S
STRATEGIC
INTELLIGENCE AND
INNOVATIVE CLUSTERS

STRATINC

STRATINC

"A REGIONAL POLICY BLUEPRINT
HIGHLIGHTING THE USES OF
STRATEGIC INTELLIGENCE IN
CLUSTER POLICY"

FOREWORD

From its beginnings the StratinC project was ambitious. Indeed, throughout its two years it has proved a valuable source of exchange and learning in the field of cluster policy for its partners. There were two clear phases to the project: in the first phase, strategic intelligence platforms were launched in participating regions and sectors. For the second phase, project partners decided to go further by putting together a strategic intelligence policy Blueprint. This was conceived as an "operational document" and its production has constituted one of the most important activities of the projects' second phase. The writing process has been characterised by extensive exchange between partners on the concepts, on the approaches, and on the practices… The Blueprint's focus is on clusters, both as economic entities and as public policy. It explores and seeks to understand the extent to which strategic intelligence tools (knowledge management, benchmarking, foresight) are able to support the creation of innovating clusters:

- by enabling firms in a region belonging to the same productive system and business context to forsee the changes in markets and technologies which may affect them,
- by improving their competitiveness through innovation,
- by designing governance systems capable of fostering collaborative strategies and implementing appropriate business development tools ('in which everyone wins').

Plans for the StratinC project were first drawn up in 2002. Against a background of deepening globalisation and increasing public policy support for innovating clusters in many countries and regions, StratinC has been a forerunner. It makes a contribution to the EU Commission's Europe Innova Initiative, as well as to its renewed Lisbon strategy (growth and employment).

The Scientific Committee

A scientific committee, made up of academics and specialists, has both monitored and been involved in the different phases and activities of the project.

Its members were:

- Jaime del Castillo, professeur of economics at the University of the Basque country (Spain), provided his expertise in the fields of regional economics and innovation
- Mickaël-Christnan Laubenheimer, expert in information and communications technolgies, advised the project regarding internet platforms and knowledge management
- Maximiano Martins, former director of the Portuguese national programme for industrial development, and member of the Portugueuse parliament, offered his experience in industrial policy, SMEs and innovation
- Paulette Pommier, the local cluster programme manager for DIACT, the French government's regional competitiveness agency, was consulted for her expertise in the field of clusters and policies for clusters
- Michel Vivant, professeur of Law, and expert advisor to the European Commission advised the project in the field of intellectual property, in particular relating to ICT and internet related issues.

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GETTING STARTED	MOVING FORWARD: THE SI 'TOOLKIT'	OPERATIONS MANAGEMENT
Know your region ● Carry out detailed mapping and stakeholder analysis to establish a preliminary strategic vision.	**Developing a foresight dimension in firms' activities** ● Use professionnal moderation and consus building techniques in foresight exercices to create a collaborative dynamic and a willingness to change around thinking about next generation products and technologies. ● Identify concrete actions within a consensus based development vision.	**Develop management skills** ● Ensure a close match between the types of tasks undertaken and the skills sets of actors involved.
Know why SI matters for cluster policy ● Increase awareness of SI practices by creating a collective capability in the generation, retrieval, use and exchange of accessible distributed information. ● Introduce SI methods and tools progressively (networking, clubs, strategic visioning).	**The economic intelligence needs of the firm and cluster** ● Create a permanent, tailored and flexible intelligence gathering system based on formal, collective and individual needs analysis. ● Ensure precise match with individual firms' day-to-day business needs.	**Road maps and action plans** ● Use road mapping to facilitate consensus based decision making. ● Keep strategy and actions coordinated and strategically focused. ● Keep it clear, keep it flexible, expect the unexpected, build in fine-tuning.
Build consensus between regional leaders ● Design cluster institutions on the basis of stakeholder agreement. ● Do not underestimate the implication of setting up clusters, once there is consensus in principle, coordinate relevant national/regional/cluster stakeholders. Politicians should know that return on investment is not guaranteed.	**Knowledge management** ● Use Foresight to identify regional skill needs and invest accordingly. ● Ensure business takes a leading role in skills needs assessment work. ● Identify, through partnership working, a cluster skills development plan with clear costing and timeframe. ● Create structured and high profile but open and flexible networks to identify, market test and support innovative ideas. ● Use KM tools to: map the knowledge networks of regional industry; identify strengths and weaknesses of networks in both business support and sectors: inform regional skills development strategies.	**What should a cluster look like?** ● Keep a strategic "bird's eye" perspective on the regional economy to identify new clusters, cross cluster opportunities and transversal or common issues. ● For formal clusters, identify and meet the highest national and international industry standards.
Sustain momentum ● Collaboration cannot be taken for granted. Create a stakeholder partnership based on clear management principles and ensure that collaboration is appropriately rewarded.	**Benchmarking** ● Use a structured benchmarking process. ● Identify good policies and establish indicators	**Evaluation:** ● Determine an evaluation strategy with stakeholders in advance.
Introducing SI into a region/cluster ● Anticipate a lengthy process. consult relevant stakeholders and most importantly consult end users; learn; be flexible.		

The term 'cluster' was popularised by Michael E. Porter's *Competitive Advantage of Nations* in 1990. Since then the promotion of innovation through clusters has become the sine qua non of regional economic development strategies[2]. Yet it is not proving easy. On top of the complexity of putting such a difficult concept into practice, those responsible for cluster polices, often regional policy makers, must negotiate difficult political and institutional circumstances, and they often lack resources.

A good deal of cluster policy experience has nonetheless been acquired. Yet it remains fragmented, and publications are often vague. There is therefore a need for the exchange of best practice and more clarity in policy action terms.

In this regard and as practitioners operating in the field, we consider that cluster policies are not yet paying sufficient attention to strategic intelligence (SI) practices. However, given the very different realities of European regions we know it is unrealistic to be prescriptive - hence our choice of a Blueprint, which is to be read as a living document *highlighting the uses of SI in cluster policy.*

The project at its origin, StratinC, was undertaken under the INTERREG IIIC programme, part of the European Commission's regional policy programme with a focus on policy exchange. In this regard the Blueprint is timely because the cluster policy community, including many newcomers, is currently preparing for a new EU programming period starting in 2007.

The Blueprint is divided into 3 roughly sequential Parts. Part I deals with 'getting started' with cluster policy issues. Part II discusses the SI 'toolkit' and Part III presents our thinking on cluster management. Each chapter concludes with recommendations. A final Chapter sums up the Blueprint with closing commentary on SI, as well as a 10 point table synthesising the document's key messages.

■ OUR TARGET AUDIENCE

The Blueprint draws on the experiences of 6 regions and contains material useful to both experienced practitioners and newcomers. It will be of particular interest to:
- Regional agencies involved in regional innovation and cluster policies.
- Business representatives such as Chambers of Commerce.
- Consultants and other experts operating in the fields of strategic intelligence, knowledge management, foresight, cluster policy, and innovation management.

As well as the Blueprint itself, a StratinC internet site has been made available at www.e-innovation.org/stratinc.

The site contains general information about Phase 1 of the project including preliminary needs analysis work related to target sectors, SI platform development details, and individual partner evaluations of the project. The site also offers suggested reading related to SI, ICT and clusters. StratinC Partners' current SI work is provided in an Epilogue to this Blueprint.

2 Stuart Rosenfeld, 'A Guide to cluster strategies in less favoured regions', (2002).

Benchmarking:
A strategic learning activity based on the methodological comparison between one's own activities and those of others.

Cluster:
A business-led PPP, which draws on its members' capabilities to realise new commercial projects.

Cluster professional:
In this document refers to practitioners across diverse networked institutions involved in cluster policy formulation or implementation.

Co-opetition:
Describes the practice of collaborating on specific projects whilst remaining independent and competitive in core business.

Economic Intelligence (EI):
Set of concepts, methods and tools behind the intelligence cycle, supporting decision-making within the framework of an established organisational strategy. Market, technology, legal, macroeconomic and other issues affecting an organisation's operations are covered by EI.

Foresight:
Action oriented analysis of probable future scenarios.

HE and **SET** institutions. We use these acronyms to refer to higher education and/or science engineering and technology.

Human capital:
Human capital refers to the level of knowledge and skills in the workforce.

Innovation:
Innovation is 'the commercially successful exploitation of new technologies, ideas or methods through the introduction of new products or processes, or through the improvement of existing ones.

Knowledge management (KM):
Approach including systematic and specific actions to facilitate the continuous collection, development, sharing and application of the intellectual capital (explicit, embedded, tacit) available in an organisation (a firm, network or cluster) and addressing its objectives. Whereas economic intelligence (EI) is mainly oriented outwards KM is mainly oriented inwards. Both approaches are nonetheless open, clearly complementary and rapidly converging.

PPP:
Public private partnership.

Roadmap:
A plan linking where one is, where one wishes to be, and how to get there.

Strategic Intelligence (SI):
Intelligence provided in support of strategic decision making in business. We include foresight, economic intelligence, knowledge management and benchmarking in our definition.
NB: We exclude the geo-strategic and military connotations of the term as employed by State intelligence services.
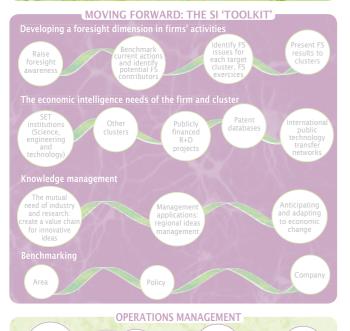
Triple Helix:
The institutions of the triple helix are government, the higher education and research sector, especially the University, and private industry. The idea concerns the interaction between these institutions and the way this interaction supports technological progress and innovation trends.

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PART I: Getting started

CHAPTER 0: CLUSTER, ORIGINS OF THE IDEA

There has been considerable enquiry into why some countries or regions achieve better economic results than others. There is a growing consensus in this respect that the ability to constantly generate commercially viable innovations on the foundation of high levels of scientific and technological progress is a key part of the explanation.

Against the background of an ever more international economy, and given the bewildering knowledge intensity of contemporary manufacturing processes and products, the notion that we today live in a competitive and innovation driven knowledge-based economy has become entrenched. The knowledge based economy is one *'in which the generation and the exploitation of knowledge has come to play the predominant part in the creation of wealth.*

It is not simply about pushing back the frontiers of knowledge; it is also about the more effective use and exploitation (i.e. innovation) of all types of knowledge, in all manner of economic activity' (UK Government, 1998).

The process of innovation has therefore become the object of research because this has been linked to competitiveness.

Innovation experts increasingly see economies as complex systems in which diverse actors interact dynamically promoting technological progress and creating conditions favourable to innovation. At first work on innovation systems had a national perspective. In order to better understand how innovation is influenced by national institutions, experts introduced the notion of 'national innovation system' or NIS.

The national innovation system brings together 3 different types of actors: public governance institutions which determine the 'rules of the game', higher education, research and technology providers, and companies. The objective is to enhance the situation for each of these actors through improving the quality and frequency of their interaction.

This has been called the 'triple helix'[3]. But within this idea emphasis does vary, for example, between 'evolutionary' or market (and firm) led, which gives the market the lead role, and 'neo-corporatist' perspectives, which give a greater role to central coordination. Of course in reality most economies demonstrate a mix of both.

NB: *These complexities apart, the key idea is that innovation is not just about what firms do in isolation, but about the interactions between firms and the wider institutional, socio-economic and technological contexts in which they operate. The cluster development perspective we take in this Blueprint is a business or market led (evolutionary) one.*

Why regional clusters? It is increasingly thought that much of the relevant knowledge creation and exploitation activity is (or can be) localized in cities, regions or places such as Silicon Valley. Influential scholars such as Harvard University's Michael Porter have looked at this phenomenon and argued that successful firms tend to be located in successful sub-national industry concentrations, or 'clusters'.

With his 1990 work *The Competitive Advantage of Nations*, he sparked enormous interest in clusters, innovation and the need for decentralised industrial policy.

It is at the decentralised level where public and private sector actors can most effectively exploit the specialised industry specific knowledge central governments do not have easy access to, and which may constitute a source of comparative advantage. It is also at this level that industry and business needs can be identified and responded to. Cluster has many definitions and of course a single term cannot describe all regional industrial concentrations.

Philip Cooke (2002)[4] defined clusters as *'geographically proximate firms in vertical and horizontal relationships, involving a localised enterprise support infrastructure with a shared developmental vision for business growth, based on competition and co-operation in a specific market field'.*

This definition is useful because it visualises clusters in a public private partnership (PPP) perspective.

Whilst it is not an operational plan, his definition usefully stresses the importance of a 'shared developmental vision'. In terms of competition and co-operation between firms this can be understood as 'co-opetition'.

This term refers to instances of co-operation (for example, joint ventures) between firms that are complementary to each other in various ways and which may engage in collaborative cluster projects, but without giving up their core activities - a simple example would be between computer hardware and software companies.

