognise that radical innovations have very special development requirements. At first, they are very threatening for many actors, so they need to develop quietly, until the beneficiaries outnumber the losers. Early adopters are then enrolled, stimulating demand for the innovations, which can finally be released into the market and a waiting audience.

Van der Ven's model needs to be adapted for a regional context, but there are clear lessons nevertheless. A small cadre of innovation enthusiasts develops the idea and produces a few eye-catching successes, paving the way for more ambitious and extensive policy changes. Importantly, one cannot see the precise end-point of the journey at its outset – not having a fixed endpoint helps alleviate regional resistance to new policy models, and helps break the aforementioned lock-in.⁵⁵

Any Regional Innovation Journey typically goes through five Stages:

- Gathering a cadre of enthusiasts:** a community of change-makers, focused on innovation, and with sufficient authority to deliver collective activities demonstrating its importance.
- Arriving at an agreed vision and strategy:** the partners jointly decide their regional strategic priorities and identify realistic activities that promise future change, capture people's imagination, and capture the interests of the main partners.
- Piloting novel activities:** undertaking a small number of eye-catching projects aimed at generating wider interest and providing the various partners with a vehicle to drive shared interests.
- Mainstreaming:** the results of the pilots generate enough interest to get the innovation agenda developed by the 'coalition' adopted more widely, hence attracting more resources and recruiting larger sets of partners to the innovation journey.
- Renewal:** mainstreaming is not the end of the game. The continuous emergence of new challenges re-ignites a new cycle of coalitions, plans and actions and prevents stagnation.

53. Different parts of the UK went through 'regionalisation' at different times; what are now the devolved administrations (DAs) had regional development agencies (RDAs) with considerable autonomy from the 1970s onwards, augmented by the creation of the DAs in the late 1990s. In England, although several regions had experimented with European innovation policy in the mid-1990s, it was the creation of the RDAs in 1999 which was the stimulus for them to develop their own innovation strategies. See Bogdanor, V. (1999) 'Devolution in the United Kingdom.' Oxford: OUP; Benneworth, P. S. (2001) 'Regional Development Agencies: the early years.' Seaford: The Regional Studies Association.

54. See Van der Ven, A., Polley, D. E., Garud, R. and Venkataraman, S. (1999) 'The Innovation Journey.' New York: Oxford University Press.

55. Shifting towards an innovation-based approach to public policy can threaten many established policy networks, and create resistance, locking the region into sub-optimal economic development trajectories.

4.2 Any Regional Innovation Journey typically has five Critical Moments

The transition from one stage to another is often not straightforward. Each stage is preceded by a Critical Moment, at which point simple forward progression is far from certain. These Critical Moments, which are explained in a greater detail in Section 5, are introduced below:

- 1. Acknowledging the problem:** Getting a small cadre of leaders to acknowledge the same problem involves many discussions, deliberations, debates and research. Given the ‘soul-searching’ nature of such exercises, there is a danger that this phase becomes too bureaucratic, or favours paper plans over producing real outcomes.
- 2. Managing partners:** Once a sense of shared vision about the nature of the challenges facing the region is established, differences might emerge in setting priorities for action. Not agreeing on how to move forward endangers progression towards any collective action. But even when a common grand regional strategy is adopted, conflicts may emerge between partners at any time due to differences around the importance assigned by different stakeholders to different issues. Dominant players may be detrimental if they threaten to leave or reduce their engagement unless their interests are well represented. Moving from vision to an agreed plan of action poses the challenge for leadership to be inclusive and representative, but also effective and efficient in order to prevent ‘too many cooks from spoiling the broth’.
- 3. From a plan for action to action:** Many regions arrive successfully to the stage where an innovation agenda or strategy is developed and agreed. However, few regions manage to move from the state of strategising to the stage of doing. Early successes must be generated to create a momentum for future shared activity, and to gain the trust from a wider range of leaders. The empirical evidence is that a few but well-planned pilot projects are both necessary and effective in stimulating and encouraging further regional action. However, such small pilots should not set the level of ambition and become themselves the ends rather than the means. On the other hand, starting off with big projects and expensive initiatives might make implementation more difficult and riskier.

4. From pilot to mainstream: Moving from pilots to large consolidated initiatives is perhaps the most challenging transition point between the different phases of the journey since it is tempting to become stuck in a period of perpetual piloting. If this happens, then the coalition runs the risk of failing to grab the interest and attention of newer, larger players. Partners must move beyond a project mindset – typically this would involve developing an effective innovation strategy, a number of pilot actions being implemented, and then the project being evaluated.

5. Renewing regional leadership: Mainstreaming can quickly become a state of stagnation, if a series of successful innovation activities create a mindset that is resistant to change. Overconfidence might create a sense of complacency and hence prevent further development through new ideas or new partners. Innovation policies and arenas may be captured by particular interest groups, preventing other actors participating in innovation. Renewal often happens with political change too. When the Coalition and Union party lost power in Catalonia (Spain), civil servants and business representatives had to replace and restore that lost momentum (see Box 4).

4.3 Critical Moments are formative

At these Critical Moments, actors interact intensively to solve problems and uncertainties, and to set a course for the next stage. They may create new formal and informal institutions to help them collectively agree and implement an appropriate solution, such as ‘innovation platforms’,⁵⁶ ‘business networks’ or consultative forums. There might be several attempts to solve one problem. Alternative solutions might involve other people, coalitions, approaches and institutions, and shape the final regional development model.

These interactions give places real power to influence their own fortunes. A coalition may stall, fall back or dissipate, if there are problems in the regional innovation journeys. However, once a region has begun a successful mobilisation, then it quickly becomes unlikely that it will default to its older, more staid approach.

A graphical illustration of the Regional Innovation Journey, its different Stages and Critical Moments, is presented in Figure 3 overleaf.

56. Innovation Platforms are government-sponsored organisations that develop responses to challenges facing national innovation systems or specific to sectors. These organisations typically bring together industrialists, public sector researchers, responsible policy agencies and ‘experts’ to identify problems and propose solutions. The approach is very common in more consensual governance systems (such as Finland or the Netherlands), although the idea has also been proposed in the Sainsbury Review.

Box 4: Catalonia: shifting from ‘Political’ to ‘political’ leadership

Since the end of dictatorship in 1975, the Spanish government has been engaged in a substantial devolution process, and Catalonia has, as one of the historic regions, been in the vanguard of this process. From 1980–2003, Catalonia was governed by a coalition led by Jordi Pujol’s Coalition and Union (CiU) party. During this period, a Catalan science framework – based primarily on investing in universities – established itself because regional businesses were perceived to be weak on innovation. This consensus was disrupted by a period of political turmoil associated with a national constitutional crisis (2002) and the 2003 defeat of CiU in Catalan elections.

There has since been a rapid turnover of Ministers responsible for both innovation and research. This has reduced pressure on the two regional Ministries’ civil servants to work together more effectively. This has allowed other networks to become more influential in policymaking, notably sub-

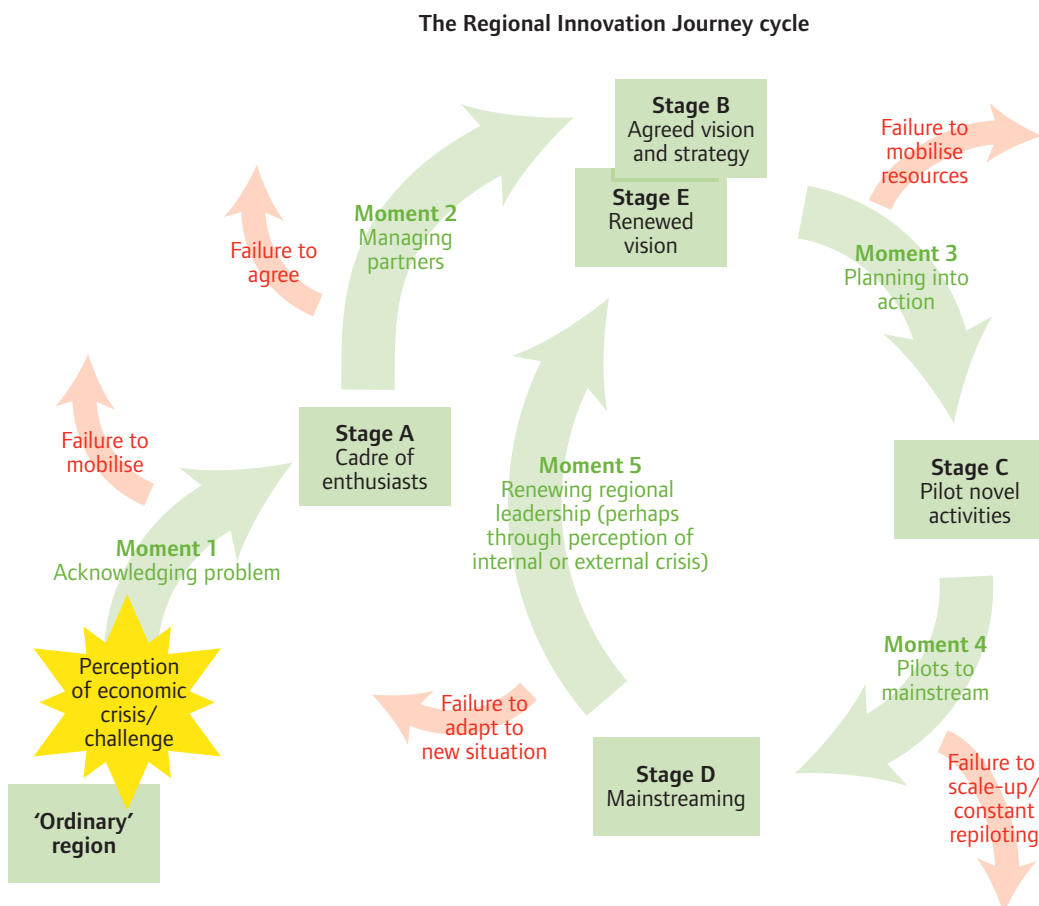
regionally and from outside government. For example, business representative organisations that previously had difficulties influencing Catalan innovation policy have been able to get involved.

This diffuse network of agents was important in restoring the momentum to the regional coalition. Some existing employers’ organisations and federations pressured regional politicians to tailor research and innovation policy more closely to their needs. Change agents initiated strategic development projects, such as the 22@ project in the inner-city Poblenou area of Barcelona.

Such strategic projects created demands for a continual stream of innovation activities, and helped to build up a new network interested in innovation. This new network was able to agree a new regional science and innovation strategy, encouraging better linkages between the science base and regional businesses.

More information on Catalonia is presented in case study 6.

Figure 3: The Stages and Critical Moments of the Regional Innovation Journey



4.4 Regional Innovation Journeys in ordinary regions face additional pitfalls

World-class regions enjoy virtuous innovation journeys with clear successes from collaboration, and may not even recognise how they have delivered their successes. Such regions have an abundance of resources and expertise to weather crises and regenerate continuous cycles of innovation – they have real capacity to adapt and even benefit from adversity.⁵⁷ Innovation is easier because the necessary resources are readily available. This, in turn, makes these regions more attractive for investors because they appear to have an almost unshakeable ‘magical’ quality in which all innovative investments will succeed.

Ordinary regions face the opposite conditions, with successes scarcer, making it harder to persuade people to engage with new ideas – they have fewer innovative actors, increasing the collective pressure they face to deliver success. This makes success harder to achieve, but can also amplify set-backs and failures.

Individual actors become more critical to the success of the system, and there is much less redundancy in the network as a whole. Maintaining the coherence of the regional partnership can be an extremely taxing process.

4.5 But there are reasons to be cheerful

Despite these problems, many regions in Europe and around the world have successfully undergone a regional innovation journey. Indeed, there are some regions now seen as being impressive and world-class, which thirty years ago were regarded as underdeveloped, lacking in potential and ultimately ‘ordinary’.⁵⁸

The innovation journeys of some world-class regions are very impressive. In the last 20 years, Silicon Valley in California and Cambridge in the UK have evolved rapidly, shaped by regional coalitions interested in retaining their global technology leadership, whilst also moving into new high-technology fields (such as biotechnology and nanotechnology) and developing innovative organisational

57. See for example Franklin, S., Eaton, C. R. and Atlas, S. J. (2002) *When life gives you lemons*. ‘MdBio Notes.’ 7: 2-6. Maryland, US: MdBio.

58. There are many regions for which a claim has been made that they have undergone real regional renewal based on high-technology industries complementing their existing technological and knowledge bases. As well as those chosen for this study, other regions might include Aalborg (marine technologies), Saxony (optical electronics) or Voralburg (Austria).

59. The idea of a ‘growth pole’ dates back to the work of Perroux in the 1950s. A growth pole is a set of strong growing firms in a locality who are deeply embedded into the region via the supply chain. The strong growth of the firms helps to create a wider growth dynamic, sometimes referred to as a ‘virtuous cycle’. In the context of the knowledge economy, such firms are typically to be found in high-technology, knowledge-intensive sectors, although need not exclusively be so. See Hospers, G. J. (2004) ‘Regional Economic Change in Europe: A Neo-Schumpeterian Vision.’ Münster/London: LIT-Verlag.

Box 5: Thessaloniki – from ancient merchant city to modern national innovation pole

Thessaloniki is the second Greek city, with a population of one million. Unlike much of northern Greece, its economy is dominated by manufacturing and services. Thessaloniki is also home to Greece’s largest university, the Aristotle University, and has begun to develop new high-technology industries building on its traditional strengths of local entrepreneurship and connectivity.

Thessaloniki began its innovation journey to access European subsidies, as Greece joined the EU in 1987 and was eligible for significant structural funding. The region experienced a severe recession after 1989 and wanted to spend these funds on projects of regional rather than national interest. However, assembling a strong coalition in Thessaloniki proved difficult, so early coalitions were rejected by the European Commission. The coalition that finally emerged was relatively small, with four lead partners, including the regional Ministry, and the economics professor who had identified the availability and regional applicability of these funds.

Nevertheless, since 1992, Thessaloniki has developed two European Commission-led regional innovation strategies, a Regional Technology Policy (RTP) and then a ‘RIS+’ scheme, in which the Commission provided pump-priming funds for a limited number of priority innovation projects. The partners learned how to set priorities and choose between competing ones – 22 RTP priorities became 9 in the RIS+, and three were adopted by the current regional operational programme.

Thessaloniki has come a long way in a relatively short period. 20 per cent of the city’s EU regional structural funding is now spent on innovation, and there is broad regional support for an innovation-led development policy. A successfully implemented ICT growth pole led to three further thematic regional growth poles.⁵⁹ Thessaloniki’s success in developing an innovation strategy has led to the region being designated as the national innovation pole by the Greek government.

More information on Thessaloniki is presented in case study 5.

forms (such as venture capital and business accelerators).

The regional innovation journey does not have to be an instant, total and dramatic change from declining industrial backwater to high-technology metropolis. The change experienced by the remote peripheral region of Thessaloniki in Greece is in some senses more remarkable. Over 15 years, Thessaloniki has become a vibrant innovation-led economy with an economic influence far beyond its regional and national borders (see Box 5).

4.6 Regional coalitions are a must for creating new 'pathways to the future'

No coalition would embark on a 'regional innovation journey' into an uncertain future without finding an acceptable way to manage that uncertainty and risk. This uncertainty gives successful regional coalitions three features. First, they consist of partners who work together collectively, pooling resources to reduce the exposure of a single partner to failure. Second, coalitions consult extensively, allowing failures to be absorbed collectively, with no single organisation becoming a scapegoat. Third, coalitions are

driven by regional leaders – often institutional entrepreneurs – with an idea and a means to realise collective regional action.

As more innovation policies succeed, partners become more prepared to invest in innovation activities, and coalitions grow as they realise innovation policy's potential to deliver their core interests such as job creation, public service improvement, safer, healthier communities and more educated populations.

4.7 Innovation coalitions must be 'fit for purpose'

There is no simple answer to the question of how such an ideal innovation coalition might appear, other than to say it needs to be fit for purpose.

First, this means a coalition that assembles actors with an identifiable shared self-interest in innovation, and ideally a track record of collaboration on innovation. Second, the coalition must be 'more than the sum of its parts', not just repeating past collaborations but achieving more substantial outcomes than before. This might involve including more partners or sectors, attracting more investors,

Box 6: Building the Yorkshire Regional Technology Network

The Government Office for Yorkshire and the Humber (GOYH) launched regional innovation in the early 1990s by (unusually) supporting a number of bodies with the capability to understand what developing a regional strategy involved:

- **GOYH Innovation Team:** it observed the Welsh Office experience developing a pilot Regional Technology Plan from 1994.
- **Regional Technology Network (RTN):** a business networking organisation bringing together a range of industrial sectors, supporting mentoring and networking for innovation.
- **Yorkshire and the Humber Universities Association (YHUA):** a single contact point with universities in deciding European Funds allocations.

- **The Regional Research Observatory:** a network of regional researchers informing debate around regional economic change.

This narrow group came together in 1995 to write a Regional Innovation Strategy (RIS) for a Yorkshire and the Humber proposal. This was managed by RTN, seeking to avoid innovation service providers dominating the outcomes (a conflict of interest perceived as undermining their capacity to propose collective regional business innovation activities). RTN organised several sector groups, which came together under steering groups and planned their own activities; some steering groups won further funding for collaborative research and innovation activities, such as the DTI-sponsored Faraday Partnerships around food and chemicals.

More information on Yorkshire and the Humber is presented in case study 8.

creating new innovation infrastructures or improving the region's external image.⁶⁰

Leadership, which is dealt with at a greater length in Section 7, is central to how coalitions function, and so regional leadership must also be fit for purpose. Larger coalitions are not always better than smaller coalitions, because relatively tightly-knit groupings are generally better able to respond to regional crises than looser, consensual coalitions. However, larger coalitions are better at enrolling new actors into innovative activities and hence helping regions deal better with the problems encountered in the course of a regional innovation journey.⁶¹

5. Dealing with different challenges at each stage of the innovation journey: lessons from the case studies

5.1 Critical Moment 1: Acknowledging the problem and seeking travelling companions

The innovation journey starts when one actor realises that innovation is important to their region, and attempts to mobilise potential partners to become more systematically connected. This first Critical Moment leads to the development of a community of change-makers, focused on innovation, and with sufficient authority to deliver collective activities demonstrating its importance.

During this phase, the challenge is to bring the idea of innovation to life, particularly ensuring that passive resisters do not hinder its development. The idea of innovation has to be animated in ways relevant to regional actors, inspiring them to change, without producing over-inflated expectations of the ease or speed of innovation. Of course, existing bodies

may feel threatened by new voices, or work against these regional visionaries. So, regional champions are needed so that the messages of change are taken seriously.

One common solution is to create a new organisation to promote regional innovation. Such organisations can blend local views and expertise with international best practice and consultancy support. The debate it leads can generate insights into the regional situation, but also help to identify the future direction of innovation policy. Such bodies build support for flagship projects for regional partners to co-operate in developing, enabling an easier transition to the next 'leg' of the journey.

