



# IMPROVING THE CLUSTER INFRASTRUCTURE THROUGH POLICY ACTIONS

Produced by the CLUNET-European  
Cluster Alliance consortium of partners

June 2009





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## 1. Executive Summary

### Improving the Cluster Infrastructure through Cluster Policy

Clusters are increasingly perceived as an important instrument to foster innovation, competitiveness and regional economic growth, so much so that cluster co-operation between EU Member States is anticipated to leverage internationalisation efforts that in turn will accelerate the development of world class clusters in Europe. To this end the European Commission is embracing cluster development and cluster policy issues as a main driver to improving cluster competitiveness and innovation thus enabling better trans-national linkages with other clusters in Europe and globally.

The 4 INNO-Net projects funded by the European Commission began the work of cluster innovation, policy networking, incubation, internationalisation and funding mechanisms. Leading from that work the EC formed the European Cluster Alliance (ECA) to progress an additional 4 working areas related to clusters and cluster policy including economic impact measures, financial resource identification, cluster infrastructure and policy and mapping and analysis of cluster activity.

This report considers the area of improving cluster infrastructure through cluster policy and it has been produced in the true spirit of collaboration by partners in the CLUNET INNO-Net project, together with a number of associate members of the ECA. It has been prepared and collated by the CLUNET lead partner: The Northwest Development Agency, UK, after extensive consultation and two partnership meetings held during the broader ECA meetings that took place in Sophia Antipolis (November 2008) and Copenhagen (May 2009).

The report puts forward and tests with the partners a cluster support environment model that is not a "one size fits all" model but one that can be tailored, developed in part or in totality for regions either embarking on cluster development in its infancy or looking to move forward to a more mature cluster policy.

Models for cluster internationalisation, innovation and Intellectual Property Rights (IPR) and Technology Transfer are also suggested in the report to enable trans-national linkages within Europe and beyond. Comprehensive examples of Case Studies from partners are also provided as supporting evidence for the models proposed.

The report can be used as a baseline for regional cluster policy best practice on support environments, internationalisation, innovation and IPR and Technology Transfer but above all it is a dynamic living document that can and should be tailored to and supplemented by individual regional requirements.





## 2. Background

### 2.1 Introduction to Cluster Policy

Clusters are increasingly perceived as an important instrument to foster innovation, competitiveness and economic growth in Europe. Although cluster development is primarily the responsibility of individual Member States and their regions, transnational activities between different stakeholders aiming to explore synergies between regional or national efforts can be handled at European Community level. Such cooperation will leverage clusters' internationalisation efforts and accelerate the pace of the development of world-class clusters in the coming years in Europe. It is also recognized that clusters cannot be created but develop in response to new market opportunities driven by the existing strengths in businesses and knowledge within a region. Clusters need to be innovative and are found to work more effectively with transnational linkages and cooperative collaboration with other clusters either in Europe or globally. To this end there is little doubt that the European Commission is embracing cluster development and cluster policy issues as a main driver in improving the competitiveness of clusters in Europe.

The Commission Communication: Towards more world-class clusters in the European Union: implementing the broad-based strategy for innovation <sup>1</sup> highlighted the need for a more targeted approach to facilitate the development of more world-class clusters in Europe that will have the critical mass, innovation capacity and international linkages to successfully compete in global markets. Striving for excellence at policy and business level is considered to be the key for the development of more world-class clusters in Europe. This includes better and more effective cluster policies as well as the need for raising the professionalism of cluster organisations, improving the integration of SMEs into clusters and promoting the cooperation between cluster organisations.

Cooperation between cluster organisations, including both trans-national cooperation within the EU and international cooperation with partners outside the EU, is an important element of the overall EU strategy for accelerating the emergence of more world-class clusters in Europe. Although trans-national cooperation is currently supported by several EU programmes, international cluster cooperation is not yet sufficiently tackled. This challenge still needs to be properly addressed in order to raise cluster excellence in Europe. The basic assumption behind this is that no cluster is excellent in all areas and in whatever is needed to safeguard innovation and global competitiveness. Although necessary, trans-national cooperation may not be sufficient to keep the level and pace of innovation high enough to compete with the "best in class".

As a result of the globalisation of markets, partnering and collaboration efforts become increasingly international. Cluster managers are more and more faced with the challenge to find excellence outside their own cluster. Indeed, clusters – just like small or large companies – are forced to look for and acquire complementary skills





wherever they are available, even if they are located far away. Products, technologies and services created by cluster firms become more and more complex and increasingly require different competences for their design and production that very often cannot all be found within the boundaries of a cluster. Moreover, as competition for excellent products and services is increasing worldwide, cluster firms are forced to use the latest technologies and best know-how available, which often may only be found outside the cluster. Access to foreign markets is also an important component of the competitive advantage of a cluster and a driving factor for its critical mass, especially when compared to local-focused clusters. All this pushes clusters to look for strategic partnerships, which will allow them to reinforce their business position in the global market.

Although there is a clear case for international cluster cooperation, in practice only relatively few clusters have strong international links. In fact, the request for better cooperation support between clusters ranks high on the list of cluster firms for improved activities.

Although cluster cooperation at international level is not yet sufficiently developed in EU countries, much cooperation between clusters takes place at EU level. This is often supported by EU programmes such as the Interreg programme under the EU Cohesion Policy, the Regions of Knowledge initiative of the Research Framework Programme and the Europe INNOVA initiative funded under the Competitiveness and Innovation Programme (CIP). These initiatives have resulted in many networking activities between clusters within the EU that have already shown some first promising results. The next challenge in this area is to move from mere networking activities to true partnerships that help clusters to innovate faster and strengthen their market position. This is the motivation behind the new concept of Europe INNOVA that will support only those cluster partnerships under the “European Innovation Platform for Clusters” that engage in concrete partnership schemes. These efforts will be facilitated by the European Cluster Observatory which will provide more and better information about clusters and cluster organisations, both within and without the EU.

In addition, the CLUNET project supported under PRO INNO Europe® (see 2.3) has clearly demonstrated the potential of such international collaboration at policy level by engaging Canada’s Montreal Metropolitan Community as a partner in the project which has led to an intense cluster policy dialogue with Canadian public authorities. A lesson to be learned from this effort is that international cluster cooperation should have a clear added value to the engaged regions if it is to be fully supported at political level.

## 2.2 INNO-Nets and the European Cluster Alliance (ECA)

To promote policy cooperation between public authorities in Member States that are responsible for designing and/or managing cluster programmes, the European Commission launched a call for proposals in 2006 and selected 4 INNO-Net projects:-





P1 Baltic Sea Region Innovation Network (BSR InnoNet), led by Nordic Innovation Centre, Norway

P2 Central and Eastern European Cluster and Network Area (CEE-ClusterNetwork), led by TMG m.b.H., Austria

P3 Cluster policy networking and exchange via the themes of internationalisation and incubation (CLUNET), led by the Northwest Development Agency (NWDA), UK

P4 Networking of national/regional funding and innovation organisations for the involvement of SMEs in technology-based innovation clusters in Europe (INNET), led by OSEO, France

The work of these projects, started in September 2006 for 3 years, consisted, at a first stage, of exchanging information about cluster programmes, clusters' specific needs for policy actions, and identifying areas for developing joint actions. At a second stage, they aim at designing, and in some cases implementing, the joint actions previously identified and developed. The principal goal of this work is to bring cluster programmes closer together by developing a number of common instruments that will allow clusters to better cooperate between them.

They are currently funded under the PRO-INNO Europe initiative managed by Directorate General Enterprise and Industry and come together under the name of the European Cluster Alliance (ECA). Altogether, 55 regional and national actors from 22 Member States, Candidate and Associated Countries work together in this initiative, covering different domains of competence and experience.

The main objectives of the PRO INNO European Cluster Alliance are:

- § To provide an open platform for discussion on trans-national cooperation between cluster policies in Europe
- § To facilitate mutual policy learning and to develop and share strategic knowledge for further cluster development in Europe
- § To strengthen the political commitment to better integrate the European dimension into regional and national cluster development and to facilitate trans-national cooperation

In pursuit of these objectives, cluster policy makers supported by the PRO INNO European Cluster Alliance have also published a PRO INNO Europe Cluster Memorandum identifying areas of common interest for future cooperation. In particular, the Cluster Memorandum has political agreement of the involved parties to work closely together at strategic level in the area of cluster policy. This trans-national cooperation includes actions such as sharing information on successful practices in support of clusters, methodologies and instruments for the evaluation of the impact of cluster policies, as well as agreements encouraging trans-national cooperation between clusters.







At the 4<sup>th</sup> Competitiveness Clusters Forum in Sophia Antipolis, November 2008, the European Commission also announced their intention of forming a European Cluster Policy Group representing high level policy makers, businesses and higher education institutions with a scope and objective to share intelligence about cluster policies and to further explore how to better assist member states in supporting the emergence of world class clusters in the EU.

### 2.3 CLUNET - Cluster Policy Networking and Exchange via the Themes of Internationalisation and Incubation

The key objectives of the CLUNET Project are:

- § To identify the range of policy actors and programmes supporting the most dynamic and growing clusters amongst the 60+ CLUNET clusters through policies for SME internationalisation and incubation.
- § To learn from and exchange best practice between partners and develop realistic policy tools that take account of in-country administrative and legal barriers and the needs of businesses
- § To design and implement a number of concrete pilot cross border cooperation initiatives to support cluster growth and innovation.
- § To develop a sustainable cluster development initiative amongst CLUNET partners and put in place appropriate best practice dissemination tools to promote better knowledge amongst policy makers.

CLUNET has brought together a critical mass of fourteen partners from all four corners of Europe and North America to share and exchange experiences regarding their cluster innovation and development policies. Together they represent some of Europe's leading innovation policy makers and opinion shapers and represent over sixty world class clusters. To rise to the challenge and ambitions of the EU INNOV 9 Strand 1 call the CLUNET project partners decided to invite a leading economic representative from North America to the partnership (Montreal MMC: the lead region in a network of 22 North American cluster city/regions) to ensure access to some of the best and latest policy and project practice concerning the development of competitive clusters across the globe.

A particular focus of the project is on the identification of policies that support fast growing clusters through such themes as the internationalisation of cluster SMEs and incubation resulting in a report on cluster best practices. These have provided the scope for defining between 6-8 joint and concrete trans-national policy and project initiatives. The cluster focus of CLUNET provides both diversity (various sectors) and a clear focus for policy actors upon which to act. The main policy actors in many European countries concerning cluster development are to be found at the regional level. National policies, where they exist (for example the Poles de Compétitivité in France) are rare and given the priorities for many regions in terms of job creation, business competitiveness and improved leverage of regional RTD resources it is not surprising to find cluster innovation policies at the heart of regional innovation strategies. Clusters themselves are not new and are covered by a diverse literature



(Porter, Cooke, Keeble etc) much of which points to the central role played by regional innovation policy actors. It is for these reasons that the fourteen CLUNET partners, all of whom are leading regional cluster policy actors, believe that clusters are a unifying policy tool for European innovation stakeholders and that they can form the basis of a common policy language amongst regional partners and stimulate sustainable trans- national policy cooperation and supporting SMEs.

Regional cluster policy actors form the bedrock of the CLUNET consortium and the partners have sought to build on the experience gained in many other relevant EU and national programmes linked to innovation and clusters. One of the weaknesses identified by regional cluster policy actors is that although clusters are given a high priority they are not always fully integrated into the regional innovation context. Two aspects which are frequently identified <sup>2</sup> are policies related to cluster growth through SME internationalisation tools and incubation support suitable for use within the specific context of cluster innovation and support policies.

CLUNET's innovation objectives within the field of cluster growth policy have focussed therefore on two sub themes: SME internationalisation and incubation support which were identified as two key innovation policy areas by the PAXIS projects and in Trend Chart activities. By focussing on these innovation objectives CLUNET partners have embedded the cluster policy both within their region, at a European and at an international level. Reducing the isolation of these innovation themes enables policy makers to develop "joined up and integrated regional innovation strategies" improving the competitiveness and coherence of these key economic development initiatives- the "Innovation Policy Continuum" (Fig 1). PAXIS and Gate2Growth highlighted the role of networks as catalysts to the innovation process, paving the ground for growth and competitiveness. EC and OECD findings show that regions - and within regions, technological clusters - constitute the central rungs on the innovation dynamics ladder and the EC has recognised the innovative potential of these clusters. By "networking the clusters", CLUNET focuses on the specific challenges and opportunities faced by clusters. CLUNET conclusions will be applicable to a much wider range of clusters and hence contribute to the needs of the European knowledge economy and industrial dynamics.

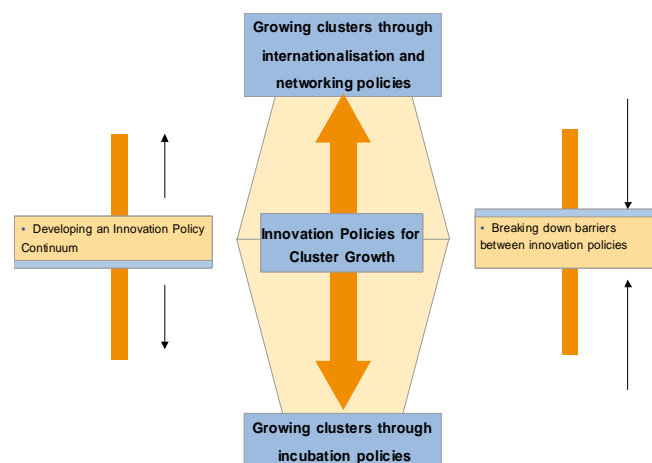


Fig 1: The Innovation Policy Continuum





### 3. ECA Project 3: Improving the Cluster Infrastructure Through Cluster Policy

In the Autumn of 2007 the European Commission ( DG Enterprise and Industry) proposed 4 working areas within the INNO-Nets related to clusters and cluster policies:-

§ Measuring the economic impact of cluster policies and programmes:

The development, testing and validation of a methodology for assessing the impact of cluster policies and programmes on the economic development of a region (or a state); led by BSR

§ Identifying financial resources to support Cluster Policies:

The identification of the financial sources in the Member States as well as at Community level that can be combined to fund cluster policy activities; led by INNET

§ Improving the Cluster Infrastructure Through Cluster Policy:

The identification of the different elements that constitute the ideal innovation infrastructure for cluster development and the policies that can support it; led by CLUNET

§ Identifying the Main Objectives and activities of European Cluster Programmes:

The mapping and analysis of the principal objectives and activities of the cluster programmes and policies developed in Europe during the last years; led by CEE

In addition to the 4 original INNO-Net partnerships, the European Commission extended the ECA to include associate members consisting of public organisations or any network of such organisations dealing with the development and/or management of cluster policies and programmes not currently involved in the Alliance's community. Each associate member is required to sign a Partnership Agreement (Appendix 1) as a Memorandum of Understanding defining mutual rights and obligations for cluster initiatives associated to the European Cluster Alliance (ECA). Signatories of the ECA Partnership Agreement are committed to contribute to the objectives of the ECA and to participate, in fields of mutual interest, in its activities. The ECA Partnership Agreement expresses the willingness to work closely together, wherever possible and opportune, at European level, by sharing information and joining forces.

The leadership of the working area "Improving the Cluster Infrastructure through Cluster Policy" was offered to CLUNET given its ongoing activities in the field of cluster policy via internationalisation and incubation.



### 3.1 Aims and Objectives

The aim of the working area is to identify the different elements that constitute the ideal innovation infrastructure for cluster development and the policies that can support it. The objectives are to develop a generic model for the physical infrastructure which might be needed by the businesses within a cluster and to develop checklists for individual types of infrastructure based on best practice from facilities in the partner regions for the project and other regions.

### 3.2 Methodology

In order to gain a wider perspective for the project the CLUNET led partnership was extended by adding partners from the other 3 INNO-Nets and expanded further by including the ECA Associates interested in this particular field of work. A full partner list is available in Appendix 2. This document is the result of the work completed by this extended partnership and aims at providing a guide for policy makers on how to develop an efficient cluster infrastructure with specific emphasis on internationalisation and innovation. Thus serving as a key input from which recommendations to the European Commission can be made for future support. The four working areas of the project are:

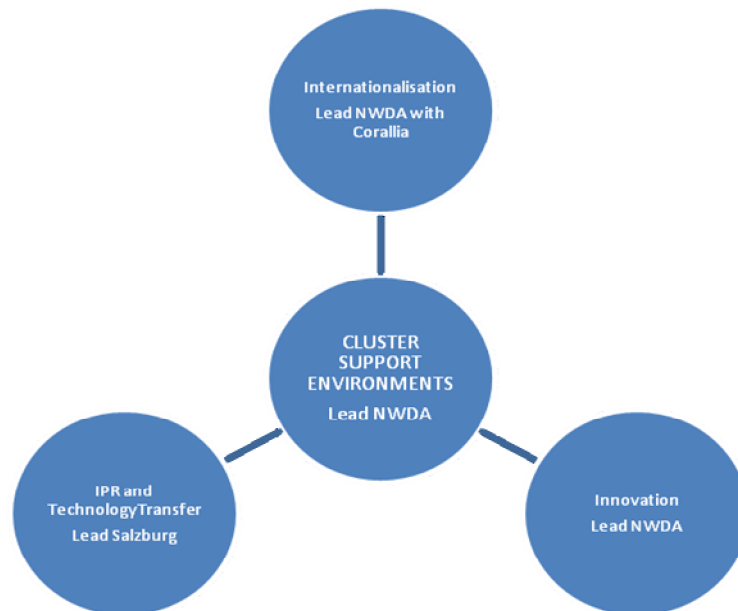


Fig 2: ECA Project-4 working areas

In each working area the methodology employed was:-

- § Project mapping and the preparation of a workplan based on a template (Appendix 3)
- § Case studies from partners
- § A workshop with all interested partners or a questionnaire

- § Analysis of results
- § Draft Report for discussion
- § Integration into this final collated document

### 3.3 Cluster Support Environments

#### 3.3.1 Overview

Cluster development is mainly concerned with encouraging networking and collaborations. The effective exchange of information and the building of trust between individuals and organisations are crucial. As the cluster grows there can be a demand for certain types of infrastructure:

- § Premises where businesses can locate e.g. Incubators and science parks
- § Facilities for use on a short term basis (Business Technology Centres) e.g. pilot plants and demonstrators

Equally it is recognised that:

- § Businesses using the infrastructure will need generic and specialised business support
- § Businesses will benefit from collaborations with the other businesses using the infrastructure

#### 3.3.2 Cluster Support Environments model

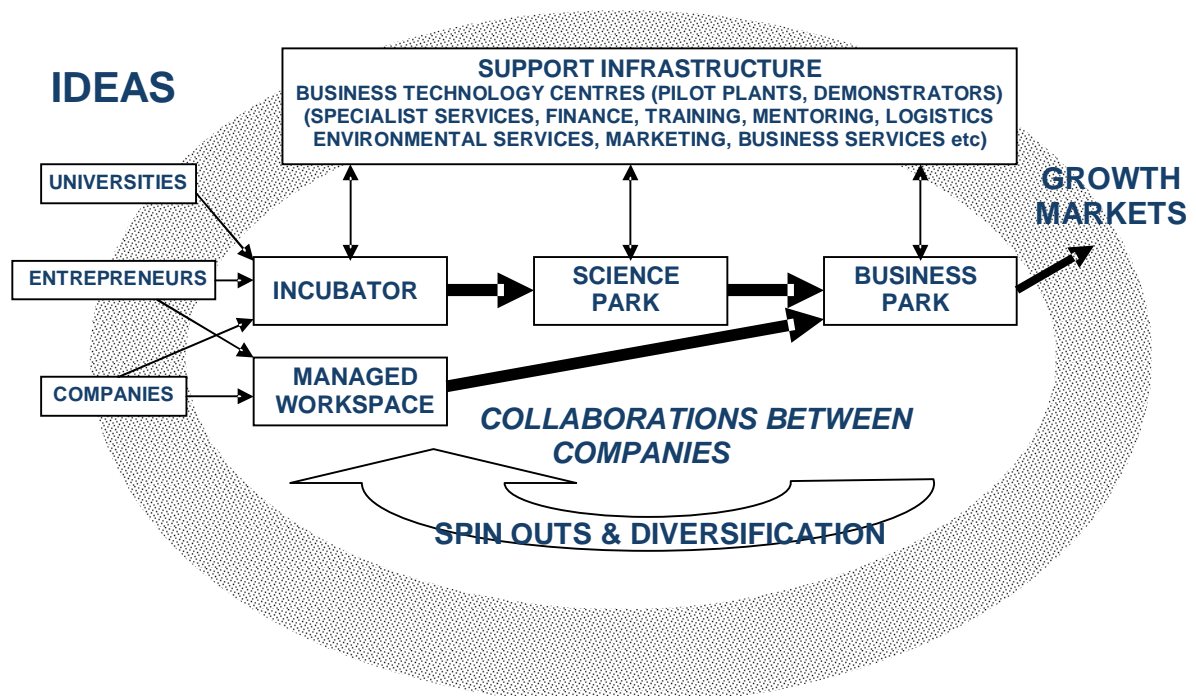


Fig 3: CSE Model



The Cluster Support Environments (CSE) model considers the physical infrastructure requirements of a cluster. Whilst all clusters are different and the specific mix of infrastructure will therefore vary, there are several generic types of infrastructure that might be present. The model considers the premises that businesses need at various stages of growth, including spin-outs and diversification from large businesses. It also considers the specialist facilities that businesses may need to use on a short term basis to develop new products and processes.

A cluster will grow both by the expansion of existing businesses through growth in the markets for their products and services, and by the creation of new businesses. These new businesses can come from spin-outs from universities and existing businesses within the cluster, diversification from large businesses, local entrepreneurs and from inward investment.

At the various stages in the growth of a business it will need different types of premises and related business support. Start-up businesses may either require space in an incubator or in managed workspace depending on the technical complexity of the business and the cost of the specialist equipment and facilities needed for the early growth phase. As a business becomes successful and expands it will need to move to larger premises and may have less need for specialist equipment to be provided as part of the location package. Again depending on the technical complexity of the business it may need to move to a grow-on facility and then to a science park before locating on a business park. Businesses with less technical requirements may be able to move straight to a business park.

What is essential when considering the needs of businesses in a particular cluster is to ensure that access to the right combination of the different types of premises is available in the right locations within the boundaries of the cluster. This will enable businesses to remain within the cluster as they grow and expand. At various points in business growth access may be needed to specialist support infrastructures. This may be by the establishment of Business Technology Centres which might include; pilot plants, demonstrators, specialist equipment, specialist IT equipment, etc. These are not facilities where a business will locate, but ones that the business will use for a short period of time, typically a few weeks. The facility may also provide a range of specialist support services as well as providing links to more general business support provision. However, due to the high cost of these types of facilities and the need to ensure a high level of utilisation it may be more appropriate to develop links with Business Technology Centres in other regions.

There are significant differences between regions in particular: the size of the region, the size of the clusters within the region, the degree of specialisation in the region and the governance structures of the region and the clusters. These will all influence the physical infrastructure which is needed and the degree to which this may be focussed on a particular cluster.

For all types of CSE the network associated with the facility is crucial and needs to be linked to the wider cluster network. Providing appropriate business support to the





tenant companies is vital. Generic business support should be provided by mainstream services which do not have to be located on site. Specialist business support can be provided by specialist businesses located within the facility or by specialists located nearby.