RECOMMENDATION

Avoid over-exposing stakeholders to these debates - this applies in particular to companies. The essential dialogue with companies should focus firmly on concrete commercial objectives.

3 See: http://users.fmg.uva.nl/lleydesdorff/th2/spp.htm/
4 P. Cooke "Knowledge economies: clusters, learning and cooperative advantage". Routledge, 2002.

CHAPTER 1: HOW TO GO ABOUT IT: FIRST POLICY STEPS __

◼ SECTION 1: KNOW YOUR REGION

Traditional sectoral or employment statistics, whilst providing necessary baseline data, miss much of what makes up clusters. For example, a cluster, or potential cluster, may involve more than one sector as there can be complementarities between sectors.

Additionally, traditional data may miss emerging new technology clusters such as, say, biomaterials. Practitioners widely agree that traditional statistics are insufficiently refined to identify cluster relevant linkages and activities.

It is therefore necessary to carefully map the regional, and, as far as possible, interregional economy to pick up clusters.

Cluster mapping can usefully begin with a comprehensive actor oriented definition. Clusters include: customers (OEM, other companies, end users); firms in downstream industries; firms in related industries; producers of complementary products; components, machinery and services; financial institutions (venture capitalists, and so on); specialized infrastructure providers, governments (national or local); other institutions providing specialized training, education, information, research and technical support (universities, vocational training providers); standards setting agencies; trade associations and other collective private sector bodies including networking organisations[5].

A further important characteristic of clusters is the way in which they have to be seen as connected to, and products of, their wider environments.

The means that it is necessary to define clusters not as closed systems, but as an open ones with various linkages (commercial, knowledge related, and so on) to the national, European or international economic scales.

Identifying clusters

In most definitions 'critical mass' is considered important for a cluster, but there is no agreement on what this means. Cluster mapping therefore requires economic insight and qualitative judgement. It is important to draw on statistical data as well as on local knowledge and experience throughout the mapping process.

This mapping process will include exploratory interviews with chambers of commerce, university research and innovation centres, and so on. Whilst the policy focus may, in the EU, be on SMEs, it is also important to extend mapping to encompass the whole economy, including large firms. Porter[6] suggested the following mapping procedure:

a. first, start with a large firm[7] or a concentration of like firms and then scan upstream and downstream in the vertical chain of firms and institutions.

b. second, scan horizontally to identify industries that pass through common channels.

c. third, identify links with technology providers, skills and training, business information providers, finance, infrastructure and so on. Public bodies, such as regulatory or education authorities can also be considered important inputs where their activities are clearly significant to the cluster.

The cluster professional should also bear in mind that there are different forms of cluster. Clusters also have lifecycles meaning their dynamics and policy needs evolve over time.

Cluster mapping provides cluster professionals with a preliminary 'bird's eye' map of the cluster in question, but a deeper knowledge of stakeholder roles, needs and capabilities is needed. The capacity or willingness of potential stakeholders to engage needs to be verified. It may, for example, be the case that a potential stakeholder needs supporting with resources in order for them to participate. Stakeholder analysis also helps to avoid role confusion at later stages, and disappointment if roles are poorly defined early on.

Stakeholder analysis allows the cluster professional to foresee and forestall certain cluster building problems, design effective partnerships and networks, set up a cluster hub, or identify potential cluster champions.

More generally, cluster mapping and stakeholder analysis improve the cluster manager's understanding of the potential of the cluster.

RECOMMENDATION

Carry out detailed mapping and stakeholder analysis to establish a preliminary strategic vision.

◼ SECTION 2: KNOW WHY SI MATTERS FOR CLUSTER POLICY

Studies have shown that successful firms have managers who are creative, willing to launch new products and are customer focused. By devoting time to strategic issues they obtain a commercial agility, which gives them an advantage[8].

Clearly, then, company managers require the best available intelligence in order to devise strategy, particularly in respect of innovation strategy, but not only. Yet firms are constantly in a state of intelligence deficit.

They (especially SMEs) often do not have the intelligence they need. Regional development agencies need to help firms obtain intelligence, and use it.

But what intelligence is needed? Strategic intelligence does not simply refer to traditional business intelligence, or 'watch' (regarding market, environmental, technological, regulatory or fiscal information).

Strategic intelligence has to do with all the critical processes by which intelligence is gathered, processed, analysed and used in strategic decision-making.

We therefore see SI as encompassing, foresight, economic intelligence, knowledge management and benchmarking. SI should also be deployed within the framework of a wider learning oriented governance approach, as we discuss later in the document.

5 Michael Porter, 'On Competition', 1998.
6 Ibidem.
7 It may also be useful to start with non private sector institutions such as, in the health sector, a large hospital, or government Ministry, which are also potential clients through public procurement.

8 Manufacturing Foundation Report, 'Successful transition in smaller manufacturers', Bourton Group,UK, 2002.

Within a cluster the use of SI is however complicated by the fact that a region is not like a single firm but the need for good intelligence is also a reason why cluster policy needs to be used. It is of course an exercise in good governance to begin by consulting stakeholders (see also page 18 on the Decilor experience). SI should be introduced on the basis of needs analysis in target sectors. The design of an SI policy process is tricky, but it can be the basis for initiating clustering in SMEs.

There should however be no imposed linkage between SI and clustering. The SI system, which is not 'mechanical' but a process which relies on people, should respect the principles of co-opetition, that is, SI should be introduced as a firm oriented service. It is the role of the cluster professional to develop clustering as an indirect consequence of the basic SI service, through initiating brainstorming sessions, business clubs, newsletters, and so on.

Clustering may be needed to help share the costs of the service amongst firms, as well as to disseminate cluster relevant information. Sharing costs, in areas non core business critical but useful areas, is a good way to encourage SME participation in SI strategy in the first place.

Through high quality intelligence gathering, exchange and analysis, introduced progressively to a potential cluster, cluster professionals and firms will identify opportunities for project-based collaboration (which firms could not do, or may not even identify, working in isolation).

Firms continue to focus on their core activities but also collaborate on specific projects where complementary capabilities (commercial, technological, productive) can be brought together in a commercially viable way.
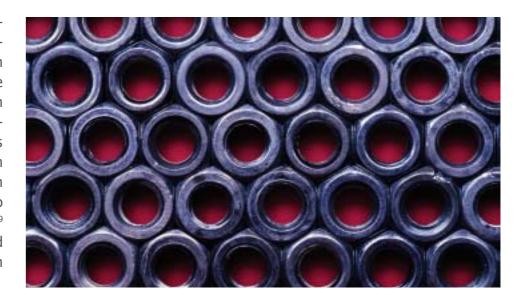
Public or semi-public organisations such as research and technology or training providers are important partners, but business must have the lead role. This is the logic of co-opetition (competition with strategic collaboration). Co-opetition is the best way to foster a clustering spirit.

RECOMMENDATION

Increase awareness of SI practices by creating a collective capability in the generation, retrieval, use and exchange of accessible distributed information; introduce SI methods and tools progressively (networking, clubs, strategic visioning).

SECTION 3: BUILD CONSENSUS

Preliminary mapping provides policy makers with an overview of the cluster. Depending on the political and institutional arrangements in the country/region careful consideration should be given to how coordination[9] between national and regional policies can be ensured.

If at first glance cluster models seem to offer practical policy tools, their definition, let alone their implementation, has proved difficult and policy initiatives can easily become overly bureaucratic. Whilst coordination matters, exposing stakeholders directly to overly bureaucratic processes may hinder private sector participation.

It is also clear that in European regions, and especially given the complex and often difficult institutional and economic realities that prevail in them, taking the (ambitious) clusters approach seriously requires both leadership and high level commitment.

A key leadership task is to build consensus amongst regional leaders that this approach is needed, and consensus should be sought in a structured and purposive way early in process.

Regional practitioners know there is scepticism and disagreement about the efficacy of past and present policies. To a degree this is understandable. The regional policy arena is both complex and constantly evolving.

For a variety of reasons, know-how can be lost. Changes in political leadership can lead to changes in policy, key personnel move on to new posts or retire, the knowledge of positively evaluated programmes is poorly disseminated or simply forgotten, and so on.

Nor does it add to the credibility of regional policy making that where outcomes are positive, responsibility can be claimed simultaneously by different organisations.

It is understandable then that scepticism exists, yet this undermines necessary attempts to identify what has been done right or what has not worked.

This can be a problem because optimism and positive attitudes are themselves key success factors as they improve the atmosphere and facilitate collaborative working.

The solution is to adopt consensus based policy evaluation model, that is, by applying the rational methods of knowledge management.

9 A wide range of government policies, emanating from various levels and Departments of government can impact on clusters. Cluster thinking highlights a need to coordinate policy processes across policy areas as diverse as physical infrastructure planning, trade policy or public procurement.

The aim is to develop an agreed strategic view about future policy orientation based on a common understanding of whether specific past initiatives have been successful or not. Ideally, cluster professionals should apply an evaluation model which:

- catalogues previous initiatives according to their aims.

- reviews and analyses policy processes and existing evaluation. Agrees with stakeholders on objective criteria to determine whether previous policies have succeeded or failed (objective impact studies).

- benchmarks outcomes against current best practice as well as against initial expectations.

- disseminates findings amongst stakeholders and debates implications.

The advantage of this process is that it lays a strong evidence based foundation for reaching a consensus, which in turn creates a space for optimism.
High-level commitment is then needed because it is likely that any strategy developed through needs analysis, foresight or other methods will impact significantly on stakeholders over the short, medium and long term. It is therefore

incumbent on political leaders to provide stakeholders with clear political backing and appropriate resources. Whilst politicians will not normally play a day-to-day role in cluster governance, their backing provides essential credibility and visibility *vis-à-vis* potential stakeholders (especially firms).

Sustaining stakeholder commitment is also crucial if the cluster is to be able to generate objectives, plan strategies and action plans, as well as oversee implementation through to evaluation and lesson sharing activities. There is nothing short-term about cluster policy, as most observers recognise, regional development policies may take decades to bear fruit.

Politicians must ensure that the policy process is sustained over the long term. Stakeholders may not stay with a process if high level backing is not maintained, or decisions not acted on.

If preliminary mapping, stakeholder analysis and other initial research flags up clear evidence of economic problems for the majority or for key elements of a cluster, or there are visible challenges in the near future, then action should begin.

Suggested getting started action steps:

- Conduct detailed (but not exhaustive) cluster focused needs analysis.
This can be done by a local university business school, or consultancy and should further map the cluster (what relevant R+D capabilities exist in regional HE institutions for example), investigate economic opportunities and challenges in detail, discuss findings and make clear recommendations (with financial implications) for policy action. This work should preferably be co-financed by both private sector actors or their representative associations and public authorities. Allow 6-9 months for this.

- Public authorities will need to organise discussion regarding needs analysis findings and policy recommendations - at the highest level possible - recall here our above comments concerning coordination between central and regional government.

Ensure commitment by political leaders *before* making the report's findings and recommendations public (brief politicians through meetings or workshops. Draw on case studies of successful applications of the strategy elsewhere using benchmarking).

- The report can then be made public in a local/regional seminar or Conference to which key actors from the private sector side of the cluster, local and regional and national public authorities and other important stakeholder groups (HE and research, skills and training organisations, trade unions, press) can be invited.

- Seek clear outputs from the Conference. This could be in the form of organising further thematic workshops on subjects such as the implications for university teaching and research, training provision and so on. Publicise these outputs through the press.

- Create a sense of momentum. Invite key actors to make press statements. This is an important opportunity to consolidate or create a sense of mutual confidence and collective responsibility in the region and in targeted clusters.

The momentum created by this process gives policy makers a mandate to oversee, coordinate and provide ongoing management input to a cluster policy process.

The existing institutional architecture in the region may include a regional development agency, but it may be necessary to set up a new steering group or provide a technical secretariat to take the whole process forward. To maintain momentum the process should respect a clear timeframe, and produce clear outcomes.

What Partnerships or networks are set up, and what configurations they take, very much depends on what organisational changes are required in the region.

It is important to go about this in an inclusive and consensual manner, as new institutions may not always be welcomed.

Cluster policy may mean setting up region wide policy making fora, bilateral inter-institutional fora (HE-SMEs, and so on), project based partnerships, specific cluster support hubs or even formal clusters.

The key stakeholders will be the three triple helix groups, government/public sector governance, the HE and research sector and, most importantly, industry.

The new institutional architecture will be multi-level and variable geometry depending on the stage of the process. In terms of specific cluster organisational architecture, no single model can be put forward; this is up to stakeholders to decide and depends on the legal and adminis-trative context in a particular country/region.

On this issue, see our comments under "about cluster secretariat/hubs" on page 17. Chapter 8 moreover offers two examples: the Norwegian Oslo Teknopol cluster model and 'Aeriades', an aeronautics cluster in Lorraine, France. Discussion includes the key principles that should underpin cluster design.