There is a danger that this phase can become too bureaucratic – a secondary challenge is to avoid perpetual re-organisations and to overcome those favouring paper plans over producing real outcomes. Creating new bodies is not hard, but avoiding the instinct to control those bodies and prevent them emerging as autonomous sensible voices is more difficult. Regional authorities may try to 'kill off' existing organisations to create a blank sheet for an 'ideal' organisation. In doing so, they ignore the personal networks and linkages already developed, and overestimate how easy it is to create 'ideal' organisations.

One solution is to use past bodies' successes to make present activities more alluring. Innovation support organisations often suffer from a need to continually fight for their existence, meaning that they have little opportunity to consider their own capacity or future development. Yet, these organisations may engage critical networks of people involved with innovation; these networks may know instinctively how it should develop in the

Box 7: Scania – remaking network roles to avoid a hidden rut

The economic transformation of Scania in Sweden ran into problems in the late 1990s, but this was hidden by general economic buoyancy. Regional organisations were failing to collaborate, but good economic conditions encouraged procrastination. Regional partners also lacked a capacity to hear critical voices; problems were raised in regional innovation evaluations in 1997 and 1998, but not acknowledged or addressed until 2002. The key to

addressing these problems lay in changing how regional partners worked together. The Lund Innovation Forum taught actors in Lund to work more effectively together (see Box 3). Malmö also learned from this to create its own Innovation Forum. This shared experience helped address traditional tensions between the two cities which had previously prevented those partners working together for the greater regional good.

More information on Scania is presented in case study 3.

60. Regional mobilisations' fitness for purpose reflects regional cultures; more consensual Scandinavian regions often have broader coalitions, whilst UK regions work better with smaller coalitions (see Chapter 8).

61. See Nauwelaers, C. and Wintjes, R. (2002) Innovating SMEs and Regions: The Need for Policy Intelligence and Interactive Policies. 'Technology Analysis & Strategic Management.' 14 (2), pp. 201-215.

Box 8: The North East of England – Newcastle Science City partnership

As an old industrial region, the North East of England has been suffering industrial decline for over a century. This long-term decline has hindered the emergence of a regional knowledge economy, compounded by low educational levels, the scarcity of innovation and R&D activities, and competition between sectors and sub-regions for resources. Since 2001, One NorthEast (the North East RDA) has spent much effort developing a regional science strategy based on five Centres of Excellence. However, regional divisions made it difficult to mobilise a strategy board to take this

(science) *Strategy for Success* forward. So, One NorthEast used an unexpected national policy announcement to create a new flagship project, 'Newcastle Science City'. This concrete proposal encouraged other regional partners to shift from criticising the idea of a science strategy to articulating how they could maximise their benefits, with other cities wanting to benefit too. This revived *Strategy for Success* and transformed it into a strategy with clearly identified sub-regional benefits including 'Sunderland Software City' and 'Middlesbrough Digital City'.

More information on the North East of England is presented in case study 9.

future. As this knowledge is embedded within existing organisations and their relationships, regional leaders should work constructively with them to include their voice and contribution in regional debates.

5.2 Critical Moment 2: Managing partners

The second Critical Moment is when partners agree a shared vision and decide their regional strategic priorities. Moving from a vision for innovation to a set of strategic priorities involves identifying activities that promise future change, attract people's imagination, and offer shared self-interest whilst being deliverable (see 3.6). These activities contain many risks which can prevent the coalition being able to identify concrete priorities from which actual innovation projects can be developed.

In successful regional innovation journeys, this issue was often addressed by using independent or external experts to work with regional partners to create a concrete innovation perspective. In Flanders, following its distinctive institutional tradition, they created a new discussion platform: the Flemish Technology Foundation, linked to an existing organisation (the Social and Economic Council), together neutralising accusations that technology destroyed jobs. In Yorkshire and the Humber, the latest Regional Innovation Strategy draws on 1990s institutional infrastructure to propose a 'hub-and-spoke' innovation support model. In the North East, the Newcastle Science City partnership is a hybrid – an informal new organisation building on past relationships and infrastructures,

addressing difficulties while developing a regional strategy (see Box 8).

The challenge is to understand which regional strengths can be exploited, *how* these broad strengths can become specific successes, and *who* will lead these new specific projects.

This often begins with a very limited form of leadership, but those leaders create something which in turn becomes the breeding ground for a much broader second-generation community of innovation leaders. In Tampere, this community was formed by the thousands of technical graduates emerging from the two technical universities who embraced Finland's 'innovation religion'. Likewise, in Twente, the textiles industry lobbied for something which ultimately attracted a Leading Technology Institute (see Box 9).

5.3 Critical Moment 3: From a plan for action to action

The time when implementation begins is a period of upheaval and change – as power centres shift, unexpected new leaders emerge, and the coalition becomes a more diffuse network with similar but fuzzier aims.

After securing collective agreement, our third Critical Moment involves a time when lessons are being learned from what has already happened, networks need to be maintained and new directions have to be identified, whilst holding a potentially fragile consensus together. Regional leadership now becomes more diffuse as multiple regional power centres emerge. At the same time, the old coalition may become exhausted and drift

62. The 2007 RIS proposes the development of innovation 'hubs', effectively science parks-cum-incubator units supporting industrial translation activity. Alongside these will be a set of translational 'spoke' activities, building relationships between universities and firms. These Centres for Industrial Collaboration, modelled on the Scottish experience, will help universities and firms work together in consortia to jointly undertake shared/collective research.

Box 9: Twente – from textiles to Telematica in two generations

Twente is an old industrial region located in east Netherlands, the remote easternmost part of the Province of Overijssel, along Germany's western border and 150 km east of Amsterdam. Twente's industrial rise came in the 19th century driven by textiles, which declined from the 1950s onwards. A new technical university was created in 1961 to save regional industry but textiles steadily declined and then disappeared.

In Twente, the chairman of one of the largest textiles firms (Ten Cate), Dr W. Kroese, established the 'Foundation for the promotion of higher technical education in the north-east of the Netherlands' in 1951. His campaign ultimately succeeded and a university (UT) was established in 1964. Professor Van den Kroonenberg became

rector in 1979, and was reappointed in 1985, devoting his whole second term to making UT an entrepreneurial, regionally-engaged university, with a spin-off programme, and technology centre. Van den Kroonenberg personally persuaded the then-Minister of Education in 1985 to fund the first dedicated Dutch chair in Informatics (also see Boxes 17 and 20). This created a pool of ICT students in the late 1980s which in turn helped attract ICT businesses to the region. In 1992, Twente was granted the (industry-funded) strategic National Telematics Research Centre (TRC). When the Dutch Government created four strategic leading technology institutes in 1997, TRC became Telematica, and was later commended by the OECD as best practice in university/business technology transfer.

More information on Twente is presented in case study 4.

63. See HM Treasury (2007) 'Review of Sub-national Economic Development and Regeneration.' London: HM Treasury.

apart. Partners have to learn critically from what has been achieved: the wider community of innovation partners has to redefine itself to encompass much wider interests in innovation, whilst original community members continue to contribute constructively.

This requires managing the personal development of the regional actors. First-generation leaders can create new roles for themselves, moving aside to focus on their specialised services – this is what happened with organisations like Twente Technology

Box 10: The North West of England – multi-level governance in one region

The North West of England is a very diverse region, and benefits from its strong tradition of civic leadership from two sources. Firstly, there is a tradition of inter-municipal co-operation underlined by the metropolitan area bodies. Secondly, the North West's Parliamentarians are very well organised within Westminster, which arguably provided a model for regional select committees as a means of providing regional democratic scrutiny proposed in the 'Review of Sub-national Economic Development and Regeneration'.⁶³ However, there are also examples of strong urban leadership, particularly Manchester, and latterly Liverpool, which aligned itself in the 1980s with government's urban entrepreneurialism policies (e.g. City Pride) to win further national investment.

The North West also benefits from a well-developed voluntary and charitable sector, keen to reflect the interests of its members. The North West is home to a number of Co-operative Societies and has strong trade unions – both are important in supporting regional debate and sponsoring research to allow them to provide a critical voice within the region. There is also a regional Business Leadership Team (NWBLT), with a membership drawn from leading businesses in the region – the NWBLT has developed its own strategies and responses to regional consultations. These various partners have been crucial in creating a nuanced regional innovation strategy that has the potential to reflect the needs of all partners within the region.

More information on the North West of England is presented in case study 10.

Circle, Sophia-Antipolis Foundation and Technology Centre Hermia. Second, as early leaders step aside, a second generation must emerge to become the new innovation leaders, potentially finding their own ways of working together. Third, as innovation accelerates, business leaders must be more closely and formally anchored in strategies to capture the existing knowledge of cluster groups and business leader networks. As an example, England's North West has used its strong local leadership to ground abstract regional innovation strategies in their regional needs (see Box 10).

During this phase, conflicts may emerge as many bodies try to become 'strategic innovation bodies' rather than being directly involved in providing business innovation support services. There is a danger, in the words of the old saying, that 'too many cooks will spoil the broth'. However, it is also important not to dissipate the experience and knowledge within these various bodies, a risk which is greatest when organisations with specialist expertise and knowledge concerning the RIS step back from a strategic role.

In the North East of England, the *Strategy for Success* was redrawn to allow 'centres of excellence' to fulfil both roles simultaneously, developing a strategic vision for stimulating their sector regionally, whilst still continuing to manage facilities and provide services for actors within the region (see Box 11).

5.4 Critical Moment 4: From pilot to mainstream

The fourth Critical Moment comes as the once-ordinary region becomes one collectively focused around innovation. It is at this stage that regional culture visibly changes and innovation becomes more embedded within regional economic practices. This may involve new ways of working with partners, new ways of managing innovation projects, or new methods for developing new innovation strategies. This is a time of volatility and vulnerability. The challenge lies in maintaining existing successes – without becoming complacent – whilst also instilling a sense of forward progress.

One problem at this stage can occur when otherwise good projects fail and undermine the regional interest in innovation policy, as with Flanders Language Valley (see Box 18). In such circumstances, it is necessary to move quickly to isolate the problem and prevent it developing into a crisis or a scandal.

Another problem is ensuring that other policy fields which can support innovation are encouraging regional innovation activity. In Catalonia, science and innovation policy stagnated when a dominant political party was voted out, creating political turmoil in which effective innovation policy was not easily achieved. National governments can reinforce this problem by providing funds in discrete 'silos' which are difficult to integrate to add value to regional funding streams.

Box 11: The North East of England – from five 'centres of excellence' to three real regional assets

The most successful 'centres of excellence' in *Strategy for Success* (see Box 8) were those that inherited an existing operational infrastructure of university/business collaboration. Several such centres had been created with European funding in the mid-1990s, including the Teesside Wilton Centre, EUROSEAS in Northumberland and the International Centre for Life (Newcastle). These centres were rolled into *Strategy for Success* as three of the five new 'centres of excellence'. Their infrastructural inheritance meant they were instantly successful, whilst the other two Centres had much greater

difficulty in establishing themselves. One NorthEast therefore produced a second version of the *Strategy for Success* giving these three 'centres of excellence' a more pragmatic role, using their experience to deliver services whilst generating a high-level strategic science vision. The fastest growing company in the North East in 2007, The Engineering Business Limited, had been supported for several years by The New & Renewable energy centre, which formed out of a merger of existing energy research assets, demonstrating the relatively long time taken to develop supportive innovation ecosystems.

More information on the North East of England is presented in case study 9.

The solution is to ensure that what is created during the regional innovation journey develops a momentum of its own, and that as many actors as possible are strategically committed to the key elements of the idea. In Twente, the Province used all its political capital to make sure that the concept of a Twente Knowledge Park encompassing regional universities and high-technology businesses was written into strategies at the regional, inter-provincial and national level. This kept partners working together during difficult moments, and created a sense of inevitability in the project. In Scotland, a decisive, long-term policy statement (*A Smart Successful Scotland*) ensured that political change did not disrupt building a more effective regional innovation system (see Box 12).

5.5 Critical Moment 5: Renewing regional leadership to address new challenges

Policies and leadership structures appropriate for one leg of the innovation journey might not suit subsequent challenges. This issue is all the more pressing when new economic crises or regional challenges emerge. The capacity of regional leadership to renew itself is a vital determinant of the lasting impacts of the innovation journey.

The primary problem at this stage is that a series of successful innovation activities may become 'set in stone', preventing further

development. Innovation policies and arenas may be captured by particular interest groups, preventing other actors participating in innovation. These interest groups may be large cities who argue that their critical mass means they should be innovation funds' main recipients. In regions with dominant innovation players, other players may react by arguing that it is their 'turn' for support. Dominant institutions may counter with threats to leave or reduce their regional engagement unless their activities are funded. This inertia reduces regional freedom to deal with unexpected problems and economic crises.

Addressing this problem requires sensitivity to the regional conditions, especially political sensibilities. There is a risk that institutional change is seen as a solution in itself, with a focus on reorganising administrative bodies rather than renewing regional leadership. One approach simply replicates the bureaucratic problems we have seen in 5.1. The other – renewing leadership – involves the incorporation of valuable knowledge and experience within a new regional debate about the future direction of the innovation journey. In Tampere, the city authorities explicitly designated specialist agencies as 'experts' in particular sectors and technology transfer techniques, limiting their own role to general orchestration rather than direct oversight (see Box 13).

64. The administration elected in 1999 called itself the Scottish Executive. In June 2007, following a change in leadership after the Assembly elections, the Scottish Executive chose to style itself as the Scottish Government. The two terms in this report are used to refer to the same body but using the name from the time under discussion.

Box 12: Scotland as a smart, successful nation

The rise of Scotland's innovation agenda has been an essential element of addressing Scotland's persistent enterprise deficit compared to the rest of the UK.

The Scottish Development Agency was created in 1975 and reinvented as Scottish Enterprise in the late 1980s. Its first Chief Executive, although a Scot, was recruited from Silicon Valley, where he had become acquainted with Michael Porter's Monitor Consultancy work on clusters.

He commissioned two key research reports which established the importance of innovation to Scotland. The 1996 report, *Globally Competitive Clusters*, gave Scottish Enterprise the objective of promoting innovation through a clusters approach,

principally by supply chain support. The parallel *The Commercialisation Inquiry* explored using universities as sources of new technologies and business ideas. These reports contributed to a consensus that Scotland needed to become innovative.

The first Scottish Executive⁶⁴ launched the document *A Smart, Successful Scotland* (2001) which linked promoting innovation with a national rebirth process. This strategy allocated money to three Intermediate Technology Institutions (ITIs) over ten years, creating a long-term framework allowing them to continue successfully to realise their longer-term potential, despite political disruptions which could have undermined their position.

More information on Scotland is presented in case study 11.

Box 13: Tampere’s ‘enabling development’ model of regional leadership renewal

Tampere City had successfully organised four ‘centre of excellence’ programmes within a national framework. In 2003 the Finnish city decided to develop its entire regional innovation strategy on this basis. The key issue was how to build upon learning and expertise in the existing agencies, reorganising them to sit within a ‘centre of excellence’ framework without imposing a one-size-fits-all approach. The strategy identified different kinds of development agency serving diverse aims: covering sectoral centres (for healthcare, business services and new media), facilities provision centres (conference tourism, business parks) and services for businesses

(seed capital, venture capital, technology transfer, and business advice).

Tampere City called this ‘the enabling development model’ – specialised agencies helped a regional partnership to develop the overall strategy. The two types of organisation would draw on their own operational models to create a shared way forward – specialised agencies created new innovation activities within a high-level innovation strategy. That strategy, using past successes as good practice, helped to update the Tampere innovators’ mental models, through learning-by-doing rather than uncritically adopting the latest economic development fad.

More information on Tampere is presented in case study 2.

A secondary problem with renewal comes through external shocks which undermine past successes and create doubt that innovation coalitions may work in the future. The closure of a research laboratory or the failure to win a large-scale facility may be a real blow to a regional coalition’s self-image, self-confidence and prestige. This may create dissenting voices who in turn propose other models of economic

development less grounded in promoting innovation.

Addressing this problem involves harnessing critics’ energy into a renewal of regional understandings of innovation. These critics may rightly identify problems or gaps in current approaches, and their criticism can be vital in reducing institutional inertia in regional

65. This was identified by the Sainsbury Review as an example of good practice experimentation in innovation policy, and that more effort needed to be made nationally about how local experiments were expanded nationally.

Box 14: From A Smart Successful Scotland to a Scottish Innovation System

A Smart Successful Scotland was published to position Scottish innovation policy as more than purely economic development measures (see Box 12). This created a number of bodies active in supporting Scottish innovation, using Scotland’s science base to promote economic development. Alongside the £450m Intermediary Technology Institutes programme, a Scottish Science Advisory Council was created to shape UK-wide science policy so that Whitehall decisions did not disadvantage Scotland.

Scottish Enterprise continued to develop innovation support activities, creating some ideas adopted elsewhere in the UK, such as the proof-of-concept funds for high-technology SMEs.⁶⁵ However, this approach

risked becoming unmanageably diverse, and in 2004-5 a stream of political and media criticism emerged focused on a small set of mistakes made by Scottish Enterprise but which also unleashed a stream of other complaints.

In 2005, the Scottish Executive commissioned a Scottish Innovation System study, to defuse these criticisms. This made two main points: it made sense to talk of a Scottish Innovation System, but there were significant gulfs between the actors within this system. Moreover, policy until then had ignored the ‘missing innovation mass’ of hidden innovation in social partners and non-traditional sectors. This report helped to restore consensus for innovation policy in Scotland, and to mark an evolution to include hidden innovators in policy consideration.

More information on Scotland is presented in case study 11.

models without discarding valuable progress. In Scotland, *A Smart Successful Scotland* used the previous criticisms of Scottish Enterprise to justify launching a new approach, the so-called 'Scottish Innovation System' (see Box 14).

6. Successful regional innovation journeys share some common characteristics

6.1 Regional coalitions form as a response to independent events

The innovation journey for ordinary regions often represents a conscious attempt to end reliance on older economic development models. By contrast, leading regions such as Silicon Valley or Route 128 may follow innovative economic development trajectories seemingly without conscious effort from regional decision-makers.⁶⁶

When ordinary regions try to develop innovation systems, they will face other (sometimes competing) priorities, such as attracting inward investment or developing local supply chains. Resisting or channelling this pressure requires a strong consensus that

things must be done differently, which may mean accepting that the 'rules of the game' have changed.

6.2 The best regional stories involve a perception of crisis as the starting point

Many successful regional innovation journeys begin as a response to crises. Where there is mass unemployment, for example, regional authorities may feel their legitimacy is being challenged. They, therefore, feel obliged to respond. For instance, in Scania, the shipyards' collapse persuaded the regional governor and the university to develop a science park.

Scania was not alone. In many of the regions studied, a crisis stimulated regional leaders to go to the United States to study the newly emerging 'science parks'. The success of many of the science parks they created as a result proved vital in persuading regional partners of the value of innovation. In Flanders, commercialisation was greatly helped by the fact that one university patent granted in 1986, licensed to the US company Genentech, produced a revenue stream for the university and the inventor worth more than \$1bn over 15 years (see Box 15 below).

66. See for example Kenney, M. and Burg, U. (2000) *Paths and Regions: The Creation and Growth of Silicon Valley*. In R. Garud and P. Karnoe (eds) 'Path Creation and Path Dependence.' New Jersey: Lawrence Erlbaum Associates.