### 3.3.2.1 Incubators / Innovation Centres

The South West Regional Development Agency (SWRDA) in South West England produced a Guidance document on the Development of Incubation Projects in 2007<sup>3</sup>. This document makes use of best practice guides on incubation and science parks produced by UK Business Incubation and UK Science Parks Association<sup>4</sup>.

The Guidance stresses the importance of the leadership and management of the incubator plus developing the network associated with the incubator. It states that all successful incubation projects have these key attributes:

- § The incubation team and its leader are entrepreneurial, visible, actively contributing to local (regional, national) economic development; respected by business leaders, investors and knowledge workers
- § The team actively creates and maintains a large diverse network and works well with other business support programmes and collaborates with other incubators
- § Client survival, growth and graduation rates are high and clients remain in the network when they leave the programme;
- § The incubator is a sustainable business in its own right

In addition the Guidance states that "in practice, most incubators are called Innovation Centres, since many businesses dislike the incubation label and its implication that they are "fledgling" or "budding" businesses in need of assistance.

The target client groups for this type of incubator facility will be:

- § Businesses ranging from pre-incorporation to those with up to twenty employees; client growth aspirations normally are greater than 30% per annum
- § Innovative businesses (SMEs) and clusters
- § Business creation and growth in disadvantaged groups and communities;
- § Start-up businesses
- § Spin outs from universities
- § Overseas Inward investment businesses
- § Knowledge base

Key success factors for an incubator include:

- § The occupancy rate and the number of successful companies that eventually leave the incubator to grow further elsewhere
- § Ready access to relevant academic expertise is vital. Incubators should therefore be located as close as possible to universities
- § Achieving a high occupancy rate is more difficult for high-tech specialised facilities where the number of potential clients is small



- § Establishing the degree of specialisation of the incubator is an important decision
- § Facilities within an incubator do not all have to be the same and there is merit in considering the degree to which specialist support companies should be allocated space within the incubator. BioCity Nottingham<sup>5</sup> is a good example of how this works in practice
- § Links with entrepreneurship and start-up programmes are essential in identifying embryonic businesses that could benefit from location in the incubator
- § Links with larger businesses in the cluster are essential in identifying spin-out businesses that could benefit from location in the incubator
- § Good incubation management and the wider business support infrastructure
- § Building networks with other parts of the cluster is important.

It is vitally important that as soon as businesses grow beyond the size that the incubator is designed to accommodate that they move out into other facilities. This will generally be a science park but in some clusters, e.g. biomedical, there could be a need for a specialized grow-on facility. Overall it is necessary to consider the pipeline of businesses moving through the incubator, grow-on space and science parks to ensure that there is adequate space so that businesses move elsewhere but not too much that occupancy rates fall too low. Ideally an incubator should be located within a science park but spatial constraints, especially around universities in urban areas, mean that this is not always possible.

Incubators need to generate sufficient income to ensure that any equipment and services provided to the tenant businesses is kept up to date.

Whilst any business starting out or growing needs the right accommodation; a building has never grown a business. Most clients of business incubators are attracted by the easy-in/easy out terms, but once through the doors, it's the access to business support that keeps them there.

### 3.3.2.2 Managed workspace

This type of facility is more appropriate for start-up businesses with minimal technical and/or innovation requirements and which mainly serve local markets. Managed workspace is rarely cluster specific and is generally funded by local government to meet local needs.

In practice the boundary between what might be an incubator and managed workspace is slightly blurred.

### 3.3.2.3 Science Parks

Science Parks, Technology Parks and Innovation Campuses typically offer accommodation and support to a number of client groups including:





- § Business Incubation environment client businesses
- § Innovative businesses with 20 to 40 employees in a larger shared environment with less pro-active business support
- § Innovative businesses with 40+ employees who wish to co-locate with similar knowledge based business and access wider networking opportunities via the Science Park operator
- § Large research or development operations for multi-national companies who wish to interact with a local supply chain
- § Specialist technical or scientific facilities
- § Knowledge base

In general Science Parks are not cluster specific but there is merit in trying to ensure that there is some synergy between the tenant businesses.

Key success factors for a science park include:

- § The occupancy rate and the number of successful companies that eventually leave the science park to grow further elsewhere
- § Larger science parks can provide a range of accommodation so that as companies grow they can move to a different location within the science park

Science Parks have a life cycle and three stages of growth were identified in a paper presented to the UKSPA Conference in January 2007 by Prof John Allen, Pythia Consulting<sup>6</sup>. The general process of science park maturation can be summarised as follows:

1. Start-up – initial establishment and first year or so of operation;
2. Development – next lot of buildings, gaining experience
3. Maturation – recognition of wider, more desirable role in community

The move to maturity or a “Third Generation Science Park” can result in profound changes:

- § Move to multi-site operation
- § More direct role in helping businesses to grow
- § Closer links with university (or other research institutes)

If they are successful, 3G science parks are not ‘stand alone’ ventures, but are intimately involved in national and regional innovation policies: positioned as leaders in the development of the knowledge economy; and influencing the great cities of the world, e.g. Manchester in the UK.





#### 3.3.2.4 Business Technology Centres

Business Technology Centres cover a range of facilities including: pilot plants, technology platforms, demonstrators, specialist equipment, specialist IT equipment, etc.

Typical business technology centres do not offer accommodation but support a wide range of client groups appropriate to the services provided. These groups include

- § Business Incubation environment client businesses
- § Innovative businesses (SMEs),
- § Large research or development operations for multi-national companies. (Large firms can also provide technology and expertise, and make specialist equipment available)
- § High growth start-up businesses
- § Spin outs from universities
- § Inward investors
- § Knowledge base

Business Technology Centres are usually technology or cluster specific.

Key success factors include:

- § The usage rate and the number of commercially successful products and services that are developed through use of the facility
- § It is essential to identify need, demand and market failure at the design phase of the facility. Public funding is frequently necessary to establish the facility and during the early operational period
- § Devising a viable business model for the facility is vital to enable it to move to commercial operation
- § Determining the sources of funding to establish the facility, initial ownership and operator and the ownership and operator when the facility becomes commercially viable are crucial

A further consideration in determining demand is the size of the catchment area for potential users. This will determine the optimum location for the facility. It will also avoid any duplication that could mean that the facility does not become commercially viable.

#### 3.3.3 Best Practice Examples in NW England

##### 3.3.3.1 Biomedical

Northwest England is one of the UK's top three biomedical clusters and includes the biotechnology, pharmaceuticals and healthcare industries. The cluster is made up of multiple multinational pharmaceutical companies, a rapidly expanding biotechnology community, major healthcare companies and internationally renowned academic and clinical research strengths. Northwest England has been recognised as a member of





the “European Super League” of biotech clusters by Strategem, and in the top 50 in the world by Boston Consulting.

The regional cluster is supported by the NWDA’s Bionow cluster programme that was established in-house and launched in 2000. There are currently 356 companies in the Northwest biomedical cluster of which 164 are “core” companies. There was a 61% increase in the number of core companies in the period 2002-07. Of the core companies, 156 (95%) have human healthcare as the single or predominant commercial or technical focus<sup>7</sup>.

The cluster includes incubators, grow-on space, science parks and technology centres.

There are two incubators: Manchester Bioscience Incubator which is on the University of Manchester campus and MerseyBio in Liverpool which is on the Liverpool University campus<sup>8</sup>. The Manchester incubator is linked to the Core Technology Facility which provides grow-on space on a nearby site. Both facilities are managed by the University of Manchester Incubator Company<sup>8</sup>.

There are three science parks that are appropriate for biomedical companies: Manchester Science Park, Liverpool Science Park, and Daresbury Science and Innovation Campus near Runcorn, which is between Manchester and Liverpool<sup>9</sup>.

There are several Business Technology Centres. The National Biomanufacturing Centre in Speke, Liverpool provides pilot plant facilities to enable biomedical companies to scale up the production of their products and to manufacture sufficient material for clinical trials<sup>10</sup>.

Other facilities include; the Northwest Institute for BioHealth Informatics<sup>11</sup> Nowgen – Genetic Knowledge Park<sup>12</sup> and the Wolfson Molecular Imaging Centre<sup>13</sup>.

In addition the cluster includes: clinical trials facilities, major teaching hospitals and major pharmaceutical manufacturing companies, including AstraZeneca who’s largest R&D facility is located at Alderley Edge, close to Manchester International Airport.

The biomedical cluster in Northwest England therefore has an excellent fit with the CSE model.

### 3.3.3.2 Chemicals

The Chemicals cluster in Northwest England is long-established and has its origins in the production of inorganic chemicals for the Lancashire Cotton industry. Today Northwest England is the largest UK region for chemicals with around 800 organisations in the cluster. These include 430 chemical manufacturers producing a wide range of chemicals from basic organic and inorganic to fine and specialty chemicals plus a wide range of downstream products for particular applications such as; personal care products, surface coatings and printing.





Chemicals NW are responsible for the Chemicals cluster which is part of the Advanced Engineering and Materials sector in Northwest England<sup>14</sup>.

The cluster contains several Business Technology Centres including;

- § The Organic Materials Innovation Centre (OMIC) in Manchester<sup>15</sup> -OMIC will form a key part of the new Knowledge Centre for Materials Chemistry which is currently being established in the Northwest
- § The Materials Discovery Centre in Liverpool<sup>16</sup>

The Centre of Excellence for Biocatalysis, Biotransformations and Biocatalytic Manufacture (CoEBio3) in Manchester<sup>17</sup> has very close links with the National Industrial Biomanufacturing Facility at Wilton (Teesside) that was partially funded by the Northern Way Growth fund, a joint initiative between the three northern RDAs; NWDA, Yorkshire Forward and One North East.

The Chemistry Innovation Knowledge Transfer Network is a national initiative which is based in the Northwest to promote knowledge transfer and the development of key platform technologies for the chemical industry of the future<sup>18</sup>.

There are no incubators specifically for the Chemical cluster which probably reflects the mature nature of the industry in Northwest England.

### 3.3.3.3 Digital & Creative Industries

The Digital & Creative Industries cluster in Northwest England consists of thousands of creative and technologically innovative SMEs and some of the world's largest media rights owners. Its growth already outstrips that of both the Northwest economy and the UK creative sector as a whole. Between 1998 and 2006, turnover in the sector grew by 40% and employment by 16%. Manchester, the largest creative hub city outside London, is now recognised as one of the world's top ten creative cities.

The British Broadcasting Corporation (BBC) decision in 2007 to move five major departments (including Children's; Future Media and Technology, Learning, Sport and Radio Five Live) to the Northwest as the anchor tenant of Media City UK in Salford Quays triggered the development of a wholly new environment for convergent media in the UK. Led by the private sector, Media City UK offers the unique combination of a dedicated world class location for content and technological innovation within an established cluster of Digital and Creative businesses. It accesses a talent base that stretches across the North of England and to a knowledge base of Universities and Colleges with experience and expertise in the sector. A project of national and international scale, Media City UK's success will be essential to the achievement of UK Government's ambition to identify the UK as the world's 'creative hub' (DCMS, 2008).





NW Vision+Media are responsible for the Digital & Creative Industries cluster in Northwest England<sup>19</sup>

The cluster includes four incubators<sup>20</sup>: InfoLab21 at Lancaster University, Digitalinc in Liverpool, Xpdia in Warrington, Ci ONE in Oldham.

#### 3.3.3.4. Other CSE facilities

In addition there are several incubators in Northwest England that are not cluster specific. These include: Liverpool Science Park Innovation Centre, Daresbury Innovation Centre, Manchester Business School Incubator, Manchester Science Enterprise Centre, One Central Park in Manchester, Technology House - University of Salford, The i-zone in Bolton, Westlakes Science & Technology Park near Whitehaven in Cumbria and Harris Knowledge Park in Preston.

There are also a number of Business Technology Centres including: Lancaster Environmental Centre and Northwest Composites Centre<sup>21</sup>. Also there are many other examples of Cluster Support Environments in other parts of the UK. Three examples which show the range of facilities available are:

BioCity Nottingham is one of Europe's largest bioscience incubators. Launched in 2003, the 129,000 sq ft award winning site currently hosts 60 companies and nearly 500 employees. The purpose of BioCity Nottingham is to provide a home for developing biotechnology and healthcare companies, with accommodation that is able to respond to a company's requirements by offering small highly flexible laboratory and office units, and grow-on space. It is able to cater for companies from 1 to about 80 employees. BioCity is part of the priority Bioscience and Healthcare cluster in the East Midlands<sup>22</sup>.

The Advanced Manufacturing Park (AMP) in South Yorkshire provides world-class advanced manufacturing technology solutions to ensure repetitive advantage for industry. Technologies on the AMP centre on materials and structures, covering metallic and composite materials; typically used in precision industries including; aerospace, automotive, medical devices, sport, environmental and energy, oil and gas, defence and construction. It is part of the priority Advanced Engineering and Materials sector in the Yorkshire and Humberside region<sup>23</sup>.

New and Renewable Energy Centre (NaREC) located in Blyth, near Newcastle was established in 2002 as a Centre of Excellence for new and renewable energy technologies. It provides a range of development, testing and consultancy services work to support the evolving energy industry and transform innovative new technologies into commercial successes. NaREC is part of the priority Energy cluster in North East England<sup>24</sup>.

There are currently around 300 incubators in the UK, supporting a wide variety of clusters. Amongst them, there are a growing number of "virtual" incubators that





deliver a similar package of business support and development services, but without the physical property element.

### 3.3.4 Best Practice examples from ECA Partners

The following key points relating to Cluster Support Environments have been taken from documents submitted by the ECA project partner regions. More detailed information can be found in Appendix 5 and/or from the relevant partners.

#### 3.3.4.1 Spain - Madrid

The Region of Madrid<sup>25</sup> has become one of the most important life sciences R&D centres in Europe, with 400 companies that generate 24,000 direct jobs (pharmaceutical industries, biomedical and medical equipment companies, academic research centres). The biotechnological industry in the Region of Madrid is mainly concentrated in five major geographical areas: The Municipal District of Madrid, the M-607 motorway axis, especially in the areas of Tres Cantos and Colmenar Viejo, the north zone, the Henares corridor and the zone to the southwest of the city of Madrid. All these areas are concentrated within a circle of less than 60 kilometres in diameter.

Madrid Biocluster<sup>26</sup> coordinated by Madrid Development Agency, IMADE<sup>27</sup> involves diverse agents from the biotechnology sector in the Region of Madrid, ranging through companies in the sector, public and private research centres, hospital and university centres, most of them participating in the madri+d regional network of research and innovation stakeholders<sup>28</sup>. PromoMadrid, the public company for promotion and development of Madrid<sup>29</sup>, also offers its services to foreign companies which are interested in doing business in the region. The Association of Biotechnology Companies of the Region of Madrid BIOMADRID<sup>30</sup> promotes Madrid Bioscience Region as a biocluster of international excellence.

Some of the most representative academic and research centres that work in biotechnology and the biomedical fields in the region of Madrid are the following:

CSIC, Spanish National Research Council<sup>31</sup>, which hosts the Biological Research Centre<sup>32</sup>, the National Biotechnology Centre<sup>33</sup>, the Severo Ochoa Molecular Biology Centre<sup>34</sup>, the Alberto Sols Biomedical Research Institute<sup>35</sup>, the Ramón y Cajal Institute of Neurobiology<sup>36</sup>, the Institute of Pharmacology and Toxicology<sup>37</sup>, and the Institute of Industrial Fermentations<sup>38</sup>; CIEMAT, Research Centre for Energy, Environment and Technology<sup>39</sup>; Carlos III Health Institute<sup>40</sup>, including the National Cardiovascular Research Centre<sup>41</sup> and the Spanish National Cancer Research Centre<sup>42</sup> Hospitals are 12 de Octubre University Hospital<sup>43</sup>, San Carlos Clinical Hospital<sup>44</sup>, Gregorio Marañón General University Hospital<sup>45</sup>, La Paz University Hospital<sup>46</sup>, La Princesa University Hospital<sup>47</sup> and Ramón y Cajal University Hospital<sup>48</sup>. Other related centres are IMIDRA, Institute for Rural, Agrarian and Food Research and Development of Madrid<sup>49</sup>, INIA, National Institute for Agrarian and Food Research and Technology<sup>50</sup> and Astrobiology Centre<sup>51</sup> Main public Universities in the







field of biotechnology are Autonomous University of Madrid<sup>52</sup> Complutense University of Madrid<sup>53</sup> University of Alcalá<sup>54</sup> and Polytechnical University<sup>55</sup>

There is one bio-incubator at the Parque Científico de Madrid (PCM)<sup>56</sup> which has two main lines of action in biotechnology: Company incubation (its biotech company incubator currently incubates 18 new companies) and Creation of technological platforms for Proteomics, Genomics and Biotransformations. PCM is linked to Autonomous University of Madrid, Complutense University of Madrid and CSIC:

There are other three science and technology parks which are appropriate for biomedical companies, including incubation services: Parque Tecnológico de Madrid<sup>57</sup> Tecnoalcalá<sup>58</sup>; and Parque Científico-Tecnológico de la Universidad Politécnica de Madrid (UPM)<sup>59</sup> The last two Parks are linked to University of Alcalá and Polytechnical University.

Other specific support infrastructures both running and under construction for biotechnological companies are the centres of Fine Chemicals, Biological and Molecular Medicine and Inorganic Chemistry at Tecnoalcalá and the Genomics center at Parque Científico-Tecnológico UPM.

#### 3.3.4.2 Spain – Asturias

The Agrofood sector is one of the largest in Asturias, representing 14% of the revenue of the industrial sector and 13% of the employment (2005). The dairy industries are the main activities in Asturias. There are several Business Technology Centres including; the Dairy Products Institute (IPLA), the Centre of competence for Milk and Derived Products, the Laboratory for the Association of Meat Industry Research and the Inter-professional Dairy Laboratory, as well as centres that are linked to the University of Oviedo.

#### 3.3.4.3. Slovenia

In 2001 the first 3 clusters were founded in Slovenia with support of the Ministry of Economy. Three years later (2004), 18 cluster offices are operational. Altogether 29 projects related to clustering are being supported, bringing together 390 companies (60.000 employees) and 120 education/research institutes.

Currently there are 14 (operational) clusters in Slovenia and the 4 most important and innovative ones, automotive, wood industry, toolmakers and high technology products manufacturers, bring together 117 business enterprises (35.773 employees) and 36 R&D institutes. Funding: financial support of their members, support to joint R&D projects (Slovene measures) and from EU R&D funding.

Clusters in Slovenia do not have incubators within the clusters, as there is no critical mass for that. As R&D institutions (various research institutes and faculties with their own laboratories) are also cluster members they work hand in hand with R&D





departments in enterprises (also cluster members) for further development of ideas  
=> new products produced "in-house" => commercialization of ideas (market).

#### 3.3.4.4 Germany

In Brandenburg there are 23 incubators and technology centres. Some are specialised in emerging sectors. A clear link has been identified between cluster development and technology transfer.

In Bavaria the cluster development programme focuses on 19 sectors and technology fields. Several of the technologies are cross cutting with a wide range of market applications. There are 23 incubators with 450 high-tech tenants which employ 2,700 people.

Linking the incubators with business support and access to venture capital is important.

#### 3.3.5 Linkages

The CSE model fits with what is found in cluster development programmes in several different regions. It describes the physical infrastructure options which need to be considered but very few clusters seem to require all the different types of infrastructure. The Biomedical cluster in Northwest England is one example where all types of infrastructure are present.

There are significant differences between regions in particular: the size of the region, the size of the clusters within the region, the degree of specialisation in the region and the governance structures of the region and the clusters. These will all influence the physical infrastructure which is needed and the degree to which this may be focussed on a particular cluster.

Application of the model has to include consideration of how the different types of physical infrastructure are coordinated together to facilitate the growth and support of businesses in the cluster at all stages of their life cycle. In addition the networks associated with the various facilities need to be integrated with each other and with the overall cluster network.

As with all other activities in cluster development, Cluster Support Environments facilities need to link effectively with a wide range of complimentary activities. These include:

- § Internationalisation
- § Innovation
- § IPR and Technology Transfer



### 3.4 Internationalisation

#### 3.4.1 Overview

The global economy is in the midst of a radical transformation, with far-reaching and fundamental changes in technology, production and trading patterns. Faster information flows and falling transport costs are breaking down geographical barriers to economic activity. These changes have significant long-term implications for European regions along with other advanced economies and regions. Rapid growth in emerging economies has the potential to increase global output and provide new sources of wealth but these developments bring new challenges and will entail significant adjustments. The benefits of global growth will not be spread equally. Some advanced economies and regions will benefit more than others from this global economic expansion and certain sectors will have the opportunity to expand while others will come under pressure to contract.

The main international economic drivers that have an impact are:-

1. The Changing balance of economic activity: this is likely to accelerate over the next decade. For example, by 2026 China is forecast to have surpassed every European Economy in size becoming the world's third largest economy after the USA and Japan.
2. Population change: International migration will represent an important demographic trend over the coming decade. As competitive advantage is increasingly defined by a region's ability to attract and retain a skilled workforce, competition between countries for high-skilled workers is likely to continue to increase.
3. Further integration of global markets: This will contribute to significant changes in global foreign direct investment (FDI) flows with emerging economies likely to attract a greater share of FDI than in the past. A.T. Kearney's FDI Confidence Index<sup>60</sup> highlighted that China is now the most preferred FDI location worldwide, and that India rose from third to become the second most likely FDI destination. Overseas migration of R&D spending is expected to rise with global investors from the USA and Western Europe indicating that their most significant R&D spending reductions will occur in their home territories. As emerging markets grow they will increasingly become providers of FDI. For example, Indian investments into the EU have been increasing year on year. In 2002 there were 8 projects, in 2003 this had increased to 28 and by 2004 there were 31. China is the only other country showing year on year growth. However, this represents only a small proportion of the overall number of FDI projects; the UK alone attracted 1,066 projects in 04/05.
4. Increasing international specialisation. Production chains are becoming increasingly flexible, specialised and dispersed across continents. The international relocation of economic activity, particularly services, is expected to intensify over the next decade.
5. Greater rewards from innovation. As global competition and the speed of technological change increase there will be enhanced rewards from innovation

and increasing pressures on firms to make the best use of innovation. Countries at the forefront of research and innovation will be best placed to move into high value-added, technology-driven areas, which can provide new sources of growth. A region's university/research base will become increasingly important in differentiating it in a competitive global economy.

6. Skills increasingly needed by all. Improving skill levels will become increasingly critical to harnessing the opportunities that come from accelerating global integration. Investment decisions will become increasingly dependent on the relative skills of the labour force in different locations.
7. Increasing pressure on energy resources and environment : This will result from forecast rates and patterns of global economic growth. Global energy demand is set to increase by 1.7% per annum over the next decade and will result in continuing environmental impacts in terms of air pollution and climate change and economic impacts in terms of price rises.