RECOMMENDATION

Design cluster institutions on the basis of stakeholder agreement; do not underestimate the implication of setting up clusters, once there is consensus in principle, coordinate relevant national / regional / cluster stakeholders; politicians should know that return on investment is not guaranteed.

SECTION 4: SUSTAIN MOMENTUM

We know that SI matters and that it provides the raw material (i.e. commercially viable ideas or the promise of) for securing interest in cluster projects.

But securing and sustaining long-term stakeholder commitment, which is fundamental to clustering, is not easy and requires careful management. It is important to respect the following management priorities: *Rewarding participation / Making tangible, relevant and visible progress / Involving high calibre people / Balancing activities across stakeholder groups / Communicating and thinking ahead.*

1. Rewarding Participation:

Participation needs to be appropriately rewarded. Potential stakeholders will want to know *'what is in it for me?'* Regional policy makers must not only be able to gain the interest of potential stakeholders quickly, but also anticipate and meet demanding expectations. It is simply an exercise in pragmatism to assume that self-interest is the chief motivation.

For example, firms may decide to participate if they believe doing so will enhance their profits, and the research community may decide to participate if they believe doing so will lever in resources or otherwise advance their research activities.

2. Making tangible, relevant and visible progress:

Clear and tangible outcomes should be programmed into the process. In this respect realism and pragmatism at the outset are crucial. Over ambitious vision statements should be avoided.

The disappointment of broken promises can be fatal to hard won trust, nor do they strengthen the credibility of those who break them, and this may make effective collaboration and exchange more difficult.

At least one major collaborative project should be programmed for completion within the first year of activities. Without being prescriptive, this can include foresight activities, the establishment of an overarching cluster secretariat or specific cluster 'hubs'.

About cluster secretariats/hubs: At the heart of cluster thinking is a search for the interactive dynamics which underpin innovation, and it is only a small step from this perspective to organising the cluster secretariat in a way which spans across complementary clusters (because of the innovation potential at the interface of clusters).

Individual clusters have distinctive needs, but the opportunity for synergies should not be missed. A region wide agency should take responsibility for this.

A central cluster secretariat (with 'hubs' for individual clusters) should take responsibility for organising relevant cluster oriented activities (seminars, and so on) as well as monitoring and reporting progress (for example, through newsletters or conferences).

Whilst co-financing is preferable, it is often necessary to finance this with public funds in the first year or two of operations. Private sector co-financing should follow, although this may not be feasible in some cases.

3. Involving high calibre people:

It is also important to create a high quality stakeholder partnership involving the highest calibre actors.

Once the key stakeholders have confidence that the process is real and that the partnership is of high quality, that it has the right mix, and

that the commitment from other stakeholders is strong, one might have a dynamic and sustainable process going.

4. Balancing activities across stakeholder groups:

It is necessary to prioritise initiatives identified by needs analysis or foresight according to whose expectations are the more immediate. The business community is generally more demanding, followed by the research community and lastly other public organisations and sponsors.

At least one event or project should be designed to benefit each stakeholder group in the course of the first year of activity.

5. Communicating, anticipating:

Public policy processes can be bureaucratic. Stakeholders will therefore need support with administrative processes (finance, reporting requirements and so on).

It is clearly sensible to make sure stakeholders understand what is required.

Political leaders can provide the high profile necessary for media interest, and their supporting role is essential as they ensure a democratic foundation to the process, but this needs to be made clear to other stakeholders early in the process whilst at the same time ensuring a sense of ownership amongst project leaders, especially firms.

It is useful to seek opportunities to bring public and private sector spheres together, and this could be when there is a milestone or policy success to announce to the press.
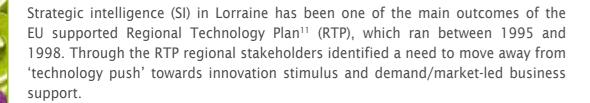
RECOMMENDATION

Collaboration cannot be taken for granted; create a stakeholder partnership based on clear management principles and ensure that collaboration is appropriately rewarded.

■ SECTION 5: INTRODUCING SI INTO A REGION/CLUSTER

Illustration box: SI, the Lorraine experience

The importance of strategic intelligence was brought to the centre stage of national policy making in France by the 1994 Martre Report, which recommended that France and its regions adopt an explicit SI strategy. More recently, the Carayon Report[10], commissioned by the French Prime Minister J.P.Raffarin in 2003, reiterated the need for further policy action. In the Carayon Report the notion of 'economic intelligence' has several definitions, the first of which is taken from the policy work of the Lorraine Regional Council. Lorraine has been a frontrunner amongst French regions in terms of economic intelligence policy. We will refer to strategic intelligence in the paragraphs which follow.

Strategic intelligence (SI) in Lorraine has been one of the main outcomes of the EU supported Regional Technology Plan[11] (RTP), which ran between 1995 and 1998. Through the RTP regional stakeholders identified a need to move away from 'technology push' towards innovation stimulus and demand/market-led business support.

SI (first in the sense of EI) became a key concept for the Projet Lorrain (the regional economic strategy), but also the region's SPD[12], and CPER[13]. By 2000 the Region had commissioned a French based consultancy.

This led in 2002 to the launch of Decilor, a demand/market-led business intelligence service in selected regional sectors.

Central to the model are business facing sectoral innovation centres (CVS), in which specially trained staff provide support to firms. It is a measure of the operation's success that some of the latter have been hired by the firms. Key lessons learned are given below.

The policy is constantly being improved and there is increasing consensus in the region that SI should underpin innovation policy. Feedback from business on Decilor has been positive, and the approach has recently become an integral part of national cluster policy *(Pôles de Compétitivité)* in the region. Moreover, a region wide network, 'Relie'[14] has been set up to coordinate the SI business support provided to firms.

Lessons learned: Key success factors in introducing a regional SI policy
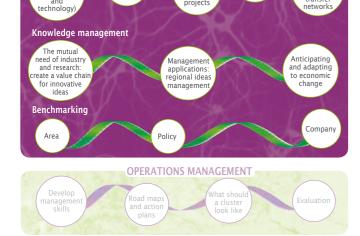
- Ensure thorough evaluation of firms' needs and capacity to engage before launch.

- Carry out an effective policy marketing strategy.

- Adopt a participative and consensus based approach – involve all key regional (policy delivery) stakeholders from the outset and maintain effective ongoing coordination between them.

- Involve the beneficiaries (firms) in the design of the SI system (both with regard to content and tools).

- Consider how the policy can be extended to new target sectors at an early stage (plan the business model, will firms pay? is there need to package SI with other services?).

- Maintain a flexible approach – evaluate regularly with respect to firms' needs.

- Ensure continuity of approach should there be changes in political leadership.

- Expect the process of consensus building to take time, possibly years.

RECOMMENDATION

Anticipate a lengthy process; consult relevant stakeholders and most importantly consult end users; learn; be flexible.

10 http://www.ladocumentationfrancaise.fr/rapports-publics/034000484/index.shtml
11 A specific EU sponsored regional innovation strategy.
12 A general EU regional development plan co-financed with the national government.
13 A regional development plan contracted between the region and the State.

14 Réseau lorrain d'intelligence économique (Lorraine economic intelligence network)

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19

GETTING STARTED

Know your region | Know why SI matters for cluster policy | Build consensus | Sustain Momentum | Introduce systematic SI sourcing to clusters

MOVING FORWARD: THE SI 'TOOLKIT'

Developing a foresight dimension in firms' activities

Raise foresight awareness | Benchmark current actions and identify potential FS contributors | Identify FS issues for each target cluster, FS exercices | Present FS results to clusters

The economic intelligence needs of the firm and cluster

SET institutions (Science, engineering and technology) | Other clusters | Publicly financed R+D projects | Patent databases | International public technology transfer networks

Knowledge management

The mutual need of industry and research: create a value chain for innovative ideas | Management applications: regional ideas management | Anticipating and adapting to economic change

Benchmarking

Area | Policy | Company

OPERATIONS MANAGEMENT

Develop management skills | Road maps and action plans | What should a cluster look like | Evaluation

PART II: Moving forward, the SI Toolkit

Before presenting in more detail what we consider to be the key elements of the SI policy toolkit, it is worth presenting again our definition of the idea. Strategic Intelligence is intelligence provided in support of strategic decision making in business. It includes the areas of work of foresight, economic intelligence, knowledge management and benchmarking.

These can be thought of as SI cluster policy tools. In the chapters in this section we consider these tools in turn although clearly they are interrelated and form part of a learning and creative process.

CHAPTER 2: INTRODUCING THE FORESIGHT DIMENSION INTO CLUSTER POLICY

Foresight, put simply, is about bringing together the key stakeholders of a region, or cluster, in order to think about the economic future and take the action which may be required. It is a useful public private partnership economic development tool[15], not least because it helps build trust and confidence between stakeholders. Indeed, a key objective of foresight is to ensure that key stakeholders have both ownership of the strategy development process and a common understanding of problems and solutions. By its nature, foresight provides a consensus-based foundation to priority setting which, properly managed, should offer 'something for everyone'.

A range of formal 'futures' techniques, from brainstorming and expert (Delphi) panels, to scenarios and morphological analysis, can be used. Morphological analysis for example helps identify gaps in the market in an organized way by studying the possible combinations of a product's characteristics. Yet if the methods are sophisticated, foresight asks two straightforward questions, 'what if?' and 'why not?' To answer these questions one of the most common approaches is to construct 'scenarios'.

Scenarios can be a stimulus to collaborative projects. The European Commission's (2004) Upgrade Blueprint is a useful introduction. The basic idea is that trends and drivers in a range of domains[16] and which are relevant to the sector in question, can be studied. Assumptions are then possible and long term[17] scenarios can be constructed. There are several types of scenario, including:

- trend/driver analysis scenarios (extrapolation of past trends into the future/factors likely to influence change)

- predictive scenarios (meticulously developed scenarios seeking accurate predictions)

- contrasted scenarios (best case/worst case)

- conflicting scenarios (alternative futures)

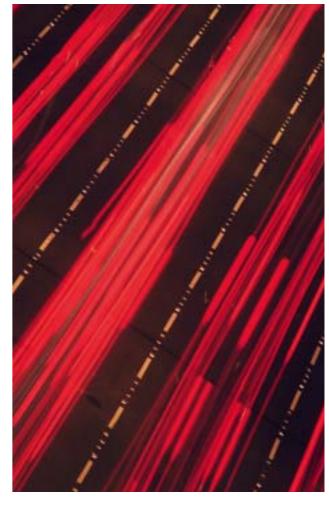- normative scenarios (desirable futures)

It is standard practice to produce more than one scenario in any given exercise because through comparison alternate futures and strategies can be considered. Changing the assumptions will of course modify the scenarios.

Symbolic labels can be given to the scenarios to portray a clear and striking image of the future, which can be used as part of a communication strategy with cluster stakeholders.

Step 1: Raise foresight (FS) awareness

In order to reach as many potentially interested parties as possible, especially firms, begin with an awareness raising campaign. Provide general information to potential cluster stakeholders about FS (presenting best practice case studies) and make explicit linkage between FS and the cluster as this adds credibility and relevance for its members.

FS exercises are suitable and feasible only where clusters already possess some experience of working together, and where firms in the cluster are not in direct competition. Moreover, do not forget that it is at the interface of different clusters that many innovation opportunities may be found – think also about cross-cluster scenarios).
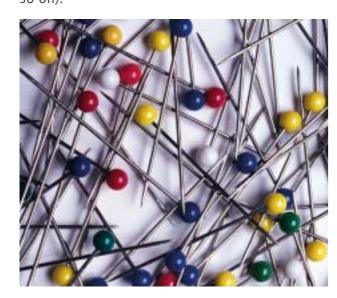
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Step 2: Benchmark current activities and identify potential FS contributors

Where clusters (or cross-clusters) have already been set up assess the extent to which foresight has already been integrated into strategy. An FS 'check-up' will help identify answer three important questions: is FS already being used and how? what degree of awareness is there of FS methods amongst cluster members? and *who is interested in going further?* These questions can be answered using a semi-structured questionnaire or interviews. Stakeholder mapping and analysis should have indicated who these people could be. At the end of this step cluster professionals should have identified, for each anticipated cluster-FS exercise, a critical mass of committed and high calibre stakeholders (firms, SET base organisations, consultants, trade or sectoral representatives, local politicians, and so on).

with the most up-to-date research on real trends. This approach stimulates debate amongst stakeholders. The aim of the workshops is to achieve a consensus position on action priorities and to identify areas for collaborative actions by the cluster.

NB: *Workshops must be professionally moderated. To facilitate trust and confidence and effective workshop chairmanship, moderators should have no vested interest in the cluster, and may for example be consultants from outside the region. They must be able to organize brainstorming and other activities, and methodologically establish consensus positions. FS workshop 'teams' should combine:*

- *Individuals from both inside and outside the cluster/region.*
- *A wide cross section of cluster/regional stakeholders.*
- *Individuals with state of the art knowledge about the field concerned.*
- *A few 'dreamers'.*

The outcome of these workshops is a draft consensus based development vision with proposals for joint actions or for more refined cluster oriented FS exercises.