Box 15: A science park in Leuven – visible success motivating regional innovation coalitions

The Catholic University of Leuven (KUL) has been a significant actor in the Flemish innovation system since the 1960s. The Belgian government, in response to general anxiety over industrial competitiveness, despatched an expert delegation led by an Antwerp professor to the United States to report on how American universities had become key players in their regional economies. Responding to the delegation's recommendations, government legislation permitted universities to establish science parks. In Leuven, KUL used this opportunity to establish a new partnership with the local municipal federation to create a new science park at Haasrode.

This was not the only benefit KUL derived from the US visit. One of the four Belgian expert delegates was a KUL Board Member, Baron Guido Declerq. Following a Board paper from Declerq in June 1972, a new

organisation, 'KU Leuven Research and Development' was created as a not-for-profit organisation to assist with commercialisation of research at KUL. They were also able to recruit a second delegate from the US visit, Dr Jos Bouckaert, to manage the new organisation.

This organisation became extremely influential because of the income generated for the university by one patent it lodged on behalf of the inventor, which was licensed to Genentech and generated revenue over \$1bn. Since then, KUL has had an unimpeachable reputation for commercial acumen and regional engagement. Regional partners including the city council and Provincial development agency (*GOM*) have worked hard to capture the secrets of KUL's success, and use them to develop their own projects – including a series of expansions to the Haasrode Science Park – into a regional success story.

More information on Flanders is presented in case study 1.

Stories of crisis can also help to mobilise a coalition. In Tampere, traditional rivalries with Oulu were used by regional leaders and media to create a sense that only innovation could prevent Tampere falling ever further behind its rival (see Box 24).

6.3 Stimulating passive or resistant actors may prove to be difficult

Openness to new ideas is vital to a successful regional innovation journey. This is particularly true in regions with a tendency to reject new ideas, preferring instead their old development models. In the absence of an eye-catching crisis, regional authorities may focus on managing decline rather than creating a new economic development model.

In other cases, regional partners may think new development models are too difficult or out of their league. This is not opposition in principle, but a form of 'passive resistance'.⁶⁷ Passive resisters can be particularly influential at the start of the journey, preventing regional leaders from building critical mass in the coalition. In both cases, it is essential to counter such resistance by stimulating an openness to new ideas from sufficient other players so as to create an inevitability for innovation.

6.4 But once on track, the journey can start shaping events

Regions that have successfully introduced and adopted a new innovation-based economic development model have manipulated events to their benefit. Tampere has successfully exploited its rivalry with Oulu, selectively mimicking it or choosing a different approach, and justifying that by playing on historical rivalry.

While it is not easy for politicians to manipulate regional culture in the short term, an alignment between cultural traditions and economic challenges can make a difference over time. This was particularly the case in Flanders, where the regional innovation journey became immersed in the desire of Flandrians for economic autonomy emerging from their language struggles. The language struggle influenced the regional innovation journey, but the latter capitalised on it to ensure mobilisation behind it.

Regional 'culture' per se is not that important for the innovation journey. What matters is how that culture is expressed in terms of regional leadership, institutions, attitudes to partnership, co-operation and learning. In Flanders, it enabled one organisation, the Dutch-speaking Flemish Economic League (promoting TIRF) to be influential whilst the French-speaking counterpart the Organisation of Belgian Entrepreneurs (the VBO, favouring subsidies for failing industry) was not.

These factors give regions the capacity to react to events. Unless we recognise this, we might assume that regional innovation journeys only involve actors working together without encouragement for the common good.⁶⁸ Such 'happy families' stories may be superficially attractive but they are extremely unhelpful for policy development. They obscure challenges and hide often difficult regional decision-making behind a tale of a fortunate confluence of events. Tensions and conflicts are present in even the most successful region. The difference in successful regions is that they are better able to deal with them thanks to three main capacities: charismatic leaders, intelligent business networks, and robust institutions.

67. See Paalanen, A., Harmaakorpi, V. and Pihkala, T. (2006) 'Absorptive Capacity in Practice-Based Innovation Activities: the Case of Lahti Region, Finland.' Paper presented to 2006 European Regional Science Association Conference. *Ersa* 06, p.347.

68. Oinas and Lagendijk (2005) criticise stories which present a case as a 'happy region' characterised by "harmonious co-operation between a variety of firms, authorities and other organisations" as being unrealistic, and hiding struggles and tensions which exist even in successful regions (p. 12). See Oinas, P. and Lagendijk, A. (2005) 'Towards understanding proximity, distance and diversity in economic interaction and local economic development.' In A. Lagendijk and P. Oinas (eds) 'Proximity, Distance and Diversity, Issues on Economic Interaction and Local Development.' London: Ashgate.

Box 16: Knowing when to know best – Tampere's elite resist external pressure

In Tampere, planning to attract a new university to West Finland began within the town council in the 1950s, amongst a clique who had led Tampere's resistance movement during the Second World War. A private university moved to Tampere in 1960, changed its name to Tampere University in 1966 and in 1974 became a state university. A key moment for Tampere came in 1965, when the university created a chair in information technology, which was to prove critical in influencing Nokia's

decision on where to locate its new mobile telephony division. A second, technical, university was attracted from Helsinki that same year, and this university proved extremely resistant to national government pressure on universities from 1975 severely to curtail their industrial liaison activities. That resistance helped to develop the culture of engineering entrepreneurship and foreshadowed the great success of the Tampere science park in the mid 1980s.

More information on Tampere is presented in case study 2.

6.5 Charismatic leaders create alluring innovation journeys

Charismatic leaders can mobilise networks to create an alluring outcome, making others realise that innovation can help them to succeed. They may lead regional authorities that boldly declare they will make innovation policy work, such as Gaston Geens (Flanders) or Niels Hörjel (Scania). They may lead particular organisations that persuade others to work with them on small-scale, risky experiments, such as Pierre Lafitte (Sophia-Antipolis) or Nicos Komninos (Thessaloniki). They may be institutional entrepreneurs who make particular eye-catching projects work despite discouragement from formal regional leaders, such as Harry van den Kroonenberg (Twente) or Tampere's elite who challenged national education policy (see Box 16).

6.6 Business networks expand the scope of the journey

Although public sector actors can stimulate activities in dysfunctional regional innovation systems, they lack routes to market to coordinate and stimulate large-scale innovation simultaneously across many activities. This is why business networks are so important – they can produce a common direction of travel for regional businesses, and have a much greater shared experience of markets.

In Catalonia, business networks helped shift the region from a university-centred science strategy towards a more business and economic focused innovation strategy over nine years. In Twente, a consortium of spin-offs created to sell services to public agencies evolved

into both a voice for high-technology and a provider of entrepreneurship support for new spin-offs (see Box 17 below).

These business networks proved particularly valuable in giving a previously small and uncoordinated group a loud, intelligent voice that was heard by regional decision-makers. In both cases, governments used these networks to help their innovation policy, and to move beyond funding university research activities. These business networks emerged from nowhere to become important nexuses between the business community, government and universities.

6.7 Strong institutions make the journey more resilient

Strong regional institutions are vital to deal with external shocks and internal failures. In essence, a regional innovation journey is a series of experiments and lessons about risk-taking – failure can put regional partners off risk in a serious way. But strong institutions, such as universities, technology centres, business representative organisations, and local authorities can help to 'anchor' the journey and enable the system to recover by taking over the essence of what has succeeded, whilst closing down and isolating that which led to failure.

The bursting of the recent high-technology ('dot-com') bubble created a problem for several public actors who had harnessed their regional innovation strategies to the growth potential of this sector. But strong regional institutions helped prevent all their activities being jettisoned following the

69. The TIMP programme is regarded as a highly successful collaboration in the field of medical device technology. See Klein Woolthuis, R. (1999) 'Sleeping with the Enemy: Trust Dependence and Contract in Interorganisational Relationships: a script prepared for the degree of Doctor of Philosophy,' Enschede: University of Twente Press.

Box 17: The TKT – a new industrial voice for high-technology Twente

In the Dutch region of Twente, the regional Industrial Circle (IKT) led calls in the 1970s for more support for innovation in textiles to try to save the dying industry. However, IKT was heavily dependent on the textiles industry for its fees, and as the industry disappeared in the 1980s, there was no strong local voice for innovation. From the early 1980s, the University of Twente (UT) began supporting high-technology spin-offs, with around 15 new firms created annually. UT established a Regional Technology Circle (TKT), initially for its spin-off companies but open to other high-

technology businesses. This initially taught spin-offs how to sell collectively to large organisations (like UT). After two years, TKT was taken over by spin-off entrepreneurs. A full-time manager was hired and began developing subsidy proposals for collective innovation activities between members, one of which was in the medical products field.⁶⁹ TIMP prospered, developing links back with the university. 'Care and Technology' emerged in 2004 as one of the important innovative strengths of the Twente region as a result of these activities.

More information on Twente is presented in case study 4.

dot-com collapse. In Twente, several dot-com entrepreneurship projects failed in 2001, but the University quickly abandoned unhelpful brands (such as Twinning and Dreamstart) whilst reinvesting in its spin-off programmes. In Flanders, when a scandal engulfed a firm leading a flagship innovation project, regional technology agencies worked hard to limit damage and ensure that useful innovation activities were continued (see Box 18).

6.8 The Regional Innovation Journey is a fractal process

The Regional Innovation Journey is an ongoing process of change, optimising regional economic activity to ensure continual productivity growth. But the 'journey' is not a recipe for delivering a successful innovative region. Rather it is a map for navigating challenges in a region and for consolidating successes to achieve wider regional economic impacts.

A regional innovation journey involves a community of interests concerned with innovation, mobilised collectively to deliver outcomes that move a region forward, such as those who assembled around then Flemish-premier Gaston Geens to promote the Third Industrial Revolution Flanders (see Box 1).

Several innovation coalitions may co-exist in any one region depending on its economic size and diversity. Different sector groups may try to mobilise coalitions to support their own innovation needs simultaneously, sometimes progressing at different speeds. Regional leaders such as development agencies can

exploit and link these different coalitions to help them share their capacities to deliver better regional outcomes. The regional innovation journey can be considered as being 'fractal' – visible on a variety of scales and across a variety of groups. Policymakers must learn to exploit and not stifle the creative possibilities this diversity offers.

6.9 Two critical elements on the innovation journey may be hidden

The Regional Innovation Journey is also a long term process with many hidden elements contributing to its success. For example, it is vital to sustain momentum and the direction of travel, especially in the earlier stages. These early stages of the journey create the communities which later become essential drivers of the process. In Tampere, the Chair in ICT at the University of Tampere – created in 1965 – was vital in attracting the Nokia R&D Centre two decades later.

Another often hidden element is the inevitable change in roles of members of the coalition. Not all stakeholders on the journey will recognise their potential contribution: as a region evolves, partners' roles must evolve too. This process creates conflicts, as actors which have been central become more peripheral, and other actors come to the fore. Conflict may destroy coalition momentum which may have taken years to build up. In many regions, a technology transfer organisation or science park was instrumental in mobilising a regional coalition, but once large firms and universities became involved, the small technology transfer organisations were sidelined.

Box 18: Flanders Language Valley – when a sensible policy goes wrong

'Flanders Language Valley' (FLV) was a government-sponsored innovative cluster based on translation software, with a business centre and a venture capital fund. FLV had a plausible background – Belgium is bilingual and hosts a number of multinational, multilingual organisations (NATO, European Union) with pressing needs for translation services. There were a number of successful high-technology language software companies around Ypres (Ieper). This project emerged at the height of the high-technology bubble. But

one leading company engaged in serious share-price manipulation leading to its bankruptcy, and the venture fund also made some very poor investments including into a Korean science park. However, regional technology agencies acted quickly to preserve the best of the concept. The business centre continued under the name 'Business Park Ieper', the venture fund was wound up, a new high-technology venture fund (Arkimedes) created, and networking activities continued independently.

More information on Flanders is presented in case study 1.

Finding new roles for experienced innovation supporters is vital to avoid conflict and retain a regional community of innovation experts (essential for a regional innovation coalition). In Scania, IDEON's founder moved to run the regional innovation agency, located in that science park, emphasising continuity within the community. In Tampere, the city council (the lead actor) specifically stated that highly specialised agencies (actors that appeared more peripheral) must be central to its innovation policy – generalist policymaking must co-operate and learn from specialised agencies rather than attempt to control them. In France, Sophia-Antipolis has undergone a continual institutional evolution which has held together a growing coalition of innovation experts (see Box 19).

6.10 External support can help reduce risk and uncertainties and generate consensus

Because the end point of the journey is normally uncertain at the outset, regional partners may not be able to agree on where the end points of such a journey lie, and hence find it difficult to be convinced to commit resources

towards working collectively around certain schemes. External support can help focus these discussions.

This was demonstrated in the Dutch region of Twente. The Provincial government built up capacity for innovation policy (see Box 20) by playing the role of the external investor. It made €50m available to local authorities if they would agree on an investment programme benefiting some areas more than others. This demand helped to generate a consensus between a split group of stakeholders as the only way to bring the external (Provincial) resources into the region.

7. Appropriate regional leadership depends on history, goal and the stage of the regional innovation journey

7.1 Some innovation policy approaches work better in particular regions

How coalitions solve problems shapes their journey. But not all solutions work in all

70. Benneworth et al. (2007b) provides a greater explanation of how this classification has been arrived at. See Benneworth, P., Charles, D. R., Chaudhuri, S., Coenen, L., Hodgson, C., Humphrey, L., Oosterlynck, S. and Sotarauta, M. (2007b) 'The role of leadership in promoting regional innovation policies in 'ordinary regions': lessons from international case studies.' A report prepared for NESTA Places and Innovation Research programme. London: NESTA.

Box 19: Sophia-Antipolis – evolving roles to hold together a coalition of all the talents

Sophia-Antipolis was established as a sunrise industry growth pole in the 1960s – large companies active in France were encouraged to locate R&D activities in a southern French development zone. A university was created at Nice in 1965, and five years later a number of public research activities relocated to Alpes-Maritime. By the early 1970s, plans had emerged for Sophia-Antipolis to become a 'city of science' to the north of Nice. In 1972, the first plan was approved, for a 2,300 hectare science park. A local inter-municipal organisation (SYMIVAL) was established as the project developer. Although strongly driven from Paris, the idea quickly became embedded regionally.

Public support has increased with Sophia-Antipolis's success. SYMIVAL began as a small science park planning organisation, but has grown with the science park's expansion across an increasing number of municipal authorities. In 1988 a general

development company was created for the area, extending SYMIVAL's responsibilities and physical scope. These organisations have supported the science park's infrastructural and regulatory needs, building up a Sophia-Antipolis brand internally and internationally.

Their roles in creating and supporting Sophia-Antipolis have clearly evolved over time. Initially, the national government acted as initiator, but later reverted to supporting ongoing local activities. Pierre Lafitte has been consistently important in the science park's development. His role has clearly changed, from proposing the idea in a 1960 'Le Monde' article through bringing an anchor activity, *École des Mines*, to developing the range of covenants, charters and support organisations which embedded the idea regionally. He finally moved to establish *Foundation Sophia Antipolis*, which develops the park by attracting new regional businesses.

More information on Sophia-Antipolis is presented in case study 7.

Box 20: Twente – building an ‘Innovation Platform’ for collective priority-setting.

The Dutch region of Twente is deeply split, between the four main cities, and between urban and rural areas. These splits hinder collective action. Moreover, there are very few large innovative businesses, and those that exist often innovate in relative isolation. Although the province supported three European-funded Regional Innovation Strategy projects, these failed to address the deep regional fissures between partners. A number of regional crises – the closure of an R&D laboratory and a national airbase, and a threat to regional policy funding – persuaded regional partners to work effectively to deliver regional strategies.

The Province established an ‘Innovation Platform for Twente’ to develop a €300m compensation programme for the airbase closure, which the national government ultimately refused to fund. The Province continued to support IPT, and promised €50m of provincial funds if Twente

municipalities would agree a set of collective priorities for this €100m programme. These funds were made available to firms and universities on a matched-funding basis, increasing the total potential investment to €200m. In 2005, a manifesto for action was launched, followed by a Roadmap for activity in 2006 and then a call for potential projects which were assembled into an Innovation Agenda for Twente.

In June 2007, the €200m Agenda was finally agreed by the 14 municipalities. This was a remarkable outcome – an agreement for innovation across a heavily divided region incapable of collective action even five years previously. It shows how a public authority can use a mid-sized investment both to address a barrier to innovation policy (better internal connections) and to create a much more substantial collective innovation programme (collective innovation infrastructure).

More information on Twente is presented in case study 4.

regions, as some depend on different types of collaborative working. Partly, regional leadership depends on the existing dominant actors, on past collaborative successes, and partly on the independent initiative of regional actors.⁷⁰

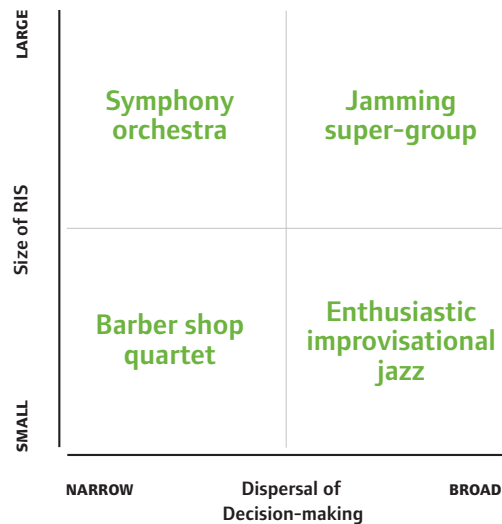
There are two variables that differentiate between types of regional leadership: the size of the regional innovation system (which, of course, hopefully increases over time); and the dispersal of regional governance.

- The size of the regional innovation system (RIS) describes the number of actors engaged in the regional innovation journey, their sectoral origin and their relative independence of interest and thinking. For example, some regions might be characterised by a single strong sector (such as telecommunications), dominated by a single industrial player (such as Nokia) and supported by a local university. The diversity in such a region is rather limited. Other regions might boast several strong players across different sectors, like the North West of England.

- Dispersal of decision-making describes the number of people making decisions, or the number of regional leaders. It reflects the degree of regional independence and autonomy including the internal regional hierarchy; the regional political structures of accountability; and softer dimensions such as the extent to which powerful actors permit other actors’ freedom of behaviour. For example, the city of Barcelona has considerable autonomy as the seat of the Catalan province, whereas English cities in general remain largely dependent on the central government in London.

Drawing an analogy with styles of musical performance, the size of the RIS can be considered as representing the talent and range of players, as well as the audience interests and sophistication. Dispersal represents how tightly the musicians are orchestrated to produce a harmonious outcome, as opposed to how much freedom individual musicians have to experiment and exercise their talents. Regional leadership style can be classified by these two variables. This classification is shown in Figure 4.

Figure 4: A 2x2 classification of regional innovation leadership styles



7.2 The ‘orchestral region’ has a few conductors co-ordinating many innovators

In ‘orchestral’ regions, the central focus of the innovation journey lies in a small number of leaders ‘conducting’ a large and diverse cadre involved in innovation. Orchestral regions find it possible to build broad coalitions relatively easily, although those being orchestrated might not always agree with the direction of travel and the coalition is therefore likely to have limits at the upper reaches of achievement.