### 3.4.2 Internationalisation Model

Internationalisation means raising businesses' awareness of emerging global markets, and the opportunities and challenges that they bring. It means helping businesses compete overseas, and it means enabling businesses to make the most of international trade, as well as inward investment into their regions. The most favoured model is as follows:

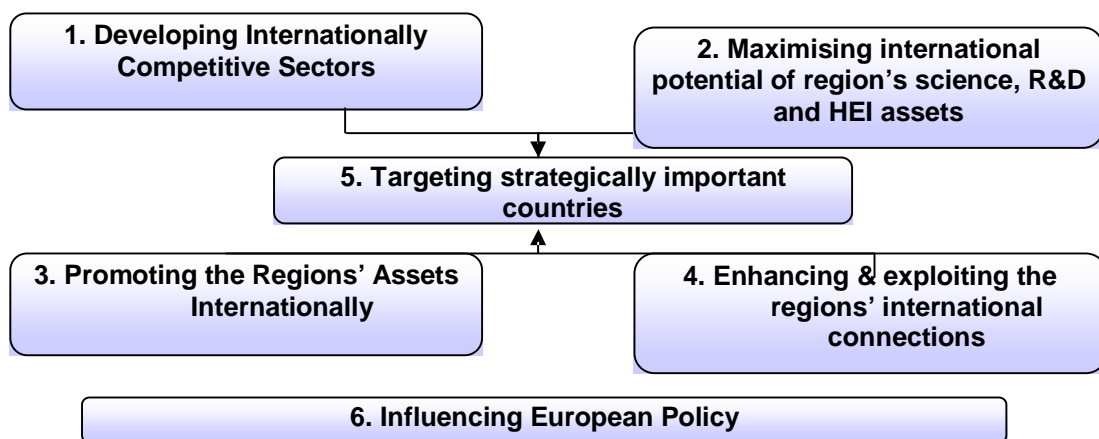


Fig:4 Internationalisation Model

1. Developing internationally competitive sectors: Attracting inward investment to the region's priority sectors and helping these sectors and other high growth companies gain access to international markets, attract and retain workers with the skills they need to compete, develop international supply chains, and take advantage of the latest research and development around the world, to help them innovate.

2. Maximising the international potential of science and innovation, research and development, and education in the region: Working to identify clusters of excellent research establishments in a region and to showcase excellence in research thereby helping to attract investment from overseas and find international partners
3. Targeting strategically important countries: By highlighting a region's strengths it is possible to then target strategically important countries that are likely to remain as key markets for businesses in priority sectors. E.g. high-growth markets led by China and India will offer increasing opportunities. These countries should be targeted through marketing activities, trade delegations, presence at trade exhibitions and inward investment activities.
4. Promoting the Regional assets internationally: Developing an international business marketing plan to promote the region's key assets and its advantages as a place to do business, and identifying specific international opportunities relevant to the region
5. Enhancing the region's international connections: Increasing the number of international transport connections through the region's ports and airports, targeting international alumni networks with key messages and attracting major international events, business visitors and tourists.
6. Influencing the European Union: Any region seriously promoting internationalisation needs to take more of a lead in lobbying EU policymakers regarding specific policies and programmes, to ensure that they help their businesses become more competitive internationally.

A key policy issue that has been identified about the performance of the European economy is the low degree of international openness, especially amongst SMEs. It is not only a question about the ability to penetrate into foreign markets, measured as market shares, but a question of attracting direct funds, hire new talents, increase exports, gain global visibility and perform international internetworking. There is a need to change the way regions operate by extracting value from different parts of the value chain, attracting and retaining high value projects and targeting research investments and high value sectors and companies.

A methodology to address this must include as a minimum:-

- § Development of mechanisms to respond/exploit global drivers
- § Achievement of a consensus around benefits
- § Provision of a framework for a prioritised & integrated approach
- § Global view of activities from an international perspective
- § Extraction of value from all parts of value web/networks
- § Links into national focus on internationalisation
- § The setting of baseline data and outputs e.g. improvement of GVA (Gross Value Added) in the region.

### 3.4.3 Best Practice Examples in NW England

The Northwest Development Agency in its Regional Economic Strategy<sup>61</sup> (RES) supports 6 priority clusters. These clusters have been benchmarked for their internationalisation strategies and relationships as a starting point for monitoring progress in the international arena. The main aim is to achieve the following objectives:-

- § Maximise opportunities from globalisation and emerging markets
- § Realise opportunities from international trade
- § Realise opportunities from inward investment

Also a snapshot of current outputs and outcomes acts as the driver for improvement in future years:-

Where are we now?	7,147 exporters £19.6bn value of exports Foreign Direct Investment accounts for 16% of the Northwest economy. In 2005/6 there were 112 Foreign Direct Investment projects which created/safeguarded 6,800 jobs 7% of all FDI projects are R&D intensive and 7% are from emerging markets 25,000 international students studying at the region's HEIs In 2006 458 businesses have relocated outside the region and 493 businesses have moved into the Northwest
Where do we want to be (2009) / what will we monitor?	10,000 exporters £22bn value of exports Increase in number of FDI projects to 150 per year with increase in % of region's GVA accounted for by FDI - 17% of all FDI projects to be R&D intensive, 25% to be for projects with average salary more than 35K and 17% to be from emerging markets 30,000 international students studying at the region's HEIs Job creation by sector (monitor) Business relocations (monitor)
Relevant RES Targets	GVA Growth * Job Creation

\* GVA = company operating profit + total employee costs + depreciation

In addition a breakdown of future actions per principal regions has also been developed:- Summary of action plans by principal region

Region	North America	Continental Europe	India	China	Japan	Emerging markets/other
Summary of main activities/actions	Target specific international trade/investment opportunities through a coordinated approach for RES priority sectors	Target specific sub-sectors in key growth markets Identify opportunities to take a lead on European programmes and networks e.g. CLUNET	Explore trade, investment, HEI, research, etc. links with India. Target international opportunities for research concentrations	Enhanced focus on inward investment lead generation and aftercare activity in China via 2 additional FTE staff (to be integrated within UKTI embassies/consulates). Work with UKTI to implement the emerging markets strategy	Maintain the focus on inward investment activities via the NOE Japan presence; focus on aftercare and target Japanese companies in London, SE and mainland Europe.	Scope emerging markets for opportunities for RES priority sectors with a particular focus on Russia, Turkey, Brazil, SE Asia, UAE. Work with UKTI to implement the new emerging markets strategy Target supply chain opportunities via the Supply Chain Excellence Programme
Resource	24%	23%	12%	13%	9%	18%





#### 3.4.4 Best Practice from ECA Partners

The following key points relating to Internationalisation have been taken from documents submitted by the ECA project partner regions. More detailed information can be found in Appendix 5 and/or from the relevant partners.

##### 3.4.4.1 Corallia

Corallia is pursuing its internationalisation strategy through a framework of a “cluster shared-services” model, i.e. a set of “win-win” services that can be shared / jointly pursued by cluster organisations based in different countries and thus aid Corallia’s clusters to expand their operations internationally.

The implementation of Corallia’s internationalisation strategy is carried out in three distinctive phases, with the first one preceding chronologically, while the second and third are likely to take place either sequentially or in parallel to each other. In particular, the first priority is the establishment of a relevant Policy Framework that will govern (per case) the internationalisation strategy and any subsequent activity; following that, the two main pillars upon which Corallia’s transnational activities get implemented, are Human Resources and Investment/Financial development activities.

##### Priority 1 - Policy Framework

###### Key Activities:

1. Memorandum of Understanding at Cluster Initiative level, defining strategic objectives and joint clustering activities
2. Collaboration Agreement at Cluster (industrial) Members level, enabling joint (R&D) projects, commercialisation partnering, and outsourcing opportunities.
3. Bi-lateral Agreements at State/Government level, setting-up joint CfP funds and forming common industrial and regional development activities.

The first phase is the establishment of a respective Policy Framework that will govern the transnational collaboration and eventually guide the materialisation of specific internationalisation activities and strategy.

Generally, a Policy Framework can vary depending on the type of organisation engagement that is foreseen, but at the very least requires an agreement set between parties that implement cluster development policies, e.g. Regional Authorities, Development Agencies, etc. In the case of Corallia, it addresses parties with a dedicated (“permanent”) cluster supporting role, via a “Cluster Initiative”-type of organisation with a clear mandate to help expand cluster activities and drive its internationalisation priorities. Such an agreement between Cluster Initiatives (CIs) is encouraged to take the form of a Memorandum of Understanding (MoU). An MoU is sufficient in order to define a common set of cluster priorities, thematic (technological) areas of interest, rules of engagement and communication guidelines between CIs, while at the same time being general and flexible enough so that it can adapt to changing conditions (as is very often the case in trans-national collaborations). On a case-by-case basis, a ratification of the MoU may take place, so





that it is extended in order to include specific actions (e.g. a project undertaking) in the pursuit of a common initiative among international partners.

Following the MoU at CI level, it is encouraged that alliances are directly supported among (mainly) industrial members, via a dedicated Collaboration Agreement defining priorities and interests at membership-level of the clusters. This helps open up a communication channel among peers that “speak the same language” and have effectively the same (economical and technological) goals. In this respect, joint (R&D) projects, joint commercialisation endeavors, and outsourcing partnerships, can help significantly transnational cluster cooperation.

Last but not least, building upon CI and industry direct cooperation, significant policy support can be drawn from a Bi-lateral Agreement at state/government level, which can be used between interested countries to set-up transnational funds for strategic cross-country activities, including Joint Call for Proposals (e.g. in an ERA-NET fashion), strengthening further common industrial and regional development activities, especially the ones aiming at research.

#### Priority 2 - Human Resources activities

##### Key Activities:

1. Summer internships
2. Student exchange programmes
3. Joint Academia-Industry Diploma and Doctorate thesis
4. Joint Academic Under- and Post-graduate curricula
5. On-line job vacancy databases for cluster members
6. Cross-matching employment agents for European clusters

Human Resources' utilisation is essential in cluster development and it can constitute an excellent contributor to the materialisation of a cluster's internationalisation strategy. There are various activities that Corallia pursues related to utilising talented human capital in order to aid transnational cooperation.

A significant activity is “summer” (i.e. short duration assignments) internships of senior/graduate-year students of one country to companies/cluster members of another country. This activity increases mobility of researchers and creates future employment opportunities for skilled workers while aiding cluster members to gain access to the scarcest resource of all: talent.

Similarly, student exchange programmes among academic institutions plays a catalytic role to expand the innovation horizon of future employees or entrepreneurs, and should be sought and supported by CIs in cooperation with the respective institutions.

In the same sense, there can be a transnational agreement framework between Universities and Industry for carrying out Diploma and Doctorate degrees, as well as feeding “where-the-market-is-heading” information from the industry to the





academia, in an attempt to influence under-/post-graduate curricula of taught lessons.

Another contributing activity is the creation of an on-line job vacancy database for cluster members, acting as a repository both for clusters managers/members seeking talent as well as workers seeking employment opportunities. The internationalisation strategy of a cluster can gain significant boost by accessing international employees that bring with them not only their skills and talent, but also their network and cultural exposure. To further support this, dedicated cross-matching employment agents for international clusters could help speed up the process, while at the same time benefiting of the economy-of-scale that a cluster's critical mass provides.

Priority 3- Investment and Financial activities:

Key Activities:

1. Transnational syndication of VCs for cluster members
2. Cluster-focused network of Business Angels
3. Collaborative frameworks for transnational projects

In a globalised economy, clusters need to become more extrovert when seeking finance and investments. Financial/investment vehicles are not only key elements to a cluster's viability but also major tools for achieving international exposure. International investors and financing tools bring clusters in contact with international markets, major clients, influential persons, and other key stakeholders for cluster development.

Especially for clusters consisting of SMEs, access to "smart capital" that combines financial support with technical and management guidance, is fundamental to achieve maximum growth. Furthermore, clusters constitute an "investment portfolio" that gives access to a wide spectrum of cluster-members / business opportunities. In this respect, Corallia is seeking to create transnational syndications between local (GR) VC organisations and European/international ones. Through formal or informal teaming-up of investors, Corallia's cluster member come in contact with the international investment scene and maximise their investment prospects and potential, while at the same time, engaged investors face a reduced risk through smaller exposure at an individual level.

Similarly, Corallia seeks to build a strong human (investment) network of Business Angels that will have dedicated experience and expertise in investing in cluster environments, e.g. being familiar with the particular dynamics that a cluster member has at its disposal by being a member in the value chain of a cluster, maximising the gains of economies-of-scale, etc.

Last but not least, a powerful internationalisation tool can be the research-oriented frameworks where Industrial cluster members can work together with Academia at transnational level on demanding, innovative projects. In this respect, Corallia is closely following European Commission's collaborative programmes (related to Policy,





Research, Industry, Innovation, and other topics) especially the ones targeting clusters as their core development element. Such frameworks create immense opportunities to internationalise each cluster's operations, not only on the basis of EU co-financing, but more importantly on sustainable cooperation ties built among participants that extend far beyond the completion of a specific EC subsidised project.

#### 3.4.4.2 IDEPA Internationalisation Activity -Master Programme in Chinese Language, Culture and Negotiation

IDEPA and Asturias Business School have designed the Master in Language, Culture and Negotiation in China, which is already in its third year. This master's course is aimed at university graduates with the purpose of orienting their professional career towards the field of business and commercial relations between Asturias and China.

The duration of the master's course is 1 year, with 2,130 class hours in 3 phases:

- § Phase 1 in Asturias: Introductory Course in Chinese Language and Culture.
- § Phase 2 in China: Chinese Language and Negotiation Culture, University of Zhejiang (Hangzhou, China)
- § Phase 3 in Asturias: Theoretical-practical training (reinforcement of Chinese language, general knowledge of foreign trade and business experiences).

Master's Course Promotions:

- § First promotion (10 students) finished training in June 2007.
- § Second promotion (20 students) has been undertaking phase 3 in Asturias since the month of September 07.
- § Third promotion (19 students) is undertaking phase 2 at the University of Zhejiang (China) since the month of September 07.

#### 3.4.4.3 FinNode - Finland International innovation centres

The importance of global innovation networks for a company's value formation has grown. Value chains fragment into different companies and different areas. This makes the requirement for specialisation and cross-border networking even stronger. Strengthening the innovation system, including the poles and clusters of excellence, and fostering international contacts in innovation policy are thus an important part of promoting the viability of innovation environments.

The international FinNode Innovation Centres are one tool in the promotion of the internationalisation of national poles and clusters of excellence. Their task is to ensure investment in innovation goes to the right place and has an impact through links with international innovation centres. Innovation centres are located in China,





the United States, Russia and Japan.

The centres are responsible for predicting trends in Finnish innovation, reports on R&D&I in the relevant countries, and promoting the Finnish innovation system. They also encourage R&D&I projects between businesses, research institutions and other innovation actors.

The objective of national regional policy is to develop the national and international competitiveness of the regions, a viable and balanced regional structure and to rise to the special challenges of the regions.

The common targets of regional development in Finland are based on the Regional Development Act and the Government decision on national regional development targets. Under the Act, one of the targets is to improve the potential for economic growth, the development of business and industry and the improvement of employment that are based on expertise and sustainable development and ensure the competitiveness and prosperity of regions. Another target is to reduce regional disparities in development, improve the population's living conditions and promote balanced regional development. Furthermore, the aim is to create a balanced regional structure which keeps all the regions viable. The responsibility for regional development rests with the State, municipalities and Regional Councils acting as regional development authorities.

Special programmes have been drawn up by Government decision to attain these targets. The programmes are the Regional Centre Programme, Centre of Expertise Programme, Rural Policy Overall Programme (including Regional Rural Part) and the Island Development Programme. The programme structure will be reformed. European Union (EU) cohesion policy complements and supports national policy.

#### 3.4.4.4. Slovene Internationalisation policy

##### NUTS 1 and 2 levels:

Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments (JAPTI), financed by the Ministry of Economy, offers its support for internationalisation to individual companies, groups of companies as well as clusters. The support is provided with help of seven economic representation offices abroad (Milan/IT, Düsseldorf/DE, Bucharest/RO, Istanbul/TR, Kazan/RUS, San Paolo/Brazil, and Shanghai/China).

Chamber of Commerce and Industry of Slovenia (CCIS), and its staff has good knowledge of Slovene R&D policy, active support to 22 technological platforms and innovative clusters, they have comprehensive insight into the entire R&D sector in Slovenia - from institutions to enterprises. CCIS provide all information as to innovation, the advance of business and technology, as well as economic development projects.





There are six Enterprise Europe Network offices in Slovenia, offering support to SMEs and clusters;

1. Jožef Stefan Institute, Ljubljana;
2. Centre for Interdisciplinary and Multidisciplinary Research and Studies of the University of Maribor, Maribor;
3. Chamber of Commerce and Industry of Slovenia, Ljubljana;
4. Maribor Development Agency, Maribor;
5. Chamber of Craft and Small Business of Slovenia, Ljubljana;
6. University of Primorska, Science and Research Centre of Koper, Koper;

#### NUTS 3 level:

Maribor Development Agency (Podravje region) – Enterprise Europe Network office offers the following support to SMEs and clusters: dissemination of internal market information, promotion of community initiatives, policies and programmes, assisting SMEs to develop cross-border activities and supporting SMEs to find relevant partners. Clusters have also been identified as one of priority groups to be supported by the Enterprise Europe Network office in the region.

SMEs and clusters in Osrednjeslovenska region (Ljubljana Urban Region, covered by RDA LUR) get the support from 3 EEN offices; Jožef Stefan Institute, Chamber of Commerce and Industry of Slovenia, Unit for Ljubljana and Chamber of Craft and Small Business of Slovenia, Unit for Ljubljana.

#### 3.4.4.5 North Rhine Westphalia

North Rhine Westphalia is the home of 16 state wide clusters<sup>62</sup>. The building up of international relations and international activities aimed at joint innovation projects and market entry are of outstanding importance for the clusters and the cluster agency.

To reach these aims, the cluster agency is extending the European visibility of the clusters, develops a strategic framework for cross-border cooperation and builds up partnerships with the location development and foreign trade promotion agencies of the state of North Rhine Westphalia.

In addition, the clusters in North Rhine Westphalia can profit from activities taking place on the federal level: As a service for German clusters looking for contacts with corresponding international clusters an international cluster monitoring service has been established containing a list and an interactive map of - currently - nine international clusters that will be extended to about 30-to 40 clusters by the end of 2009<sup>63</sup>. The cluster portraits are in German but are complemented by a news service in the respective local languages. In order to support inter-cluster cooperation, the German Federal Ministry of Education and research has published a call for proposals for projects between German networks and clusters and their international counterparts<sup>64</sup>.







Strategic background for the international activities is a recent study by the VDI Technologiezentrum GmbH, Düsseldorf on best practices in cluster internationalisation analysing clusters in, among others, Europe, North America, Asia, the Middle East and Australia. The study "Internationalisation of Innovative Clusters"<sup>65</sup> is based on in-depth on-site and telephone interviews with representatives of 83 international clusters.- with the following results:

- § International Clusters are magnets for human capital and investments
- § There are different types of international clusters with different needs
- § The chances of internationalisation are its impulses on cluster dynamics and local profile building
- § Potential risks can be met through benchmarking and development of framework conditions
- § Internationally oriented cluster policy finds its reflection on all policy fields and levels
- § Regions need joint internationalisation strategies

#### 3.4.4.6 The Lazio Region Biotechnologies District (DTB)

In line with the strategic importance attributed to clusters by the European Union, Italy<sup>66</sup> has created the Technological Districts (TD) tool. TD, also known as High-Tech District, has been formally identified by the Ministry of Instruction, University and Research (MUR) and aims to create a (mainly) regional network, in given sectors, based on the presence of numerous highly specialized enterprises, integrated by qualified technical-scientific competencies and research and innovation structures (private and public research centres, Universities, etc. located in the Region).

The DTB roadmap has the following objectives:

1. activate a structured network of relations and technical-scientific collaboration amongst the operators of the enterprise and research systems;
2. improve the ability of the applied and industrial research system to design projects, operate and prototype;
3. facilitate investments in dedicated technological and technical-scientific infrastructures;
4. promote and support the generation of new high-technology enterprises;
5. strengthen and improve the visibility of this sector at the international level;
6. promote better training of existing professional profiles.

In terms of internationalisation, Italian industrial districts lag behind the most industrialized nations. In May 2008, the regional government approved a law disciplining regional operations promoting operations for the internationalisation of the small and medium-sized enterprises in Lazio that aims to promote competitiveness and the presence of the Lazio productive system on the international markets. The law entails financing for a total of €3 million (1m€ pa for 3 years, 2008-2010) to promote indirect support to SMEs, for the promotion of the Lazio system





abroad, to exploit production at an international level, develop projects, market analyses, databases, sector research and studies, organise technical and international missions to strengthen international relations, create an international network to support enterprises on priority-level foreign markets, support structures promoting Lazio Region exports and co-finance projects involving other public and private subjects.

In legislative terms, the Lazio Region designated the Sviluppo Lazio “Sprint” Regional Agency (Regional Office for the Internationalisation of Enterprises, Art. 6), responsible for the diffusion of information concerning activities and services related to export, to facilitate the access of operators to promotional, insurance and financial services and provide support to SMEs by coordinating public and private initiatives. Lazio Region information on commercial, productive and financial policies are central to this initiative.

In a joint analysis prepared by Unioncamere and the Tagliacarne Institute, the process of internationalisation of Italian clusters presents both quantitative (only 8.4% of district enterprises have stipulated agreements with foreign partners) and organisational weaknesses. In the majority of cases, initiatives are adopted individually without rooting them in a larger cooperation and coordination framework involving the other district operators. In this context, although the Lazio Region has introduced interesting and significant initiatives, it does not represent an exception. It continues to suffer the lack of a complete and integrated internationalisation policy framework specifically supporting clusters. Nonetheless, concern about this issue has grown significantly and a debate is underway that will hopefully lead to future strategic programmes in this context.

#### 3.4.4.7 Montreal Metropolitan Community ( CMM) Canada

In 2003, the CMM adopted a strategic vision statement for the economic, social and environmental development of the metropolitan area. Entitled “Charting our international future: Building a competitive, attractive, interdependent and responsible community”: this vision was the result of a rigorous analysis and presented what the community would like to become by the year 2025 namely:-

- § A competitive community- to set demanding goals to regain position as one of the world’s leading metropolitan areas.
- § An attractive community-to fulfil the expectations of its citizens and attract more people to the metropolitan area by optimising assets: creativity, innovation, knowledge and culture.
- § An interdependent community- to fight social exclusion, reduce the school dropout rate, increase the number of immigrants contributing to development and develop partnerships between firms and educational institutions.
- § A responsible community-to meet the challenge of participatory democracy by providing its citizens with continuous information and “online government.”





Vision 2025 is a call to mobilization and action. It provides a common focus for the actions of all players involved in regional development and helps ensure consistency. As such, the CMM's Vision 2025 is an indisputable example of strong, constructive leadership. The CMM's Economic Development Plan, the City of Montréal's Economic Development Strategy and its Imagining• Building Montréal 2025 game plan together constitute a consistent, sector-based vision of the region's medium and long-term development. Finally, the ACCORD project and the CMM's Competitiveness Fund both complement the aforementioned initiatives by supplying exceptional levers for accelerating and supporting the implementation of a support organization for each cluster<sup>67,68</sup>.

The Greater Montreal can now count on five cluster initiatives that actively contribute to the international reputation of the region: AeroMontreal, TechnoMontreal, Montreal InVivo, the Cinema cluster and the Cleantech cluster.