The identification of threats and opportunities is frequently a sobering exercise for all concerned and the result may well be a greater sense of urgency and therefore greater commitment to change.

Step 3: Identify FS issues for each target Cluster-FS exercise

The first step is to determine existing perceptions within the cluster as to future scenarios. This can be achieved through questionnaires or interviews, with summary reports compiled by cluster professionals.
Following this step a series of FS team based moderated workshops is organised to compare and contrast stakeholder views about the future

Step 4: Present results to the cluster

Once a consensus position on scenarios and development visions has been established, these need to be presented to the wider cluster. This is an important stage, especially in cluster identity forming, and must be carried out in a professional manner. FS teams need to decide in conjunction with cluster professionals how best to achieve this.

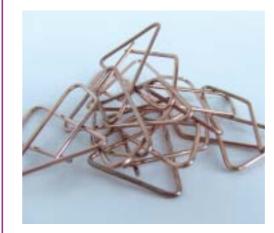## Priority-setting: some dilemmas to anticipate

Collaborative foresight tools enlighten priority setting. Where priorities are unclear or disputed, foresight methodologically compares perceptions about future trends prevalent within the cluster with expert projections.

Priorities set this way achieve greater support than if less transparent processes are used, and this would be no small achievement as developing trust is important for subsequent policy formulation and implementation.

Of course, where resources are limited, there is no easy rational basis for setting priorities between sectors as diverse as tourism and leisure, biotechnology or new materials.

Many potential projects require the public sector to invest because of 'free rider' problems. Place marketing, investment in SET infrastructure, skills training, internet portals and SI systems all fall into this category.

Investment should be steered towards significant projects in which the main stakeholders are involved, but a political decision will be needed should it be necessary to choose between investing in new industries or investing in those at the end of their lifecycle.

Ultimately, there cannot be a purely rational selection mechanism. It may be judged necessary to support particular industries on various non-economic grounds.

RECOMMENDATION

Use professional moderation and consensus building techniques in foresight exercises to create a collaborative dynamic and a willingness to change around thinking about next generation products and technologies; identify concrete actions within a consensus based development vision.

CHAPTER 3: THE ECONOMIC INTELLIGENCE NEEDS OF THE FIRM AND CLUSTER

A s cluster experts have observed[18], a cluster is itself an important source of intelligence for firms. However, geographical location should not isolate a cluster from evolutions taking place elsewhere. Whilst they must of course draw on and invest in their internal knowledge assets and processes, accessing external sources of economic intelligence on a permanent and day-to-day basis is also important. The policy implication of this is that clusters need to design and implement a formal strategy.

Firms are constantly searching for intelligence from their environment. The vast majority of them are however far from having formalized search activities. Only a small number have an explicit strategy, and only a small number therefore have any strategy for harnessing external sources to improve their own business activities (knowledge management), which is a serious limitation to their innovation capacity. Firms could do more in various intelligence gathering activities, and in particular in: participating in international R&D projects; engaging in systematic competitor monitoring/ learning; regularly attending scientific conferences; systematically searching scientific journals, patent databases or deep internet resources.

The intelligence[19] stored within such sources is of high strategic significance. It is clearly useful to consider how to assist and equip companies to systematically search, retrieve and efficiently use external sources through a formal and organized process. Cluster professionals must approach this however with considerable discretion as firms will naturally wish to have clear guarantees that their privacy will be respected.

It is impossible to offer a definitive list of external economic intelligence sources, but it is nonetheless possible to offer examples:

1: SET institutions *(Science, engineering and technology)*
Even in the case that a regional university or other HE/Research establishment cannot itself provide what is required, they are likely to be members of wider networks with links to institutions which can.

2: Other clusters
There will be similar clusters in other regions or countries with which it may be useful to establish links. For example, if, as a cluster professional, you are interested in the furniture industry, you should be aware that there are established furniture sectors in North Carolina (USA), in Brianza (Italy) and in Valencia (Spain). Firms do attend trade fairs organised in competitor locations, but more often than not this is to find out about innovations too late.

3: Publicly financed R+D projects
Public sector driven technology programmes such as the European Union's Research Framework Programme systematically publish the results of the research projects they finance. These programmes evaluate projects to the highest standards and therefore constitute excellent intelligence sources.

4: Patent databases
More than 80 % of the technical literature contained in patents is unavailable outside of their own storage centres or databases.

5: International public technology transfer networks
The number of publicly funded international technological development networks is growing.
In Europe, the Eureka programme is a good example. These networks constitute a good source of intelligence because they facilitate access to expertise.

Intelligence must be tailored

The external economic intelligence system must be tailored to needs. For the cluster secretariat, the first stage in the procedure is to identify the needs of the cluster in question through formal needs analysis.

But there should also be a continuous needs review process and modifications as necessary to search strategies.

The increasing power of ICT and the interconnectivity between professionals in the worlds of higher education, research makes it relatively easy to activate and draw on network contacts.

Cluster professionals should therefore ensure that they identify the scientific, technological and commercial networks relevant for the cluster.

Cluster professionals must also continuously monitor, analyse and disseminate intelligence which is useful. Whilst the secretariat (or cluster hub) will search fields identified as of interest by needs analysis, they must also be able to spot any clearly relevant development or piece of intelligence and should design monitoring systems and practices to ensure this.

The difficulty here is to filter out what is not relevant. What constitutes 'relevant' is for the cluster professional to decide *in liaison* with firms.

Cluster professionals must therefore be able to understand firms' needs. Consequently, they need to develop a relationship with them based on confidence, understanding and trust.

RECOMMENDATION

Create a permanent, tailored and flexible intelligence gathering system based on formal collective and individual needs analysis; ensure precise match with individual firms' day-to-day business needs.

CHAPTER 4: KNOWLEDGE MANAGEMENT

INTRODUCTION: THE SIGNIFICANCE OF KNOWLEDGE MANAGEMENT (KM)

KM emerged during the 1990s as a strategic management function in a context where knowledge in its widest sense was becoming ever more critical to economic performance. KM concerns the continuous collection, development, sharing and use of the intellectual capital (explicit, embedded, tacit) available in an organisation (a firm, network or cluster) and addressing its objectives.

Whereas strategic intelligence (SI) is mainly oriented outwards, KM is mainly oriented inwards, it concerns how knowledge, in its raw form, information, or ideas, is processed and used within organisations. Both approaches are nonetheless open, clearly complementary and rapidly converging.

They are interdependent in the sense that there is little point in having an external SI supply strategy if the results are not exploited. KM is not a new subject, but it is an important avenue for future policy and research[20]. The documented innovation management failings in firms are thought to be the result of poor knowledge management, so improving KM offers opportunities to exploit the potential in firms which is going untapped[21], and, ultimately, foster clustering.

Thinking in terms of knowledge management means rethinking the roles and strategies of both business and industry and public sector business support. Section 1 below looks at the new roles of business and industry in developing the regional knowledge base and exploiting its entrepreneurial potential. This is followed by Section 2, which looks at how KM offers a means of improving public sector business support, especially in a cluster perspective.

SECTION 1: THE ROLES OF FIRMS

A: Developing the knowledge base

The knowledge base is clearly a crucial asset for a region or cluster in the same way as the knowledge base within a firm is its main asset.

In a regional perspective the two best known knowledge base actors are the higher education and research or SET[22] institutions (especially applied research).

But the region's firms and workforce, whose skills and know-how also constitute an important, and often underestimated knowledge resource, is also a key actor. Each of these actors needs to be sufficiently organized to play an institutional stakeholder role.

New knowledge also emerges within industry. This is particularly true in new industries such as health and medical oriented biotechnology[23]. One of the KM challenges of cluster policy is therefore to ensure that the supply of graduates and other professionals meets the needs of these evolving industries.
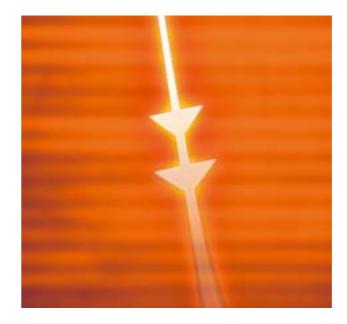

Stakeholders must therefore make a calculation about near future skills needs and invest appropriately. Again, foresight is a suitable KM approach for identifying appropriate strategies in this respect. Foresight activities can break down obstacles to collaboration by providing actors with an incentive to engage in co-operation.

It can encourage both firms and other institutions to become less isolationist, more organised, and thereby engage in meaningful collaborative activity focussed on 'next generation' product development or, in the case considered here, skills needs. Cluster professionals have a catalytic and supporting role to play but the main actors will be business and in particular the larger internationally exposed companies along with the HE sector.

To be successful these companies need the highest quality personnel and are therefore likely to be willing to co-finance higher education and research, that is, relevant applied SET research, not basic research.

This potential for synergy is in effect an opportunity to integrate larger internationally exposed firms in policy formulation and implementation in both the area of technology

development and transfer, and the supply of a suitably qualified workforce. This can be achieved nationally, but the opportunities to do this regionally should not be missed.

In the case of SMEs, they too require highly qualified and trained personnel whether they serve the end-user directly or supply to a large firm/OEM. These firms may benefit from the investments made by the larger firms through various spillover effects, including knowledge spillovers or staff mobility within the cluster. These companies may be willing to collaborate in regional training schemes and collaborative research projects if public co-financing and organisational support is made available.

RECOMMENDATION

Use Foresight to identify regional skill needs and invest accordingly; ensure business takes a leading role in skills needs assessment work; identify, through partnership working, a cluster skills development plan with clear costing and timeframe.
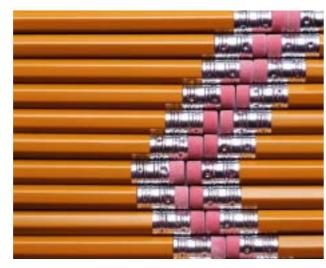
B: Regional ideas management

Many leading companies have implemented ideas management. The concept is straightforward, and consists in the harnessing of the innovative ideas company employees may have. Although the context is different, the same approach can be applied to a cluster, or to a region. Good ideas may come from anywhere, from the public or private sectors, from researchers, technicians, or from finance, sales and marketing – and good ideas for new services are as desirable as those for new products.

20 The subject is the focus of the scientific review, Knowledge Management Research and Practice, published by Palgrave.
21 See 'Objectif Innovation', Prax, Buisson and Silberzahn, Dunod, Paris, 2005 (in French).
22 Science, Engineering and Technology.
23 Source: Oslo Teknopol StratinC needs analysis survey.

Cluster professionnals will need to co-opt in the multiple business support inputs and expertise needed, from IP management advice to technology transfer, and from prototyping facilities to production, marketing and export support.
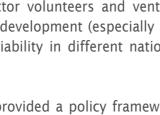
Technical expertise and logistics is not enough however. Before a product is marketed its concept must be properly tested in the business arena (market testing). This can only be achieved by bringing business into the process. It is a good idea to draw on existing foresight partners as this provides a good balance of business acumen (strategic intelligence) including R+D expertise, and also helps sustain and develop a clustering spirit in the region, although it is important to ensure that the strategy is not limited to a single cluster. Ideas emerging between clusters, between technical textiles and medical devices for example,

should also be targeted. We present below the example of the Connect programme, an ideas management programme which has proved its worth in different contexts, and most recently as part of the Connect Baltic Sea Region Interreg IIIB[24] initiative.

Illustration box: the The CBSR Connect Model

The University of California in San Diego (UCSD) set up the first Connect programme in 1985. Connect is a not-for-profit business development initiative designed to create 'connective institutions' bringing together private sector volunteers and venture capitalists to support high technology based business development (especially ICT and Life Sciences)[25]. The programme has proved its viability in different national contexts.

The European Commission's Interreg IIIB project has provided a policy framework for the Connect Baltic Sea Region Connect project (CBSR) which has been running since 2002. In just a few years CBSR, which has been managed by Oslo Teknopol, has directly or indirectly helped set up and develop 30 networks in 8 countries. These networks have recruited more than 5100 volunteer experts for 'springboard' panels (see below) and have helped more than 950 companies raise almost €900 million in venture capital.

CBSR: how the model works

The Connect concept is that an entrepreneur is trained to effectively communicate his/her core business model within 12-15 minutes to a professional investor audience. The two-stage training process consists of (1) coaching in presentation skills and (2) an opportunity to test the idea to a volunteer panel of experts from the field. Connect managers call this the 'springboard'.

24 The Interreg IIIB Programme aims to stimulate interregional cooperation and thus better integration between geographically coherent European regions.
25 Details of the programme are available on http://www.connect.org The site offers examples of the high technology start-up companies that have been helped by Connect.