These regions are most successful when able to adopt a more bottom-up approach than would usually be the case. This would typically involve specifying the regional direction of travel, make a (more or less) open call for proposals demonstrating partnership, and then orchestrate the best of those into a coherent programme of change. External partners can be the most effective way to bring novel opportunities and ideas to the attention of the regional coalition.

Box 21: Catalonia – Leading an innovation system in an historic nation

Although Catalonia is unique as a capital city of a relatively rich and successful region, there are still interesting lessons from the case study. Catalonia’s challenge is – as with all regions – to create a diffuse community of change agents generating new activities delivering innovation. The strength of Catalonia’s institutions creates a tendency towards inertia – firstly through a five-year interregnum while the Catalan government challenged the national Science Act in the Constitutional Court, and more recently through the political void created after a near quarter century of unbroken CiU rule.

Catalonia’s RIJ has been strongly driven by a number of key actors as a nation-building process, although the region does not cover either the historic Catalan lands or all those places where Catalan is spoken. In reality,

activities were heavily Barcelona-focused, and both contributed to and benefited from Barcelona’s emergence as a strong European capital. The challenge has been spreading the systematised approach to innovation across the region, supporting autonomous innovation communities in these places, whilst building a strong research base able to exploit European funding streams.

One response has been the building of a science park network, spreading regional expertise within longer-standing science parks associated with the University of Barcelona and the Autonomous University of Barcelona. This extended network of 14 science parks includes several in Barcelona’s urban regeneration projects, (including 22@) but also in the Catalan cities of Lleida, Girona and Tarragona.

More information on Catalonia is presented in case study 6.

A practical example of an orchestrating region is Catalonia (see Box 21).

7.3 The 'barber shop quartet' is skilful but for a small audience

The journey in 'barber shop quartet' regions is led by a few people, largely for the benefit of those few players – typically a small number of universities or multinational organisations. As a result, they are the most dependent on concrete outcomes, something of exceptional quality that animates the idea of innovation, arousing curious outsiders' interest. These ideas need to be both eye-catching enough to inspire support, but simple enough to be achievable.

'People' are critical to delivering successes rather than creating the 'idea' in a particular project plan. For ideas to succeed, individuals need freedom to develop projects that act as a rallying call. This needs organisational stability to recruit people of sufficient calibre, and to give them the opportunity to leave their mark behind regionally.

Appropriate policies are less focused on 'collective' dimensions of innovation (encouraging collaboration), and more

on building something successful which attracts more people, indirectly expanding collaboration. Capacity is evolutionary – it is easier to build an existing strength into something more convincing than to build something eye-catching from nothing.

A practical example of a 'barber shop quartet' region is Thessaloniki (see Box 22).

7.4 The 'enthusiastic improvisation' region has difficulties in finding a common tempo

'Enthusiastic improvisation' regions are those with relatively few leaders, but with a more general regional willingness for stimulating innovation policy – there is a lot of amateur leadership and very little 'doing'. A number of different activities may run in parallel, not always effectively co-ordinated.

Achieving success in such regions is difficult. Where it can be achieved, it depends upon 'co-ordination without commanding', combining existing strengths into a common motif (a central 'melody') which others implement in different ways on the basis of their expertise. Successful approaches flexibly develop innovation system knowledge over time. This might involve having a call for proposals

Box 22: Thessaloniki – big returns from a small innovation coalition

Thessaloniki became interested in innovation in a very instrumental manner, to win European funding, but this has created innovation-based growth in the region. The region experienced a severe restructuring after 1989, undercut by increased competition from former communist states; European funds were one way to address this problem. One individual who tried to assemble a coalition to win European funds immediately ran into political problems, and ingrained regional political allegiances meant that the first coalition which emerged was not acceptable to the European Commission.

This coalition reconfigured itself internally retaining the idea that innovation was something worth pursuing. In the course of the last 15 years, Thessaloniki developed two regional innovation strategies supported by the European Commission: a Regional Technology Policy (RTP) and then a RIS+. The region learned how to set

priorities and choose between competing priorities – of 22 RTP priorities, nine were taken up in the RIS+ strategy, and three were expanded under the current regional operational programme. This journey has been highly successful and Thessaloniki is now acknowledged nationally as Greece's hub of innovation.

Political leadership was important in Thessaloniki, but in a non-partisan way. Firstly, the coalition started small and apolitical, and remained that way as it grew over time. Secondly, activity was not rooted in existing local political networks, but used external networks, both nationally and through the European Commission, breaking the lock-in of local networks. Thirdly, the coalition was unorthodox in composition and activity, so certain potentially disruptive partners purposely absented themselves from it.

More information on Thessaloniki is presented in case study 5.

for innovation projects, then establishing a committee which attempts to build critical mass by sensitively assembling similar projects into a general programme.

In the ‘enthusiastic improvisation’ region, the development of the ‘regional melody’ is very important in the progress of the journey to ensure sufficient acceptance and tolerance of diverse ideas, along with a willingness to focus on particular areas where necessary. Strong and effective leadership may not be greatly in evidence in these ‘enthusiastic improvisation’ regions. They may be dependent on either one local actor behaving determinedly or an outside actor insisting that partners work together and find a way to co-ordinate and arrive at collective agreements.

In this case, this strong actor acts as an ‘informal conductor’ for the region, providing key signals and direction to help to bring some co-ordination to regional activities. Once this happens, regional progress can be quick as the various innovation activities already present in the region can easily be combined to be more than the sum of their parts.

7.5 The ‘jamming super-group’ region has to hold ‘big names’ together effectively

‘Jamming super-group’ regions are those with a successful innovation community with multiple and competing visions for innovation policy, alongside great depth in innovation capacities.

From time to time, their world-class innovators create something genuinely impressive and unexpected, and policy actors respond to this well. When they function well, these regions make innovation appear effortless, even normal – like in Silicon Valley. However, these regions may experience difficulties in delivering obvious and dramatic changes, as partners are accustomed to creating a permissive rather than a targeted project environment.

The most successful policies in this sort of region are those that facilitate adaptation and ensure that coalitions continue to evolve sensibly. Mature innovation support services may change away from being strategic decision-making centres, but their expertise remains valuable to the new ‘strategists’ in understanding the overall regional development trajectory. These regions typically have potentially overlapping and redundant discussion/consultative bodies. This overlap allows world-class partners to vent frustrations as appropriate, gluing the coalition together when egos clash. They also allow the appropriate kind of coalition to emerge in response to a particular challenge, while those not directly involved remain active in innovation and ready to respond to future challenges.

An archetypal ‘jamming supergroup’ region is Tampere (see Box 24).

Box 23: Creating an ‘incubator for regional business leaders’ in Twente

Twente is a very split Dutch region with a deep political split between urban and rural areas, and within the urban area between the main towns. These splits have hindered taking collective, focused action (see Box 9). From the early 1980s, the University of Twente successfully promoted university spin-off companies (USOs) through its ‘TOP programme’, developed a Business Technology Centre for its spin-offs in partnership with the RDA, established the Twente Technology Circle to help USOs sell to regional firms, invested in the Technostarters seed capital fund, and developed regional knowledge institutes to help firms access university knowledge.

These networks, which began around loosely affiliated individuals, slowly and imperceptibly evolved into co-ordinating mechanisms. Over a decade, TKT (see Box 10) developed into a networking organisation which helped new entrepreneurs find finance, managed a series of high-technology subsidy projects and established itself politically. Evolution took place as high-technology (often TOP) entrepreneurs themselves matured from ‘Technostarters’ into experienced business leaders. A number of key individuals took over running formerly public sector activities and oriented them more towards the needs of high technology businesses.

More information on Twente is presented in case study 4.

8. The UK's ordinary regions face similar challenges on their innovation journeys

8.1 Regions do not take enough advantage of the potential contribution of strong self-interested actors to regional innovation

It can be hard for regional authorities to distinguish between competing claims from different actors about which activities public policy should support. Some actors have louder voices and more compelling stories to tell than others. Strong multinational corporations, universities and public research laboratories may 'protest too much' that innovation policy ignores them, but their knowledge and connections may equally be vital to the regional innovation journey. Balancing investment in existing excellence with attractive potential is difficult.

Regions must better understand the inherent value of self-interested innovators working together within regional innovation ecologies, and identify what additional value they can offer in return for specific investments.

8.2 Central government needs to resist inadvertently supporting a vicious circle in 'ordinary regions'

Policymakers understandably want to see a good return on their investment. This reduces public investment in less successful regions, locking them into a self-fulfilling equilibrium of low innovation and productivity levels. It would be unrealistic to expect this to change without

changing policymakers' attitudes. So, we need a new perspective for regional innovation policy with different goals, intentions, hopes and timescales of public investments. Without changing the national policy perspective, differentiated regional innovation policies could worsen the current situation, by sucking investments out from good activities in less successful regions.

Policymakers should focus more on investing in capacity-building, evaluating investment returns against other regions at similar positions in the regional innovation journey rather than the absolute scale and return of investments.

8.3 Public policy pressures regions to abandon existing journeys

There is a strategic paradox in the UK nations and regions: they abandon never-implemented strategies to write new strategies, implying that they are failing to begin their innovation journey.

Turnover of 'innovation strategies' in the UK nations and regions has been curiously high. Sometimes new strategies are launched even before previous strategies have been implemented. Strategies are developed in response to funding requirements, and new funds demand new strategies. If central or national government imposes external priorities on regional partners, this imposes an additional barrier to regional innovation.

Box 24: Tampere – building sequences of strengths over long horizons

The two Tampere universities have long been important in the Finnish region's further development. The technical university (TUT) deliberately maintained close connections with regional companies during the 1970s when national policy discouraged university/business linkages. In the early 1980s, Oulu established a business park, and Tampere retaliated in 1986 with its own science park. The science park developed a Technology Centre with specialised staff helping potential entrepreneurs with business start-ups. TUT acted as an effective source of new science park businesses – by 2001, 145 science park companies employed 3,000 staff.

The city's enabling development model recognised the reality that a number of policy experiments created a fertile environment for further collective action (see Box 19). The science park, a narrow and specialised activity, drew together a community of entrepreneurs and policymakers, which slowly changed wider regional community attitude to innovation. This community built on TUT's commercialisation experience, rivalry with Oulu and the city's commitment to innovation to create new highly specific regional knowledges.

More information on Tampere is presented in case study 2.

As central Government moves to a more active innovation policy (signalled in Lord Sainsbury's Review, 'The Race to the Top: a review of Government's science and innovation policies'), there will be a temptation to set detailed priorities for regions. This may damage existing innovation support organisations which do not politically fit with new strategies.

8.4 Innovation policy at the regional level is relatively new, and good processes need to be matched by good people

The regional innovation journey may be regarded as a process, but what is ultimately important is improved innovation. In the early 1990s, every English region had two types of innovation advisor. Regionally, external 'innovation advisors' – high-level secondees with business backgrounds – helped the Government Offices to stimulate innovation. Nationally, Business Links recruited experienced innovation counsellors to help firms become better at innovation. But these efforts became diffused as funding arrangements diverged, and their impacts were highly variable.

There is a pressing need in all regions to develop a community of innovation experts who can help RDAs, local authorities and other bodies to develop a more supportive environment for regional innovation. This community must be well trained to reflect developments in the business, theory and practice of innovation policy.⁷¹ This must be prestigious, externally accredited and valued by employers, drawing on existing programmes such as Masters courses in Public Administration.

8.5 Sustaining momentum depends on sustaining partners' motivation

Any innovation journey is exhausting for its participants. After difficult periods, there is a natural desire to rest before continuing. But rest periods are dangerous – partners can lose interest, drift away from regional coalitions, or criticise the pace of change. Consequently, regions must balance maintaining partner enthusiasm during this tiring process and sustaining forward momentum in the journey.

8.6 Good process is not enough: the people running the processes are the real assets

Successful projects provide institutional entrepreneurs with opportunities to experiment with policies. These institutional entrepreneurs are critical to developing new meaningful innovation support. They must be drawn into the strategy processes so their knowledge can

be used to improve the quality of the Regional Innovation Journey. Institutions such as boards, innovation platforms and strategy groups are essential to ensure that these individuals and their knowledge are used to give regional innovation strategies 'flavour', grounding their abstract ideas as far as possible in the reality of what has already successfully been achieved.

9. Nations and regions need to find their best recipe for innovation

9.1 Any innovation journey must be closely tailored to the conditions of its region

Different situations require different types of support from government, and regional innovation will be influenced by a range of policies, not just those explicitly concerned with innovation. The most effective journeys have been those that have effectively integrated policies such as education, economic development and infrastructural investment to create more supportive environments for innovation.

Within a region, some sub-regions will benefit most from better innovation policy, and it is therefore essential to balance local interests to create a regional consensus. This will require an explicit explanation of how all sub-regions will benefit from particular policy measures, with some creative thinking about how the benefits can be spread out, and how the strengths of one sub-region can help others.

The same is true nationally – some regions benefit more from innovation policy than others. A range of policies tailored to the needs of different types of regions is required. However, these should be integrated within a clear vision for national innovation policy which sets out how innovation policy can help regions learn and improve their own regional innovation environments.

9.2 Central innovation policy should enable development by national and regional coalitions, and monitor regional progress

A fully-regional approach suggests that central government would be better to outline the UK's priorities, ask nations and regions to reflect on how they could support those priorities, and then (where necessary) have central government modify those priorities in the light of regional capacity. Regions must learn to convert their strategies into a sequential evolution of regional thinking about innovation support – though this will require

71. This echoes the finding in 'Hidden Innovation' that actors "responsible for innovation [policy] must therefore include a highly skilled strategy and policy unit" (p. 26).

support for regional innovation to be based on regions' past performance and evaluations of where those regions lie on the innovation journey.

Taking a regional innovation journey perspective, Tampere's enabling development model (see Box 19) suggests that a national innovation policy could be developed by a government listening to all its regions. Regional coalitions could develop regional action plans to access a substantial national investment fund which would support different innovation activities on the basis of sensible targets. Different regions would be set qualitatively different types of targets, depending on their position on the innovation journey and their style of innovation leadership.⁷² The UK Government should ensure that central innovation policy supports this diversity, and does not disadvantage regions early on in their innovation journey. Central government should develop a 'UK innovation monitor' to reflect and consolidate the achievements of each nation and region.

9.3 Regional leaders do not have to be at the 'regional' scale

Regional leaders in our journey are critical to motivating a coalition of individuals to work together collectively to improve the capacity of regions to innovate. This does not mean that regional leaders always wear a chain of office inscribed with the word 'region'. As we have seen in our case studies, they may be education, business or community leaders.

Within the UK, political leadership is often likely to emerge outside the regional level – elected representatives are only found at a district, county, constituency or national level. Public bodies such as universities, executive agencies and research laboratories may be 'in a region but not of the region', and must define their own reasons for involvement in a regional innovation journey.

Policymakers must respect that the real regional leaders are those who identify with a shared self-interest, commit to the coalition and work hard and motivate others to collectively address the problems experienced in the course of that journey. Just as our report highlights how innovation can come from unexpected sources, so too could the leadership for regional innovation do so.

9.4 Building up business voices is vital to effective innovation journeys

Public bodies are just one element of any innovation system – no Regional Innovation System can function without effective business contributions. Businesses have vital knowledge and understanding which help better co-ordinate each RIS. Businesses are also essential partners on the regional innovation journey because they can help spread new ideas and approaches into the region.

Those regions that found ways to embed particular lead business users in their journeys found it easier to address emerging problems and increase the take-up of particular instruments and activities. But it is not easy to get effective business contributions into strategic debates and discussions. Satisfied business beneficiaries are a vital asset in our journey and more needs to be done to formally acknowledge and expand their participation in regional innovation activities.

9.5 Intelligent evolution is necessary to ensure that regional leadership is always fit for purpose

Effective regional innovation coalitions function by building working relationships between partners. Some actors must voluntarily accept changes in their role and status along the journey, and hence within regional decision-making forums, to ensure that today's innovative structures do not become tomorrow's institutional inertia. Complex inherited structures can tempt authorities to 'kill off' or simplify institutional arrangements and to try and build a system from scratch. But continuity is also important – not least because of the residual learning accumulated over time, and because constant change can absorb enormous amounts of leadership time.

9.6 Innovation leadership styles must evolve over time too

Innovation leadership styles reflect both regional cultures of authority and the capacity for innovation in particular places. Both these features will change over the course of an innovation journey, as more firms and institutions orient themselves towards innovation. Successful innovation journeys increase places' innovative capacities – correspondingly, regional innovation leadership styles and appropriate policy approaches must evolve too.

Central, national, regional and local partners must all ensure that their own understanding of what others contribute to their own

72. In England, the new TSB strategic innovation fund announced in the 2007 Comprehensive Spending Review presumes an enabling development model approach. Without that approach, resources will flow to the 'Golden Triangle' regions at the expense of ordinary regions – under these conditions, it is extremely unlikely that the six much better-resourced RDAs in ordinary regions will invest in these activities, so the TSB fund will not achieve its £180m of additional RDA funds.

journeys reflects this evolving reality. These understandings must then be reflected in regional innovation policies.

9.7 A continual process of learning and development

At every stage of a regional innovation journey, policymakers must be open to change and guard against institutional inertia. But they must be ready to build strong coalitions that challenge prevailing orthodoxies and enable the innovative capacities that lie within every region to emerge. Equally, they should avoid seeing new strategies as equivalent to real change, or losing the lessons from what has gone before. This report has shown how cities and regions across Europe have risen to that challenge – their lessons should be learned carefully as regional policy evolves.

Appendix A: Glossary

Acronym	Full title
BERR	Department for Business, Enterprise and Regulatory Reform
BSSP	The (BERR) Business Support and Simplification Programme
CLG	Department for Communities and Local Government
CSR	Comprehensive Spending Review
CPD	Continuing Professional Development
DIUS	Department for Innovation, Universities and Skills
DTI	Department for Trade and Industry (until July 2007)
GERD	Gross Expenditure on Research and Development
GOM	Provincial development agency (Flanders)
GOYH	Government Office for Yorkshire and the Humber
IKT	Twente Industrial Circle (Netherlands)
IPT	Innovation Platform for Twente (Netherlands)
ITI	Intermediate Technology Institute (Scotland)
NIS	National Innovation System
OECD	Organisation for Economic Co-operation and Development
ONE	One NorthEast (RDA for North East of England)
PBR	Pre-Budget Report
R&D	Research and Development
RDA	Regional Development Agency
RIS	Regional Innovation System
RTN	Regional Technology Network
RTP	Regional Technology Plan (Pilot EU innovation strategy programme)
SE	Scottish Enterprise
TEKES	National Technology Agency for Finland
TIRF	Third Industrial Revolution Flanders (Belgium)
TKT	Twente Technology Circle (Netherlands)
TOP	Temporary Entrepreneurs' Programme (University of Twente)
TSB	Technology Strategy Board
USOs	University spin-off companies
YHUA	Yorkshire and the Humber Universities Association

Appendix B: Eleven case studies of nations and regions

The project involved two types of case study. The first set of studies was of seven European 'ordinary' regions that had undergone an economic transition. These illustrate the process of an 'innovation journey'. The second set was a group of four UK 'ordinary' nations/regions (outside of the 'Golden Triangle' of London, Oxford and Cambridge) that are currently undertaking an innovation journey.