A benchmarking study of North American Strategies in Cluster Development conducted in June 2007 and presented as a discussion paper for the Montreal CLUNET meeting: "Europe meets America", produced the following best practice ideas<sup>69</sup>:-

1. Draft and publicise: importance for the leading strategic organization to publicize officially the cluster-based strategy once it is drafted.
2. Encourage a bottom-up approach, key for success: mobilization has to come from the community to identify development needs and industry challenges, followed by governmental stakeholders with a regulatory and funding framework.
3. Engage all levels of stakeholders: strategy might be drafted at metropolitan or provincial levels, but defining a cluster-specific legislative agenda with high levels of governments remains crucial (federal grants, tax credits, etc.)
4. Build on what's existing: foster cluster development through optimization and mobilization of existing initiatives and/or facilities, i.e. Do not reinvent the wheel.
5. Involve the Business and Education communities in the planning process: this early involvement in the process seems to have created a natural cohesion in the community and have kept its members mobilized.
6. Get support from hands-on partners: delegate specific aspects of the cluster development to dedicated groups/councils/committees (ex: internationalization, innovation, marketing & branding, etc.).
7. Encourage networking and exchange: implement networking tools to get the mobilization going, through platforms for companies, universities and the whole community to meet, exchange best practices, pursue mobilisation, accelerate promotion of the cluster and foster economic growth for companies (ex: Cluster Networks). Monthly meetings, newsletters, Web portals.
8. Measure performance: on a regular basis, strategy and/or clusters' performances need to be evaluated (ex: Montreal, where clusters are evaluated annually on their ability to reach their business plan's objectives).





9. Update strategy and make it evolve: organize an annual event to keep everyone up-to-date on the cluster's priorities and to give a regular opportunity for every actor, from business leaders to federal officials, to get together and discuss initiatives and policy changes (ex: Annual Leadership Summit).

### 3.5 Innovation

#### 3.5.1 Overview

Innovation can be described as "...the successful creation, absorption and exploitation of new ideas in the economic and social arenas..." However, innovation needs to be considered on a wider basis than the conventional science and technology or product concepts. The European Commission discuss a broad based innovation strategy for Europe that translates investments in knowledge into products and services.

The key elements of a successful innovative economy focus around three core activities:

- § Innovation Capacity
- § Innovation Collaboration
- § Innovation Investment.

The activity of Innovation (as a cross-cutting theme) should be a process that engages skills, sources of knowledge, business, market structures and consumers in an open exchange which increases competitiveness, productivity and improves quality of life for all. Innovation activity can be considered to be below the socially optimum level as a result of individuals and firms not capturing the full extent of their investment. Additionally, small firms in particular struggle to access all relevant information sources and may need to collaborate on development. These issues can result in the firms not investing to the extent they could when the demonstrated returns from their investment cannot be achieved.<sup>70</sup> A key aspect of tracking innovation as a driver for improvement is the development of an innovation model that can be applied universally to monitor innovation maturity in both clusters and individual companies.

### 3.5.2. Innovation Maturity Model

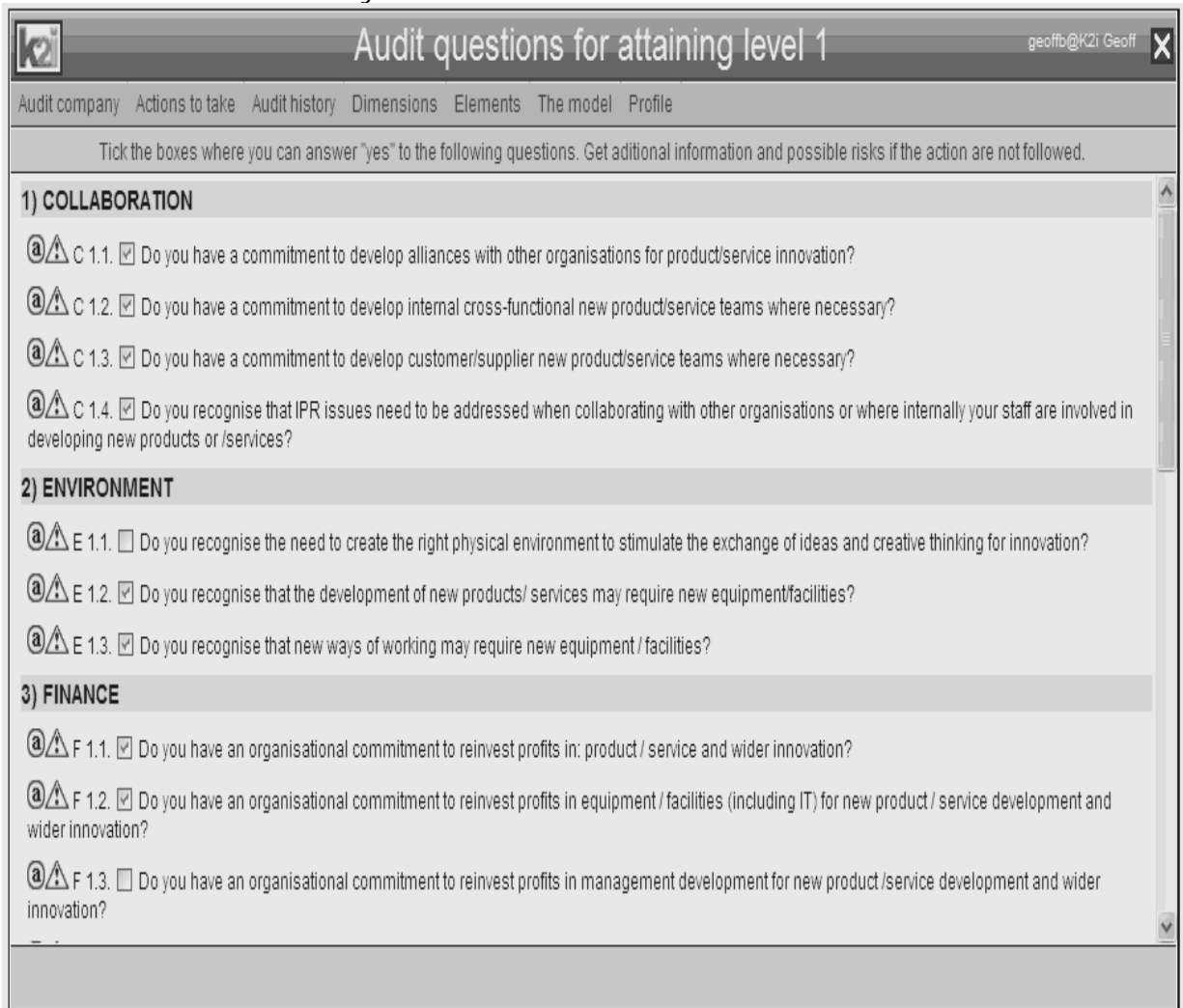


Fig 5: Innovation Capability Maturity Model

The Capability to Innovate Maturity Model, for which the intellectual property rights belong to the University of Central Lancashire, Northwest England, UK, is based upon principles first expressed in the Capability Maturity Model developed by Humphrey<sup>71</sup> and then further developed for other domains by Gillies and Howard<sup>72</sup>. The model is available under license from Gillies and Howard.

In November 1986, the US Government asked the Software Engineering Institute (SEI)<sup>73</sup> to provide a method for assessing the capability of their software contractors. In September 1987, the SEI released a brief description of the process maturity framework and a maturity questionnaire<sup>74</sup>. The SEI intended the maturity questionnaire to provide a simple tool for identifying areas where an organization's software process needed improvement. Unfortunately, the questionnaire was too often regarded as "the model" rather than as a vehicle for exploring process maturity issues. A key part of the approach was an emphasis upon improvement, which contrasted sharply with other models of the time such as ISO9000, AQAP and



BS5750. Gillies and Howard have previously applied this approach in a range of domains with small organisations, often in the public sector. For example, the original application was in primary health care. Primary health care in the UK NHS moved from paper based records to electronic health records between 1990 and 2004. Since primary care is organised around small independent general practices consisting of typically one to six doctors employing a range of other clinical professionals and support staff, who are in turn managed by Primary Care Trusts (PCTs), the system is very diverse and often disjointed. There was a wide range in organisational maturity in moving towards the stated national goal of paperless practice by<sup>75,76</sup>. The maturity model developed, known as the General Practice Information Maturity Model (GPIMM) was deployed by a number of PCTs, who found it effective in assisting the smaller general practices in developing capability in the use of electronic health records<sup>72,77</sup>. The first private sector iteration of the model was developed for SMEs in the North West of England on behalf of the Northwest Development Agency, and will be the subject of a presentation at the 4<sup>th</sup> European Entrepreneurship and Innovation Conference in Antwerp in September 2009. A further implementation in support of World Class Commissioning in the NHS is the subject of a bid to the UK ESRC. Another instance is being developed in Romania in support of improving the use of Evidence Based Medicine arising from a student placement under ERASMUS MUNDUS, which is also funding the AHEAD-EU project based upon a further instance of this model.

Maturity models provide a paradigm within which domain-specific frameworks can be deployed to assist the capability development of small social and commercial enterprises. Deployment is focused around an audit of the organisation against a model, encapsulated within an electronic tool available via the internet to registered users. The audit process is based upon the principle that higher level maturity items can only be achieved once the foundation for that item at lower maturity levels has been established. In this way organisations are asked the minimum number of questions to obtain the maximum information regarding their capacity to innovate. The organisation's responses are compared with the model and the electronic tool then identifies current capability and, perhaps of even greater importance, the key priorities for improvement. Each development issue is annotated with examples of the risks associated with that "not attained" status. On completion of the audit the SME and the support organisation have access to comprehensive reporting tools.

### 3.5.3 Practical Applications of the Model

The Capability to Innovate Maturity Model assesses capability for innovation across seven strands: Collaboration, Environment, Finance, Knowledge, Senior Management, Risk, and Staff, against five maturity levels:

Maturity Level 1 Commitment is about establishing clear goals and gaining commitment to them from the entire enterprise. Leadership is crucial, without it, no one else will take the goals and the actions that flow from them seriously. Such support is demonstrated more powerfully by actions than words. SMEs who do not yet meet this level are characterised as "Working towards commitment".







Maturity Level 2: Putting a process in place is about establishing clear processes and procedures to ensure that actions are put in place to deliver the goals of the SME. These defined processes are the foundation of future improvements since they provide the basis on which performance will be measured and improved.

Maturity Level 3: Monitoring activity is about measuring performance in terms of compliance with defined processes and procedures to ensure that measurable improvements are made towards the goals of the SME. Simply defining a process does not mean that people will follow it or that the impact will be as intended. Only through measurement, can improvement be demonstrated. Measures can come in many forms and it should also be remembered that a measured improvement is not evidence of cause and effect. In other words, because you have done one thing, and another has happened, you have not demonstrated that the one caused the other. It could have been caused by something else altogether.

Maturity Level 4: SMART goals and improving performance is the feedback loop in the improvement cycle. It is astonishing how many companies invest heavily in measuring what is happening and then do nothing to change it when they discover areas where performance is poor. There are many reasons for this. One is the blame culture which often exists, where improvement cannot happen because no-one can admit there is a problem, in case they are blamed for it. To achieve this level of maturity, an SME must demonstrate that they not only measure their performance but act upon the findings, and make improvements informed by the performance data. The audit questions are designed to elicit this information.

Maturity Level 5: Continuously improving performance is the embedded stage of the model and the final stage in the improvement cycle. This does not imply that no more improvement is required. Rather, it is about the SME demonstrating that continuous improvement is a routine part of its culture.

At this level of maturity, the SME has demonstrated improvements, informed by measured performance data that are both a routine part of the enterprise and fully integrated into all of its business processes. Moreover, it is evidenced by an organisational culture where members of staff are encouraged to think about how they can do their jobs better and, where these ideas have resourcing implications, there is a process by which they can seek such resources. Finally, it is characterised by confident leadership: rather than feeling threatened by staff suggesting improvements, managers are inspired by working in an exciting innovative SME and see encouraging staff to challenge orthodoxy as a key part of their role. Each level of the model is considered across seven strands: Collaboration, Environment, Finance, Knowledge, Senior Management, Risk, and Staff. In most organisations performance will be better in some strands than others. The electronic tool identifies both existing good practice, and areas that are currently limiting capability to innovate.

Having looked at organisational capability, the next stage in the process is to examine the capability and competencies required by members of staff who work in



the organisation<sup>78</sup> outlining two paradigms for performance. Firstly the competency based approach; that is a measurement of how well people are doing the things that they do, and secondly by disregarding the way in which things are done and simply looking at the outcomes. This is the output-focused approach to performance management. Gillies and Howard have attempted to bridge this paradigm divide by using a model which includes not only what the individual brings to the situation, the list of competencies, but also what they achieve. This model builds on previous work<sup>79,80</sup> to produce a two dimensional matrix of job roles and competencies, with proficiency as the intersecting metric. However it is clear that the competency required of an individual is not simply defined by their role but by the maturity of the organisation within which they work. In the GPIMM example the competencies required of a doctor to enter data into the medical record are very different in a Practice using a paper record than one using an integrated electronic health record. Therefore different competency sets are designed for defined roles at each level of organisational maturity. This flat matrix is then reworked on the basis of each level of the Capability to Innovate Maturity Model to produce a three dimensional matrix for individual competency. Organisational maturity is assessed first; the appropriate role competency set is then selected, based on that maturity level and the individual role. It is this competency set which is then used as the template for individual competency appraisal and identification of training needs. The next iteration of the electronic tool is intended to include this dimension of an organisation's Capability to Innovate. The Capability to Innovate Maturity Model is aimed at helping SMEs to develop their innovative capability. However, Clusters also have a need to develop their maturity in terms of improving their own Infrastructure and Effectiveness. One approach to the achievement of this goal would be to develop a European Cluster Infrastructure and Effectiveness Maturity Model, using adaptations of the existing underlying Maturity Model and electronic toolkit. Such an approach would allow the Clusters to improve their own maturity, as benchmarked against a common European Standard. Previous deployments have demonstrated that such an approach can facilitate both the management and partnership roles of an umbrella organisation working with SMEs. In turn this would allow the European Commission to monitor Cluster Infrastructure and Effectiveness in order to better allocate appropriate support.

### 3.6 Intellectual Property Rights (IPR) and Technology Transfer

#### 3.6.1 Overview

In recent years the importance of IPR and technology transfer issues has grown rapidly in Europe. Companies have recognised the importance of research and development to overcome strong competition and the need for the bringing together of research and market has been identified. Many EU countries and regions have developed specific policy measures to support technology transfer. The importance of facilitating the transfer of research results to the market and the contribution of institutions of higher education and research to innovation is a key concern of regions and nations. However, most regions and states experience significant challenges in creating models capable of supporting technology transfer. The

consequence is that high-potential innovations that do emerge from the research systems have difficulty in maturing and reaching a market. The experience gained in this workpackage shows that Clusters can be regarded as a unifying policy tool for European innovation stakeholders and that they can form the basis of a common policy exchange language amongst regional partners and form the basis of sustainable trans-national policy co-operation.

### 3.6.2. IPR and Technology Transfer Model<sup>81</sup>

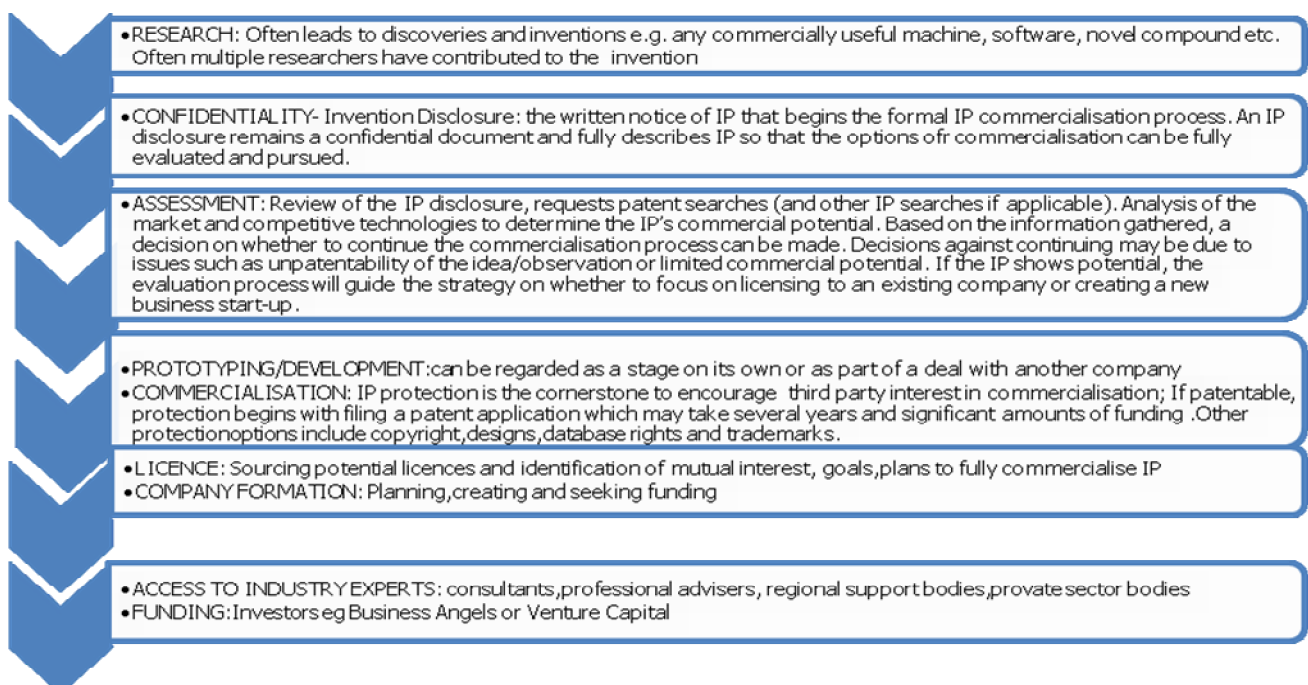


Fig 6: IPR and Technology Transfer Model

**Research:** It is widely recognised that research, innovation and entrepreneurship need to be harnessed to maintain and promote economic growth in a region. The knowledge base (HEI's) therefore often actively seeks to protect its intellectual property (IP) and to commercialise the results of research where appropriate. Revenue earned through commercialising IP can benefit the research worker, the research itself and the HEI. Rewards in terms of reputation and finance can be substantial, but the process requires careful management, often over a long period.

**Confidentiality:** Creating a new idea or invention and looking at prospects of commercialising it can be a rewarding process, although it is never straight forward or easy. An important point that many people overlook when trying to develop an idea is the need for confidentiality. Premature disclosure of ideas can cause many difficulties later on, particularly if patent protection is needed. Initial discussions should be limited to the benefits of an idea unless a Confidential Disclosure Agreement (CDA) has been signed (sometimes called an NDA, or Non-Disclosure Agreement). This is necessary for each and every person or organisation that you

deal with (apart from solicitors and patent agents, who have a duty of confidentiality.)

Market & Area Assessment<sup>82</sup>: At the outset, desirability of any product can only be guessed at. The main benefits need to be assessed and listed along with those of existing or competing products, which includes different types of products solving the same problem. Market research is necessary to determine whether the market really needs a product of the kind envisaged, and if so, would people be prepared to buy at a reasonable price. It is also necessary to determine if a product can be made and shipped to the market at a viable price.

Competitors	Internet searching can give a good indication for most markets.
Market value	Market reports, available at the British Library, can help with calculating expected income. Income generated by companies selling similar products can also be used. It is best to be realistic in calculating your expected income, and to build in aspects that could affect it.
Market culture	What are the things that affect the market? e.g. trends in different countries.
Market needs	Some of this information will be available on the internet, but sometimes prospective customers need to be approached (without giving away confidential information).
Route to market	Is manufacturing appropriate via your own company, or would it be best to license the idea (and any IP) to another company? What are the steps of development for similar products? How are they supplied to the market?

Fig 7: Market Analysis

Whatever the idea or invention is, it will need to be proved at various stages of development that it will work. If it is possible to make a working model or prototype, this can be more attractive to organisations or companies which might support the idea. In some cases a basic or part prototype or working model is sufficient for early stages.

Prototype Building / Development: Prototype building or development at this stage is often done with the help of another company or organisation. Costs for this stage of the commercialisation process can vary greatly, as can length of time to complete development. In some cases a virtual prototype or basic working model can be sufficient to gauge interest from potential licensees or the market; a licensee might want to tailor the idea to their own product portfolio so previous extensive prototyping work might be wasted. Conversely it may be necessary for a fully working prototype to be built. Prototyping can be regarded as a stage on its own, or integral to a 'deal' with another company which might eventually take the product to market themselves under a licensing arrangement.

Commercialisation: Intellectual property (property that arises from creative thought) can take the form of patents, copyright, designs and trade marks. It is important to

decide which of these, if any, apply to the idea. IP rights can be important to investors or licensees as commercialisation progresses, and have value as any other form of property might. Once it has been decided what IP protection might be suitable action may need to be taken to protect it, by filing a patent, trademark or registered design application. These applications can be filed by individuals but it is always advisable to enlist the help of a patent or trademark agent to write and file the application. Patenting can be a complicated process that involves skill and strategic planning to obtain the best protection. It can also be a very costly exercise so a dedicated patent budget is often required not only for the initial filing of the patent but for future policing of it as well. Some examples of IP protection might be:

#### Patents

Patents protect technical and functional aspects of inventions, and give the patent owner the right to stop others from making, selling, using or importing the patented invention in the country covered by the patent. The term of a patent is 20 years, usually from patent application filing date. There are a number of questions which need to be answered in assessing whether an idea is suitable for patenting, and relate to patent requirements for novelty, existence of an inventive step (non-obviousness), and industrial applicability. These are:

- § Has anyone thought of the idea before? (Novelty)
- § Would the idea be obvious to a person who is skilled in the technology area relating to the invention? (Inventive step)
- § Could the invention be made in an industrial setting? (Industrial applicability).

To decide if an invention is new or novel, a prior art search can be done. This identifies ideas generated by others which might be close to or the same as the idea. It usually takes the form of a search of published patent applications, patents and published literature.

#### Copyright

If copyright applies to the idea, it exists from the moment the idea is created in a permanent form. Copyright applies to and protects material such as written work including music, computer source code, diagrams, art, recordings. Copyright protects against copying without permission, and can last for the life of the creator of the work plus 70 years, depending on the type of work.

#### Designs

Design Rights are applicable to 3D objects or a design for a 3D object (i.e. design for a car). The shape of the object is automatically protected by Design Right (i.e. no registration needed), but not 2D designs, such as patterns. Design Rights last for between 10 and 15 years.

It is possible to apply for a Registered Design, which protects both the shape and pattern, and lasts for up to 25 years (renewed every 5 years). The design must be





new and have individuality to be registered. Both Design Rights and Registered Designs give the right to stop others copying or using the design.

#### Trademark

Trademarks protect names, signs or symbols, slogans, which people then associate with certain products or companies. Trademarks can exist automatically if a name has become associated with a product over time. Usually however it is best to register a trademark. The mark needs to be distinctive, and not descriptive of the purpose of the product or service, among other criteria. Trademark protection lasts 10 years but can be renewed. Trademarks must not be the same or similar as an existing one for the same or similar product. To decide whether any proposed trademark already exists, it is possible to do a trademark search<sup>83</sup>.