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The role of the springboard, often in combination with a lunch sponsored by Connect, is to provide feedback to the entrepreneur on their performance in a two-hour session after the presentation.

The most promising presentations are then put forward for national and international meetings with potential investors (venture capitalists). The system works because everyone gains from the process:

- the entrepreneur may obtain the start-up capital investment he/she is seeking.

- the experts can make new contacts, discover a new idea, or at least enjoy a free lunch !

- venture capitalists gain time in their search for investment opportunities because they benefit from multiple high quality presentations of business ideas in one event.

RECOMMENDATION

Create structured and high profile but open and flexible networks to identify, market test and support innovative ideas.

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◼ SECTION 2: KNOWLEDGE MANAGEMENT APPLICATIONS: HOW KM CAN HELP PUBLIC SECTOR BUSINESS SUPPORT PROVIDE A BETTER SERVICE TO FIRMS

The importance of clustering and networking for business success in the knowledge economy has been understood by many enlightened entrepreneurs.

However, the practical consequences of this have not yet filtered through to the wider mass of firms, to their business practices, to their staff development strategies, and so on.

In the experience of the present authors, in part through the StratinC project, many firms have a great deal of modernising still to do in this area. Moreover, in western Europe there is a need to develop policies in this area rapidly because of the imminent loss of experience and skills through demographic change.

Introducing KM to a cluster, and ultimately to firms, is not easy however. In many cases it is necessary to develop new knowledge management routines in the regional business support networks first. It is a question of leading the way in a credible and practical fashion.

In Lorraine enhancing the KM capability in the business support networks for the wood products industry has been seen as an essential platform for pursuing a wider SI strategy for this industry. The approach is described below:

Illustration box:
Technological Transfer Center for wood sector

With 22,000 employees the wood products sector represents about 15 % of total employment in Lorraine, and is located mostly in the Vosges *Département*. Preserving the sector is crucial to the region's efforts to retain employment in its extensive rural areas.

In the course of successive innovation policies targeting the sector cluster professionals in Lorraine have found that what happens inside firms as well as between firms in the cluster in terms of knowledge retention, human capital maximisation and network management is a potential source of weakness.

This is because where sectors are fragmented and existing networks informal the departure of key individuals can easily have a destabilising effect. Analysis has shown that inevitable processes such as staff turnover, outsourcing/offshoring but also poor technological and market monitoring pose a clear threat to the sector.

The wood / timber industry technology resource center (CRT) therefore decided to carry out a KM audit using an external consultant.
The Regional Council of Lorraine financially supported this initiative. This audit concerned, first of all, the key institutional actor for the sector, the wood products industry technology resource centre (CRT Bois), which is a nationally recognised technology and business support service, and its networks. The audit began with a diagnostic phase in which stakeholder needs and expectations were ascertained. Following this a knowledge mapping exercise was carried out to provide a detailed picture of the CRT's knowledge sources and linkages (who knows what, who knows who, and so on).
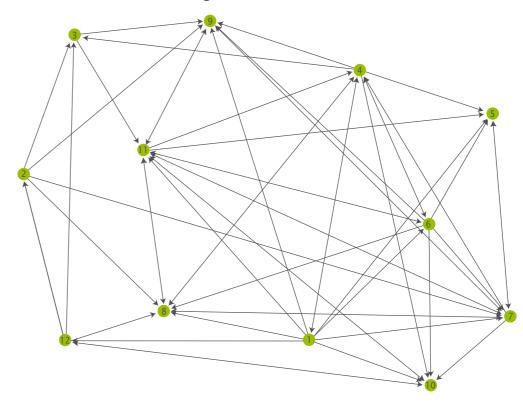
The audit turned up important weaknesses in the support networks, such as fragmentation, and a risk of losing key staff through turnover or retirement.
In terms of improving the situation a KM strategy is being deployed to develop knowledge maps (see below) to progressively introduce more formal linkages and to create a human capital database for the CRT Bois which will ultimately improve the quality of the business support provided to the sector and prevent knowledge from disappearing.
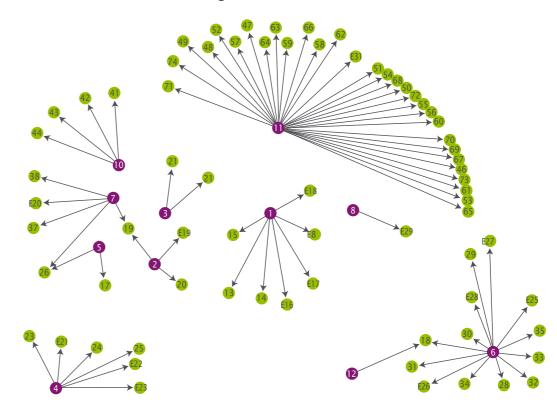
Mapping internal and external knowledge flow patterns

a. CRT Bois internal knowledge networks

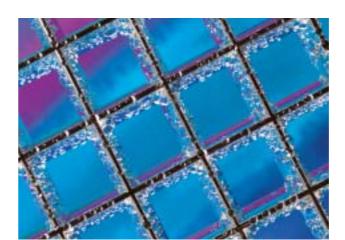**b. CRT Bois external knowledge networks**

E is for Expert
Numbers in green stand for firms and individuals.

The practical utility of this process in the wood products sector in Lorraine has been to raise awareness within the business support infrastructure itself of the importance of introducing KM for sustaining industry competitiveness. The mapping process is a powerful catalyst for re-focusing strategy and for the emergence of KM initiatives. Ultimately, the aim is to avoid knowledge loss and non-use, to bridge network 'holes' and encourage knowledge based networking and the potential commercial synergies this brings.

In a wider employment strategy perspective KM mapping not only highlights better ways to coordinate knowledge processes but also offers a means to tackle day-to-day employment issues – the two issues are clearly interrelated. In particular KM has the potential to help policy makers:

(1) rethink recruitment and job search techniques. This could be achieved, for example, by establishing better KM based match making and profiling between recent graduates and available jobs.

(2) improve the employability of those currently in work but who are 'at risk' by enhancing re-deployment and training mechanisms. It is increasingly necessary to identify and make use of available knowledge and skills and organise re-training in innovative ways.

RECOMMENDATION

Use KM tools to: map the knowledge networks of regional industry; identify strengths and weaknesses of networks in both business support and sectors; inform regional skills development strategies.

CHAPTER 5: BENCHMARKING

Benchmarking is a comparative learning process consisting in continuously identifying, understanding and adapting outstanding practices and processes. It is about identifying who is the best, why they are so good, and importantly, how their performance can be matched.

Benchmarking is therefore about strategic information, quality improvement, and business re-engineering. It implies confronting one's own performance with that of others.
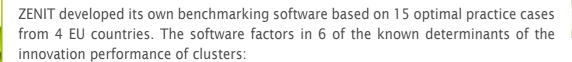
In an economic development perspective the world's leading economic governance institutions (WEF, OECD, European commission, and so on) are developing national economic competitiveness indexes.
Regional (sub-national) competitiveness is an emerging concept and has been defined as *'the ability of regions to generate high income and employment levels while remaining exposed to domestic and international competition'*[26]. Establishing useful indicators is currently a key objective for regional policy makers.

The most significant factors contributing to regional competitiveness are thought to be the knowledge intensity and concentration (critical mass) of regional industry and of course the ability to generate new economically useful knowledge.

The association of regional development agencies in Europe, Eurada, devotes space to this on its internet site. But the question of specific competitiveness and innovation metrics for regions, and the question of what and how to benchmark, is a new field. Whilst emerging competitiveness and innovation scoreboards provide useful metrics, and are increasingly detailed, there remains a question of how to use benchmarking in practice.

As a permanent process benchmarking can monitor overall performance or specific performance on a particular indicator. Benchmarking can also be used as an input to problem solving on a particular topic. Ultimately, it asks 3 basic questions:

- What are the alternatives to current strategies and practices?
- What is the margin for improvement relative to best performers?
- What are the benefits, costs and risks of the alternatives and what is transferable?

Cluster relevant benchmarking can focus on areas (regional or local), clusters, policies or firms. Brief commentary and links to StratinC partner work on these topics is given below.

● Area or cluster benchmarking
This application of benchmarking helps to understand the reasons for economic success in regions or clusters elsewhere. It must be based on intelligence based indicators. Therefore, drawing on the latest qualitative analysis of successful clusters, ZENIT, the regional development agency in NorthRhineWestphalia (NRW) has developed a structured cluster benchmarking tool. This is (currently in German) available at http://innopol.zenit.de/index.htm and the process is summarised on page 34.

● Policy benchmarking
Policy benchmarking is a distinctive comparative policy process which seeks to learn lessons from successful policies implemented elsewhere. Some are sceptical about policy transfer but the notion that a policy accomplishment cannot be transferred 'belies economic history and denies human ingenuity'[27]. The European Union is currently advocating policy benchmarking as a key policy learning and improvement activity. However, policy learning is difficult because contexts are not the same.

This is why ZENIT devised a two-stage peer review process to analyse and draw policy lessons from elsewhere. Examples of this process in practice can be consulted (in German) at http://innovative-milieus.zenit.de/. The UK government also offers guidance on policy benchmarking on www.policyhub.gov.uk.

● Company benchmarking
Companies, especially internationally operational companies, routinely benchmark their activities. However, there remains a need to encourage SMEs to do likewise. This is why the URENIO research unit at Aristotle University in Central Macedonia (Greece) developed an online secure benchmarking tool for SMEs. It is available at http://e-benchmarking.org/.

26 The Department of Trade and Industry regional competitiveness indicators, DTI, London, 2001.

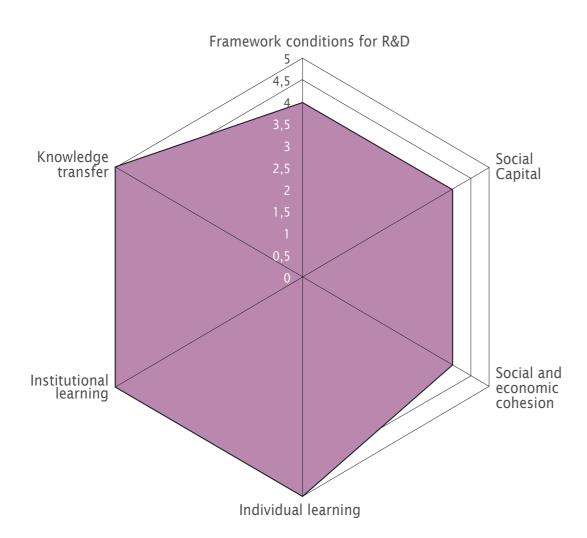27 P.Cooke, 'Knowledge economies: clusters, learning and cooperative advantage'. Routledge, 2002.

Illustration box: Cluster benchmarking in Northrhine Westphalia (NRW)

ZENIT Gmbh, the development agency in NRW, supports regional clusters through providing information on good practices and also training in best practice for cluster professionals in the region.

ZENIT developed its own benchmarking software based on 15 optimal practice cases from 4 EU countries. The software factors in 6 of the known determinants of the innovation performance of clusters:
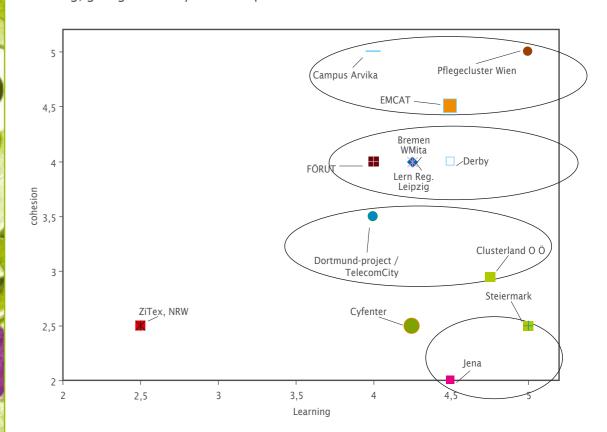
- framework conditions for R+D
- social capital
- institutional learning (interactivity, networks)
- knowledge transfer
- individual learning
- social and economic cohesion

The software maps results on a radar graphic as shown below. This is an example based on the benchmarking of an Austrian cluster.

In NRW's case there was interest in comparing performance in 3 areas: social cohesion, institutional and individual learning. To be able to visually represent NRW's performance in these 3 areas on a simple two dimensional plot, an arithmetical average was calculated for the results for institutional and individual learning, giving the easily readable plot shown below:

The first advantage of such a representation is that it offers cluster professionals an evidence based and structured means to compare strategies and performance with those of good or best practice elsewhere. Careful interpretation is of course required.

However, a second advantage lies in the form of presentation itself which offers understandable results. These benchmarking outputs can be presented to sponsoring politicians and other stakeholders as decision support tools.

NB: The NRW benchmarking software is currently available at:
http://innopol.zenit.de/index.htm

RECOMMENDATION

Use a structured benchmarking process; identify good policies and establish indicators.