The case studies followed a common outline based on twelve questions. The outline structured the presentation of information and allowed the case studies to be compared and their lessons learned. The case studies reflect the purpose of this report, which is to understand regional leadership for innovation in the UK's ordinary regions. The overseas case studies are set out more briefly to give a sense of how these regions addressed the key challenges – more is said about these case studies in the body of the report. The UK case

studies are slightly longer, to provide more detail on these situations, including the key challenges facing the four studied regions. We also outline the coming policy challenges for a nuanced regional innovation policy in the UK.

The case studies follow a common ordering. Each case study begins with some outline statistical information to position the region within the European context. The population figure shows the approximate size of the regional economy; GVA per capita indicates the relative wealth of the region; 'GERD in GDP' shows how much regional output is expended in research and development; whilst unemployment indicates the impacts of structural change on the region. The other headings show how the region (or nation) has progressed through its innovation journey, from the problems faced, the challenges addressed, to the regional leadership style used to tackle the challenges.

Case Study 1: A third industrial revolution in Flanders

Region	Flanders, Belgium	GERD in GDP (EU 27 = 1.9%)	2.08%
Population	6,080,000	Unemployment rate (LFS 2005)	5.4%
GDP EU PPS* (2005, EU 27 = 100)	123		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Flanders is the northern, Dutch speaking region of Belgium comprising five provinces, one of which (Flemish Brabant) entirely encircles the capital region, Brussels. With a population of six million, it is the largest of the three Belgian regions. It is far more prosperous than the Walloon region to the south, which has suffered greatly from de-industrialisation in the last half century. The port of Antwerp has been home to a successful and growing chemicals sector. In the post-war period, the region was extremely successful in attracting investment in manufacturing, and there is also a tradition of local entrepreneurship, particularly in Flanders' western provinces.

The economic centre of gravity of Belgium has shifted over the last half century, as Walloon heavy industry has declined and Flanders has undergone several waves of re-industrialisation. This shifting economic imbalance has coincided with the increasing regionalisation of Belgian politics. Whilst regionalisation has undoubtedly been driven by the language issue, economics has given the language struggle real political importance. In the 1970s, both Flanders and Wallonia sought greater regional economic development powers to address their pressing economic needs. In the 1980s, in response to Wallonian socialist pressure, new regional governments were established in the three regions that make up the Belgian federation.⁷³

In 1980, as part of the wider recession in Western Europe, the Flemish economy also experienced a dip in its fortunes. This gave the Flemish government an opportunity to provide a distinct response. Flemish politics had been strongly shaped by its struggle for linguistic emancipation within the French-speaking state. One organisation, the Flemish Economic Union (the VEV) had developed a position strongly advocating developing a more locally-driven economy in Flanders, reducing reliance on (Francophone) Brussels. The VEV had close

links with the Christian Democrat Party, and the Christian Democratic politician Gaston Geens became the first Flemish prime minister. The VEV saw in the new Flemish government a vehicle for realising its own ambitions for autonomous Flemish development, and the chance to encourage new high-technology industries freed from the costs of subsidising industrial decline in Wallonia.

Challenges addressed

But the regional politicians had relatively limited resources. This proved to be a blessing in disguise, as it limited the extent to which failing companies could demand subsidies from them. The Flemish government was able to establish a principle that they would only invest on the basis of solid business plans rather than for political reasons. However, this did not obviate the need to create an emblematic policy – a series of high profile but light-touch measures that would symbolise successful Flemish government – without incurring government expenditure. The policy that emerged was called 'Third Industrial Revolution Flanders' (TIRF). It aimed to deal with the uncertainties of the prevailing economic situation (the collapse of Bretton Woods and 'stagflation') by creating a new wave of high-technology induced growth.

TIRF was the title of a report produced by the VEV in the early 1980s, written by a Flemish intellectual, Kris Rogiers, who was seconded to work in Geens' personal office to implement the regional government's vision. One of the main challenges identified in the TIRF report was the great popular resistance to new technologies, since they were seen (and often portrayed by the unions) as destroying rather than creating new jobs. In response – and to quell disquiet amongst some left-leaning social scientists that little thought was being given to the social consequences of this rapid

73. Flanders, Wallonia, and the Brussels Capital region.

change – the Flemish Technology Foundation (STV) was established as a consensual body to research these changes.

The TIRF identified three technology areas suitable for support – micro-electronics, biotechnology and advanced materials. Research support measures for these areas, including the inter-university Micro-Electronics Research Centre (IMEC), were developed. Cluster groups were also formed, largely from existing well-organised sector groups who sought ‘cluster’ designation to access further government resources. There was investment in university research activities to strengthen the economic base. The resulting technologies have remained central to Flanders’ innovation strategies since.

Moving along the regional innovation journey

The TIRF set the Flemish government on an innovation-driven course that has lasted to the present day. However, Flanders has been through at least three distinct cycles, including TIRF. During a second wave of Flemish industrial policy from 1992-1999 (associated with the premiership of Luc van den Brande), more emphasis was placed on investing in the cluster networks, not just the university research centres. Five more industry-led cluster groups demanded recognition and support in this period. In a third cycle since 1999, there has been a mix of firm-based support and support for clusters. However, innovation policy has remained a central concern of the Flemish government, and was an important issue in the discussions about a new coalition government in 2007.

Regional innovation leadership style

The regional innovation leadership style in Flanders is very broadly based. It actively stimulates a wide range of policy activities and is sensitive to political changes within the regional government. Three main phases of development can be identified:

- Building large, emblematic centres (notably IMEC).
- Building firm-led networks.

- Attempting to improve the integration of the centres and networks.

The continuing importance of innovation in this period has over time given innovation policy a great deal of resilience to interference and change, and has helped to ensure that politicians of all parties remained committed to promoting innovation.

This has been greatly facilitated by what was achieved through the TIRF programme. For example, between 1983 and 1989 the Flemish government organised a technology fair every two years – ‘Flanders Technology International’ – to convey an upbeat message around technology to the electorate, and to legitimise the investments being made in the three cluster areas at a time when manufacturing sector jobs were being lost. By emphasising that embracing these new technologies would create new employment opportunities for the engineers whose rising unemployment was a significant political problem for the government, TIRF also contributed to a lasting cultural shift within the region.

Case Study 2: Tampere – from textiles to technology through autonomous knowledge-building

Region	Tampere, Finland	GERD in GDP (EU 27 = 1.9%)	3.49%
Population	454,000	Unemployment rate (LFS 2005)	9.5%
GDP EU PPS* (2005, EU 27 = 100)	102		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Abundant hydro-electric resources helped Tampere, Finland's second city after Helsinki, to emerge as one of the country's dominant industrial centres since the 19th century. Several textiles businesses were set up in the southern Finnish region, which were served initially by a complex of engineering businesses such as machine builders. So prolific was its textiles industry that Tampere became known as the 'Manchester of Finland', reflecting its emergence as Finland's second city.

Since then, Tampere has wrestled with de-industrialisation and how to make the effective transition to a high-value knowledge economy. In the post-war period, the Finnish government decided to expand the Higher Education sector nationally. New universities were built on a number of strategic sites, and the city of Oulu was granted one at Tampere's expense, even though Oulu was only the sixth largest city in the country.

In the early 1990s, Finland experienced a deep economic crisis as a result of the collapse of the neighbouring Russian market, a significant trade partner. The national government created a new National Technology Agency (TEKES) which launched a Centres of Excellence programme to promote regional economic development by investing in technology. Responding to both these initiatives, Tampere faced the problem of developing and sustaining knowledge-intensive activities in the region, having been initially overlooked by the central government.

Challenges Addressed

Tampere's post-war revitalisation benefited from having a group of leaders who had considerable experience working together

during the Second World War as part of the national resistance movement. These individuals took positions of power during the 1960s and were able to work across the contemporary political divides. These town managers set about attracting new Higher Education Institutions (HEIs) to Tampere to overcome the city's neglect in favour of Oulu, already a fierce rival of Tampere.

This 'rainbow coalition' included Erkki Lindfors (social democratic Mayor), Yrjö Silo (social democratic politician), Lauri Santamäki (non-socialist politician) and Jaakko Hakala (chief editor of the local newspaper). Branches from an extension college and the technical university in Helsinki were established, and by the early 1970s Tampere had two universities – one general in scope (UTA), and the other specifically technical (TUT).

These two universities were important in the further development of the region – the TUT deliberately maintained close connections with regional companies during the 1970s when national policy favoured no formal linkages between universities and business. After Oulu established a business park in the early 1980s, a science park for Tampere was established in 1986. Partly because TUT had already developed an effective methodology for working with businesses, TUT was able to act as an effective source of new businesses for the science park, and by 2001 there were 145 companies there employing around 3,000 staff. A central part of the science park was also the development of a Technology Centre with specialised staff to help potential entrepreneurs to establish their businesses.

These activities helped Tampere to demonstrate to national government that it was successfully making the transition to a modern knowledge-based economy. Tampere then bid to TEKES for three Centres of Excellence – mechanical engineering/ automation, ICT and healthcare

– citing its proven success with the science park in these fields. The national designation of these three centres helped to demonstrate to local and regional actors that there were genuine regional strengths in these areas. It also helped to connect existing engineering companies – which had previously been seen as traditional and unimaginative – and the new start-up firms, through developments such as the physical infrastructure science parks and the centres of excellence. All this helped to create a regional consensus that Tampere could establish itself as an innovative region with global competencies focusing on manufacturing and ICT industries. The centre of excellence programme helped to fund some co-ordination activities within the three sectors, and to demonstrate the potential economic benefits of co-operation.

The city then proposed to develop regional development agencies which would specialise in supporting particular activities. The specialisations of these agencies were diverse, and included sectoral centres (for healthcare, business services and new media), and facilities provision centres (conference tourism, business parks), as well as services for businesses (seed capital, venture capital, technology transfer, business advice).

In Tampere, the main actors were often willing to challenge national decisions, but only with support from regional partners. In the 1960s, the decision to create a regional university at Tampere was counter to national policy – in the 1990s, Tampere city decided to support its businesses services cluster despite TEKES arguing that it was not a centre of excellence. Those experiments succeeded – both universities in Tampere are well established and make strong regional contributions, and in a Centre of Excellence proposal in 2002, TEKES acknowledged and supported business services as a regional strength. This independent action was not wilful, but based on building a regional consensus for action that accepted that taking an extreme course was reasonably justified.

Tampere is about more than just the exercise of autonomy. This could appear like a region that, feeling spurned by central government, decided to do its own thing. But while that may have spurred the region to action, it was a highly informed autonomy. There were many experiments undertaken, and they helped to steer what happened next. The science park was created and made to succeed. Once it was successful, it was sold to a private company, as new ways to transfer technology and create

economic benefits were sought. Success with the science park helped attract the centres of excellence programme, which was in turn important for highlighting that there was much greater economic potential for stimulating innovation in the manufacturing sector than hitherto realised. This helped to make the regional innovation agenda interesting for manufacturing companies in Tampere, and to increase the scope of the regional innovation coalition.

Moving along the regional innovation journey

Tampere has undergone at least three regional innovation journeys with a high degree of success, and this positions the region extremely favourably for the future. The three involved:

- the attraction and embedding of the universities as a source of high-technology outputs;
- developing a science park to house a new technological community; and
- persuading local partners to think in a sophisticated way about how they could learn about their innovation system, and how to incorporate local and external experts in decision-making in Tampere's regional innovation system.

Tampere is continually seeking to expand the scope of its innovative activity, and to help to bring innovation and other policy fields together to create better outcomes for its citizens. Its innovation policy field is extremely well developed and supportive of other activities.

Regional innovation leadership style

Leadership for innovation in Tampere is extremely pragmatic, identifying what strengths there are in the region and creating new strengths by bundling existing actors together in interesting ways, as with the attraction of the two universities. There have been many experiments in innovation policy, and regional leaders have attempted to ensure that as many of these as possible are used to become the foundation for future activities. These are seen as being 'specialised agencies'

who worked with bodies developing regional strategies to co-develop the strategies.

Since 2000 (when the first Centres of Excellence programme ended), Tampere has reconfigured its innovation strategy, with a hub-and-spoke model of specialised agencies delivering services and generalised agencies integrating a high-level strategy. Regional partners then commit to that high-level strategy, which helps it to update their mental models. This means that new ideas come into the region in an applied form, on the basis of trying to do something better rather than in an abstract and potentially unworkable form. Tampere City terms its current approach the 'enabling development model' – specialised agencies helping a regional partnership to develop the overall strategy. It is important to stress that the enabling development model emerged implicitly within the city's practices from the late 1990s, and was formally recognised somewhat later.

The example of the science park illustrates how one very narrow and specialised activity can draw together a community of entrepreneurs and policymakers, who help to change the attitude of the wider regional community to innovation. The key to this has been long time horizons and deliberate attempts to scale up what is currently done well. In 2000, two five-year programmes were launched (eTampere and BioneXt), which involved a range of projects around a common theme – explicitly experimental with what worked and what was productive, but also aware of the limits of what could be achieved. These programmes were partly intended to create a better understanding of the future for these sectors in Tampere and how their development could be supported, in tandem with experimental investments in the 'nitty-gritty' practicalities of supporting real business innovators.

Case Study 3: Scania – from shipbuilding to scientific success

Region	Scania, Sweden	GERD in GDP	4.13%
Population	1,500,000	(EU 27 = 1.9%)	
GDP EU PPS*	110	Unemployment	8.8%
(2005, EU 27 = 100)		rate (LFS 2005)	

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Scania (*Skåne*) is the southernmost county in Sweden, and both a gateway to continental Europe and an important strategic region. Its post-war development has reflected this position, with the region developing a very strong shipbuilding industry in the post-war period.

Shipbuilding entered a crisis in the late 1970s just as Swedish cities were following a wave of 'green suburbanisation'. In response to both developments, a science park was created in an attempt to lay the seed for a new regional knowledge-based economy. It worked initially – Scania developed during the 1980s into a very successful innovation system.

However, by the late 1990s, Scania's institutional transformation was running into problems. Scania had recovered well from Sweden's early 1990s recession, but its growth during the decade masked the fact that its institutions (while appearing collaborative) had remained at least somewhat competitive. The general economic buoyancy reduced the urgency on innovation partners to find solutions, partly because they had not developed a capacity to hear and heed critical voices. Indeed, problems had been raised in regional innovation reports in 1997 and 1998. It was only in 2002 that they were really acknowledged or properly acted upon.

Challenges Addressed

Scania has experienced a significant amount of high-technology growth since the crisis in shipbuilding, albeit in very different locations. As the shipyards declined, a new science park, IDEON, was developed to serve as a springboard for new businesses and industries. The park was opened in 1984 at Lund, the site of Scandinavia's largest university. IDEON was

placed beside research laboratories from large firms including Astra and Ericsson. The park has grown over the last two decades to include two new 'estates', including one specifically for biotech activities.

The success of the IDEON model encouraged policymakers to expand the approach more generally across the region. Part of IDEON's success reflected the concentration of regional innovation support activities on the Lund site, creating a community of interest in high-technology entrepreneurship, including entrepreneurs and support services. When the Swedish government created regional Technology Bridge Foundations, the foundation for South Sweden was located in IDEON. The foundation established an advice service (*Teknopol*), a seed capital fund (*Teknoseed*), and a patent advice business (*Forskarpatent*). At the same time, the university and IDEON together developed a business incubator unit. IDEON therefore became the centre of a local innovation system with a range of support services to help turn high-technology business ideas into operational companies.

The presence of a community of people highly skilled in support provision in Lund meant that part of the local innovation system could be expanded into other parts of the region. Indeed, new incubator centres – drawing in the Technology Bridge Foundation competencies – have been established in other locations in the region. These new centres have allowed new sources of innovation to emerge, including the ten-year old Malmö University and regional colleges in Blekinge (an adjacent region) and the cities of Karlskrona, Ronneby and Karlshamn.

Moving along the regional innovation journey

Scania has been very successful in developing innovation support activities in particular parts of the region. The city of Lund has particularly benefited from this success, and has become a 'Cambridge of the North' with a strong university delivering a range of local and regional economic benefits. Partners around Lund have come together to address the problems of excess competition and limited interaction. The IDEON science park has also developed very successfully, moving into other parts of the region.

Scania's current regional innovation journey is concerned with further developing this regional scale of activity, ensuring that all parts of the region can benefit from the high-technology growth, and developing a regional consensus for further high-technology based growth.

Moreover, following on its technological success, Scania is branching into the social and cultural fields, expanding its innovation coalition to include figures from social organisations and the creative industries. As a result, the Scania regional economic development strategy is supporting creative industries and media, and promoting Scania's distinctive natural landscapes as an ideal backdrop for film production, which in turn helps to stimulate more 'green' tourism.

Regional innovation leadership style

Scania's style of innovation – which started from the 'pet project' of a handful of regional leaders in the regional administration, the regional university and the science park – has been successful. That success has enthused a growing cadre of innovators who have started to co-ordinate their innovation activity along similar lines.

The initiator of the change in Scania during the economic crisis was the nationally-appointed Governor Niels Hörjel. He lobbied Ericsson very hard to bring a new high-technology project to Lund. Ericsson originally employed twenty people working on research into mobile telephony, and over time grew to be the successful Ericsson telecoms division. The presence of the university, Ericsson and a number of other large R&D activities, allowed the science park to grow and succeed.

A pivotal moment in the development of IDEON was when the actor who had established IDEON was appointed to run the Technology Bridge Foundation. This created something that fitted very closely with the needs of the firms there, and which provided the basis for its expansion from Lund to other locations across the Scania region.

The key to addressing later problems came through regional partners changing their way of working, which although networked through formal institutional collaboration, was extremely inflexible. The early years of this century were lost years for Scania, in that the partners had to regroup, address their complacency, and experiment with new and more effective ways to work together.

This process of renewal involved two types of leaders: the institutional leaders, who had to commit to taking more risks; and institutional entrepreneurs, who had to respond to these new opportunities by proposing new activities that would create regional capacity. Scania is a good example of how leaders' roles can evolve during a regional innovation journey. Malmö City (the municipality) has evolved from being a critic of knowledge-based policies to a supportive partner for Lund and an institutional supporter of the Malmö Innovation Forum.

Case Study 4: Twente – from textiles to telematica in two generations

Region	Twente, part of Overijssel Province, the Netherlands.	GDP EU PPS* 113 (2005, EU 27 = 100)	
		GERD in GDP 1.37% (EU 27 = 1.9%)	
Population	660,000	Unemployment rate (LFS 2005)	5.2%

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Twente is an old industrial region located in the east of the Netherlands very near to the German borders in the easternmost part of the Province of Overijssel. It lies around 150km east of Amsterdam, and thus is remote from the key centres of political and economic power of the *Randstad*, the conurbation that includes Amsterdam, Utrecht, The Hague, and Rotterdam.

Twente's rise as an industrial region came in the 19th century with the growth of the textiles industry. It was the decline of this industry from the 1950s onwards that undermined regional economic restructuring. Even though a new university was created in Twente in 1961 to try to promote textiles innovation and reverse its decline, the industry steadily disappeared, with regional political actors focusing on managing decline, and winning jobs against a relatively weak knowledge economy.