#### Know How or Trade Secrets

Any idea may have a part of it which can be kept secret, and would be difficult or impossible to find out, or copy, by any means. If this is the case, the secret aspect is called know how or a trade secret, and can exist along with IP rights.

Licensing: Depending on the nature of an idea or invention, it may be appropriate to license it to another company as a way of getting it to market. If intellectual property protection is appropriate for the invention, it is vital to have this in place before approaching a potential licensee. This gives an added layer of protection for you, clarifies ownership, and can give weight and leverage in negotiations. A confidential disclosure agreement (CDA) should be signed if confidential information is to be shared during discussions, and it is advisable to involve a solicitor to give advice about the type of things you should aim to get out of a license arrangement, which would normally be drawn up by a solicitor or other suitably qualified professional.

Company Formation: It may be advisable to set up a registered company to deal with the project. If there are a number of people involved, existence of a company with a registered address can make it easier for organisations supporting an idea to communicate, and can be more attractive in a business sense than an individual or group scenario.

Access to Industry Experts: A valuable contribution to this process is the input from individuals with business experience to help guide, mentor and coach a start-up company. These are typically high calibre people who have had success in senior positions in industry and now want to help early stage companies benefit from their experience in a part time or non- executive director capacity.

Funding: Funding for early stage ideas could be for development, prototype building, IP protection, or market investigation. Funding availability will depend on many factors e.g. what is available in the EU member state or in the particular region. Typically funding sources are Business Angels or Venture Capitalists, Development Agency funds, Central Government funds etc.





### 3.6.3 Key Policy Issues and Legal Foundations

A literature search has been completed for recent data and an IPR and technology transfer questionnaire developed (Appendix 4), involving questions regarding general conditions, actors, policy instruments, measures and strategies in order to better understand the context of technology transfer in Europe.

To define the scope of “IPR and Technology Transfer” data has been collected from 14 regions in Europe to identify case studies, key learning points and sources of know-how in the field of IPR and technology transfer.

To examine different technology transfer systems it is very important to take a look at innovation systems in which different actors are active and to analyse what exactly is meant by the term technology transfer. Inventions and innovations are not only generated by one actor but in a more and more interactive process by different actors (e.g. through cooperation's between industrial sector and creative industries). The innovation process is no more focused within one company but rather based on interaction between different actors (e.g. Open-Innovation, User Innovation...) who are part of the innovation system. Due to the rise of information- and communication technologies the international context of innovation systems play's a central role in terms of technology and know-how transfer. Know-how intensive sectors, such as creative industries have become increasingly important. As a result of these dynamics in internationalising innovation, legal frameworks for Intellectual Property Rights have become a key concern in technology and know-how transfer.

There are many different actors within technology transfer systems : The following have been identified:

- § Producers of Knowledge and Technology (Public or private?); Creative Industries and knowledge intensive industries versus industrial sector.
- § Technology Consumers or Users (already existing or new founded companies).
- § Intermediate Actors and Technology Transfer Institutions – TTIs: Which services are provided? Who is the target group? Are there barriers for other groups? Which role do clusters play in transferring technology or knowledge? Can TTIs be categorised at all?
- § Political Decision Makers (Existing policy instruments and measures).

This categorisation is useful when comparing technology transfer systems of different regions.

Due to the increasing importance of Technology Transfer and Know-How Transfer (e.g. ICT and the creative industries) intellectual property rights (e.g. Registered Designs, Patent, Copyright, Trade Marks, Utility Models...) continues to be an important issue. The latest literature shows that in European countries SMEs are often facing a lot of barriers in using IPR but especially these companies that are active within the ICT sector or the creative industries. In most regions a range of different actors exist, mostly publicly funded, and therefore it is important to get an



“overall picture” of how any regional system works. Important questions that arise are:

- § Where are clusters (considering as well cluster initiatives and networks) positioned in such systems
- § How do technology transfer initiatives satisfy the demand on IPR services for industrial oriented sectors and know-how intensive sectors at the same time
- § Which IPR services are supplied and who are the main consumers of them.
- § What are the most valuable and the most effective of the services offered

## 4. Conclusions and Recommendations

### 4.1 Conclusions

1. The CSE model considers a mix of infrastructures. The right infrastructure combination in the right locations is critical for cluster growth and expansion. Then as clusters grow specialist Business Technology Centres are required to provide access to a large range of support facilities. This is most cost effective when these facilities are shared with other EU regions and is a key driver in the internationalisation of clusters, and that suitable networks are put in place to exploit these resources.
2. The global economy is in the midst of a radical transformation with far reaching and fundamental changes in technology production and trading patterns. To compete in a global market clusters need to concentrate on human capital, financial investment and RTD. Generally, an Internationalisation Policy Framework can vary depending on the type of organisation engagement that is foreseen, but at the very least requires an agreement set between parties that implement cluster development policies e.g. Regional Development Agencies (RDA's) for the most part.
3. There is a need for regions, through RDA's where possible, to have an internationalisation strategy that has dedicated funding and measurable outputs. Measuring the regional impact of cluster internationalisation is important and should include as a minimum GVA increase, inward investment, research intensity in the HEI base, jobs created, average salary per job, increased international sales for companies, human capital expansion.
4. Innovation maturity for an SME within a cluster depends on seven strands: Collaboration, Environment, Finance, Knowledge, Senior Management, Risk, and Staff. Clusters can be the unifying policy tool for EU innovation stakeholders to form the basis of a common policy exchange amongst regional partners and the basis of sustainable trans-national policy co-operation.

### 4.2 Recommendations

1. There is a clear case for international cluster co-operation by linking with strategic partnerships in other EU regions but this co-operation must have clear





- added value, dedicated resource (funds and people) and be supported at a political level to be successful.
2. It is clear that trans-national cooperation should be encouraged
    - i) To facilitate access to and to enable the sharing of knowledge, infrastructure, pilot plants and academic excellence.
    - ii) To enable integration into high value markets, developing markets, and joint efforts for opportunities in BRIC countries.
  3. Creating effective trans-national cooperation needs information on what is available in EU regions and resources to build the links and trust with partner regions.

## 5. Acknowledgements

The Northwest Development Agency, lead partner for CLUNET and coordinator for the CLUNET-ECA project, would sincerely like to thank all the partners in the extended ECA for their support and input into this project. In particular they would wish to thank the partners who took on the lead responsibility for two of the work packages: Corallia<sup>84</sup> for Internationalisation and Innovations –und Technologietransfer Salzburg for IPR and Technology Transfer.

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7. [www.bionow.co.uk](http://www.bionow.co.uk)
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10. [www.biomanufacturing.co.uk](http://www.biomanufacturing.co.uk)
11. [www.nibhi.org.uk](http://www.nibhi.org.uk),
12. [www.nowgen.org.uk](http://www.nowgen.org.uk)
13. [www.wmic.manchester.ac.uk/](http://www.wmic.manchester.ac.uk/)
14. [www.chemicalsnorthwest.org.uk](http://www.chemicalsnorthwest.org.uk)
15. [www.omic.org.uk](http://www.omic.org.uk)
16. [www.materialsdiscovery.com/](http://www.materialsdiscovery.com/)
17. [www.coebio3.manchester.ac.uk](http://www.coebio3.manchester.ac.uk)
18. [www.innovation.globalwatchonline.com](http://www.innovation.globalwatchonline.com)
19. [www.northwestvision.co.uk/](http://www.northwestvision.co.uk/)
20. [www.infolab21.lancs.ac.uk/](http://www.infolab21.lancs.ac.uk/); [www.digitalinc.org.uk](http://www.digitalinc.org.uk); [www.xpdia.org](http://www.xpdia.org);  
[www.incubationnw.org/incubators/](http://www.incubationnw.org/incubators/)
21. [www.lec.lancs.ac.uk](http://www.lec.lancs.ac.uk);[www.futurecomposites.org.uk](http://www.futurecomposites.org.uk)
22. [www.biocity.co.uk/](http://www.biocity.co.uk/)
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29. [www.promomadrid.com](http://www.promomadrid.com)
30. [www.biomadrid.org](http://www.biomadrid.org)
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32. [www.cib.csic.es](http://www.cib.csic.es)
33. [www.cnb.uam.es](http://www.cnb.uam.es)
34. [www.cbm.uam.es](http://www.cbm.uam.es)
35. [www.iib.uam.es](http://www.iib.uam.es)
36. [www.cajal.csic.es](http://www.cajal.csic.es)
37. [www.ift.csic.es](http://www.ift.csic.es)
38. [www.ifi.csic.es](http://www.ifi.csic.es)
39. [www.ciemat.es](http://www.ciemat.es)
40. [www.isciii.es](http://www.isciii.es)

41. [www.cnic.es](http://www.cnic.es)
42. [www.cnio.es](http://www.cnio.es);
43. [www.h12o.es](http://www.h12o.es)
44. [www.hcsc.es](http://www.hcsc.es)
45. [www.hggm.es](http://www.hggm.es)
46. [www.hulp.es](http://www.hulp.es)
47. [www.hup.es](http://www.hup.es)
48. [www.hrc.es](http://www.hrc.es)
49. [www.imidra.com](http://www.imidra.com)
50. [www.inia.es](http://www.inia.es)
51. [www.cab.inta.es](http://www.cab.inta.es).
52. [www.uam.es](http://www.uam.es),
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54. [www.uah.es](http://www.uah.es)
55. [www.upm.es](http://www.upm.es) .
56. [www.fpcm.es](http://www.fpcm.es),
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58. [www.pctua.org](http://www.pctua.org)
59. [www.upm.es/investigacion/parqueupm/](http://www.upm.es/investigacion/parqueupm/) .
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  84. [www.corallia.org](http://www.corallia.org)





## 7. Appendices

### APPENDIX 1: ECA Partnership Agreement

#### EUROPEAN CLUSTER ALLIANCE PARTNERSHIP AGREEMENT

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The ECA Partnership Agreement is a Memorandum of Understanding that defines mutual rights and obligations for cluster initiatives associated to the European Cluster Alliance (ECA). Signatories of the ECA Partnership Agreement are committed to contribute to the objectives of the ECA and to participate, in fields of mutual interest, in its activities. The ECA Partnership Agreement is a legally non-binding document and does not, for both sides, imply any financial commitments. It expresses the willingness to work closely together, wherever possible and opportune, at European level, by sharing information and joining forces.

ECA partners have the right to:

- Participate in the work undertaken by the INNO-Nets and/or the working areas of their choice;
- Be invited to events organised within the Alliance;
- Participate in and co-fund Calls for proposals launched by the Alliance;
- Fully access the Alliance’s intranet site, established under the PRO INNO Europe web site;
- Use and disseminate the results obtained within the Alliance.

On the other hand, ECA partners have the obligation to:

- Support the objectives and activities of the Alliance and to give them public visibility;
- Invite ECA partners to events organised under their initiative;
- Provide regular information about their activities, to be published on the PRO INNO Europe web site;
- Inform the ECA partners about their own activities in areas of mutual interest;
- Self-finance their participation in the work of the Alliance.

Authorised Person

Organisation

Position

Signature

Address/email

Date

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APPENDIX 2: CLUNET-ECA PARTNER LIST

Improving the Cluster Infrastructure Through Policy Actions-CLUNET		Country	Contact details
NWDA	CLUNET	LEAD	Lynne Taylor Fabien Martel
Economic Development Department Karlsruhe		Germany	Steffen Buhl
Fundacion para el Conocimiento Madrid		Spain	Eduardo Diaz
Etruria Innovazione ScPA		Italy	Laura Righi Sara Bonci
Ljubljana Regional Development Agency		Slovenia	Natasa Mrsol Barbara Hrovatin
South Great Plain Regional Development Agency		Hungary	Peter Nagyvari
West Pannon Regional Development Agency	CEE	Hungary	Tamas Kocsondi
Innovations –und Technologietransfer Salzburg GmbH		Austria	Christian Prucher Oliver Jan Wagner
Maribor Development Agency/Euro Info Center Maribor		Slovenia	Vladimir Rudl Marko Kac
Swedish Agency for Innovation Systems(VINNOVA)	BSR	Sweden	Helene Vogelmann
Enterprise Estonia		Estonia	Tiiu Evert
ZAB ZukunftsAgentur Brandenburg GmbH	INNET	Germany	Thilo Lang
TSB Technology Foundation Berlin ( TSB)		Germany	Carsten Domann
Veninn ( Veneto Innovazione)	ASSOCIATED MEMBERS FOR CLUNET	Italy	Ivan Boesso
Wirtschaftsministerium Baden-Wurttemberg		Germany	Juergen Oswald Swantje Apel
ERRIN –European Regions for Research and Innovation		Belgium	Sylvia Schreiber Anthony van der Ven
Institute for Economic Development of the Principality of Asturias( IDEPA)		Spain	Victor Gonzalez Marroquin
Ministere de la Region Wallonne/Direction generale de l'economie et de L'emploi		Belgium	Daniel Collet
Hellenic Technology Clusters Initiative ( Corallia)		Greece	Vassilis Makios
Papirbredden Innovasjon AS		Norway	Knut Brinchmann
ERRIN –European Regions for Research and Innovation		Belgium	Sylvia Schreiber Anthony van der Ven
Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology		Germany	Stefan Wimbauer
European Pro Clusters Association (EPROCA)		Finland	Leena Zitting
Institute for Economic Development of the Principality of Asturias( IDEPA)		Spain	Victor Gonzalez Marroquin
Direccion Xeral de I+D+I Conselleria de Innovacion e Industria Xunta de Galicia		Spain	Salustiano Mato de la Iglesia
EUROCEI		Spain	Rosario Zozaya
Ministere de la Region Wallonne/Direction generale de l'economie et de L'emploi		Belgium	Daniel Collet
Cluster Agency of the State of North Rhine Westphalia	Germany	Silke Stahl-Rolf	
National Agency for Innovation and Research	Luxemburg	Gilles Schlessler	

### APPENDIX 3: TEMPLATE FOR ECA WORK-PACKAGES

ECA Workpackage Number: -

Lead: -

#### OBJECTIVES

Describe the objectives you want to achieve in the workpackage based on the ECA workplan outcomes and outputs required –no more than 150 words

#### BACKGROUND

Describe the rationale for the work and give some background information as to the what and why this is important –no more than 350 words

#### ACTIVITIES

Describe the activities to be undertaken in the workpackage – no more than 100 words

#### PROJECT PLAN

Define the actions in the workpackage under the following headings

1. Definition & Mapping - describe responsibility for this and who will need to participate

1.1 Definition

- bullet points

1.2 Mapping

- Bullet points

2. Literature Search - describe responsibility for this and who will need to participate

Literature search for recent work (preferably within the last three years) and best practice on this topic

3. (Optional) Workshop - describe responsibility for this and who will need to participate

Workshop to share best practice and start to produce the framework model

- When?
- Where?
- Who will attend?
- Format?
- Agenda?
- Will it be facilitated?

(It should be possible to have additional project meetings combined with other events, e.g. CLUNET meetings, Cluster Conference in Sophia-Antipolis, etc), so these need to be agreed at an early stage.

4. Analysis - describe responsibility for this and who will need to participate

Analyse outcomes from the work as described above

4.1 Identify examples of best practice

4.2 Produce case studies illustrating specific aspects of best practice

- Identify examples
- Who will produce the case studies?
- How will they be reviewed and coordinated?

5. Detail the Outcomes you expect from the project

6. Sustainability of the project



E.g. what other projects can come out of the work done –this is relevant for further bids to EU calls

7. Produce the final report and disseminate it

An interim report will be needed for the European Cluster Conference in Sophia-Antipolis in November 2008.

8 TIMINGS

Please insert Gantt chart for timings

Key dates are:-

- 13<sup>th</sup> & 14<sup>th</sup> November 2008 – Presentation of Interim Report at the European Cluster Conference in Sophia-Antipolis.
- Interim meetings/reports
- August 2008 – Final Report

APPENDIX 4: IPR AND TECHNOLOGY TRANSFER QUESTIONNAIRE

Profile of Region .....

1. Technical data:

A	What is the official name of your organisation?	In your national language: Text In English: Text
B	Name of the region where the operation takes place (relevant if the partner is a regional organization not a nation-wide institution):	
C	Country:	
D	Author(s) of this report:	
E	Contact of author (phone, e-mail):	

2. Context for technology transfer

Referring to the following topics please provide information about your region to achieve a better understanding of general conditions, policies & strategies relevant to technology transfer and the related elements of IPR & technology transfer services in your region.

- Lengths of the report for each issue should not exceed ½ a page.

2.1. Technology Transfer in your region

2.1.1. Regional and national policy instruments (programmes, schemes, initiatives):

2.1.2. Existing models & structures for technology transfer:

2.1.3. Role of Clusters in technology transfer:

2.2. Target Groups and main Aims of Technology Transfer

2.3. Technology transfer models, good practice cases (If there are models relevant to technology transfer, please describe below in details.)

5. How important are the following services and instruments?  
(Please check all that apply!)<sup>1</sup>

Tasks and duties	Importance		
Examples of Services - Elements of IPR & tech trans services			
provide data bases	• high	• medium	• low
Patent advising, Patent Scout (provides infos on patents and IPR)	• high	• medium	• low
Consulting, information services and general advisory	• high	• medium	• low
enforcement of branch related projects	• high	• medium	• low
provide functioning network	• high	• medium	• low
guidance through official channels	• high	• medium	• low
find relevant partners	• high	• medium	• low
find relevant research institutions	• high	• medium	• low
marketing measures	• high	• medium	• low
Business advisory services, support in developing business plans	• high	• medium	• low
Investor development activities	• high	• medium	• low
Initiation and professional management of third party funded science-industry projects	• high	• medium	• low
Placement of students and graduates	• high	• medium	• low

<sup>1</sup> Please mark appropriate level of importance.



Organisation of technology transfer events and workshops	• high	• medium	• low
Initiation and organisation of further training courses	• high	• medium	• low
Presence on selected fairs and exhibitions	• high	• medium	• low
Information & consultation regarding regional, national and European R&D support grants, advice for best suitable subsidy sources	• high	• medium	• low
Market observation/ funding of market studies	• high	• medium	• low
Attract inward investors	• high	• medium	• low

Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low

Tasks and duties	Importance		
Examples of Instruments			
R&D department	• high	• medium	• low
Branch-related market observation	• high	• medium	• low
Branch-related R&D department	• high	• medium	• low
Cluster and business networks	• high	• medium	• low
Network creation	• high	• medium	• low
Funds for R&D projects	• high	• medium	• low
International exchange projects	• high	• medium	• low
Branch-specific related projects	• high	• medium	• low
provide online platform	• high	• medium	• low
special knowledge transfer	• high	• medium	• low
own education centre or system	• high	• medium	• low
Branch-specific search for best suitable project partners for innovation process	• high	• medium	• low
Incentives to boost collaboration among universities and companies.	• high	• medium	• low
SMEs innovation projects with unis and technology centres	• high	• medium	• low
Creating regional innovation networks	• high	• medium	• low
Regional innovation strategy	• high	• medium	• low
Support	• high	• medium	• low

Pilot programme to encourage greater take up of internationalisation services	• high	• medium	• low
Funding new and existing activities	• high	• medium	• low
Planning the future of companies	• high	• medium	• low

Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low
Any other, please specify:	• high	• medium	• low

4. Which institutions/actors are relevant for creation of technology transfer policy in your country/region? <sup>2</sup>

Institutions/ actors for policy making in the field of technology transfer

No.	Institution (English)	Level: national or regional	Type	Status	Policy focus	Their 3 most important services
1.						
2.						
3.						
4.						

Are there bodies with advisory role? <sup>3</sup>

No.	Institution (English)	Level: national or regional	Type	Policy focus	Role
1.					
2.					
3.					

<sup>2</sup> Indicate the following: Name of the institution, Level (National or regional – if region, specify which), type (government, business, university, NGOs, mixed – please specify), status/role (decision-making, coordination, implementation, advisory), policy focus (what is the policy where this institution is most active? - industrial policy, enterprise, innovation), up to 3 most important services. Add rows if necessary.

<sup>3</sup> If yes, indicate the following: Name of the institution, Level (National or regional; if regional, specify which), type (government, business, university, NGOs, mixed – please specify), policy focus, what is their role.



Which institutions/actors are responsible for the implementation of key policy priorities according to the documents?<sup>4</sup> Are certain policy objectives related/entrusted to specialized institutions (e. g. agency, fund)?

No.	Institutions (English)	Level: national or regional	Type	Policy focus	Role	Their 3 most important services
1.						
2.						
3.						

Which institutions/ actors are providing technology transfer services in <sup>5</sup>

No.	Institution (English)	Level: national or regional	Type	Policy focus	Role	Their 3 most important services
1.						
2.						
3.						

If you have any further comments, please do not hesitate to share them with us. Thank you!

<sup>4</sup> Indicate the following: Name of the institution, Level (National or regional – if regional, specify which), type (government, business, university, NGOs, mixed – please specify mixed), status/role (providing funds, managing the programs, ...), policy focus (industrial, enterprise, innovation ...), up to 3 most important services.

<sup>5</sup> Indicate the following: Name of the institution, Level (National or regional – if region, specify which), type (government, business, university, NGOs, mixed – please specify), status/role (decision-making, coordination, implementation, advisory), policy focus (what is the policy where this institution is most active? - industrial policy, enterprise, innovation ...), up to 3 most important services. Add rows if necessary.



## APPENDIX 5: OTHER CASE STUDIES

### 1. Slovenia

Detail of 4 main clusters

1. Automotive Cluster of Slovenia (ACS), <http://www.acs-giz.si>;  
(sources: ACS strategic agenda, ACS web page)

The Automotive sector is one of the most important in Slovenia, representing 6% BDP of the industrial sector and it provides 24.000 jobs, together with the related sectors 5 times more (approx. 120.000). Due to strategically important role of the automotive sector for the Slovene economy, setting up of the Automotive Cluster of Slovenia (ACS) in 2001 was among the first clusters (within a pilot programme of the Ministry of Economy for cluster development). Within this pilot project the following priority fields of ACS development were defined (common infrastructural projects):

- a) Joint research, developmental and quality infrastructure
- b) Promotion and marketing
- c) Quality and business in excellence
- d) Informatics
- e) Vocational education and training (VET)
- f) Suppliers chains
- g) Joint R&D projects

ACS is a reliable and intensive R&D network of automotive suppliers to global vehicle producers & system suppliers at special segments with complex products of higher added value. It is a network for business in the engineering and manufacturing industries: metal working, mechanical, electrical and electronics, chemical, rubber, textile and transport equipment industries, as well as partners from R&D institutions and other services in the supply chains that create and deliver products and services for the automotive industry.

Today ACS has become the central communication point between manufacturers, suppliers, research organizations and the government with innovative infrastructure support for the Slovenian automotive industry. The Automotive Cluster of Slovenia has 59 members, from which 53 industrial companies (having their own R&D centres) and 6 R&D institutions - 5 faculties & an independent institute with approximately 2.000 employees; at least a half of them are registered researches. This means that ACS has become the meeting point of all the three spheres. In 2007: 50 members, annual turnover of 2,5 billion €, no. of employees: 17.600, 80% of export.