GETTING STARTED

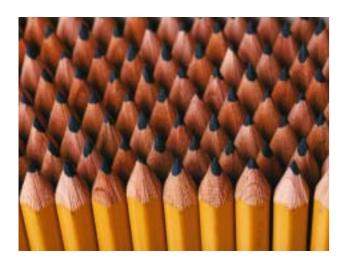Know your region — Know why SI matters for cluster policy — Build consensus — Sustain Momentum — Introduce systematic SI sourcing to clusters

MOVING FORWARD: THE SI 'TOOLKIT'

Developing a foresight dimension in firms' activities

Raise foresight awareness — Benchmark current actions and identify potential FS contributors — Identify FS issues for each target cluster, FS exercices — Present FS results to clusters

The economic intelligence needs of the firm and cluster

SET institutions (Science, engineering and technology) — Other clusters — Publicly financed R+D projects — Patent databases — International public technology transfer networks

Knowledge management

The mutual need of industry and research: create a value chain for innovative ideas — Management applications: regional ideas management — Anticipating and adapting to economic change

Benchmarking

Area — Policy — Company

OPERATIONS MANAGEMENT

Develop management skills — Road maps and action plans — What should a cluster look like — Evaluation

PART III: Operations management

Taking cluster policy forward beyond preliminary work (i.e. implementing the toolkit and beyond) requires considerable planning, effort and skills over the long term. In this final Part to the Blueprint we consider aspects of cluster governance. In chapter 6 we draw on the Blueprint as a whole to summarise the skills needed to take cluster policy forward. In chapter 7 we briefly look at 2 management tools, the Roadmap and the Action Plan. Chapter 8 presents 2 examples of organisational configurations for cluster policy (the Oslo Teknopol model, and Aeriades, an aeronautics cluster in Lorraine). Chapter 9 looks at the question of evaluation.

CHAPTER 6: MANAGEMENT SKILLS

The aim of cluster policy is to improve business performance and especially regional innovation capability. It requires interactive behaviours and the establishment of collaborative institutions and working – we should say *institutions for learning.* Learning refers to the future, of products, technologies and markets.

Cluster thinking provides a policy framework for interactive learning between industry, government and research and education (the triple helix institutions).

The question of 'what role for who, when and why' remains however an important one because the process is lengthy and capabilities must correspond to evolving economic and policy contexts. For example in the launch stage, when collaborative institutions are being set up, there is clearly a role for political leadership (and sometimes large firms) whereas once clusters are in place attention must turn to concrete cluster led actions such as R+D, prototyping, manufacturing, and so on. In cluster policy stakeholders need to be clear about their respective roles:

- **The Firms** are central to the whole process Large firms can play a leading role in the initial stages of a cluster initiative and in defining needs throughout.

- **The Policy-makers** play a catalytic role at the outset; they help establish broad visions and goals, provide legitimacy, management support mechanisms and infrastructures.

- **The HE and research (especially SET) community** plays a supporting role throughout the cluster policy process, they can constitute drivers to innovation networks,

provide knowledge input or more concrete cluster support through providing science park /incubator facilities.

- **The financial sector** provides seed finance or venture capital and business advice, they support the core dynamics of cluster growth, they provide support to start-ups and spin-outs).

- '**The end users**' mean the market (customers and clients). This 'stakeholder' category must not be overlooked. The reader is referred to the diagram in chapter 10 (page 51) which shows just how important end users/customers are and how SI links the triple helix to them.

It is common to find lists of potential cluster participants. What is less common is analysis of the capabilities and skills actors should have in order to be able to engage in cluster policy.

In our experience the ideal skill set of potential cluster stakeholders and professionals varies according to the stage of the process, as shown in the following table.

Capabilities and stages of the cluster building process

Stage of the cluster process	Aims	Skills	Actions
(1) Getting started. Building mutual trust and confidence	Prepare the ground, build, nurture and sustain trust and confidence	Leadership, natural authority, confidence building, willing to challenge the status quo, delegation (enabling) skills. Relational and communicational skills. Awareness at the outset that cluster building is both complicated and time-consuming (patience, commitment, resilience). Excellent knowledge of the region.	Stakeholder identity building, cluster foundation (trailblazing activities).
(2) Creating and formalising strategic linkages	Build institutional bridges, institutionalise collective routines	Excellent regional knowledge and vision. Integrity, managerial and analytical skills. Brokerage, mediation, conflict resolution and communication skills.	Setting up overarching networks, clusters. Obtain a thorough understanding of the region and its clusters by carrying out needs analysis and mapping of clusters and cross-clusters. Knowledge mapping.
(3) Vision, foresight, strategy development	Determine strategy, produce roadmaps, action plans, continuous evaluation (fine-tuned visions).	Analytical and managerial, excellent market and regional knowledge, awareness and vision. Consensus building capability including the use of external moderation and expertise to support the process.	Enable firms with SI. For example use PPP futures tools such as foresight.
(4) Implementation	Improve cluster dynamics: promote new technologies and firm growth, stimulate clustering, secure resources, invest in the cluster asset base.	Managerial, relational, analytical, able to secure resources, technical skills including advanced ICT skills.	Organise relevant seminars and workshops, create observatories, develop R&D centres and stimulate joint projects. Set up incubators, enhance the business support infrastructure (KM). Develop business' own SI capabilities, continue cluster analysis, carry out place marketing using clusters.
(5) Evaluation, sustainability	Continuous policy improvement; provide resources (institutional, human, financial) to the cluster, set up continuous evaluation process at high level in order to rapidly adapt to changing contexts, and needs.	Executive leadership, ability to see the broader picture and significant change processes and re-assess, integrity.	Consensus based (stakeholder) evaluation process.

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Whilst some skills are clearly generic, the specific skills required of the cluster professional vary with the stages of the process. At the different stages there are roles for different stakeholders.

What this means is that a variable geometry approach to who does what and at which stage is required because no single actor possesses all the requisite skills.

Nor is there any single set of tasks or standard recipe in cluster policy.

Clusters should be steered by the private sector (by entrepreneurs, champions) once set up.

Interactions within public private partnership (PPP) processes can usefully follow a flexible *aims/skills/actions* model in which all stakeholders play important roles at different times.
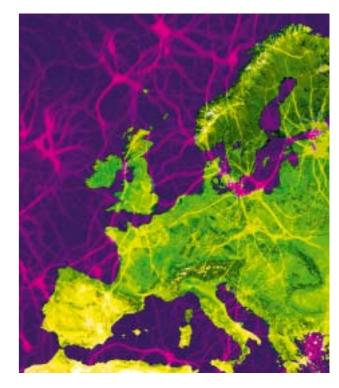
RECOMMENDATION

Ensure a close match between the types of tasks undertaken and the skills sets of actors involved.

CHAPTER 7: ROADMAPS AND ACTION PLANS

Roadmaps were first used in the semiconductor industry as a graphical depiction of a product's technologies extended over a long planning horizon. Roadmaps have since proved useful in the private sector in identifying the key technological inputs necessary to develop new and existing products and have evolved into a strategic management device. 'Product' roadmaps are not simply technology driven but must include an assessment of social (market), of science developments as well as of emerging technologies and their potential applications. A product roadmap will also include analysis of alternative technological solutions and costing.

In a cluster perspective road mapping is similar to foresight although it clearly focuses on the implementation steps needed to get from A to B. The approach is currently used in EU cluster based technological and product development programmes such as Eureka, for example.

Kees Van Mourik, who is Director ITEA, one of the largest Eureka programmes, commented on ITEA's digital software technology road

mapping programme saying, 'A Roadmap is a living document which must respond to change: in the last two years there have been many developments...we need to know what microchip technologies to base our plans on'. ITEA has produced several roadmaps[28].

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A typical roadmap therefore asks simple questions, such as:

'why do this?' (how and where is the market changing? what socio-economic and technological drivers matter? what is our current place in the industry?);

'what is our objective?' (where do we want to be? what are the challenges?);

'how do we get there ?' (what technology inputs are needed?). The Roadmap will normally be linked to an action plan where simple questions such as, 'can we do this in-house or do we need collaborators?' must be answered.

The **first stage** of road mapping is to identify the objectives. Is the objective to identify a completely new product? to improve aspects of an existing product? or is it to switch from one type of technology to another?

The **second stage** is to use strategic intelligence (SI) methods (expert panels and so on) to identify new areas of science, emerging technologies, and changes in markets – these are the parameters which help inform strategic choices.

These two stages are not necessarily chronological and will clearly interact.

The **third stage** is to determine how the objectives can be attained.

The first roadmap will need to be refined and further research can be needed in order to cost an action plan.

The outcome of a road mapping exercise will be a schematic illustrating project actions, milestones and timescales. It will identify the new product, as well as those technologies needed to produce it. The action plan will show how those technologies can be created or acquired.

Roadmaps can attain a high degree of sophistication. However, in a cluster policy perspective and whether the aim is to introduce a horizontal SI capability as under StratinC (phase 1), to develop a new product or devise a training course, they should be kept simple. They offer a means of building consensus amongst the main

stakeholders on objectives, on approach and actions, and on project timescale. Care should be taken to express goals in terms which will be acceptable to stakeholders.

The schematic should: identify main challenges and opportunities, desired destinations, set milestones, and so on. It must remain flexible, as it may be necessary to adjust goals. The timescale should be symbolic.
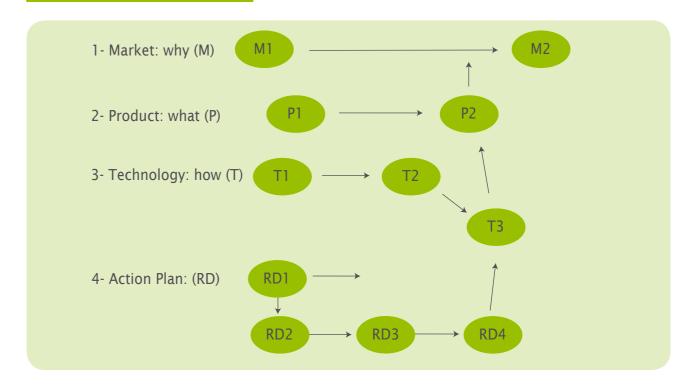
The past should be shown to highlight achievements and the future should focus on what needs to be done in the short term. The short term should be relatively detailed whereas the longer term should remain concise.

Road mapping is a powerful management tool because it coherently signposts objectives with a delivery programme and solutions. As a management tool it offers a high degree of intelligibility making it particularly suited to multi-stakeholder based cluster strategies.

Roadmapping can be carried out by a relatively small group of experts (from science, industry and end users) but in a cluster perspective it is a good idea to involve the main stakeholders in the process.

A simplified product roadmap

In the above schematic the vertical layers represent: (1) 'Market: Why', or how and where the market is changing and analysis of the direction of broad industry level parameters (scientific, socio-economic, and technological drivers, and the firm's current industry position); (2) 'What product?' or in which product market do we want to be?; (3) 'How' relates to what technology inputs are needed to produce the identified new product? (4) 'Action Plan' may begin by planning R+D, as in the schematic, may extend to how to manufacture: (prototyping, production in-house or joint venture?, timeframes, costing and so on).

Illustration box:
From roadmap to action plan, the StratinC case

The policy goal of the StratinC project was to assist SMEs to develop a collective SI capability. The ultimate challenge of course has been to promote foresight and road mapping methods to the wider mass of SMEs, many of which have little capability in these areas and equip them with the basic tools, i.e. SI practices.

The advantage of a roadmap is that it is a formal management tool which clarifies strategic objectives, what to do: when and why to do it. Roadmaps must also integrate user needs and adapt and evolve with them. Action plans in particular should therefore integrate a fine-tuning process. The StratinC action plan is described below:

1. Roundtables. Invite key actors/stakeholders to determine the conceptual framework for the policy, objectives, anticipated results, target groups (sectors), preliminary thinking on methodology/tools (including awareness-raising action).

2. Policy-makers decision n. 1: decision to proceed on the basis of a feasibility study:

3. Feasibility study: the feasibility study can be carried out 'in-house', i.e. through collaboration between stakeholders or through sub-contracting to a consultancy or university. The feasibility study should address the following issues:
  a. Specify objectives (determined by the roundtables)
  b. Analyse cluster and individual stakeholder needs
  c. Analyse current knowledge supply context
  d. Identify knowledge gaps
  e. Specify expected results and target groups
  f. Design operational tools (what technological choices vs feasibility issues?)
  g. Legal framework
  h. Business model: (set up and running costs, user contribution, sustainability)

4. Policy-makers decision n. 2: decision to implement

5. Implementation phase:
  a. Identify management organisation, recruit and train staff
  b. Carry out a pilot phase
  c. First user evaluation – establish an ongoing user evaluation methodology
  d. Fine-tuning
  e. Market to target firms (e.g.: demonstrator road shows)
  f. Implementation using finalised tools

6. In the StratinC case, dissemination of results (internet site, this Blueprint).

7. Evaluation and fine-tuning.

Road mapping: 2 potential difficulties:

1. Technological/product road mapping: Clearly future events and trends in end user needs or technological progress are very hard to predict with confidence. This of course means road mapping must both continuously use the best SI available and remain open, flexible and constantly under review.