Twente is a divided region with a number of weaknesses that hinder collective action – there are very few large innovative businesses, and those that are present often innovate in relative isolation. There is a deep political split within the region between urban and rural areas, and even the urban area has great difficulty in agreeing collective actions because of competition between the main towns. Earlier attempts to develop collective and systemic innovation activities in the region were undermined by these limitations. In this respect, Twente emerges as an anomaly in the normally consensual Dutch political landscape, exemplified by the fact that one municipality lobbied the national parliament to vote down an elected assembly for Twente because of fears that the assembly would be located in another municipality.

It took a series of regional crises to persuade regional partners to work effectively to deliver regional strategies. The announced closure in 2003 of a military airbase stimulated regional partners to suggest to national government that compensation for that closure should come by way of knowledge economy investments.

Challenges addressed

Innovation activity in the region was initially led by the regional university, itself faced with extinction as a result of the disappearance of the textiles industry that it was supposed to support. From the early 1980s, the University of Twente (UT) had been developing its regional contribution as a means of ensuring its post-textiles future. It promoted the creation of spin-off companies from the university (the TOP programme), developed a Business Technology Centre for these companies in partnership with the Overijsselse Ontwikkelingsmaatschappij (OOM, the provincial RDA), and developed regional knowledge institutes to help firms access university knowledge. These actions helped to build connections between regional firms and the university, which became the basis for further actions.

One example was the *Technologie Kring Twente* (TKT or Twente Technology Circle) established by the university to help its spin-offs sell to regional firms. Over a decade, it developed into a politically influential networking organisation which helped new entrepreneurs find finance and managed a series of high-technology subsidy projects.

One of its subsidy projects – the Twente Initiative for Medical Products – was so successful that it went on to expand into a regional cluster in the late-1990s. These

projects – all focused on promoting firm-based innovation – helped to persuade local and national government to invest in further innovation. Local authority partners did so through an umbrella strategic project, the so-called *Kennispark* (Knowledge Park). National government invested €50m in the development of a high-technology milieu in Twente, focused around the university campus and the adjacent science park. The value of *Kennispark* therefore lies in its encouraging a range of partners to support a series of very place-specific and focused interventions that previously could not justify their support.

The Province encouraged Twente to mimic the incoming Balkenende government in 2003 by creating an innovation platform to create a coherent series of investments using €300m compensation claimed by regional actors for the airbase closure.

Although The Hague refused to fund the €300m programme, the Innovation Platform became a mechanism for collective priority-setting in innovation, creating in 2005 a manifesto for action, and by 2006 a ‘roadmap’ for activity. The Province was able strongly to support a number of proposals, funding a selection from its own innovation budget, and promoting a number to The Hague for funding under the *Gebiedsgericht Innovatieprogramma* (GIP, or regionally-oriented innovation programme). The regional cluster became one of the five research themes of this Innovation Platform, and won national funding for a Care and Technology ‘cluster house’ as a single location where university research and high-technology small firms could come together to collaboratively bring new technologies into the market.

Moving along the regional innovation journey

The Twente region only started to take the innovation agenda seriously when the Province began to apply significant pressure from 2002. Before then, the University ploughed a lonely furrow, developing its own contact networks and support instruments, but with generally limited interest from other regional actors. Although UT is very experienced, it is only now that other partners are becoming involved with the regional innovation journey that strong progress is being made. Through this much wider coalition, Twente is trying to deliver two main activities.

The first is to make the Innovation Platform work effectively and align the 14 municipalities and regional companies across five sectors behind a single investment programme with a total size above €200m. This strategy development process is now ending, and the partners are moving towards the implementation of the strategy. The second is the *Kennispark* project, developing the university campus as a new ‘marketplace of ideas’ for the Twente region, and ensuring that all parts of the region have the opportunity to benefit from that activity. This is at a much earlier stage in its lifecycle – and partners are assembling existing activities within a single institution as a precursor to using the critical mass of the range of activities to improve regional conditions for business innovation.

Regional innovation leadership style

Regional leadership for innovation in Twente was until very recently extremely limited in its scope, with very few actors and very few activities. Until 2002, innovation was exclusively led by UT. From 1987 until 1996, UT was not directly interested in leading innovation, being much more concerned with internationalisation and excellence. Since 2002, the Province has been active in persuading regional partners to work to create an innovative Twente region, as the Province’s best chance to attract innovation subsidies from the national Ministry for Economic Affairs. Since the early 21st century, there has been a more general interest in what innovation can bring to the region, and regional partners have attempted to use their existing contact networks (such as Regio Twente) to develop a new approach to support innovation.

The Province has undoubtedly driven this process. Since 2002, it has been pushing its regions to become more engaged with innovation so that Overijssel captures a good share of national economic development funds (which are spent primarily on successful innovative regions). This Provincial support has helped encourage those already active (in an *ad hoc* or informal way) in promoting innovation to come together more systematically.

An important feature of Twente has been the evolution of networks, which began as loosely affiliated individuals but became co-ordinating mechanisms that were in turn the basis for further activity. In the early 1980s, the university was at the centre of many of these

networks, creating the TOP entrepreneurship programme, supporting a Business Centre, and proposing the TKT.

However, these networks evolved, particularly as entrepreneurs themselves matured from 'Technostarters' into experienced business leaders. TOP entrepreneurs in turn moved into new leadership positions in the region. In 2007, TOP entrepreneurs were – independently of the university – running a regional seed capital fund and the TKT, sitting on the Twente Innovation Platform and proposing a range of new innovation projects which successfully won national innovation funding.

Over the course of Twente's development, regional capacity has evolved as several groups of actors (the municipalities and firms) changed their behaviour and began collaborating by creating a collective fund to support private business innovation. Attempting to rationalise actors and institutions proved unhelpful and undermined these bodies' capacities to react to the volatile environment for innovation.

What was more important was the creation of shared success activities that inspired others to participate more actively in the consensus-building process and to help shape the new agenda for innovation. These processes worked hand-in-hand, and the various actors worked to inspire each other to take the risk of supporting investment in these activities. The best example of this was the way in which the Twente municipalities were persuaded to invest in the Innovation Fund for Twente.

The *Kennispark* (a new structure, funded by the Province and the UT) worked very hard for six months to persuade the municipalities to support business innovation. This meant addressing the municipalities' fears that innovation only involved the large cities in the region. They did this in part with bilateral meetings, but also critically with two visits to high technology locations in February 2007. One visit was to the MESA+ incubator facility at the University of Twente, which had taken ten years to build up, and showed that the university really was capable of producing new industries from its research base. The second was to the Royal Ten Cate textiles innovation centre in (rural) Nijverdal, which helped persuade them that innovation was not just something which benefited the big cities of the region.

Case Study 5: Thessaloniki – from maritime gateway to national innovation pole through non-traditional leadership

Region	Thessaloniki, Greece	GERD in GDP	0.6%
Population	1,060,000	(EU 27 = 1.9%)	
GDP EU PPS*	69	Unemployment	11.1%
(2005, EU 27 = 100)		rate (LFS 2005)	

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Thessaloniki is the second largest city in Greece with a population of around one million in its city region. Unlike much of northern Greece, the region has an economic structure dominated by manufacturing and services rather than agriculture. Thessaloniki occupies a special place in the Greek national consciousness, in part as the second city after Athens, but also as a gateway city through its harbour and airport, which provide direct physical connections to the Balkan and Black Sea regions. Thessaloniki is also home to Greece's largest university, the Aristotle. It has begun to develop new high-technology industries, building on its traditional strengths of local entrepreneurship and also connectivity.

City leaders in Thessaloniki have become interested in innovation in a very instrumental manner, seeing it as a means to win European funding autonomously from the Greek state. There are historical reasons for this. On the one hand, the region experienced a severe restructuring after 1989 as its traditional competitive advantage of low wage costs were rapidly undercut by increased competition from former communist states. On the other hand, Greece had joined the Common Market immediately after dictatorship and the European Commission had allocated a significant portion of its regional development budget to the Greek regions. This provided Thessaloniki with a compelling reason to engage with the European regional development funds. Through engaging with these funds, and in seeking to gain regional control over their allocation, Thessaloniki got drawn into innovative activities.

Challenges addressed

Thessaloniki's case is interesting because the extent of its transformation is quite remarkable over such a short period. Twenty per cent of EU funding into the region is now spent on innovation, and there is a consensus that investing in high-technology areas is a sensible policy focus. There is a growing community of people in business and the public sector interested in promoting innovation. The challenge for Thessaloniki is in embedding these changes and taking them forward. But having a coalition of local partners in place and ready to act is not enough to create action – financial resources are needed to move ideas and agreements into action.

When Thessaloniki wanted to change, it faced not only the challenge of competing for regional and national resources across Greece, which was already fierce, but the greater challenge of securing new funds through traditional gatekeepers.

The regional innovation leaders succeeded by making a distinctive break with the existing regional political structures, capitalising primarily on growing ties with EU institutions. The coalition was mobilised by a regional academic, Nicos Komninos, who perceived a general public good for the region in developing a regional innovation strategy for Thessaloniki. Komninos realised the opportunities provided by various European funding programmes and sought to tie his plans for a local innovation agenda to European programmes.

Thessaloniki successfully accessed three plans, narrowing their 'priorities' from 22 to three in the process. The first plan was a Regional Innovation System (RIS), which amounted to assembling the right regional coalition, since the Commission would not approve a coalition of 'usual suspects'. The second was a RIS+

programme around implementation, which helped to persuade partners to deliver the science park, which enabled a successful ICT cluster. The third was related to innovation, in which three cluster groupings were developed, whilst the ICT cluster was designated the regional innovation pole – in other words its success became a catalyst for change throughout the region.

In doing so, Komninos was competing less with other regional players for regional and national funds, while taking advantage of growing European funding. This European angle is what makes Thessaloniki such an interesting case study. The initial coalition was small and outside traditional political spheres. The coalition that emerged had four lead partners, and was unorthodox in that it included the regional Ministry (rather than – as is customary in Greek governance arrangements – the local prefecture) and the economics professor who had identified the availability and regional applicability of these funds.

Moving along the regional innovation journey

Thessaloniki's success is by no means assured, but the science park appears to be well established. The region has successfully completed three innovation journeys, agreeing the first RIS, producing the ICT cluster, and agreeing and implementing the innovation pole approach. However, the coalition involved in innovation is still relatively small, although expanding over time. The current innovation journey involves creating new networks of change agents in these new sectors and in the existing administration to ensure that innovation is a more mainstream element of public policy.

The (slightly fortuitous) science park contributed to the region's first endogenous success, the development of an ICT cluster and supportive policy framework. The successes of the science park and the successful promotion of new ICT-based businesses helped persuade regional partners that, in the third RIS, they should develop the region as an 'ICT pole', attempting to expand the scale of the activity from the science park to the region. The success in building a supportive partnership in the RIS process meant partners did agree to fund this ICT innovation pole, and its success has persuaded regional partners to extend the approach into three further innovation poles

in other sectoral areas. The general success of the approach in Thessaloniki came to the attention of the national government, which subsequently designated the region as the Innovation Pole for Greece, signalling the progress which the region had made.

In the first funding round from the RIS network, much emphasis was placed on supporting businesses directly, whilst in subsequent rounds, the committee was able to invest in 'networks' to help increase the scope of their interventions. However, investing in networks was only possible because a clear methodology had been identified for investing in businesses. The innovation poles approach was not a top-down policy, but relied very heavily on a shared set of understandings that had been built up on the basis of a single success. The committee evolved a perspective on what made a successful 'cluster' on the basis of the successful ICT activities, permitting them to identify analogous activities in other areas and invest in them. The 'larger' concepts used in Thessaloniki have been built on the basis of small activities, like that of the science park, and have remained dependent on their success.

In the course of the last fifteen years, the region has developed two regional innovation strategies with the support of the European Commission: a Regional Technology Policy; and then a RIS+ for the implementation of the strategy. The process has been a useful strategic learning experience for the region – it had to learn how to set priorities and choose between competing priorities. Of the 22 highlighted in the RTP, nine were taken up in the RIS+ strategy, and three have been expanded under the current regional operational programme. The most tangible evidence of success has been the science park, originally created to help support the regional chemicals industry, but since expanded to include an incubator unit. It is now the hub for the promotion of cluster activities.

Regional innovation leadership style

Thessaloniki has been characterised by a very narrow and elite style of regional leadership for innovation. Partly because regional actors were uninterested in the idea, it fell to a peripheral group to get outside resources to make the idea work. This outside group then had to get the national government's support to encourage regional actors to align

their activities behind their successful efforts. There are very few homegrown innovators in the region (though their number has grown slightly) which has made the regional innovation leadership style more concerned with building up a set of small and peripheral activities.

Because Thessaloniki started from a position where there was very little innovation outside the university and the chemicals sector, external partners have been very important in building up the innovation agenda. However, this has not happened through a well articulated regional steering group commissioning best practice reports from other regions, but instead through a mixture of 'carrot' and 'stick' from outsiders.

The central issue was not just the absence of innovation in the region, but also that regional culture and norms were so tied to particular interests that an innovation support agenda was unlikely spontaneously to emerge in time to access European funds. The 'carrot' of European funds helped engender a prescribed set of methodologies around consensus-building and strategic project selection. The 'stick' came through various threats from the Commission to withdraw funding if, for example, particular partners from outside very narrow interest networks were not involved in steering groups.

This increased interest in innovation was identified by one individual, Professor Komninos, as a source of potential increased regional development funding. He assembled the coalition to try to access those funds. Doing so was difficult, not least because of local resistance, but also because the deeply political nature of the region meant that the first attempts to build a coalition were not acceptable to the European Commission, and so this coalition had to find a way to reconfigure itself internally whilst grappling with the idea that innovation was something worth pursuing. The European Commission played the role of the 'External Sponsor' and 'Guide' to the local coalition formers.

Political leadership was important in Thessaloniki, but it was a very soft kind of leadership, which was not overtly party-political. A real risk for the region, which is dominated by the socialist PASOK party, was that national party political shifts could destabilise the relatively young coalition. This risk was ameliorated in three main ways. First, the coalition was relatively small and apolitical, and

remained apolitical as it grew over time. Second, the activity was not rooted in local political networks, but used external networks, both with the national Ministry and the European Commission, to counter the inertia of local networks. Third, the coalition was unorthodox both in terms of its composition as well as in what it was doing, which meant that certain parties that might have disrupted the activities purposely absented themselves from it.

Case Study 6: Catalonia – how political instability widened the coalition for innovation

Region	Catalonia, Spain	GERD in GDP (EU 27 = 1.9%)	1.27%
Population	7,130,000	Unemployment rate (LFS 2005)	8.4%
GDP EU PPS* (2005, EU 27 = 100)	120		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

The region of Catalonia lies in the North East of Spain, adjacent to the French border, and is one of the three most prosperous regions of modern Spain. Since the end of dictatorship in 1975, the Spanish government has been engaged in a substantial devolution process, and Catalonia has, as one of the historic regions, been in its vanguard. From 1980–2003, Catalonia was governed by a coalition led by Jordi Pujol from the *Convergència i Unió* (CiU), a conservative party, but since then has been through political turmoil. Although Catalonia is relatively successful in the Spanish context, the region and its businesses still underperform within Europe, so an important task for the Catalan government has been to strengthen this economic performance.

The Catalan government has identified the relatively weak performance in research and development activities as one of the drivers of this process. Although they have attempted to address this problem directly, it has not been easy. First, it was difficult to begin to develop a regional innovation policy because of pressures from the national government. Second, a decade after this problem was resolved, the long-time dominant political party lost power, and administrative disintegration threatened the gains made. However, the innovation networks built up in the preceding decade provided the basis of a solution to these problems.

The barriers experienced in the Regional Innovation Journey

In 1982, the national government legislated to make science and technology its responsibility, in order to invest more heavily in it. In 1988, the Catalan government challenged this in the Constitutional Court, attempting to gain

control of national science spending in the region. The court ruled against it in 1992. So, the challenge for Catalonia has therefore been to develop an autonomous innovation and technology policy without infringing the limitations placed on it by the court judgement.

The 1988–92 period represented a roadblock for the development of a Catalan innovation policy – in the early 1980s, Catalonia had developed a regional technology plan focused on improving innovation in businesses, but fully implementing this was postponed in anticipation of the Constitutional Court judgement. This meant that the natural business-facing tendencies of the (conservative) CiU were temporarily suspended, creating a void that the universities tried to fill. From the early 1990s, academics' lobbying helped to build the idea that a regional science policy could benefit Catalonia by helping regional research activities (in both universities and businesses) to win a greater share in European Framework Funds for research.

Challenges addressed

Since 1980, regional Catalan politicians have focused on building a regional innovation system, to link better the agendas and interests of two Catalan Ministries responsible respectively for Innovation and Science/R&D. Alongside a co-ordinating commission, there have been attempts to develop a series of research plans – over time, the strategic focus of these plans has evolved from strengthening the region's research base to better access European framework programmes to developing intermediate technological institutes. From 2005, a Research and Innovation Plan has been published to attempt to continue this system-building process.

However, these positive developments in Barcelona appear to have been undercut by a more general period of political instability associated with the 2003 regional election defeat of CiU. There has been a rapid turnover of Ministers associated with both innovation and research, which has reduced pressure on the two regional Ministries' civil servants to work together. However, this inertia in Government has spurred the growth of other external policy networks, particularly from business representative organisations which had hitherto had difficulties influencing the Catalan policy agenda.

Catalonia illustrates the difference between continuity and stability within regions for the development of successful regional innovation activities. The Catalan case study has a long period of continuity (the CiU government 1980–2003). Within this period, there has been a shorter unbroken period of stability for innovation policy from 1992–2003, a period that allowed new coalitions to form, and allowed regional actors to reorient themselves successfully by giving them a set of stable expectations of the demands placed on them. However, what is remarkable about this example is that despite all the drivers for dynamism, that stability relatively easily fossilised into inactivity (continuity), requiring external stimuli to take it forward (the Court judgement in the first instance and regional networks in the second).

Moving along the regional innovation journey

In one sense, Catalonia has been unambiguously successful – increasing regional expenditure on R&D, whilst preserving the share of business R&D in the mix (0.96 per cent GERD in GDP in 1992 to 1.38 per cent in 2004). This has largely been achieved by targeting regional capacity for participation within European Framework programmes and projects.

However, this has had positive and negative effects – negative, by focusing innovation policy primarily on research activities, but positive by increasing participation by businesses with an interest in innovation. Since 2000, government has been driven by business to attempt to support innovation more effectively, and has embarked on a learning process, pulled by this regional interest network.

Regional innovation leadership style

The regional innovation leadership style in Catalonia is distinguished by a number of actors who are interested in promoting innovation as part of a wider nation-building process, their nation being 'Catalonia'. However, these innovation activities have been focused very strongly on Barcelona, both contributing to and benefitting from Barcelona's emergence as a strong European 'capital' city. The challenge has been to spread this systematised approach to innovation across the region, and to support autonomous innovation communities in these places, whilst retaining the focus on building a strong research base able to exploit European funding streams.

One response has been the building of a network of science parks, drawing on expertise already within the longer-standing science parks associated with the University of Barcelona, the Polytechnic University of Catalonia and the Autonomous University of Barcelona. This network of 14 science parks includes those in urban regeneration projects (such as 22@ in the inner city Poblenou area of Barcelona, taking high-technology development into an old inner city area) but also in other Catalan cities including Lleida, Girona and Tarragona.