R&D members:

Within University of Ljubljana: Faculty of Electrical Engineering - [www.fe.uni-lj.si](http://www.fe.uni-lj.si);  
Faculty of Mechanical Engineering - <http://www.fs.uni-lj.si>; Faculty of Natural Sciences and Engineering - <http://www.ntf.uni-lj.si>;



Within University of Maribor: Faculty of Electrical Engineering and Computer Science - <http://www.feri.uni-mb.si/>; Faculty of Mechanical Engineering - <http://www.fs.uni-mb.si/>;

Today the Slovenian automotive sector represents a sectoral coverage of the supply chain, particularly strong in sub-clusters of material processing, production technologies and mechatronic/telematic applications. Unique for the automotive sector in Europe, Slovenian suppliers are in private ownership of Slovenian owners, partially also in mixed and foreign ownership. There are no important Slovenian suppliers of automotive components in state ownership.

In 2007 ACS set up Polycentric Technological Centre (PTC). The project "Polycentric Technological Centre as an international innovative system of Slovenian automotive supply industry" was started in order to improve mutual investments as well as the co-operation between the economic and academic sphere. Strategic goals of the project were: establishment of new research development centres, creating new posts, development of new materials, production technologies and high technological products as well as lifting the quality and increasing the co-operation between the economy and the academic sphere. This can already be noticed in the higher number of projects with the academic sphere and in the fact that there are new qualified researchers in this field.

In 2008 ACS has also started with a new project: Slovenian Automotive Living Lab (SALL).

Appropriate infrastructure, which is without any restraints at the disposal of all members (project partners), is vital for successful implementation and completion of R&D projects, respectively to improve ACS competitiveness model. In the past years ACS made large investments in the infrastructural modernization within the projects and it plans to continue this activity also in the future. In accordance with EU trends ACS will establish the "Living Lab" in Slovenia (estimated duration of the project: 2008-2011) that will satisfy the needs of the automotive industry. "Living Lab" is an innovative environment where "the world of knowledge" and "the world of industry" will meet and thus create new ideas for products with the highest added value.

In the last two years ACS has successfully implemented its own cluster model in Serbia and Russia (the region of Samara) – in both cases supported by EC and Slovene Government. ACS has also opened its branch office in Moscow.

ACS is also one of the founders of the national technological platform for vehicles, roads and traffic –TP Airtrack.

## 2. Wood Industry Cluster (WIC), <http://grozd.sloles.com>

Like ACS also TCS was founded in 2001 as one of the three clusters within a pilot programme of the Ministry of Economy for cluster development.

WIC linked together one-third of the Slovenian wood processing and forestry sector as well as the most important research and educational institutions in the industry.





In 2007 WIC had 32 members (of which 5 R&D), 9.000 employees, annual turnover 0,5 billion € and 54 % of export.

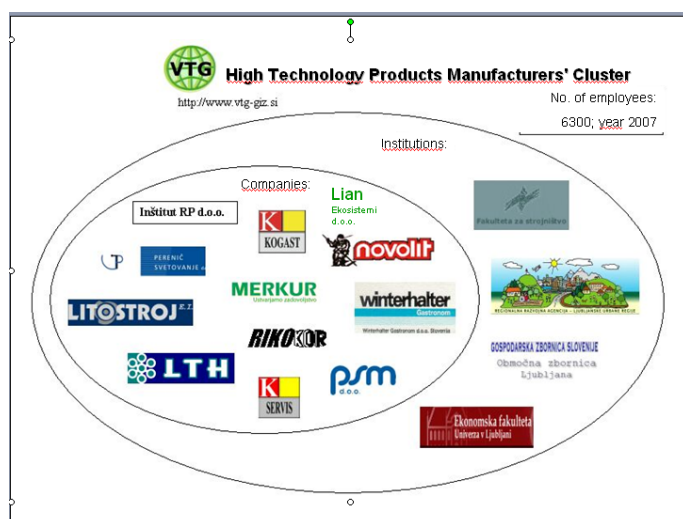
3. Toolmakers Cluster of Slovenia (TCS), <http://www.toolcluster.net>

Like ACS also TCS was founded in 2001 as one of the three clusters within a pilot programme of the Ministry of Economy for cluster development.

TCS vision is a regional network of high qualified companies and organizations-development partner of the most demanding industries in the EU. Target markets of TCS are automotive, aerospace, IT and domestic appliances industries. TCS is organized as a network of virtual dynamic organizations with C-TCS Institute as a centre, which is included in numerous Slovene and international R&D networks. TCS enables its partners connections with its member-companies, which has great potential for tools and machines development and productions, as well as with its members-institutions, with diversified offer of development, education and training, research, consulting, IT and financial services. Major customers: VW, Mercedes, AUDI, BMW, Magna Chrysler In 2007 TCS has 47 members (of which 19 R&D institutions) with 1.889 employees, annual turnover: 136 million € and 63% of export.

4. High Technology Products Manufacturers' Cluster (VTG), <http://www.vtg-giz.si>

VTG links companies, research units and governmental institutions. The goal of this linkage is to achieve synergic effects at marketing, development and production of hi-tech products and technologies. Although VTG is a small local cluster (within NUTS 3), having only 15 members (of which 2 R&D institutions), it gives jobs to 6.300 employees (2007). The annual turnover of cluster members was 870 million € (2007).



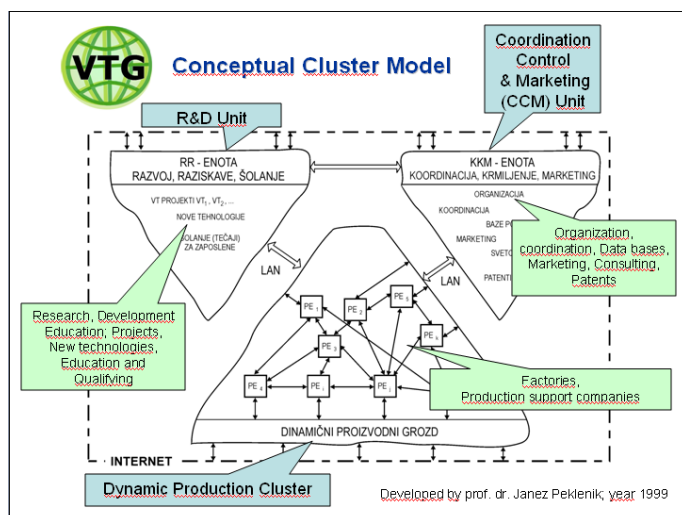
The cluster targets a global market. It is designed in a new organizational form of dynamic cluster-type manufacturing structures. The cluster's products are new hi-tech products with high added value, and a complex offer of different system





solutions that are based on core competencies at a strategic level. The cluster operates on a project basis.

VTG has developed its own conceptual cluster model.



Technology Networks of Slovenia (TNS), <http://www.fe.uni-lj.si/>

Technology Networks of Slovenia (TNS) is a consortium of 3 Technology Networks:

1. ICT Technology Network, <http://www.ict-slovenia.net>;
2. Technology Network for Process Control Technology, <http://www.tvp.si>;
3. Technology Network for Intelligent Polymer Materials and Pertaining Technologies, <http://www.fs.uni-lj.si/cem/IPMT/IPMT.htm>

Members of TNS cover research and development (R&D) in the mentioned research areas.

Ad 1) Technology network of information and communication technologies (TM ICT), <http://www.ict-slovenia.net>;

Since 2005 TN has been operating as a consortium of companies, universities and its members, public and other research institutions and other legal entities, together 44 members, which have expressed interest to ensure efficient mechanisms for the support of joint technology development projects and establishment of an integrated innovation environment in the field of information and communication technologies. Some figures for TM ICT in 2007: no. of employees: 13.500, annual turnover: 1,8 billion €  
20 % of export.

Incubators:

There are 7 incubators in Slovenia with approx. 130 incubatees; 3 incubators are located at universities:

1. University of Ljubljana: Ljubljana University Incubator, Ljubljana; public; <http://www.lui.si/>



2. University of Maribor: Tovarna podjetij, Maribor; public; <http://www.tovarnapodjemov.org/>
3. University of Primorska: University development centre and university incubator of Primorska Ltd., Koper; public; <http://www.uip.si/>
4. Network business incubator of the Savinjska region, Celje; public (in cooperation with the University of Maribor) <http://www.mpi-celje.si/>
5. Incubator Sežana, Sežana; PPP; <http://www.inkubator.si/eng/intro>
6. Smart incubator, Ljubljana; private; <http://www.smartstart.si/?langid=2>
7. SAŠA incubator, Velenje; PPP; <http://www.sasa-inkubator.si/>

#### Technology Parks:

Slovenia has 5 technology parks (TP) with approx. 270 incubatees (only regular members), respectively 400 (including associate members); some TP are sector oriented.

1. Technology Park Ljubljana - <http://www.tp-lj.si/en/>; mainly IT, also: automatization in industry, new materials and biotechnology; TP Lj is situated at 3 locations in Ljubljana, sharing common premises to all members.
2. Styrian technology Park - <http://www.tp-lj.si/en/>; not sector oriented
3. Technology Park of Primorska - <http://www.primorski-tp.si/>; not sector oriented
4. Tehnopolis Celje - <http://www.tehnopolis.si/index.php>; not sector oriented
5. Pomurje Technology Park - <http://www.p-tech.si/eng/default.aspx>; biotech, fashion industry and design, new materials, ICT technologies, environment and energy

#### Centres of Excellence:

At present Slovenia has 10 Centres of Excellence – high quality multidisciplinary groups of researchers both from academic and business spheres, combining critical mass of knowledge and adequate research infrastructure;

<http://www.centriodl.si/index.php?lang=en>

1. Centre of Excellence Biotechnology with Pharmacy (CoE BP)  
Leading research organisation: University of Ljubljana, Faculty of Medicine, Ljubljana
2. Centre of Excellence F.A.B.R.I.C.A. (CoE F.A.B.R.I.C.A.)  
Leading research organisation: Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana
3. Centre of Excellence for Information and Communication Technologies and Services (CoE ICT)  
Leading research organisation: University of Ljubljana, Faculty of Electrical Engineering, Ljubljana





4. Centre of Excellence Materials for the Electronics of the Next Generation and Other Emerging Technologies (CoE ME)  
Leading research organisation: Jožef Stefan Institute, Ljubljana
5. Centre of Excellence Advanced Metallic Materials (CoE AMM)  
Leading research organisation: Institute of Metals and Technology, Ljubljana
6. Centre of Excellence Nanoscience and Nanotechnology (CoE N&N)  
Leading research organisation: Jožef Stefan Institute, Ljubljana
7. NMR Centre of Excellence for the Study of Structures and Interactions in Biotechnology and Pharmacy (CoE NMR)  
Leading research organisation: National Institute of Chemistry, Ljubljana
8. Centre of Excellence Environmental Technologies (CoE ET)  
Leading research organisation: Jožef Stefan Institute, Ljubljana
9. Centre of Excellence Supercritical Fluids (CoE SCF)  
Leading research organisation: University Of Maribor, Maribor
10. Centre of Excellence for Advanced Control Technologies (CoE ACT)  
Leading research organisation: Jožef Stefan Institute, Ljubljana

## Regional Cluster Policy

### NUTS 1 and 2 levels:

The Ministry of Economy (ME) launched the cluster support programme in 2000 (ended in 2005). The main goal was to encourage cooperation among business enterprises on one side and a particular sector and public R&D institutes on the other. The concept of the first project was to identify strategically important clusters for Slovenia. Besides several consultations and meetings with foreign experts, also an extensive assessment of the potential clusters, involving 1700 companies, was carried out. The overall conclusion was that no "real" cluster actually existed in Slovenia at that time. Instead of a uniform programme, ME decided to adopt a wider package of measures to encourage co-operation and networking.

The Slovenian cluster development policy pursued three objectives:

1. To encourage co-operation and networking between companies in order to strengthen individual and joint abilities to develop partnerships in different business fields. For this purpose, ME co-financed joint projects carried out by at least 3 companies and at least 1 R&D institution in 6 different areas; technical improvements, product development, specialisation, supply chains, joint production and marketing.
2. To promote cluster development through increased investments in support infrastructure.
3. To initiate cluster formation in practice.





ME designed the outline of a cluster development process (Slovenian model), followed by measures and instruments for the various steps of the process. The 3 phases of the Slovenian model are:

- The initiation phase: the involved companies, institutions and organisations develop a common vision, e.g. a strategic cluster development concept and prepare an action plan for its implementation,
- The early growth phase: covers the implementation of the action plan which is mainly focused on building and strengthening the common ICT, technology and organisational platforms needed for the dynamic growth phase and
- The final phase - dynamic growth: activities focus on building an innovative environment and developing a nodal position for the cluster in an international value system.

Results:

In 2001 when the first call for proposals was launched, 3 projects were selected: Automotive, Transport and Logistics, and Toolmakers cluster.

In 2004, 18 cluster offices are being operational. Altogether 29 projects related to clustering are being supported, bringing together 390 companies (60.000 employees) and 120 education/research institutes.

Year	No. of clusters (source 1)	No. of supported cluster projects	Budget in mio € (source 1)	Budget in mio € (source 2)
2001	3	3	...	0,625
2002	5	11	...	1,379
2003	14	17	1,5	2,708
2004	18	29	2,5	4,208

Source 1 - INNO-Policy TrendChart – Policy Trends and Appraisal Reports – Slovenia

Source 2 - Final report: Evaluation of Cluster support measures in Slovenia, 2001-2003 (Nov. 2004, only in Slovene)

Differences in the budget: While INNO-Policy TrendChart (Source 1) includes only the budget from published tenders for direct encouraging of clustering, Evaluation of Cluster support measures in Slovenia (Source 2) includes financial data from internal documents of ME.

The external evaluation of the measure in 2004 showed, that the main reason for establishment of clusters was to obtain financial support. It was discovered that clustering would not have happened unless it had been supported by special measures and that the clusters at that time felt confident to continue even if the government support should cease. However, nowadays we can notice that many of the clusters ceased their operations with the end of public or intermediary financial support. Only some of more developed clusters (e.g. Automotive, Toolmakers, High Technology Products Manufacturers’ Clusters) have survived with the financial support of their members, support to joint R&D projects (Slovene measures) and from EU R&D funding.





Final report: Evaluation of Cluster support measures in Slovenia (EF, 2004) also showed that clusters in Slovenia are mainly understood as institutions of cooperation as cluster members, especially in the initiative phase of the cluster establishment, collaborate at most at R&D projects, joint promotion and vocational education and training (VET). Main cooperation among enterprises is at building of common infrastructure and VET (consecutively of common trust for further cooperation), as there is no strong competition among them in the mentioned fields.

Change of Initiatives:

Even though the evaluations assessed the cluster programme as a successful measure, the new government decided to discontinue the cluster programme and no calls were launched in 2005.

In 2006, the public calls issued for the use of ERDF in RTDI named clusters as one of the groups of potential beneficiaries of the measure to support development of research infrastructure. This opened a window of opportunity for the existing clusters, which were sufficiently strong to maintain their activity and were in the position to apply for funding of new research infrastructure. Also, joint R&D projects, initiated by clusters, could apply for support. But the cluster concept as such fell into oblivion at policy level, both national as well as regional, which was not the case on the local level (NUTS 3).

NUTS 3 level:

An example:

[Maribor Development Agency \(within Podravska Region\)](#): Regional development plan for Podravje 2007-2013 includes the measure Support to global competitiveness and internationalisation of on knowledge based economy that aims:

- § To support investments of companies into the high technology.
- § To strengthen the human resource capital and knowledge of employees and creation of high value added jobs.
- § To raise the share of high qualified experts in economy, transfer of knowledge and mobility of experts from knowledge institutions into economy and from large companies to SMEs.
- § To assure greater cooperation between economy and educational institutions and R&D support institutions for development of innovative and technology advanced economic environment.
- § To create financial instruments for encouraging the development of innovation and technology projects of companies.
- § To encourage development of business, business excellence, business dissemination on foreign markets and internationalisation of companies.
- § To Further develop specialised expert services for development and internationalisation SME support
- § To encourage different forms of networking and cooperation between SMEs
- § To increase SME accessibility for national and international development incentives





Beside the regional development plan Maribor Development Agency has also prepared the Cluster strategy and action plan (2008) for the Podravje region. Activities were carried out in cooperation with existing clusters, cluster initiatives, member SMEs and supporting institutions. Coming out from the SWOT analysis, the regional cluster model will be developed towards the "triple helix" model.

#### SME policy

Programme of Measures for Promoting Entrepreneurship and Competitiveness 2007 – 2013 is directed towards four key areas for entrepreneurship:

- § Promoting entrepreneurship and entrepreneur-friendly environment
- § Knowledge for business
- § R&D and innovations in companies
- § Promoting small and medium-sized enterprises with equity and debt instruments

#### Industrial policy

In the period 2001-2005 Slovenia decided to integrate the concept of clusters systematically in a comprehensive approach to serve long-term economic policy goals. It anchored clusters at the heart of a pro-active industrial policy aiming at SME support and the upgrading of productivity levels and innovation potential of Slovenian industry dedicating significant resources both in money and in attention paid to the process. Slovenia's approach of "dynamic concentric circles" encouraging clustering of SMEs around a lead company, mostly large in size, had fostered eleven institutionalised clusters encompassing 700 companies working on more than 150 joint projects in areas such as marketing, production, R&D and internationalisation in 2003. On the national level at the Chamber of Commerce and Industry of Slovenia the National centre of clusters and technology networks is active in supporting existing clusters in Slovenia.

#### Research and innovation policy

The Ministry of Higher Education, Science and Technology (MHEST), <http://www.mvzt.gov.si/en/>, supports joint projects of companies and R&D institutions through Technology and Innovation Agency (TIA), [http://www.tia.si/o\\_agenciji,533,0.html](http://www.tia.si/o_agenciji,533,0.html) For supporting Slovene companies by the inclusion to global development and research chains of "big players", MHEST supports projects which could be included in larger projects on the EU level (e.g. Joint Technology Platform). The future support of MHEST and the Ministry of the Economy will be aimed to research and technology development by use of structural funds.

#### Financial Support Mechanisms for Cluster Policy

The financial support for implementation of cluster policy is given through EU structural funds - Operational programme for strengthening regional development potentials 2007-2013 - Slovenian development net.

#### Internationalisation Policy

NUTS 1 and 2 levels:







Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments (JAPTI), <http://www.podjetniski-portal.si/>, financed by the Ministry of Economy, offers its support for internationalisation to individual companies, groups of companies as well as clusters. The support is provided with help of seven economic representation offices abroad (Milan/IT, Düsseldorf/DE, Bucharest/RO, Istanbul/TR, Kazan/RUS, San Paolo/Brazil, and Shanghai/China).

Chamber of Commerce and Industry of Slovenia (CCIS), [http://eng.gzs.si/slo/products\\_and\\_services/internationalisation](http://eng.gzs.si/slo/products_and_services/internationalisation) and its staff has good knowledge of Slovene R&D policy, active support to 22 technological platforms and innovative clusters, they have comprehensive insight into the entire R&D sector in Slovenia - from institutions to enterprises. CCIS provide all information as to innovation, the advance of business and technology, as well as economic development projects.

There are six Enterprise Europe Network offices in Slovenia, offering support to SMEs and clusters; <http://www.een.si/index.php?lang=en>

1. Jožef Stefan Institute, Ljubljana; <http://www.ijs.si/ijsw/JSI>
2. Centre for Interdisciplinary and Multidisciplinary Research and Studies of the University of Maribor, Maribor; <http://www.uni-mb.si/podrocje.aspx?id=0&langID=1033>
3. Chamber of Commerce and Industry of Slovenia, Ljubljana; <http://eng.gzs.si/slo/>
4. Maribor Development Agency, Maribor; <http://www.mra.si/maribor-development-agency/introduction-of-maribor-development-agency.aspx>
5. Chamber of Craft and Small Business of Slovenia, Ljubljana; <http://www.ozs.si/eng/prispevek.asp?IDpm=19>
6. University of Primorska, Science and Research Centre of Koper, Koper; <http://www.upr.si/en/>

#### NUTS 3 level:

Maribor Development Agency (Podravje region) – Enterprise Europe Network office offers the following support to SMEs and clusters: dissemination of internal market information, promotion of community initiatives, policies and programmes, assisting SMEs to develop cross-border activities and supporting SMEs to find relevant partners. Clusters have also been identified as one of priority groups to be supported by the Enterprise Europe Network office in the region.

SMEs and clusters in Osrednjeslovenska region (Ljubljana Urban Region, covered by RDA LUR) get the support from 3 EEN offices; Jožef Stefan Institute, Chamber of Commerce and Industry of Slovenia, Unit for Ljubljana and Chamber of Craft and Small Business of Slovenia, Unit for Ljubljana.



## 2. Italy - LIFESCIENCE Sector in Tuscany: an overview

The lifescience sector in Tuscany owes its strength to a consolidated scientific and industrial tradition in the pharmaceutical sector and in pure research. This tradition owes a lot to the high quality of resources from the three universities of the Region (Florence, Pisa and Siena).

The Life Science sector is the main source of production of the Tuscan biotech market, with vaccines and diagnostics being the main products. Most of the therapeutic products are imported from abroad. Multinationals and local small and medium enterprises, some of which are leaders in their market segments, are the main players in this sector. Over the last few years many spin-off companies from universities and leading pharmaceutical firms have been created. Many small companies, established by university researchers and company executives, carry out research commissioned by third parties. They manage to offer an efficient type of outsourcing and supply highly specialised and niche services and products to large companies such as monoclonal antibodies, various types of enzymes, identification of gene functions and pharmacological targets, development and improvement of production processes, development of specific vectors, etc. This is an extremely common form of division of labour as it enables large companies to foster activities such as the discovery of new products and production processes which they can then acquire, develop, manufacture and distribute. Bearing in mind that many centres of excellence in biomedical research and a large number of pharmaceutical companies and companies interested in biotechnologies are based in Tuscany and, in general, Italy, it is likely that this sector will continue to grow with an increasing level of scientific competence.

Production tends to be concentrated around the universities of Florence, Pisa and Siena thanks to their proximity to specialised research centres. This proximity promotes interaction between companies, research centres and universities, and creates the necessary critical mass to attract further initiatives and investments. To facilitate the development of this sector, interesting location opportunities are on offer to set up in well-equipped technology parks and specialised incubators. Lastly, the high quality of life in Tuscany and the beauty of its landscape make it easier to relocate scientific staff and attract researchers and skilled human resources from abroad and Italy. Tuscany has a long standing scientific and industrial tradition in healthcare and life sciences in general. This tradition is matched by national and clinical research, with teams of doctors of international renown working in hospitals such as Mayer, considered to be an international centre of excellence for paediatrics, Le Scotte, Careggi and S. Chiara. Medical and scientific traditions are supported by industrial traditions in the pharmaceutical sector. In this context, it is worth mentioning the Istituto Gentili, Sclavo and the Menarini Group which have played a major role in the pharmaceutical industry of Tuscany and Italy. They have generated and encouraged an important cluster of Italian and foreign pharmaceutical companies and groups in the region, many of which are also actively involved in biotechnologies. One of these companies is Baxter, with its biotech division in Ospedaletto near Pisa employing over 100 people. The division specialises in



packaging and marketing albumin. Another company worth mentioning is Lilly Italia, whose plant in Sesto Fiorentino is an international leader in the production of cephalosporin, an antibiotic molecule to be administered orally and by injection. The company, which employs 1200 people, is investing in biotech activities in Sesto Fiorentino. And finally, Boehringer Ingelheim Italy with pharmaceutical plants in the Florence area and a commitment to develop other products and biotech sub-contracting in Tuscany. Tuscany has 200 companies in the Life Science sector generating 3,4 € Billion sales and employing around 13.000 people

## TUSCANY BIOCLUSTER

The situation of biotech clusters in Tuscany is evolving with new actors and new dynamics taking place. A number of new initiatives regarding, scouting, finance and business development are being started all over the country both from private and public bodies and are detailed in the chapters that follow. We think that the initiatives supporting biotech should be implemented only where the seeds of the biotech industry are already in place and where there is strong coordination between local principal actors and central government. That doesn't mean that the government role is to create clusters because the clusters must be business-driven; however, it can create the conditions to support the growth of clusters. The establishment of tax credits over R&D expenditures is indeed a step in this direction. In concrete terms, as shown by the above figures, Tuscany do

SIENA biocluster : Toscana Life Science [www.toscanalifesciences.org](http://www.toscanalifesciences.org)

With 51 products in the pipeline, the Tuscany biocluster ranks second behind Lombardy in terms of pharmaceutical productivity. This achievement is the result of the joint efforts of both public and private actors, which have heavily invested in the development of the biotech industry in this Region. Built around the scientific pole of Siena, the Tuscany biocluster has many assets on its side.