2. 'Policy' road mapping: even the best policy planning cannot forsee all possible eventualities and a range of policy related problems can occur. In an earlier chapter we emphasised the need to build consensus and this is important to ensure before setting out to introduce a new policy initiative, but it is also necessary, as the StratinC example shows, to integrate end user oriented fine tuning into the policy process.

RECOMMENDATION

Use road mapping to facilitate consensus based decision-making; keep strategy and actions coordinated and strategically focused; keep it clear, keep it flexible, expect the unexpected, build in fine-tuning.

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CHAPTER 8: WHAT SHOULD A CLUSTER LOOK LIKE?

It is impossible to be prescriptive but examples can be given and certain principles can be highlighted. The particular organisational form a cluster will take depends on: what stakeholders want, the nature of the regional economy, its potential, its strategic objectives, and the nature of particular clusters (sector, industry dynamics, scale and so on) plus, in a practical perspective, the organisational forms legally and administratively possible (including PPP arrangements).

Funding is a complex issue and of importance for PPP initiatives. The regional, national and European levels will all support a PPP based cluster building project, and public funding will be necessary throughout. However, as the Aeriades example (below) illustrates, this can require several years. Careful 'multi-level' financial planning throughout is therefore necessary.

The governance architecture of a cluster must allow for a wide range of business activities, from the strategic to the day-to-day, although capacity will be developed progressively as legitimacy and confidence grow.

Two examples are offered below. First, the cluster policy framework adopted by Oslo Teknopol is presented.
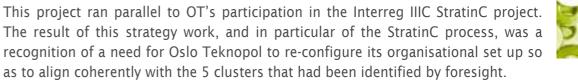
This is followed by the example of the 'Aeriades' aerospace cluster in the Lorraine region of France. These examples are complementary in the sense that the Oslo case highlights the strategic role of a development agency at cross cluster level, whereas the Lorraine case concerns why a single cluster has adopted a specific organisational form.

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Illustration box: Institutional configurations for clusters, the Oslo Teknopol and Lorraine 'Aeriades' cases

Example 1: Oslo Teknopol in Norway
In the Oslo case a large scale foresight project (Hovedstadsprosjektet) was carried out between January and May 2005.

This project ran parallel to OT's participation in the Interreg IIIC StratinC project. The result of this strategy work, and in particular of the StratinC process, was a recognition of a need for Oslo Teknopol to re-configure its organisational set up so as to align coherently with the 5 clusters that had been identified by foresight.
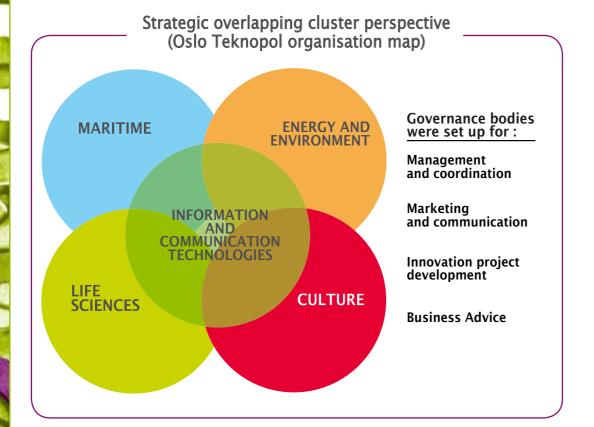
It is important to establish the organisational framework for cluster policy in the weeks following preliminary needs analysis and foresight work, otherwise confidence and trust will quickly ebb away.

The 5 clusters were Maritime, Energy and environment, ICT, Life sciences and Culture. But it was also considered important not to do this in a way which would fragment strategic policy thinking. Simply put, because the interfaces between clusters are potential sources of innovation, a bird's eye perspective on them is needed and this needs to be designed into institutional arrangements.

This led to the adoption of the cluster governance model shown in the following schematic:

**Strategic overlapping cluster perspective
(Oslo Teknopol organisation map)**

MARITIME

ENERGY AND ENVIRONMENT

INFORMATION AND COMMUNICATION TECHNOLOGIES

LIFE SCIENCES

CULTURE

Governance bodies were set up for :

Management and coordination

Marketing and communication

Innovation project development

Business Advice

Example 2: Aeriades: An aeronautics cluster in Lorraine
In a manufacturing based cluster such as Aeriades the main functions include:

- Improvement of knowledge and skills in individual firms and in the wider cluster
- Stakeholder coordination
- Training and KM (for example, e-business, simultaneous engineering, risk sharing, quality control, metrology)
- Collective participation in business events (fairs, trade shows, seminars, forums)
- Strategic 'watch' (technology, regulations and norms, business/e-business, market, customers, etc)
- Increase of investment (in capital, in people)
- Collective adoption of innovative technologies, incremental or breakthrough
- Management of collaborative partnerships between firms and research organisations
- Management of IP issues
- Exchange of practices

Aluminium bronze undercarriage bushes (L.B.I.)

Aeriades was initiated by the Lorraine Regional Council and ARES[29]. Aeriades is a response to the opportunity of emerging markets in the civilian aerospace sector, and a need for diversification in regional firms affected by Defence industry restructuring since 1997. Stakeholders feared that key industrial *Know How* could be lost if no action was taken.

The first stage was to scope the potential for a cluster project. Preliminary work in this regard involved assessing the capabilities of regional SMEs as well as market analysis in terms of demand. Target SMEs were later encouraged to collaborate through presenting a joint stand at the *Le Bourget* Paris Airshow, which was the first major joint project for the target firms.

In the early stages the approach used a 'light touch'. In order to overcome inertia, obtaining strong long-term political support has been crucial. It is however a delicate balancing act to promote clustering without seeking to interfere with firms' routine activities.

The stakeholder cluster process has been based on the principle of business leadership, but with a facilitating and catalysing role played by public authorities. In 2003 stakeholders opted for a strong yet flexible institutional configuration in the form of an SAS[30], that is, a full company status, in which participating firms have a financial stake.

This organisational form was selected in order to guarantee credibility, first and foremost with potential clients such as Airbus. The SAS was only a first step however.

It has also been necessary to obtain the labels necessary to be recognised as 'serious players', which in the aeronautics case in France meant obtaining GIFAS[31] accreditation. In this way the requirements of the target industry, in this case aerospace, have influenced the organisation of the cluster, but also its capability and identity building. This process began in 2001 and was completed only in 2005 when the first contacts from OEMs were made.

Rotor blade module (Fournier SA)*

29 Armée Recherche Economie Science (ARES).
30 In French 'Sociéte par actions simplifiées'. In English, a 'Public Limited Company'.
31 GIFAS is the French aerospace industries association. It has over 240 members, from OEM and system suppliers to small specialist companies.

The SAS structure integrates all the functions necessary to provide a complete complex product to clients, that is, R+D, quality control, and so on. This means a range of regional organisations contribute to the cluster's capabilities.

The SAS also provides a permanent and clear organisational centre which allows efficient and rapid coordination of what are otherwise disparate and independent public and private cluster members.

It also creates international visibility. Aeriades has so far remained a regional initiative, and is based at the regional airport located between Nancy and Metz.

Framework for forming of a reinforcement in honeycomb (Fournier SA)*

In 2002, Aeriades attracted the Welding Technology Institute (L'Institut de Soudure) to set up its Friction Steel Welding workshops on the airport site. This technology, obtained under Licence, is being used to develop an aeronautics manufacturing capability in the region.

The region is also working with partners to develop the capabilities of regional SMEs in other aeronautics relevant technologies. The development of the cluster is in its early stages, but a wider *Grande région* 'Euro-regional' dimension, integrating new partners and new firms, is beginning to emerge.

*The images 1, 2 and 3 represent actual industry products typical of those that the cluster is capable of manufacturing.

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RECOMMENDATION

Keep a strategic 'bird's eye' perspective on the regional economy to identify new clusters, cross cluster opportunities and transversal or common issues; for formal clusters, identify and meet the highest national and international industry standards.

CHAPTER 9: EVALUATION

The evaluation of cluster policy should focus on three areas of policy and its outcomes: (1) strategy (2) effectiveness of policy instruments (3) real economic impact assessment. Reliable evaluation tools are needed in order to design better future strategies.

But evaluation is also needed because the use of public resources must be justified, and as we discussed in Part I Section 3 evaluation can help achieve consensus between stakeholders on what to do. Yet, evaluating cluster policy is not easy for several reasons:

- The need to measure intangible qualitative aspects (connectivity, synergies, trust).

- There is often a lack of available cluster specific regional data.

- The process of obtaining information is costly due the diversity of relevant sources: public stakeholders, companies, clients, technology and skills providers, and so on.

- No two clusters are alike. It is therefore important to develop tailored evaluation methods and indicators.

- Cluster development policies may take a decade or longer to bear fruit. Requirements in terms of the rate of return on public investment must take this into account.

- Realism. Stakeholders should determine whether investing in fashionable sectors (biotechnology, opto-electronics and so on) is appropriate.
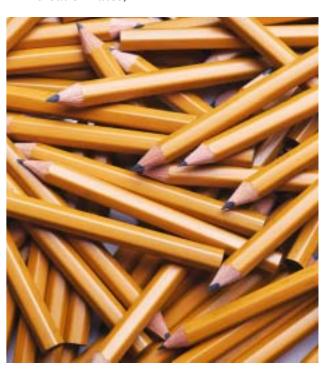
It is therefore necessary to devote time and resources to devise a satisfactory methodology and indicators. There are two levels of evaluation. First, the broader economic level. Here a range of standard indicators can be used to monitor general economic performance.

The following indicators (which is not necessarily an exhaustive list) are accessible and can provide a good overall picture of the performance of a region or well-delineated cluster.

GENERAL EVALUATION

Labour force indicators

- Total number of persons employed
- Attraction of skilled labour
- Investment in skills and training
- Numbers of researchers
- Entrepreneurship, (high-tech company creation rates)

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Economic indicators

- Total net turnover
- Total gross added value
- Financial-growth: use and availability of equity, of seed and venture capital, of business angels, of loan guarantees, and so on.

Innovation indicators

- Density of innovating firms (R+D, etc)
- Expenditure on technology (investment on equipment, in-house or outsourced R&D, etc)
- Expenditure on industrial design
- Licenses, technological advice obtained Investment in marketing
- IPR applications (Patents)

Internationalisation

- Export volumes (rates of change)
- Outward investment
- Inward FDI, % foreign firms in the cluster

Similarly, the innovation policy work of the European Commission provides information on innovation evaluation methodology and indicators. This is available at www.cordis.lu/innovation/en/policy/home.html and includes details from the bi-annual community innovation survey (CIS), the Innobarometer survey and Innovation scoreboard with 26 indicators grouped into 5 themes: Innovation drivers, Knowledge creation, Innovation and Entrepreneurship, Application, and Intellectual property.

A useful source of background reading on the evaluation of cluster policy is also available at http://trendchart.cordis.lu/reports/documents/TR_clusters_03_1.pdf.
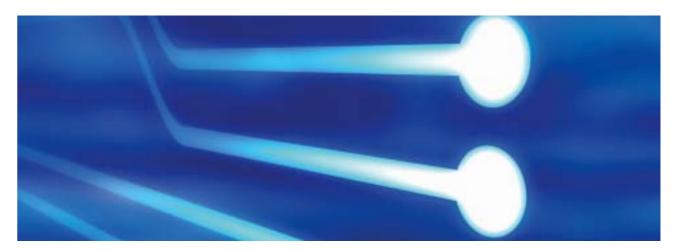
■ TAILORED EVALUATION

Because clusters are unique, it is prudent to assume that there is no 'one-size-fits-all' methodology or set of indicators. Over and above the generic indicators suggested above, each cluster should design its own tailored evaluation techniques and indicators with reference to its own context, strategy and objectives and even timescales.

These techniques and indicators should be designed to provide clear evidence both for the internal evaluation of the clusters themselves (to inform policy fine tuning, new policies), and for sponsoring authorities.

Economic performance:

Competitiveness (direct value added, and so on) at the industry level is easily measured but should not be the only consideration. The impact on the wider economic and social fabric is also relevant.

Innovation performance:

Evaluate the capacity of the cluster to use and exploit knowledge. This means measuring new product rates, the rate of introduction of new processes or new organisational models, and also measuring new approaches to sales and marketing, outsourcing and so on.

The knowledge flows underpinning business innovation should also be measured (internal and external linkages, knowledge diffusion and so on).