Catalonia illustrates the importance of a diffuse network of agents able continually to consider and critique policy activities at the fringes of the regional coalition. In Catalonia, these were formed in part from a number of existing employers' organisations and federations, who have provided consistent pressure for regional politicians to ensure that research and innovation policy met their needs.

These change agents have also been important for sustaining momentum – Catalonia has developed a number of strategic development projects. Such projects require a continual stream of innovation activities to succeed. People who come forward with an existing or potential network of innovators and offer to use them to advance strategic concepts are critical to the delivery of successful strategic projects, and hence the more general support for innovation activities.

Case Study 7: Sophia-Antipolis – boosting competitiveness on the Cote D’Azur

Region	Sophia-Antipolis, part of Provence-Alpes-Cotes-D’Azur (Paca), France.	GDP EU PPS* (2005, EU 27 = 100)	105
		GERD in GDP (EU 27 = 1.9%)	1.87%
Population	1,010,000	Unemployment rate (LFS 2005)	11.8%

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Sophia-Antipolis was established as a classic (Perroux-inspired) growth pole for new high-technology industries in the 1960s. Perroux’s concept suggested that new ‘sunrise’ (1950s high-technology) industries could help to create a virtuous cycle of growth and development in non-industrialised areas. This inspired the creation of Sophia-Antipolis, when large companies active in France were encouraged to relocate their research and development activities to a development zone in the south of France.

In the early 1970s, the idea emerged that Sophia-Antipolis could host a city of science to the north of Nice. The national government welcomed this as a way of creating new economic growth outside the then booming Parisian metropolitan area. Although the idea was originally strongly driven from Paris, it quickly became embedded regionally as new businesses were located there, including European bases of IBM and Texas Instruments. In 1965, a university was created at Nice, and in 1970 a number of public research activities were located within the province of Alpes-Maritime where Sophia-Antipolis is located.

The most recent iteration of the innovation journey came at the turn of the century in response to two drivers: the bursting of the high-technology bubble; and the trend towards outsourcing and offshoring peripheral business functions. The closure of a number of firms in the region created a worry that the inherent weaknesses of being dependent on external businesses for employment and innovative dynamism would lead to the collapse of the sector. A number of collective industry groups had already been organised in a number of technological fields – the Telecoms Valley had been established in 1991, led by seven international telecoms firms located in Sophia-

Antipolis – and the decision was taken to expand the scope of this activity to create regional clusters.

Challenges addressed

In 1972, the plan was approved for a 2,300 hectare science and service industry park to the north of Nice. The idea originally emerged at a national level, with an agreement to use national investments to promote development in the region. The then French government was keen to create its own high-technology growth pole in response to those emerging in the US, notably the Research Triangle in North Carolina.

A local inter-municipal organisation (SYMIVAL) was established as the project developer, all the time supported at a high level by national government which deemed the park of national significance. A key enabler was the decision by Pierre Lafitte, an academic at the Paris-based *École des Mines* to relocate his establishment to the science park. Over the next 25 years, the science park grew, physically in terms of the land occupied, but also in terms of its economic significance for the wider region, and as actors attempted to use the park as the foundation for more comprehensive changes.

Public support has evolved incrementally and reflectively. SYMIVAL began as a relatively small planning management organisation for the science park, and grew as the park grew to encompass an increasing number of municipal authorities. In 1988 a general development company was created for the area, as well as regional strategy ‘high technology routes’, in which Sophia-Antipolis figured prominently. These public organisations have helped to meet the infrastructural and regulatory needs of the science park (for example, making more land available), and have helped to realise the idea

of Sophia-Antipolis, as much as an external as a local brand. Thus, 'Sophia-Antipolis' has been woven into the fabric of the *département*, making it a central feature of economic development there.

The main disjuncture in this growth trajectory came in 2001, with the global bursting of the high-technology bubble. Many ICT firms found themselves having to retrench massively. For a region like Sophia-Antipolis, reliant on R&D activities of highly mobile multi-nationals, this retrenchment could have been a disaster. The regional response was to try to retain individuals associated with these R&D activities, helping them to find new employment or create their own businesses. More emphasis was placed on supporting regional networks of companies that had emerged, often on thematic lines, such as telecoms, health technologies or security systems.

The French national government also responded by making resources available for investment in high-technology and R&D, in particular investing €1.5bn in the *pôles de compétitivité* programme, an open call in which regional clusters were invited to bid for recognition. As a result, the Telecoms Security cluster SCS from Sophia-Antipolis was acknowledged as one of France's six globally competitive clusters, and extra funds were available to invest in fundamental research to support the regional innovative activity. This helped to stabilise the cluster at an extremely vulnerable time in its lifecycle, and to ensure that the region maintained its forward momentum.

Moving along the regional innovation journey

Sophia-Antipolis is slightly different from the other regions selected in that prior to the creation of the business park there was no strong industrial base in need of modernisation. This has meant that the innovation journey has had to pay much less attention to existing actors and power relations, and has had the opportunity to build institutions up to serve particular purposes.

While this may in one sense have made matters slightly easier in Sophia-Antipolis than in other regions, it may also have meant that the city has not experienced the pithy learning experience undergone by Scania or Twente.

But the region has completed two important innovation journeys. First, the original founders of the concept have moved on to the Foundation Sophia-Antipolis where they remain focused on the science park. Second, a coalition of regional municipalities has come together (SYMIVAL) to do better spatial planning to support the economic contribution from the park.

Regional innovation leadership style

The original style of leadership in Sophia-Antipolis was of a single innovator coming up with the idea for the park. He made the park successful, and as it has grown, other actors have co-ordinated themselves around what has been achieved. Leadership has generally been subdued, emphasising exploiting and facilitating the success rather than directing or controlling it. In that sense it is one of the least locally co-ordinated regional leadership styles of the eleven case studies examined.

There has been a clear evolution of the roles played in creating and supporting Sophia-Antipolis as a high-technology space. At the beginning, the national government played a strong initiating role, but its role reverted to supporting the ongoing local development activities. Pierre Lafitte has played a consistently important role in the development of the science park, but again, his role has evolved: from proposing the idea in a *Le Monde* article in 1960; to bringing an anchor activity, *École des Mines*; then later helping to develop the range of covenants, charters and support organisations that have embedded the idea regionally; and finally running Foundation Sophia Antipolis, which works to facilitate the development of the park by attracting new regional businesses.

The support of the national state, and in particular an ongoing commitment to decentralisation, has arguably been critical to the success of Sophia-Antipolis. National government played a number of key roles, designating the Future Development Area, creating a national plan for Sophia-Antipolis, and locating French government science and technology activities there.

The national clusters programme was not specifically developed to support Sophia-Antipolis, but the presence of a real ICT cluster helped the region to benefit from national policy. The situation has also been helped by

the ongoing French programme of regional devolution, which has placed an increasing responsibility for regional development in the hands of low level actors. These activities have all created an incredibly fertile environment for Sophia-Antipolis, whilst encouraging it to reduce its dependence on this national support.

The role of private sector leadership has been in helping to reinforce the developments taking place, and to realise the latent potential generated by the presence of large numbers of high-technology businesses. Private business leadership has been responsible for helping to stimulate a number of networking organisations, such as the Telecoms Valley Association in 1991.

The willingness of private businesses to work together has encouraged business support organisations and public agencies to experiment with other types of networking activity such as the Chamber of Commerce's Enterprise House (linking businesses on and off the park). These networks have created good contacts between individuals and businesses which have helped both in terms of mobilising coalitions to pursue national cluster funding, but also to experiment with new combinations of networking organisation, such as 'Club High Tech Cote d'Azur' and 'Club Sophia Start-up'.

Case Study 8: Yorkshire and the Humber – bringing innovation to replace industrial decline

Region	Yorkshire and the Humber, England, UK	GERD in GDP (EU 27 = 1.9%)	1.3%
Population	5,040,000	Unemployment rate (LFS 2005)	5.1%
GDP EU PPS* (2005, EU 27 = 100)	104.7		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Like many English regions, Yorkshire and the Humber has considerable sub-regional differences, although its current regional boundaries have been consistent over the last 20 years. The region includes the very rural East Riding as well as North Yorkshire, the port, steel and fishing sub-region of North Lincolnshire, the former steel and mining county of South Yorkshire, and West Yorkshire, once famous for its textiles industry but now dominated by Leeds' financial services industry.

Its main economic problem has been industrial decline, slowly in the case of engineering and manufacturing, and more quickly with mining and textiles. Creating new industries to replace these old sources of employment has proven difficult, except perhaps for the Leeds knowledge-intensive services cluster.

There was rapid progress before the creation of the RDAs in 1999 – the Government Office took a strong lead in trying to bring a group together to promote innovation policy. From 2000, the increasing importance of regional science policy in England led the RDA to try a change of direction. The network that had been developed to create a regional innovation strategy was seen as lacking the capacity to develop a regional science and innovation strategy. But it took time to establish a new regional Science and Industry council. As a result, the new body had to rebuild interest and enthusiasm for regional innovation activities.

Yorkshire and the Humber's main problems with innovation are a fundamental lack of basic innovation inputs alongside high employment in industries ignored by traditional indicators (and associated with 'hidden innovation'). The reported regional expenditure on R&D reflects a number of factors:

- High levels of employment in industries with traditionally low R&D levels (e.g. financial services, leisure & tourism).
- Innovation activity is relatively low, notwithstanding the structural bias within reported R&D levels.
- Proportionally low levels of R&D in the Higher Education and government sectors.

Challenges addressed

As in all the UK regions, Yorkshire and the Humber's interest in innovation policy was driven both by rising European interest in regional innovation and by attempts within Whitehall to stimulate business innovation across the UK. However, the relative paucity of regional innovative activity meant that the first wave of funds (after the structural funds reforms of 1989) were absorbed by many innovation service providers, often public sector organisations with limited experience of stimulating or managing innovation.

In 1992, a nationally appointed Innovation Advisor from the Department of Trade and Industry's London Office came to the Department's regional office, and persuaded the European regional funds team there of the importance of innovation activities in restructuring an economy suffering from the decline of mining and manufacturing.

When Government Offices were created in 1994, the newly created Government Office for Yorkshire and Humberside (GOYH) unusually supported a number of bodies in developing a regional strategy. GOYH built a strong innovation team, which observed the Welsh Office's experience in developing a pilot Regional Technology Plan from 1994. A

business networking organisation, the Regional Technology Network (RTN), was also supported to promote innovation. GOYH encouraged regional universities to form a Yorkshire and the Humber Universities Association, a single regional point of contact with the Higher Education sector. Finally, GOYH also supported the Regional Research Observatory, a network of regional researchers to inform debate around regional economic development.

This group came together in 1995 with a proposal for a regional innovation strategy. Their bid for European Commission funds required both a rigorous local consultation and the involvement of a range of local and external experts. RTN managed the process, allowing new organisations to propose innovative activities. RTN organised a range of sector groups, which came together under steering groups and undertook their own action planning processes. Some of these steering groups were quite successful in winning further funding for collaborative research and innovation activities, such as the DTI-sponsored Faraday partnerships around food and chemicals.

RTN worked with existing regional industry groupings to help them move into promoting innovation amongst their members. One example was the Leeds Financial Services Initiative, which helped to organise the financial services sector group. RTN won further funding for the RIS programme in 1998, and began work on implementation – RTN was subsumed into the innovation activities of the RDA, Yorkshire Forward, when the project reached the end of its life in 2000. Reflecting national government encouragement for the RDAs to support regional clusters, the sector groups became ‘clusters’.

Activity was limited until the regional science council was founded in 2004. The council began drafting a new regional innovation strategy to hold together different sectoral activities. From this, a new RIS was written with two main foci: developing ‘innovation hubs’ (effectively science parks cum incubator units supporting industrial translation activity); and Centres for Industrial Collaboration (modelled on the Scottish experience) to help universities and firms work together in consortia to jointly undertake shared/collective research.

Moving along the regional innovation journey

A small but effective regional cadre emerged in the early 1990s around the Regional Innovation Strategy. Since that point, there have been a number of key challenges that have been addressed, and a series of innovation journeys completed. The RTN developed a number of pilot projects that were successfully implemented, and taken forward by the new RDA, though progress slowed in this period. Yorkshire and the Humber region is currently attempting to develop a new regional innovation concept, based around providing space for innovation networks. There are important regional debates ahead, over how particular hubs and nodes will be chosen, how intra-regional balance will be provided, and how the diverse activities will come together at a regional scale.

The current Innovation Strategy represents a reasonable approach to deliver these goals, particularly if a community of practice develops between those running the innovation hubs, and if that community can actively inform future innovation policy developments. But what will make a difference is how the strategy is implemented, and the extent to which the focus is on delivering targets or on building a knowledgeable community of innovation practitioners.

Regional innovation leadership style

Yorkshire and the Humber has very small innovation policy networks alongside a relatively small regional innovation system. The regional innovation coalition is dominated by Higher Education (with Yorkshire and the Humber Universities Association recently becoming Yorkshire Universities). Attempts to create a regional consultancy one-stop shop for the universities through YHUA initially foundered because the individual universities did not see small-scale consultancy projects as a fruitful means of building up regional relationships.

Over the past few years, regional leaders have expended considerable effort in integrating regional innovation strategies, such as the regional Innovation Strategy, the RDA's cluster strategy, and the Regional Economic Strategy. But successful regional activities supporting innovation and translational activity have not always been strategically driven. Rather,

they have followed a much more bottom-up process, in which regional funders have been primarily reactive. The role for strategy in such circumstances is therefore to anticipate which kinds of proposal for strategic projects might emerge from 'grass roots' coalitions, and to develop a methodology to optimise and improve those proposals as they emerge. The leadership of the region is well positioned to take this step and to start creating strategic projects that address the diverse needs of the region, whilst consolidating existing innovation regional expertise.

- Retaining enthusiasm of regional partners (who have been active in innovation policy now for some 15 years).

The coming challenges for regional innovation

Yorkshire and the Humber has been through a difficult regional innovation journey – one characterised by the rise and fall of successive special interests. Originally, an elite group built up an innovative network to attempt to rebalance innovation policy away from local authorities. However, over the course of a decade, this had the effect of creating a whole new set of interest groups – the sector networks. Along the way, some important successes have emerged, including a number of Faraday Partnerships, and strong industry voices alongside those of the universities. Innovation policy must now use the limited number of instruments, science parks and CICs in a tailored manner, to help extend their benefits across the regional innovation system.

Over the next few years, those leading the Yorkshire and the Humber innovation journey will face a number of challenges, including:

- Making better use of local experts to develop a regional innovation strategy, learning from successful low-key experiments and taking those lessons into a regional strategy.
- Developing the next round of strong local voices for innovation, particularly for small high-technology businesses outside established sectors, and those active in hidden areas of innovation, so they can influence regional strategies.
- Retaining strong contact with networks of innovating businesses, ensuring that strategies remain focused on both helping regional businesses compete better through innovation, and on building capacity for high-technology entrepreneurship.

Case Study 9: The North East of England – moving from four strategies to one policy

Region	The North East of England, UK	GERD in GDP (EU 27 = 1.9%)	1.3%
Population	2,450,000	Unemployment rate (LFS 2005)	6.4%
GDP EU PPS* (2005, EU 27 = 100)	94.2		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

The North East is an old industrial region that has been suffering from industrial decline for over a century. The legacy of this decline has hindered its transition into the knowledge economy, due to poor educational levels, and the absence of innovation or research and development activities. There is little government investment in R&D in the region, and whilst the five regional universities do contribute strongly to the knowledge base, business-sector R&D is extremely limited in its scope (mainly manufacturing) and scale (small).

Regional actors have had a recurrent interest in promoting innovation, from T. Dan Smith's 1962 idea for a Newcastle Education Quarter to the 1970s ICI innovation complex on Teesside and the 1980s Newcastle Technology Centre. But these efforts have always been undertaken against the background of industrial decline, with regional businesses investing relatively little in innovation, and a continuing business tension existing between innovation for growth and rationalisation for survival. One consequence is that there is relatively weak private sector leadership in innovation policy. However, it is only those activities that have had a strong private sector involvement, either by individual firms or as membership 'clubs', that have had long-term success – a good example being the European Process Industries Competitiveness Centre, which emerged out of ICI on Teesside, and continues to this day as the Process Industries 'centre of excellence'.

At the same time, public policy until 1998 clearly prioritised attracting inward investment, in which year a number of high-technology plants closed, including the region's two micro-chip factories. This highlighted to regional decision-makers that a new public policy model was required to support the emergence of new

industries and businesses. However, there have been many problems in attempting to identify that new public policy model and implement it meaningfully in the region.

England's regionalisation process in the last ten years has created new organisations and institutions such as the Regional Development Agency (RDA), but also a number of regional representative organisations that have tried to influence the RDA's policy agenda. Universities have worked closely with the RDA to find an approach to innovation policy that meets their respective needs. The regional science policy, the *Strategy for Success*, emphasises traditional science-push measures over other innovation approaches, a reflection of the extent to which the universities have been able to shape regional innovation priorities.

Challenges addressed

There have been long-term regional successes in innovation policy, driven by a few committed individuals (notably in the Government Office). From the 1990s, several local authorities implemented some genuinely novel activities, particularly techno-park and incubator approaches focused on helping smaller firms to become more innovative. European funds have also helped create innovation support activities – the 1995 *Three Rivers* strategy built these individual projects into a wider set of regional activities.

The North East has also come together behind Newcastle's 'Science City' tag. This has formed the core of a set of activities notable for embodying the lessons of a successful strategic science project developed in the late 1990s – the International Centre for Life (ICfL) – where research, commercialisation, business innovation and entrepreneurship have all come

together in a single location. A community of individuals is emerging with the expertise in building up publicly subsidised innovation support projects that are helpful for business innovators. Some of these projects, such as the Chemicals support centre EPICC (European Process Industries Competitiveness Centre) and ICfL, have been recognised by key regional decision-makers as offering a new model of innovation-based economic development. The regional science strategy is one attempt to take these successes forward and increase the magnitude of their regional impact.

Business leadership in the North East is starting to emerge, although it is doing so in a very subdued way, reflecting structural shifts in the region. Until the 1990s, there were a number of large and powerful branch-plants in the regions, whose managers enjoyed enough internal autonomy to be able to act as business leaders, moving into positions on various regional institutions such as the Training and Enterprise Councils and Urban Development Corporations. New regional entrepreneurs are becoming involved with the public sector in providing leadership. There are good innovators who are directly demanding new support and projects, and entrepreneurs are also becoming involved with boards, committees and working groups shaping regional decision-making.

Moving along the regional innovation journey

The North East currently sits squarely in the implementation phase of the regional innovation journey, with a number of large projects being developed around Science City, renewable energy and new media. These projects can be thought of as 'hybrid', bringing together different universities, businesses and support providers in highly visible shared communities. They have some potential to fill in gaps in the regional innovation system, and to help encourage new actors to become more engaged with regional innovation agendas and more effective at collaborating for innovation. The current challenge for the North East remains in integrating these existing demonstrator activities into a better functioning regional innovation system.