First, the public commitment of the local public administrations of the Province of Siena and the Tuscany Region which believe that the leadership in the biomedical field may be a main driver of the local economic development.

Second, the commitment of the Monte dei Paschi Foundation, which supported strategic investments aimed at fostering innovation in services and technologies.

Third, the presence of a global pharmaceutical company, -Novartis Vaccines- whose establishment roots back to 1904 and the "Sieroterapico and Vaccinogeno Toscano Sclavo", an institute which gave rise to a class of skilled personnel in Life Sciences in Siena.

The combination of these elements and the capacities of the people leading the cluster are the main drivers behind success of this biocluster. The development of the cluster in Siena dates back to 1904 when the "Sieroterapico and vaccinogeno Toscano Sclavo" was founded. This institute gave rise to a class of skilled personnel in Life Sciences that grew up to 1440 units in 2006. The presence of a big research centre has led the local government and public institutions to create a technological district at the forefront of biomedical research, able to attract the best international





people with salaries, benefits and a working environment being globally competitive. Besides the local administration, the Foundation of one of the most important banks in Italy, the Monte dei Paschi Foundation (MPS), also shares the idea that leadership in the biomedical field may be a main driver of the local economic development. The Province of Siena and the Monte dei Paschi Foundation are working to foster innovation in services and technologies through specific programmes to create an organic system connecting public and private actors. This strategic vision is not limited to the city of Siena but places Siena with its aggregation of assets and capacities in the context of the Regione Toscana economic strategy. The strength of Siena's cluster is based on the cohesion between all the entities that ensure long term planning and very rapid decision making processes. The starting point of the project was the creation of *Sienabiotech*, a private centre for advanced pharmaceutical research supported by public institutions and financed by Monte dei Paschi di Siena. The aim of the company is to identify new targets, validate them and find small molecules as potential drug candidates. The company may be seen as a pharma company or as an instrumental company to enhance the value of the academic discoveries. The company brought to Siena state-of-the-art technologies including bioinformatics, proteomics gene expression profiling, animal models combinatorial chemistry, HTS in vivo and in silico ADMET, preclinical technologies including toxicology, PK/PD, formulation and clinical testing expertise. These platforms and expertises are pivotal for the success of Science Park Toscana Life Sciences (TLS) and for the companies that it will host. The presence of a big company like Novartis and *Sienabiotech* brought in Siena and will help to attract skilled people that are fundamental for the cluster development. The scientific knowledge and support is provided by the five Universities established in Tuscany that are involved in the board of the Science Park. The Park has also a brand new incubator with 2000 sq.m. of laboratories and offices. Another very important critical factor for success, the availability of finance, was achieved in 2006. A seed capital company, *Biofound S.p.A.* was created to finance the start-ups that will be hosted in the Science Park. This seed financing tool, that has 40% of its capital held by the Monte dei Paschi Foundation, will operate with less aggressive policies than venture capitalists and will help companies to overcome the pre-seed and seed capital stage. A key issue for the cluster and its supporters is how to proactively address the evolving needs of the new companies, research centres, infrastructures services that operate in the area. And as the President of both the Province of Siena and Toscana Life Sciences says: "The Province of Siena is interested in joining a strong Italian "super-cluster" and this new entity should become a strategic reference point for National Policies supporting biotech."

#### The key cluster infrastructures

The Science Park is positioned in Siena in the historical area of "Torre Fiorentina", where the prestigious Istituto Sclavo started operations in 1904 where Novartis Vaccines and Diagnostics Srl ([www.novartisvaccines.com](http://www.novartisvaccines.com)) has today concentrated its Research & Development activities and part of its vaccine manufacturing facilities. Since 2002, the area has also been hosting *Sienabiotech S.p.A.* ([www.sienabiotech.it](http://www.sienabiotech.it)), a fast-growing company focused on drug discovery in the





CNS therapeutic area, and the Molecular Biology Department of Siena University. All together, over 350 researchers are currently working at the Torre Fiorentina Campus, which offers state-of-the-art technological platforms, scientific equipment and support services. The Science Park staff is made by a small group of professionals with both scientific and industrial backgrounds, specifically skilled in technology transfer processes and particularly able to support the new companies. For this purpose, the TLS Park will also give access to an internationally recognized panel of experts able to provide advice on a wide range of matters, from drug discovery to business development. Besides the equipped labs and offices rental, the TLS Science Park provides incubated companies with a full package of services, ranging from General Services, linked to day-to-day research activities, to Consultancy Services in line with company business management needs. In addition to the services package and in order to facilitate the first three years of operations, the TLS Science Park provides a large number of technology platforms for common use and dedicated scientific equipments inside the bio-incubator. Close cooperation and synergism with research labs of Novartis Vaccines, Senabiotech and Siena University located at the campus are strongly encouraged and pursued, as well as international collaborations with excellence centres in the life sciences sector around the world.

"Toscana Life Sciences" Foundation, Created in Siena on 18th May 2005 in partnership with Chamber of Commerce of Siena, Hospital of Siena, Monte Paschi Bank, Monte Paschi Foundation, Municipality of Siena, Province of Siena, Scuola Normale Superiore of Pisa, Scuola Superiore Sant'Anna of Pisa, Tuscany Region, University of Florence, University of Pisa, University of Siena. Its objective is to create a new research centre in biomedical sciences. The new Science Park represents the most important project of the TLS Foundation, created by several institutionals and private partners. TLS Foundation has taken its first steps by setting up a bio-incubator to nourish and catalyze the formation of start-up and spin-off companies. Two floors of the 3000 sq. m. restored building, located within the industrial area of Torre Fiorentina, have been already completed and equipped with eight state-of-the-art laboratory modules (from 60 sq. m to 90 sq.m units), an animal house facility, a PCL3 laboratory, dedicated rooms for communal analytical equipment, storage of chemicals, refrigerators and freezers. The new Science Park represents the most important project of the TLS Foundation. The main aim is to offer equipped buildings, services and financing opportunities, thus creating a fertile ground for the development of new biotech companies focused on pharmaceutical, biotech, diagnostic and innovative biomedical technologies. This process, fostering the industrialization of ideas, will be continuously facilitated by a number of potential synergies available at the site where consolidated pharmaceutical companies are located.

The Bio-incubator - TLS Foundation is committed to facilitate the start-up creation process through the development of its Science Park located in Siena, where to attract companies operating in the pharmaceutical and biomedical fields. To achieve this goal, TLS Foundation has taken its first step in 2006 by setting up a bio-incubator to host new entrepreneurial initiatives in the life sciences field. Three floors







of the restored building, located within the industrial area of Torre Fiorentina for a total of 3000 sq.m. was completed and equipped with several state-of-the art laboratory modules (from 60 sq.m. to 150 sq.m. units), animal house facility, PCL3 laboratory, analytical equipment, storage of chemicals, refrigerators and freezers available to all companies hosted. The bio-incubator also features furnished offices, meeting rooms, a reception and a recreational area.

Companies wishing to locate within the bio-incubator are subject to an evaluation of their assets and business ideas. For this purpose, the TLS Foundation has devised a selection procedure supported by an international Evaluation Committee, composed by individuals belonging to industrial, academic, and business communities. The selected companies may rent laboratories and offices for a maximum period of 3-5 years. Fees for space rental and access to services and technological platforms are extremely competitive when compared with international market standards. Moreover, a dedicated "seed capital" company (BioFund Spa) has been set up, aimed at investing with a minority equity model in the start-ups in order to sustaining their financial needs during the first three years of incubation period. In addition other financial tools are available in the area like the MPS Venture and Toscana Innovazione Investment Fund ([www.sicisgr.it](http://www.sicisgr.it)), made up with the contribution of the Tuscan Region and regional bank foundations for a total amount of 45 million euro available for innovative entrepreneurial initiatives.

Technology platforms - The Torre Fiorentina area, where the TLS Science Park is located, has been hosting research and industrial activities in the field of vaccines for more than one hundred years. In this location, facilities and skills in microbiology, immunology, molecular biology and cell biology have been growing and consolidating. Recently, further competences have been established in bioinformatics, computational chemistry, small drug design and discovery thanks to the expansion of the research activities of Chiron Vaccines, now Novartis Vaccines and Diagnostics, the establishment of Sienabiotech and the presence of the Molecular Biology Department of the Siena University. The high concentration of multi-disciplinary knowledge, the investments made in the area and the recent realization of the bio-incubator have led to the establishment of state-of-the art technology platforms accessible to any group wishing to locate within the site.

Major platforms currently available are:

- Computational biology
- Computational chemistry
- Confocal microscopy
- DNA synthesis & sequencing
- Flow Cytometry
- Genomics
- Highthroughput screening
- Mass Spectrometry
- NMR spectrometry
- Peptide chemistry
- Proteomics
- Small molecule drug design & synthesis







- Vaccines production
- Vaccines research & development

The Services - Besides the equipped labs and office rental, the TLS Science Park provides incubated companies with a full package of services, ranging from General Services, linked to day-to-day research activities, to Consultancy Services in line with company business management needs.

General Services include:

- Site cleaning, maintenance and security
- Site utilities
- Reception, telephone switch board and mail
- Centralized procurement
- Conference room
- Meeting rooms and coffee break area
- 24 hour first aid
- Access to the most complete life sciences library in the region
- Access to the Campus Cafeteria
- Lab clothing cleaning
- Lab utilities
- Storage space for chemicals and reagents
- Common and dedicated refrigerators
- IT security
- Server space and back-up
- Free-of-charge national telephone calls

Consultancy Services include:

- Scouting for business opportunities and scientific collaborations
- Business Development coaching
- Support for licensing agreements
- Scouting for national and international grants
- Intellectual Property Rights protection
- Human resources administrative management
- Legal advice
- Fiscal and administrative advice

In addition to the services package and in order to facilitate the first three years of operations, the TLS Science Park is providing a large number of technology platforms for common use and dedicated scientific equipments inside the bio-incubator.

#### OTHER REGIONAL INFRASTRUCTURE SERVICES SUPPORTING LIFE SCIENCE CLUSTERS DEVELOPMENT

- Strong presence of Universities and Research Centres that perform high quality R&D in Lifescience





#### Universities:

- University of Pisa [www.unipi.it](http://www.unipi.it) : The Pisan University system is formed by the "Scuola Normale Superiore", [www.sns.it](http://www.sns.it) , the "Scuola Superiore Sant'Anna" [www.sssup.it](http://www.sssup.it) and the "University of Pisa". Established in 1335, the University of Pisa has 11 Faculties including Pharmacy, Engineering, Medicine and Surgery, Veterinary Medicine, Mathematics and Physics. Life Science Master's degrees offered are: Vegetable Biotechnologies, Biomedical, Engineering, Food Biotechnologies.
- University of Florence: Founded in 1321, the University of Florence has 12 Faculties and about 9.400 graduates per year. Life Science Master's degrees offered are: Industrial and Environmental, biotechnologies, Pharmaceutical, Biotechnologies, Medical Biotechnologies, Biomedical Engineering. In 2007 with 42 research projects of "national interest "managed by Tuscan professors, the University was 2nd in Italy for amount of funds received from the Italian Government for research. [www.unifi.it](http://www.unifi.it). Departments of Agricultural Biotechnologies and Biomedical Science, Interdepartmental Research Centre of Biotechnology in the Agricultural, Chemical and Industrial Sectors (CIBIACI) <http://www.cibiaci.unifi.it/> .
- University of Siena. Created in 1240, it has 9 Faculties: Pharmacy, Medicine and Surgery, Mathematical, Physical, Natural Sciences. The University of Siena owns the Scientific Area of San Miniato where a huge research activity in the Medicinal, Toxicological, Chemistry, Pharmaceutical and Organic Chemistry fields is performed. Life Science Master's degrees offered are: – Human Health Biotechnologies. [www.unisi.it](http://www.unisi.it)

#### CNR centres:

CNR has in Tuscany a total of 16 Institutes plus 13 territorial sections; among them there are some important Life Science research centres as: The institute of clinical physiology ([www.ifc.cnr.it](http://www.ifc.cnr.it)) in Pisa, with 190 people employed, is focused on the research of Physiopathology and clinics of cardiovascular and pulmonary diseases, molecular medicine and clinical biology. For its clinical activities it is federated with Fondazione Monasterio (500 people) which provides over 5.000 cardiovascular hospital admissions per year. The institute of neuroscience in Pisa ([www.in.cnr.it](http://www.in.cnr.it)), which employs around 40 people, is focused in the fields of molecular, cellular, physiological, and pharmacological study of the nervous and neuromuscular systems. Institute of Biomedical Technologies ([www.itb.cnr.it](http://www.itb.cnr.it)) which carries out research on the human genome, degenerative diseases, bioinformatics, comparative genomics, epidemiology and medical informatics. CNR owns multiple centres of interest as the Institute of applied physical, the Institute of Applied Optics and the Institute for chemical and physical processes. Institute of applied physical in Sesto Fiorentino ([www.ifac.cnr.it](http://www.ifac.cnr.it)). The institute works in the field of micro-optic sensor and their applications and is developing innovative biomedical solutions for the glucose control in patients with high glucose levels. Institute of Applied Optics (<http://www.ino.it/Main/EnglishVersion/Presentation/Arcetri.php>) in Florence. The institute of applied optics, incorporated by CNR in 2005 develops optical devices for diagnostic uses. A strong field of research concerns the application of lasers for





medical purposes Institute for chemical and physical processes (<http://www.ipcf.cnr.it>) in Pisa. With 140 employees of which 87 researchers the institute for chemical and physical process works in the field of basic and applied research oriented at the development of new materials and equipments for scientific and medical uses

Other Research Centres:

– ITT - Istituto Toscano Tumori (<http://www.ittumori.it/IttSanitaSrty/jsp/start.jsp>). The Istituto Toscano Tumori (ITT) conducts fundamental, clinical and translational research on cancer. It comprises the Centre for the Study and Prevention of Tumours (CSP) and 16 oncology departments spread across the main Tuscan provinces. Oncology departments are located in 12 Local Health Authorities and in 4 Teaching Hospital Trusts. Research activity in ITT is performed by 400 people, mainly located in Teaching Hospital Trusts.

– LENS - European Laboratory for Non-Linear Spectroscopy ([www.lens.unifi.it/](http://www.lens.unifi.it/)). LENS was established in 1991 at the University of Florence, in Sesto Fiorentino. The research fields at LENS cover a wide spectrum of subjects, from atomic physics to photochemistry, biochemistry and biophysics, from material science to photonics, from art restoration and preservation to solid and liquid state physics. The Laboratory employs about 70 people, of which 25 scientific staff members and about 35 post doctoral graduates.

– CERM – Magnetic Resonance Center ([www.cerm.unifi.it/home](http://www.cerm.unifi.it/home)). CERM, located at the Polo Scientifico fiorentino, performs advanced basic research in numerous fields as drug discovery, structural proteomics, bioinformatics and computational biology, electron and nuclear relaxation and relaxometry. The collection of instrumentation at CERM is among the most advanced in the world, including magnets from 400 MHz to 900 MHz. CERM employs about 80 people, of which 70 researchers.

Other Science, Technology Parks and Incubators

Fondazione Farmacogenomica FiorGen: Set up in 2003 in co-operation with the Magnetic Resonance Centre of the Scientific Centre of Sesto Fiorentino, the Biomedical Centre of Careggi, the Chamber of Commerce of Florence and the Ente Cassa di Risparmio of Florence. [www.fiorgen.net](http://www.fiorgen.net)

Science and Technology Park of Pont-Tech in Pontedera: It is a consortium for Industrial Research and Technology Transfer resulting from a joint initiative of public and private entities. [www.pont-tech.it](http://www.pont-tech.it)

Science and Technology Park and incubator of Navacchio: It favours the setting up and growth of newly formed companies and it supports the development of those already established prevalingly for the following sectors: ICT, micro electronics, biomedical, robotics, energy and environment, advanced services. [www.polotecnologico.it](http://www.polotecnologico.it)

An effective, sustainable Regional Health System:





The Tuscan health system is one of the best managed in Italy, thus favouring a collaborative mood between Authorities and Industry. Tuscany offers to its inhabitants a high quality of care. •Quality of care measured through KPIs scores higher than the Italian average •More than 12.500 public beds are available provided by Hospital and Local Health Authorities and Research Centres. Hospitals in the Region favour R&D activities and a high number of clinical trials are performed with the participation of global players.

Biomedical Hub – Careggi (FLORENCE): Institutes of Biochemical Science, Oncology, Pharmacology, Department of Clinical and Pre-Clinical Pharmacology etc. [www.aou-careggi.toscana.it](http://www.aou-careggi.toscana.it) .

Biomedical Center “Le Scotte” (SIENA), Institutes of Molecular Biology and Oncology; one of the examples in Italy where university research and private companies work together at the same place. [www.ao-siena.toscana.it](http://www.ao-siena.toscana.it).

Santa Chiara Hospital (PISA) [www.ao-pisa.toscana.it](http://www.ao-pisa.toscana.it)

Equity funds:

SICI – Sviluppo Imprese Centro Italia.

There's an equity fund investing in Life Science which focuses specifically on Tuscany: SICI Sviluppo Imprese Centro Italia. Mission: The aim of SICI is to provide a simple access to funding for all innovative companies which would like to invest in Tuscany; innovative fields in Tuscany are mainly in Life Science, energy and environment, telecom, automation and aerospace. Investors: Current subscribers are 11: Tuscan banks - Monte dei Paschi di Siena owns the largest share of the fund (25%). Potential recipients: Current raised capital amounts to 60 mln €, partly invested SICI is made up by the most important companies of the Tuscan banking network. By means of investment of its own funds SICI aims to favour and stimulate the growth of companies coming mainly from the economical and productive part of central Italy which are not listed on the stock exchange. Its goal is to strengthen its patrimonial dimension and to reinforce its capacity to cope with the fluctuating markets, even at an international level. At present, SICI manages two investment funds, the “Fondo Controinvest” and the “Fondo Toscana Venture” for an overall figure of 90 million euro and it has invested in more than 20 companies mainly dealing in the traditional sectors in central Italy. SICI has decided to complete the offer of innovative financial instruments by launching a new fund “Toscana Innovazione”, endorsed mainly by institutional participants such as the Tuscany region and the network of the Several Tuscan Bank Foundations. It is a means to favour the birth and development of innovative companies with a high growth potential such as academic spin-offs or industrial companies looking for financial partners with whom to share the industrial development of a technology advanced project. The fund participates in the start up phase, investing in new ideas and in advanced projects which offer a high potential for growth, giving strength in this way to innovative proposals and creating a kind of partnership between universities research and hi-tech companies. The Fund would like to favour the allocation of projects in Tuscany in collaboration with entrepreneurial centres and with scientific and technological parks present in the region. Hence, we are extremely interested in welcoming to Tuscany research teams and projects started in other contexts, even international loans, for further development at entrepreneurial level. The universities





of Florence, Pisa and Siena and the incubators which have come out of this prestigious research centres, make up fertile ground for the development of these enterprises of knowledge. The Fund has an endowment of about 45 million euro and the average size of each investment is about 1-2 million euros. It will invest in the capital of new companies with a time horizon of 5/7 years, favouring particularly the biotechnology, biomedical, nanotechnology and advanced mechanical sectors. During this period, the Fund will be able to act as a “trainer” of new economic realities, following them from “business idea” to the creation of a structured company, bringing in not only financing in the form of “Patient capital” but also a series of financial, organisational and administrative services to support the specific entrepreneurial initiative. The contribution of such resources will permit the participating companies to overcome the initial phase and to reach a point in which outside investors will be encouraged to participate to greater extent, not excluding the possibility of quoting the start –up companies in the relevant regulated markets.

#### OTHER TUSCANY TECHNOLOGY PARKS, INCUBATORS and POLES (not exhaustive)

POLO SANT'ANNA VALDERA - Conceived by Scuola Superiore Sant'Anna as a tool aimed at fostering a better placement of research laboratories and promoting a full enhancement of the research activities of the School, the Polo Sant'Anna Valdera (PSV) was established in Pontedera (Pisa) with the aim of making the link among the scientific research world, the economic and production world and local institutions systematic and, thus, synergetic and operational, by integrating at different levels and with various methods with the social, economic and production system of Valdera and its interconnected areas. Polo Sant'Anna Valdera wants to act as a linking bridge to international centres of knowledge. The objectives that Scuola Superiore Sant'Anna wants to reach through Polo Sant'Anna Valdera are referable to three major guiding principles:

- Strengthening research, through the creation of an environment able to stimulate a cross-fertilization among the different subjects;
- Enhancing the results of research and establishing a bridge to the international centres of knowledge; and ;
- Promoting territorial development policies through the collaboration with local and national partners, the incentive to the establishment of and start-up support to new high-tech spin-off companies and the offering of training and professional advice.

From Piaggio sheds to the present architecture: the area, where Polo Sant'Anna Valdera stands, was donated by Piaggio & C. S.p.A., through the good offices of the then President of Piaggio, Giovanni Alberto Agnelli, which the facility is dedicated to. Then, it has been reconverted by Scuola Superiore Sant'Anna with the grants by MIUR (according to Law No. 488/92), European Union, Region Tuscany and the Municipality of Pontedera.

The establishment and start-up of Polo Sant'Anna Valdera were made possible through a Plan to Strengthen the Territory Development and Research Network,







conceived by Scuola Superiore Sant'Anna since 1994, with the start-up of the LINK Project, which schematized its contents and objectives.