Learn to learn:

Clusters must continually and collectively evaluate their status and activities. It is necessary for leading cluster stakeholders to be able to stand back and assess whether change is needed, and this can sometimes be difficult because stakeholders are often very close to the process.
As we indicated in the table page 38, cluster evaluation must be a consensus based activity. There are practical ways to get a new view on the situation. One is simply to repeat Foresight exercises as this will use sound methodologies including professional moderation to come to consensual conclusions. The regular use of Foresight is therefore a good measure of a cluster's learning capacity.

■ CAPACITY TO CHANGE

Whilst tailored evaluation is clearly appropriate, benchmarking, which was discussed in Chapter 5, can also be deployed as an evaluation or learning tool.

For example, it may be useful to compare firms within an industry which are part of a target cluster, with firms in the same industry but which are not in the cluster. It is also useful to carry out longitudinal studies of a cluster over sufficiently long time scales.
An important capability of a cluster is its ability to develop the collective learning routines which enable it to react efficiently to a changing environment. Cluster policy should therefore seek to stimulate learning capabilities.

In terms of evaluation, this must consider the extent to which policy modifies the conditions for learning between companies and across the wider cluster, region or industry (especially between triple helix stakeholders, see SI schematic in Chapter 10). Indicators can include the patterns of use of Foresight, benchmarking or external expertise as well as nature and levels of stakeholder interaction.

RECOMMENDATION

Determine an evaluation strategy with stakeholders in advance.

CHAPTER 10: SUMMARY AND KEY MESSAGES

Strategic intelligence is clearly important at every stage of cluster building. As an economic development tool it not only fosters a climate of confidence at the moment of first contact with firms, but also reinforces the links between the three most important innovation stakeholder groups: firms, SET institutions, and public governance bodies.

In addition, it stimulates interest in futures work which is the springboard for other cluster policy activities, including the constant evaluation of new objectives. Consequently, strategic intelligence constitutes the basis of interactive learning. In other words, it is the activity which connects the partners of the triple helix with the market or the customer (see diagram on page 51).

Progressively, through the use of strategic intelligence practices, the needs of single firms will cease to be the only focus and collaborative cluster working involving relevant stakeholders around next generation products and customers will emerge. The difficulty facing the cluster professional concerns how to catalyse and foster this process.

Clusters cannot be imposed by policy fiat, they must be founded on the initiatives of firms themselves. It is therefore necessary to frame cluster policy within an evolutionary triple helix model[32], rather than to see clusters as an emanation of public policy.

Through deploying the SI toolkit and by applying the principles of intelligent governance, those responsible for cluster policy play a supportive and catalytic role.
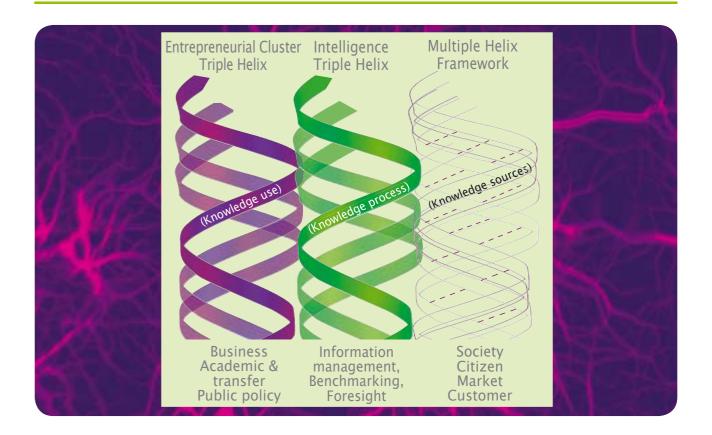
This is of course a fundamental role in cluster building and activities, yet it is not easy because it is a role which requires high-level managerial, relational and technical skills.

A further difficulty is in achieving the right balance between collaborative (inter-firm) and individual (single firm) oriented policy actions: here, intelligent cluster policy should both encourage firms to develop their strategic vision, their capabilities and their willingness to collaborate and enable them to perform better individually. This cluster approach is known as "co-opetition" (cooperation and competition).

32 A Business-led triple helix.

Strategic Intelligence:
is the triple helix the missing link between the entrepreneurial cluster, Society and Market?"

Entrepreneurial Cluster Triple Helix — Intelligence Triple Helix — Multiple Helix Framework

(Knowledge use) — (Knowledge process) — (Knowledge sources)

Business Academic & transfer Public policy — Information management, Benchmarking, Foresight — Society Citizen Market Customer
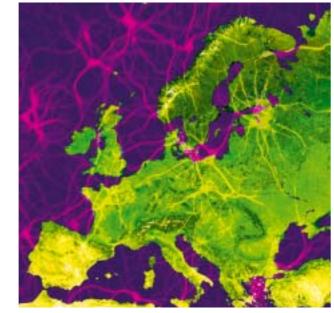
StratinC's 10 core messages

1. Understand why strategic intelligence matters for cluster policy

2. Know your region, understand and develop your own capabilities

3. Before and whilst acting, seek consensus

4. Deploy the strategic intelligence toolkit

5. Stay focused on the needs of firms, be flexible, be a good listener; evaluate

6. Develop soft institutions and partnerships; create and nurture the conditions for collaboration; support strong cluster partnerships where they emerge

7. Prepare for the long run; maintain momentum

8. Do not underestimate the need to respect stakeholders' own objectives and working timescales

9. Ensure that cluster professionals have the requisite inter-personal and technical skills

10. Share your experiences with the economic development community !

StratinC has demonstrated its value as a project supported by the EU's regional policy programme.

The authors of this document are convinced that, in the long term, strategic intelligence and intelligent public private partnerships (PPPs) are necessary cluster building tools.

This is a living document, and part of an ongoing dialogue between professionals working in the field of European regional economic development. Constructive comments would be most welcome.

EPILOGUE:
AN UPDATE ON STRATINC PARTNERS SI ACTIVITIES

CURRENT PARTNER ACTIVITIES

Region of Central Macedonia, Greece

Central Macedonia is situated in Northern Greece and has a strategic position in the EU as its neighbours include the Balkans and Eastern Europe. It is a dynamic industrial region with a population of circa 1.8 million. Its main industrial sectors include: food and beverage, furniture, metal products, chemicals, medical services, and ICTs. The region has a strong HE and research base, with two Universities, two Technical Educational Institutes, and the Centre of Research and Technology Development, a number of business incubators, and a Technology Park.

In StratinC the Region of Central Macedonia cooperated with the Urban and Regional Innovation Research Unit (URENIO), a research lab at the Aristotle University of Thessaloniki. URENIO's research focuses on regions whose economic development is based on technological innovation. Our main research interest is in the cities and regions of innovation, including innovative clusters, technopoles and science parks; regional innovation systems and strategies; innovation management methods and tools; and digital innovation spaces. URENIO is involved in the European R&D framework programme and in the Innovative Actions programme run by the European Commission's Regional Policy Directorate. Our recent research has focused on intelligent cities and regional intelligence, which includes innovative clusters, learning institutions, and digital innovation spaces.

Zenit, Northrhine Westphalia Germany

NRW is the largest German Land. The StratinC project targeted the New Materials sector (which studies show is a growth sector but which currently lacks international visibility) and was managed by ZENIT, the regional development agency with essential support from the target sector's representative association NeMa (New Materials).

StratinC, it was hoped, would complement existing attempts by ZENIT to support this fragmented but significant (more than 10,000 firms, and over 70 % SMEs) materials cluster in the region. Needs analysis for StratinC was conducted in early 2004 with the help of NeMa. This flagged up a need for assistance with developing an SI system (with 61% of interviewed firms). Yet this project has not been taken forward because from April 2005 NeMa has had organisational difficulties and on top of this political changes in the summer of 2005 led to a moratorium on new policies towards the new materials sector.

Until new priorities are set, limits in public sector finance will continue to hold back progress. Nevertheless, ZENIT is seeking a private sector partner, in the form of a leading large firm in the region to reanimate the StratinC tool.

Info, Murcia, Spain

The fruit juice sector in Spain remains largely Spanish owned. Murcia is home to 27 out of the 70 firms nationally in this industry. In the 27 are both extraction and production/packaging oriented firms.
INFO, the Regional Development Agency in Murcia, carried out a cluster SI needs analysis under the StratinC project which established that an information supply need existed, notably in regards of norms and regulations, market information and technology. The aim of StratinC was therefore to introduce a common internet based information tool and this has been successfully introduced. It is available in Spanish at http://zumos.ctnc.es.
This site is a sub-domain of the Canned Food Technology Center (CTC) portal.

The CTC has been the main actor in the introduction of an SI capability in the fruit juice industry due its close links with the R&D departments of the main producers.

Through StratinC INFO has gained a crucial SI capability and has also learned key practical lessons relating the supply of intelligence. These include the need to process intelligence so that it is tailored to specific needs, to ensure that intelligence is complete in itself and well referenced (firms are than able to follow-up without support).

These straightforward questions are fundamental as they highlight the need for policy makers (suppliers) and firms/other users to co-develop SI tools, that is, top down supply without a mutual understanding on what to look for is insufficient.

As a result of its experience with StratinC, INFO is currently leading in Murcia on the updating of the existing regional Strategic Information system for the regional network of ten technology centres (TCs). The experiences gained in StratinC are in this way being mainstreamed and applied to other industries covered by the TC network.

Oslo Teknopol, Norway

The biotechnology industry constitutes a major long-term (post oil) diversification aim for Norway. However, due to geography and late mover disadvantage the development of the Norwegian industry will be within a wider Scandinavian cluster (including Norway, Sweden and Denmark – the latter having already established the Medicon Valley label).

The industry in Norway is fragmented and there are over 30 public or semi public agencies. It has been impossible therefore for OT to introduce a new internet based platform, instead SI work has progressed in collaboration with an existing site under development by MedCoast Scandinavia, a Swedish/Norwegian networking organisation.

However, due to the reluctance of firms to share information ambitions for StratinC had to be scaled down and in effect the site contains the Scandinavian Life Sciences Database (SLCD). On the positive side the StratinC project has, unintentionally, created a meeting place for regional stakeholders, which had been lacking.

Moreover, the StratinC process has helped create an awareness of the strengths and weaknesses of the Norwegian (Oslo region) biotechnology cluster, and significantly the need, noted above, to establish a wider collaborative Scandinavian project.

Lorraine Regional Council, France

Strategic intelligence is increasingly seen as the foundation of innovation policy by the region. In order to embed this practice the Lorraine region is currently engaged in developing and extending its SI business support programme.

DECiLOR, helps 9 selected regionally significant sectors achieve an independent SI capability. In addition to this the regional Relie[33] network (Regional Network of Economic Intelligence) now provides SI support to all regional firms and DECiLOR provides support to the two recently labelled competitiveness clusters in Lorraine: MIPI (Innovative Materials – Metallic – Smart Solutions) and NFGE (natural fibres, textile, wood, pulp and paper).

Lorraine has also supported a Knowledge Management pilot in the wood products industry sector as detailed in this Blueprint. Il has also supported a KM exercise for energing medical devices clusters in the region. In France, Lorraine has pioneered SI through DECiLOR, and other French regions are today taking an interest in the DECiLOR experience.

StratinC increased the awareness of European policy makers of Lorraine and its Decilor initiative and also confirmed the importance of benchmarking and foresight as pillars of innovation and knowledge based governance.

33 A regional economic intelligence support network.

THE TEAM INVOLVED IN THE PROJECT STRATINC IS:

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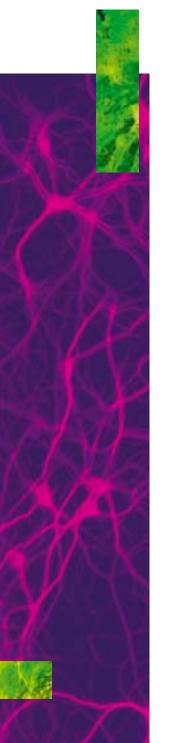**Mancommunidad del Norte de Tenerife**
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This project benefited from the expertise of:

- Michel LACAVE, Lacave Allemand & Associés Consultant, StratrinC scientific committee manager;
- Mireille LACAVE-ALLEMAND, Lacave Allemand & Associés Consultant, StratinC process consultant;
- Alasdair REID, Director of Technopolis Group Office in Brussels, evaluation consultant.

Thanks to the efforts of this team, the blueprint is published simultaneously in English, French, German and Spanish.
STRATINC sponsored events to raise awareness on foresight and benchmarking.
The following persons took part in these events:

- Ali BAYAR, Professor, Free University of Brussels;
- Martin EICHLER, Economist, BAK Basel Economics;
- Berit JOHNE, Special Advisor for the National Research Council Norway;
- Castulus KOLO, Consultant 'Consulting, Training, Research';
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lorraine
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Oslo Teknopol IKS
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Germany

Mancomunidad del
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Community of North Tenerife
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ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΕΡΙΦΕΡΕΙΑ ΚΕΝΤΡΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ

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