However, the course of the North East's journey to this point has not been completely smooth – a consultant-led project (under the European Regional Innovation and Technology Transfer Strategy framework) in

the 1990s failed to build regional enthusiasm for innovation. In a similar vein, the 2001 Innovation Action Plan largely summarised existing activities rather than advancing policy implementation. *Strategy for Success* remains heavily dependent on the success of the Science City, whilst many other innovation support services are currently on hold pending a strategic review of regional business support provision.

Regional innovation leadership style

The North East regional innovation strategy has a limited scope, and there is relatively limited involvement in the regional leadership forums in which innovation policy is decided.

The RIS has grown relatively slowly, and although jobs in knowledge intensive sectors have increased, this reflects national growth. There are also relatively few effective innovators seeking public sector support. Until now, this has reinforced the relatively closed approach to innovation policymaking in the region. But this is beginning to change as more private sector actors become involved in regional innovation policymaking.

Despite this innovation leadership style, there have been a number of innovation successes led by maverick leaders who have worked pragmatically to develop what they see as 'their' activities. Both EPICC and ICfL have been led by ebullient institutional entrepreneurs who built these organisations up in often quite unfavourable situations, effectively integrating different funding streams, while winning national as well as regional support for their activities. They have also been able to build links with regional firms to ensure that the knowledge assets are being effectively exploited.

Making better use of these policy entrepreneurs is absolutely critical to developing a more networked and intelligent approach to regional innovation policy. Integrating them into a more collective form of regional leadership for innovation will be challenging but essential if the North East is to make strides towards the next stage of its innovation journey.

The coming challenges for regional innovation

Over the coming years, the North East will face a series of challenges if it is to realise the potential that has been built up over recent years:

- Increasing participation by firms in innovation activity, in particular getting businesses experienced in working with public actors to help develop better strategies, and strategies more directly linked to the provision of particular innovation services.
- Lengthening the implementation time of individual strategies, to encourage more people to get involved in developing them, and to build more trust in the strategies, allowing them to exert greater influence over innovative behaviour.
- Supporting volatile sectors and encouraging vulnerable businesses where there is a risk that the sectors will fail – without support or encouragement the regional environment for innovation will not improve.
- Widening innovation policy beyond Science City, emphasising in particular its links to other parts of the region, and as a central focus for attracting talent and investment to the region as a whole.
- Creating a new collective vision for innovation to reflect two elements currently in short supply: the views of innovative businesses; and what the region's institutional entrepreneurs can offer.

Case Study 10: The North West of England – using traditional excellence to develop a modern innovation strategy

Region	The North West of England, UK	GERD in GDP (EU 27 = 1.9%)	1.9%
Population	6,830,000	Unemployment rate (LFS 2005)	4.3%
GDP EU PPS* (2005, EU 27 = 100)	104.9		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

The North West of England is a relatively strong region in the English context, particularly compared to other regions outside the 'Golden Triangle' of the South East, East of England and London. Regional Gross Value Added levels are just below the national average, whilst unemployment is slightly above the national average, in one of the more populous UK regions – it has seven million inhabitants. The region has a very strong science base, with a number of highly innovative multi-national firms and research intensive universities investing proportionally more than in other regions.

Innovation activity in the North West is mainly undertaken by large organisations, both firms and the university sector, identified with large scale investments in research. The North West also amalgamated several very different sub-regions in the 1990s, when the already diverse North West DTI region (Cheshire, Greater Manchester and Lancashire) received Cumbria (both the declining industrial region of West Cumbria and Barrow as well as the remote rural Lake District) in 1994 and Merseyside (a European Objective 1 region, implying a GDP per capita of less than 75 per cent of the EU average) in 1998.

A key moment in the North West's innovation journey was a crisis in 2000 when the Government announced that a national science facility, the DIAMOND light source, would be located at Didcot in Oxfordshire (in the 'Golden Triangle') rather than the competing Daresbury, Cheshire location, already home to a national high-energy physics laboratory. A regional coalition of universities, businesses, the RDA and local authorities mobilised to campaign to reverse the decision, and this was ultimately to prove unsuccessful.

Challenges addressed

Although unsuccessful, the Daresbury coalition won a very helpful response from Government which profoundly shaped their regional innovation journey. Firstly, £25m of special funding was provided for strategic regional science projects through the Smith Review. Secondly, the Smith Review also led to the creation of a science council to be responsible for a regional science strategy. This differed from traditional science strategies in that it emphasised how investing in science would deliver regional economic development benefits.

What followed built on the emergent structure, including the regional science strategy. More importantly, it demonstrated to the very diverse regional leadership that there were potential significant benefits in engaging collectively to deliver outcomes of collective interest, particularly where these would help to configure national policy to be more supportive of regional interests.

The North West has proven that it is collectively capable of reacting quickly to grasp opportunities, as the Daresbury, New Manchester University and BBC Salford examples all showed (see below). In these cases, new groups were rapidly assembled and then tightly focused on delivering particular outcomes. This may provide a solid foundation for mobilising other coalitions, particularly around the thorny issue of encouraging more businesses to undertake innovation.

This form of leadership functions most effectively when there is a clear and attractive reward for co-operation. Indeed, if the right carrots can be found to encourage these partners, then the North West is capable of moving forward in a common direction very quickly. This might also be thought of as the

capacity to create a 'coalition on demand' to respond to certain types of opportunities.

In parallel with this regional activity, there has also been a very bottom-up set of activities driven by civic leadership in Manchester and its city-region – the *Manchester: Knowledge Capital* (MKC) project. This idea emerged in discussions in the late 1990s between provincial English cities seeking to influence national urban development debates. The city has been redeveloped as a space for science-based entrepreneurship, using urban regeneration as a tool for creating new innovative activity. This is exemplified in the 'New University for Manchester' project, where Manchester and UMIST came together to create a large world-class university, releasing valuable real estate in the city centre immediately adjacent to the university's science sites. The success of MKC in delivering urban and economic growth benefits was important in persuading the Government to launch the Science City programme from November 2004 onwards.

Moving along the regional innovation journey

The North West has one of the UK's strongest regional innovation systems outside the 'Golden Triangle', despite regional complaints of a shortage of government investment in R&D within the region. There are some deep pools of expertise in the region, in manufacturing industries related to the North West's traditional strengths in nuclear, aerospace and chemicals. However, new sectors emerging in 'hidden innovation' sectors appear to reflect strong urban/cultural drivers, such as the media cluster now forming around Manchester, which may be strengthened with the arrival of the BBC at the Salford Campus. These clusters offer attractive opportunities for the region, but suffer from being intimately associated with their city of location. The challenge is to find ways to spread these benefits across the region more generally, in the way that the biomedical cluster being trialled in Liverpool is already doing.

There is also a strong and expanding Higher Education sector in the region, with new universities in the last decade including Liverpool Hope, Bolton University, Chester University, Edge Hill University and the University of Cumbria. The region's universities are involved in the strategies pursued by

their sub-regional partners. For example, Manchester University is a leading partner within Manchester Knowledge Capital, while the University of Cumbria is arguably more important to the prospects for improving innovation performance in Cumbria as a whole. Certainly, Higher Education and health care provision are the two most evenly distributed knowledge-intensive sectors in the North West as a whole.

For some of the strategic sectors with large firms that have well-articulated innovation needs – particularly chemicals, pharmaceuticals and aerospace – there are well functioning relationships between universities, companies and some cluster groups. Regional firms' demands for high quality business education in the 1990s led to the formation of the Manchester Federal Business School, highlighting how critical mass within universities can help better support businesses demands.

Regional innovation leadership style

The current leadership style is one with a relatively diverse innovation system, and a number of different sectors interacting to develop policy, but led by a relatively small number of strong regional leaders. This approach was a great asset in the Daresbury crisis, where the region moved from opposition to innovation to developing a whole new policy paradigm (regional science policy) with an externally-developed strategy, science council, and strategic investment projects. However, in the absence of such crises, such as with the slow and continuing decline of Blackpool and Barrow, regional leadership has difficulties in identifying and effectively prioritising these cases when more promising regional prospects such as Manchester Knowledge Capital beckon instead.

Strong civic leadership exists within the region, both within local authorities but also provided by the North West's Parliamentarians. The strength of their organisation and presence within Westminster is arguably one reason why the new Government is exploring regional Select Committees as a means of providing democratic scrutiny of the regional tier. However, there are also examples of strong leadership within cities, particularly Manchester, which from the 1980s onwards managed to align itself with the urban entrepreneurialism of national government,

winning further national investment in the process.

The North West also benefits from a well-developed 'third sector' with an interest in reflecting the interests of its members. The region is home to a number of important Co-operative Societies, and regional partners have been interested to explore co-operative models of social innovation. The North West further has a strong trade union presence, and unions have been important in supporting debate, sponsoring research to allow them to provide a critical voice within the region. There are also a number of academic and research organisations that have developed a specialist knowledge in economic development using the North West's conditions as a micro-laboratory.

Finally, there are also good possibilities for regional business leadership for innovation – a number of collaborative groupings have emerged with perspectives that, whilst not immediately focused on innovation, are underpinned by a sound understanding of the region which could inform innovation strategy. The regional Business Leadership Team (NWBLT) has a membership drawn from leading businesses in the region. The NWBLT has developed its own strategies and responded to consultation processes of regional partners, although it has not yet attempted to articulate a single set of regional priorities for innovation.

The coming challenges for regional innovation

The North West offers something of a regional conundrum. It has achieved a quite remarkable mobilisation compared to other 'ordinary' regions in the UK, with a group of regional actors coming together successfully to challenge a major national policy decision. There are a strong and coherent set of universities and a number of large, research-intensive firms committed to the region. There are collaborative activities around particular interventions and driving forward business innovation. But what is curiously absent is a single coherent regional innovation strategy that serves the role of an ongoing regional orchestrator.

When there are clear opportunities, these regional leaders emerge and produce results, such as the Smith Review, or the decision to stage the 2002 Commonwealth Games in Manchester, or to make Liverpool the European

Capital of Culture in 2008. But the region is still dependent on these outside stimuli to produce its most effective results. There is a lot of effort put into preparing strategies, but these have difficulties in capturing the dynamism and energy of the reactive responses of regional partners. The challenge for the region now lies in finding a way to bring together these diverse partners, and their energy and capabilities, to create a strategy that identifies how the North West region can develop into the future.

As it strives to turn a series of individual project successes into a coherent region-wide innovation agenda over the next few years, the North West faces several specific challenges:

- Linking success in the North West's innovation poles (specifically Manchester) to the wider region.
- Creating voices for those currently not well-represented in the regional innovation debate, notably small firms, high-technology entrepreneurs and those considering establishing innovative businesses.
- Continuing to ensure that where regional funds are provided to fund R&D, there are clear mechanisms in place to ensure that the research is exploited effectively to produce more general social, economic and cultural benefits.
- Using the examples of success in the North West to persuade national government that innovation in 'ordinary regions' can contribute to improving the UK's productivity problems.
- Making best use of strong sub-regional leadership, harnessing experts wherever they are found in the region to create a community of innovation 'evangelists' who stimulate a more general drive for innovation.

Case Study 11: Scotland – using innovation to complete the smart, successful nation

Region	Scotland, UK	GERD in GDP (EU 27 = 1.9%)	1.7%
Population	5,080,000	Unemployment rate (LFS 2005)	5.9%
GDP EU PPS (2005, EU 27 = 100)	113.5		

*EU Gross Domestic Product index at Purchasing Power Standard (EU 27 = 100)

Nature of regional crisis

Scotland is an old industrial country which has been experiencing de-industrialisation since the 1940s – in which much of its traditional coal, steel and heavy engineering industries have disappeared. Scotland experienced several waves of re-industrialisation, and from the 1960s, Scotland has been a prime location for inward investment, a trend that accelerated in the 1970s and 1980s as a large number of footloose electronics firms chose Scotland, leading to the soubriquet of ‘Silicon Glen’. The discovery of North Sea oil in the 1970s provided a welcome revitalisation for heavy engineering, with many firms reorienting from shipbuilding to offshore engineering. The financial services sector in Scotland also benefited greatly from deregulation in the UK in the 1980s, and the Scottish financial services sector has become impressively strong within the UK outside the Square Mile.

However, Scotland’s economic restructuring process is by no means complete. Several weak points remain, which are at the heart of its current problems. First, business R&D investment remains low, and is concentrated amongst large businesses, with very few SMEs having effective links to research institutions. Second, new firm formation rates are very low, despite a decade of measures to raise entrepreneurship through the Business Birth Rate Strategy (BBRS). Finally, there are very strong inter-regional disparities, with policymakers’ attention concentrated on the Central Belt including Glasgow and Edinburgh, to the exclusion of other regions.

Challenges addressed

The rise of the innovation agenda in Scotland has long been part of attempts to address a persistent enterprise deficit with the rest of

the UK. The Scottish Development Agency was originally created in 1975 to recycle North Sea oil funds into the promotion of high-technology growth businesses, but over time this mission shifted towards more generalist business support, and in the late 1980s, SDA was reinvented as Scottish Enterprise (SE).

As part of this reinvention, SE launched the BBRS in 1993 to promote entrepreneurship in Scotland. Innovation was seen as an important source of new businesses, and the first move towards tackling the challenge was in hiring an experienced expat. The first Chief Executive of Scottish Enterprise, although a Scot, was recruited from Silicon Valley. There, he became acquainted with the work of Michael Porter’s Monitor Consultancy on how innovative clusters could promote national competitiveness. He had witnessed first hand how innovation could drive regional economic development, with a set of strong companies creating a dynamic environment more supportive of new innovations and entrepreneurs. At the time, a number of small European regions with nationalistic aspirations (including Flanders and Catalonia) were commissioning their own cluster studies because of their promise to produce visible economic successes for relatively limited investments. Scotland chose to get involved by commissioning its own study to demonstrate its distinctiveness and to highlight its similarities to these other competitive high-technology economies.

Scottish Enterprise laid the foundations for change with two key reports, which represented an important next step on the journey. The first, *Globally Competitive Clusters* (1996) developed a clusters approach for Scottish Enterprise and provided a means to support clusters by focusing innovation on a number of priority sectors. The second, *The Commercialisation Inquiry* (1996) explored using universities as sources of new

technologies and business ideas. This signalled to universities that they could access a new funding stream in return for commercialisation.

The next impulse in the innovation journey came with the creation of the Scottish Parliament, for which innovation and enterprise policies were two fully devolved matters. Though it may not have been deliberately intended to improve innovation strategymaking, the creation of an effective delivery arm undoubtedly helped, allowing a particularly important conjunction to emerge between the political will of Scottish Executive and Scottish Enterprise as an effective delivery arm. Science and innovation became a central pillar of the Executive's first economic development strategy, complemented by the publication of *A Smart, Successful Scotland*, a science and innovation strategy for Scotland. This strategy's rationale was that increased investment in science and innovation was vital for Scotland to emerge as a confident and modern nation.

The next stage in the journey came in 2005, when the Scottish Executive commissioned the 'Scottish Innovation System' study. This validated the idea that there was a Scottish Innovation System, but highlighted the remaining huge gulfs between the actors within this system. Part of this was due to the fact that it ignored 'hidden' innovation in social partners and non-traditional sectors. This report has created a general acceptance that innovation policy needs to extend beyond the hard science base to create the space for these hidden innovators, the fourth step of the innovation journey.

Moving along the territorial innovation journey

Although Scotland has made huge advances in the last three decades, it is once more in a vulnerable position. Rapid advances during the 1990s, driven by Scottish Enterprise and then by the newly created Scottish Executive, have given way to a period of consolidation, which has hindered attempts to extend and exploit this journey.

Scotland is in a strong position, but this may erode quickly if its vulnerabilities are not tackled – it is at a 'crossroads' in its institutional evolution. The main challenge lies in expanding the innovation strengths in the Central Belt for the benefit of more peripheral

parts of Scotland. The change in political leadership following the 2007 elections, which left the Scottish National Party as the largest in the Assembly, may present an opportunity by offering a new group of actors the change to revitalise the regional innovation coalition.

The experimental nature of Scottish innovation policy is an asset with real value. Scotland could position itself as a place where policy experiments from small, innovative countries such as Norway, Finland and Ireland are made to work in the UK. This could be attractive to other UK regions which have already learned that Scotland develops effective policies, such as the proof-of-concept funds. These funds bridge the early-stage equity gap often experienced by high-technology firms between discovering an idea and having a plausible product/market combination that further investors are willing to fund. This idea was pioneered by Scotland but is now in use across the UK. The payback for Scotland would be that it could become a focus for a multinational and dynamic community developing the latest ideas on innovation, and it would be Scotland's innovation environment that would be improved by the experiments of this policy community.

Scotland's style of innovation leadership

Scotland has many of the elements of a national innovation system, including a range of national laboratories, national learned societies, a university funding council, and a science (education) Ministry. It has arguably the most diverse and plural regional base of leadership of the four regions studied, something which has received a fillip of late from recent political developments in Holyrood, but which is by no means exclusively a consequence of devolution.

Prior to 1997, responsibility for innovation policy was contested between the Scottish Office and Scottish Enterprise – each organisation had different ideas for what it wanted to achieve. Political tension between the (Conservative) Scottish Office Ministers and the solidly Labour Scottish establishment created a shared Scottish interest in developing a distinctly Scots flavour to the enterprise and competitiveness agenda. The extent to which this Scottish consensus is genuinely cross-party will be tested during the SNP administration,

and the extent to which it continues the moves for a distinctive Scottish innovation agenda.

Another feature of Scotland's plural leadership is the presence of a well-formed 'marketplace of ideas' around the main decision-making networks. There are independent think tanks, learned societies, lobbyists, and peak interest organisations, all of which play a role in the development of the Scottish Innovation System, ensuring that many voices are heard.

The coming challenges for territorial innovation in Scotland

Scotland enjoys a privileged position in developing its innovation system because of the high degree of internal autonomy in its administrative system. Yet, these favourable conditions can also be a drawback because they encourage a concentration by policymakers on easier activities and outcomes. As a result, innovation can be seen as something relatively easy to support and promote, leading to a failure to adapt institutional structures and strategies to changing circumstances, thereby potentially squandering a favourable position by failing to make the necessary adjustments in a timely manner.

To date, Scotland has used innovation policy effectively and experimentally with a community of policymakers and politicians building up, but that community stands now at a critical point in terms of moving forwards or drifting apart. Five main challenges are apparent:

- Maintaining the experimental edge in the policy system, and disseminating the results of these experiments within the UK policy community, so that Scotland remains an inspirational example for others.
- The need for a new innovation leadership for Scotland as a whole, which may involve current dominant actors in the Central Belt stepping back and working to support bodies with a wider set of interests than Edinburgh-Glasgow.
- Making innovation something exciting for policymakers, exploiting the stability offered by the ten-year innovation strategy, without letting innovation become something ordinary or run-of-the-mill.

- Using the successes across Scotland in effective innovation policy to inspire policymakers to learn from new models and replace science-based linear (technology transfer) models with more interactive, knowledge-exchange concepts relevant to more sectors.
- Spreading the boundaries of the Scottish innovation system beyond Central Belt Scotland, integrating innovative activities in Scotland's periphery more closely into Scotland's strategies, exploiting Scotland's considerable sub-national variation.

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