A few key figures of Polo Sant'Anna Valdera:

- 6,300 sq metres of total area
- 4,000 sq metres of covered working area
- 250 sq metres of meeting rooms and teaching laboratories
- 4 classrooms for university and training courses (184 desks)
- 25 offices for professors and researchers
- 20 lodgings in a company flat
- 7 among Laboratories and Research Units
- 2 "cleanrooms", class 1000-10000
- 2 CAD laboratories for engineering
- 1 precision mechanics workshop
- 130 persons (average age: 28 years; 95% graduates)
- 10 patents

Services for corporations and companies:

consulting services on technological innovation, as regards both products and processes, Economic and Managerial Innovation; education activities; stimulate: The establishment of new high-technology companies living and working on the territory, by enhancing the research resources of Polo Sant'Anna Valdera and the results achieved; The collaboration with the companies, that is to say enriching the companies that already exist on the territory, by developing joint activities between the world of research and the entrepreneurial world; and The establishment of a dialogue with and among the major actors of the local, social and economic, world advice in the field of intellectual property and ensures its assistance in patenting and product certification procedures, by highlighting the risks and protections and suggesting possible paths of research enhancement;

Pont-tech Technology and Incubation Pole: conceived as Operational Hand of Scuola Superiore Sant'Anna on the Territory. The goal of Pont Tech is to promote economic development through the provision of services for technological and organizational innovation, and in order to foster the settlement of new companies working in innovative sectors. Pont Tech is also the manager of the company incubator located at the former Piaggio lodge, in Pontedera. To regulate the synergy between Scuola Superiore Sant'Anna and Pont Tech, a framework agreement, in which Pont Tech is designated as the preferential – but not the only – channel through which Scuola Superiore Sant'Anna acts on the territory, was signed. [www.pont-tech.it](http://www.pont-tech.it)

#### POLO TECNOLOGICO DI NAVACCHIO

Polo Tecnologico created in 2000, it is in a reconverted, abandoned industrial site. It was created through an agreement between Regione Toscana, Provincia of Pisa and Cascina Town hall. It has a Private management. The sectors: ICT, Energy and Environment, Microelectronics, Biomedical, Services, Robotics







Polo Tecnológico was conceived with the aim of creating favourable conditions for increased competitiveness in the small and medium enterprise market by means of integration between the innovative requirements of these and the provision of technological knowledge originating from specialist centres and the research system. The installation of tens of high-tech companies in a single, suitable and allocated site also allows for increasing economies of scale for the management of both structural and added value services and favours collaboration and co-operation between Polo and enterprises and the enterprises themselves. The local system's technological development and scientific research allow the companies in the area to insert themselves in national and European research networks, concentrating enterprises in a single location who offer high quality skills and services to the advanced tertiary sector, thus creating a laboratory for new technologies and supporting co-operation processes between enterprises, research centres and universities.

In particular the objectives are: favour cooperation between High tech SMEs and between them and local Research Centres. Help the start up of new High Tech companies. Help with the competitiveness of traditional sectors. They are pursued by: Favouring and facilitating integration among High tech SMEs, Favouring and facilitating relationship with research centres, Assembled relevant information on previous phases, The strategy key elements were defined tanks to: Start up BP, Benchmarking activity, "On site" activity, Original theories no longer valid: Organization and operative management comes from specific experience and from the kind of activity of specific type of companies. The structure is formed from a set of restructured buildings in an old industrial area for support the technological companies' settlement. Area: more then 60.000 sq.m. of building for 60 single blocks, 10 for incubator projects.

SERVICES: More visibility, more strength to be present in the market through synergy with neighbouring companies, Economies of scale, Attack the market together from a position of strength.

The Structural services that Polo offer to the installed companies: products related to ICT, data banks relevant to finance opportunities for innovative projects and industrial research, management of incubation area and tuition for new enterprises, including secretary and administration, fiscal, business, technical, technological and financial advice and support, 15,000 sq. m. of premises, 2/3 of which are already realised, in sectional units, fibre optic cabling, air conditioning, halls for congresses, training, meetings, press room. guest-quarters.

Added Value: Co-ordinated promotion and marketing, Integrated projects aimed at innovation development.

Intranet: information on finance opportunities, data banks on the business system, laws, monitoring of the internal structural services used, press-news review.

ENTERPRISES INCUBATOR added value: "Protected" background where it should be easier to face the critical start up phase, Reduction of costs; i.e. less risk





for new companies. An incentive to start up entrepreneurial activities having support in the most critical phase, so favouring economic growth of a region.

Renewal of the Technology Park's offer and of the surrounding region through the introduction of new companies that once activity develops bring another increase in economic terms. The Navacchio incubator primary objective is to guarantee support and assistance, in the start-up phase and following two years, to the small and medium enterprises within Polo's sectors of competence. It is foreseen that the newborn companies that set up within the structure receive advice and assistance on various levels. The company will be provided with cabled, equipped and furnished premises and have a multi-skilled management staff capable of guaranteeing pre-incubation activities (Business-Plan, training): centralised secretary, administrative services, fiscal, company, legal and technological consulting, promotion and marketing activities, What are the results of our INCUBATION up to now: 48 selected projects, 24 start up companies, 7 patents. <http://www.polotecnologico.it/>

The Digital applied Pole of Arezzo:

The Digital Pole of Arezzo stems from the need to make system and enhance the excellence of enterprises in the productive system of Arezzo.

Partners:

The town of Arezzo, Regione Toscana, Industrial Association, CNA, Confartigianato, Chamber of Commerce and businesses of Arezzo, Arezzo Innvazione and Etruria Innvazione.

Objectives of the Pole:

Aggregate companies involved in process innovation and product in the field of digital technology applied in the fields of reference of the productive system. Encouraging the growth of small innovative companies in the sector by creating networks of digital products that enable an acceleration of business competitiveness. Providing an outlet working at Arezzo for new graduates of the University Polo Aretino in the territory and attract expertise from across the south of Tuscany. Create a brand that attaches the concept of territory for Innovation at Arezzo. Encourage company investment in research and development factored in the areas of investment and training.

Services

Any company that operates within the Polo will get a set of common services

The services provided and offered to enterprises are:

- Services related to Knowledge management:
- Training services and promotions:
- Scouting technology:
- Infrastructure services:
- Marketing Services
- Assistance to start-up
- Funding opportunities

[www.polodigitale.arezzo.it](http://www.polodigitale.arezzo.it)





### 3. Spain- Asturias

#### Regional Cluster Policy

The rapid appearance of new technologies and accelerated development of new products and markets demands continual modification by every economic agent. The different tools for developing the innovations are not exempt from these changes and must be evolved in a similar way. Highlighted within these new mechanisms is the development of clusters.

In the Principality of Asturias, the first steps in this direction have been taking place since 2002, under the Regional Program for Innovative Actions (PRAI), with the aim of creating 4 Innovative Groups or Clusters. Since then eight sectors have been identified in the Principality of Asturias which are capable of forming an Innovative Group. Since then IDEPA (Institute for Economic Development of the Principality of Asturias) has been carrying out work on developing and strengthening Innovative Groups, turning them into an invaluable tool for achieving greater integration and structuring of the Regional System for Innovation. The development of these Innovative Groups in Asturias is in response to the need for the development of a sartorial policy allowing the formation support means capable of responding to the specific needs of the particular sectors.

#### Innovative Group of the Maritime Sector

The Principality of Asturias has 345 kilometres of coast which comprises 5.6% of the total Spanish coastline. The maritime sector has always been one of the foundations of the Asturian economy, but the changes suffered to the world economy in recent years demands an adjustment to the sector. The development of an Innovative Group favours modernisation of the sector, meaning that new challenges are dealt with jointly. With regard to the infrastructures it must be highlighted that the ports of Avilés and Gijón are going to benefit from different extension works that will be complemented by the creation of the Area for Logistic and Industrial Activities of Asturias, (ZALIA). Without a doubt, these investments will favour the development of this sector in an important way. On the other hand, the Foundation Innovamar, which supports this initiative, is also promoting the creation of an Innovative Group at national level, from which the different regional groups will be formed.

#### Innovative Group of the Automotive Auxiliary Industry

In Asturias, basic elements are produced for this industry such as steel, zinc for galvanization and aluminium. Furthermore, other components are supplied from this region such as bodyworks, car windscreens and windows, shock absorbers or sintered products for change/token machines. Also of note is the presence of one of the biggest world leaders in two wheel vehicle manufacturing, producing motorcycles and their spare parts and components for export from Asturias to the whole world. Nowadays, the most important challenge facing industries in this sector is in innovation, so their competitiveness depends on their capacity for developing new products and for continually improving productivity of the design and manufacturing processes.





#### Innovative Group of the Energy Sector

For many years, Asturias was the main producer of energy minerals of Spain. The presence of the coal-mining industry in the region gave rise to the subsequent installation of power stations and allowed the development of a conglomerate of auxiliary and supply businesses, as much for mining as for the generation and distribution of electricity. Nowadays the Asturian electricity system is very much in surplus and the power generated for the region makes up more than 7 % of the total produced for the whole of Spain. At these times we find ourselves in the process of rebalancing the electrical mix in such a way that levels of renewable energy will be notably increased in the coming years. In this framework, the important investments anticipated for Asturias in the energy sector (regasification and combined cycle plants, biodiesel, biomass, wind farms...) should allow the consolidation of the energy sector and the adaptation of all its agents to society's new demands.

#### Innovative Group of the Wood and Furniture Sector

The region of Asturias, by virtue of its climate and geographical properties, has some ideal conditions for the development, exploitation and rational management of its wealth of forest, which provides –as well as the consequential economic benefits– other indirect benefits: protection of the environment, contact with nature..., which are to the advantage of society. This sector incorporates businesses belonging to the different stages in the wood transformation chain: forestry exploitation, sawing, manufacture of boards and veneer, carpentry and furniture manufacture; including also the manufacture of wood pulp. The Forestry and Wood Technological Centre aims to carry out research, development and innovatory activities for Asturian businesses, as well as focussing on forest heritage. On the other hand, the hallmark of quality of “Mueble de Asturias” is attempting to get the businesses which accede to it to differentiate their quality and revenue in product design, at the same time increasing their competitiveness, by having to deal with a series of internal improvements

#### Innovative Group of the Agrofood Sector

The Food and Agriculture Industry, one of the biggest sectors of the Asturian economy, reached 14% in 2005 of the revenue of the industrial sector and 13% of employment, being the third branch of activity which generates more employment and more revenue in the industry. The dairy industries, with a solid place in the national market are, together with the meat processing and drinks producing industries, the main activities of the sector. One of the keys to the strength of the sector is the high quality of the products. Furthermore, it is characterised by a strong atomisation, so that it is made up of companies, the majority of which are small, family-run businesses. The Innovative Group of the Agrofood sector also contributes, specifically, to the cooperation of the businesses with other agents contributing to their improved competitiveness. Among them, in the Principality of Asturias, are found the following research centres: the Regional Service for Research and Agricultural and Food Development (SERIDA), the Dairy Products Institute (IPLA), the Centre of Competence for Milk and Derived Products, the Laboratory for the





Association of Meat Industry Research and the Inter-professional Dairy Laboratory as well as the centres that are linked to the University of Oviedo

#### Innovative Group of the Chemical Industry

The main activities of the chemical industry in Asturias are centred on: carbochemistry, pharmaceutical products, fertilizers, and synthetic fibres. It is a productive sector, known for its contribution to the sustainable development of Asturias and for being an indisputable reference point and standard of diversification and generation of high value services in the region with future international expansion. The chemical industry has become one of the examples of profitability of the large investments in Asturias. Furthermore, the economic and technological development of the sector has stimulated the parallel development of other linked sectors, as has happened with the environmental industry sector. The creation of an Innovative Group will also contribute towards counteracting the incidence of the new European Regulations REACH over competitiveness of the sector and promotion of the cooperation and interchange of knowledge between its members.

#### Innovative Group of the Knowledge Industry

The sector of technology of the information and communications (ITC) has undergone huge growth in recent years, with the creation of new businesses and the introduction of important companies for which human capital is one of the main assets. Specifically, according to the last data from EUROSTAT, Asturias is the 4th European region with a greater employment growth rate in this sector. Asturias has had an ITC Cluster since 2004 which groups 60 businesses together. Its mission is to improve competitiveness of the Asturian ITC businesses, and assure their sustainable growth. Furthermore, the Technological Centre of Information and Telecommunications (CTIC), is in favour of the dynamisation of the sector. The Foundation CTIC is the headquarters for Spain and Latin America for the consortium W3C (World Wide Web Consortium), the most important international organisation with regard to matters relating to the standardisation of the Internet.

#### MANUF@CTURIAS: Regional Technology Platform

MANUF@CTURIAS is a regional initiative of the European Technology Platform MANUFUTURE. The cluster, created in 2006 in Asturias by different public and private entities, has the main objective to promote renovation, reactivation and restructuring of traditional industrial sectors by means of a strategy based in RTD activities. Due to manufacturing is the dominant sector of the European economy, activity developed by MANUF@CTURIAS represents a determinant factor to assure the competitiveness of an important group of Asturias entities. The initial approach was to adapt the European experience of MANUFUTURE to the future of manufacturing at regional level and in this way joint all required bodies (industrial and services entities, RTD Centres and Public Administrations) to establish a bridge between Europe and Asturias. This initiative has been really extraordinary in our region and it was the first regional platform created in Europe. Currently more than 90 entities make up the cluster, being around 83 % industrial enterprises and the 17% remaining RTD Centres and public bodies. The regional cluster is an active and







permanent forum open to the identification of future manufacturing technologies and new collaborative investigation areas. Regarding this objectives, MANUF@CTURIAS operates lined-up to Strategy Research Agenda of MANUFUTURE and considering also other European platforms and their research agendas. Based on this Research and Innovation Strategy, MANUF@CTURIAS has grown to currently become a meeting point and opportunity area of the Asturian industrial sector. Within the platform, last March, it has been constituted a new business figure: MANUF@CTURIAS AEI (Innovative Enterprise Association) formed by the 28 most dynamic entities of the regional platform (27 industrial companies and one technology centre, PRODINTEC Foundation). The Innovative Enterprise Association - MANUF@CTURIAS AEI has been constituted around Asturian manufacturing industry and its mission is to contribute to the growth and the expansion of its own members by means of encouraging research activities, establishing new manufacturing technologies and increasing innovation activities. It is worth highlighting that MANUF@CTURIAS AEI has been recognised by the National Ministry of Industry, Tourism and Trade as an Excellent Innovative Association of Enterprises after passing the excellence criteria of its Strategy Plan.

#### SME policy

The hallmark of quality of "Mueble de Asturias" is created at the initiative of the Government of the Principality of Asturias in order to enhance and help Asturian furniture companies to improve their competitiveness and sustainability through actions that lead companies to progressively increase its capacity and entering a momentum of continuous improvement. The hallmark is attempting to get the businesses which accede to it to differentiate their quality and revenue in product design, at the same time increasing their competitiveness by having to deal with a series of internal improvements.

To obtain the mark companies are evaluated, so that companies with different size, maturity, technological level, and so on, can get the stamp of quality immediately or through a process of improvement, here is where the work of the Technology centre Foundation PRODINTEC has great importance, since when the Technology Centre for Design and Manufacturing, can give companies a great help in adapting to the demands of the brand, supporting them with the resources necessary to carry out this task effectively and efficiently. Among the objectives of the brand is improving internal processes of the companies, production, design, etc, and to improve their image with customers and users.

#### Research & Innovation Policy

The Plan of Science, Technology and Innovation 2006-2009 (PCTI), has for purpose develop all those actions that enhance scientific research, the technological progress and the innovative activity in the region. In order to provide with a major protagonism to the Asturian society and to the companies especially, the PCTI has to be able to implement tools that develop a great transformation of the productive and social fabric of the region to line up with the European policies and to guarantee its citizens quality employments. In this sense to integrate the scientific and technological policy of the region in the international framework, facilitating the







incorporation of companies and technology, centres in projects and networks supranationals. Technological innovation, both of product and process, is a factor that increases competitiveness and helps companies to survive in a changing and highly competitive market.

Moreover, Asturias is a member of the project Galactea-Plus, sponsored by the European Commission, one of whose aims is to promote transfer of technology through agreements between transnational corporations and Asturian research centres and companies and research institutions of the European Union, Israel, Turkey, Chile, Norway, Switzerland, Iceland, Croatia, Macedonia, Montenegro, Serbia, Lebanon and Armenia.

#### Financial Support Mechanisms for Cluster Policy

The main objective of the new industrial policy is to improve the aggregate productivity in our economy. It is necessary to improve total factor productivity, especially the innovating capacity of companies and industrial areas, in two different ways:

- § Strengthening the advantages of scale economies
- § Strengthening the advantage derived from the environment

#### Support Programme for Innovative Business Groupings

Support for Innovative Business Groupings aims to establish close collaborative links between the General State Administration (AGE), the Autonomous Communities, and the Local Bodies in order to enhance the competitiveness of Spanish companies, especially small- and medium-sized enterprises. Support for Innovative Business Groupings aims to mitigate the market deficiencies related to problems of coordination that hamper the development of the groupings or restrict the incentives for companies to have contact with each other, to set up information and knowledge flows, and to collaborate in technological or organisational innovative projects, as these are too large for the resources of an individual company to handle:

- § Launched 2006, first call for projects march 2007, second one April 2008
- § Purpose of the program: support innovation and competitiveness strategies in groups of innovative firms
- § Stimulate collective innovation projects whose cost is shared among members of the cluster

#### Target firms

- § International orientation
- § Innovative Strategy
- § Commitment to invest in innovation
- § Commitment to cooperate in ambitious projects with other firms and organisations





#### Selection criteria

- § Strategic AEI plan: quality, depth and breadth. Identification of critical innovation collective projects
- § Technical, economic and financial feasibility
- § Co-financing commitment by firms
- § Involvement of regional and local governments
- § Economic impact of the group: critical mass
- § Continuity: possibility of derived actions
- § National, regional and local impact

#### Special Cluster register: "Cluster label"

- § Assessment by the Directorate General of SME Policy of strategic plans presented
- § Inscription of those proposals with accepted strategic plan in "ad hoc" Cluster register, for a period of four years
- § Special consideration and "extra" points for Cluster projects when submitted to all Ministry of trade and Industry, innovation support programs and agreements with other government bodies (state and regional)

#### First call for projects

- § First call Cluster program in march 2007: Subsidies to prepare the strategic plan of the Innovative Business Groupings
- § 171 proposals submitted
- § 60 have been accepted
- § After approval of strategic plan >>Registered as Innovative Business Grouping
- § Next call for projects April 2008: Subsidies to establish a governance-coordination unit for the registered Cluster

#### Internationalisation Policy

IDEPA and Asturias Business School have designed the Master in Language, Culture and Negotiation in China, which is already in its third year. This master's course is aimed at university graduates with the purpose of orienting their professional career towards the field of business and commercial relations between Asturias and China.

The duration of the master's course is 1 year, with 2,130 class hours in 3 phases:

- § Phase 1 in Asturias: Introductory Course in Chinese Language and Culture.
- § Phase 2 in China: Chinese Language and Negotiation Culture, University of Zhejiang (Hangzhou, China)
- § Phase 3 in Asturias: Theoretical-practical training (reinforcement of Chinese language, general knowledge of foreign trade and business experiences).





Master's Course Promotions:

- § First promotion (10 students) finished training in June 2007.
- § Second promotion (20 students) has been undertaking phase 3 in Asturias since the month of September.
- § Third promotion (19 students) is undertaking phase 2 at the University of Zhejiang (China) since the month of September.

#### 4. Model for providing mentoring and other support to High Growth Businesses within Clusters Winning Business Academy™ - Supporting High Growth Businesses

##### 1. Summary

The Winning Business Academy™ is an innovative initiative that has proactively engaged with the growth wish business community. The academy has delivered practical and results driven interventions that have proven to deliver sales growth that in turn improves GVA for a region's clusters. The initiative is driven by the private sector and plugs a gap in current business support provision for ambitious entrepreneurs. Winning Pitch Ltd in partnership with the University of Manchester Incubator Company (UMIC) established the Academy to address the paucity of selling acumen within the high technology business environment. A challenge that also appears to be widespread throughout the SME community.

The Winning Business Academy™ has clear focus on developing strategic selling skills and building networks that facilitate rapid access to markets, finance, skills and expertise. It has addressed the issues that other economic support bodies have started to take into consideration. The Global Entrepreneurship Monitor 2005 for Scotland made very public the need for strategic selling to be embedded within the entrepreneurial environment – The Hunter Centre For Entrepreneurship at Strathclyde University and its patron Sir Tom Hunter stated in recent strategic documents that "If entrepreneurs can't sell, they can't succeed. Period". The Academy builds on this principle.

##### 2. Winning Business Academy™ purpose

The Winning Business Academy is the first academy, based in England's Northwest, dedicated to helping the rising stars of the North West to reach their full potential. The Academy pays particular attention to supporting high growth potential businesses to embrace entrepreneurial selling excellence that is underpinned by clear strategy and disciplined systems and processes. The Academy defines its purpose as being:

"Provide practical business support to high growth potential companies in the North West. Through the application of tried and tested interventions the WBA will be a





catalyst for growth, value added employment, innovation and increased sales. It will embed strategic selling at the heart of success."

The Academy is based at One Central Park in New East Manchester, a strategic NWDA location. A highly skilled team of professionals that have a proven entrepreneurial track record supported by an extensive and impressive networks and contacts base deliver the services.

### 3. The Winning Business Academy™ - Services

The Academy provides the following services to entrepreneurs with a growth wish:

- § Pathfinder Guide – to building a high growth sustainable business. This publication provides the framework for building a high growth business – it provides handy tips and wise words on going for growth (Published by Winning Pitch Productions Ltd April 2007 ISBN 978 –0-9555515-0-5)
- § An accelerator programme for growth wish entrepreneurs. This is based on the proprietary methodology "A Winning Sales Approach™" that links strategy development to tactical entrepreneurial selling. The programme involves master classes and one to one coaching.
- § Delivery of learning bites through networking events where established practitioners of good practice share their secrets of success
- § Best practice workshops covering key aspects of building a winning business.
- § Tailored training and consultancy – provision of support to businesses that have specific training needs in relation to growth. To date intensive interventions have been provided to businesses on Manchester Science Park, One Central Park and Core Technology Facility
- § An innovation - Mind to Market™ programme has been developed and will be delivered to 45 companies over the next 12 months. This programme provides a road map for developing ideas into revenue streams.
- § The Academy has also established an Observatory function to study best practice in entrepreneurial selling and high growth. This will be disseminated through white papers.

### 4. Route to identifying Growth Wish Entrepreneurs

Companies and entrepreneurs for the Academy have been identified through a number of channels, they include:

- § Sector and Cluster Organisations
- § Regional Business Advisor Network





- § The North West incubators
- § HEI entrepreneurship activities
- § Manchester Momentum
- § Sponsor recommendations

Other routes to identifying suitable businesses will include:

- § Delivering events in the sub region in partnership with Local Authorities
- § Business Link brokerage
- § The Academy's own business development activities

## 5. Achievements

In such a short time frame (launched in January 2007) the Academy has achieved a prominent position in delivering business support to currently trading companies that have a growth wish:

- § Attracted over 200 businesses to events and networking sessions
- § Delivered 5 accelerator programmes involving 80 growth wish entrepreneurs – all participants rating the programme as excellent with a large proportion stating that the intervention will have a long lasting impact on their business. Many entrepreneurs indicating an immediate impact on sales growth
- § An accelerator programme targeted at the creative sector involved 20 entrepreneurs – delivered in May 2007
- § An accelerator programme targeted at high growth companies involved 40 entrepreneurs – delivered in May 2007. A further contract to deliver a 90-company programme has recently been secured.
- § Supporting 90 growth hungry businesses that will be put through the accelerator programme.
- § Written and published a Pathfinder Guide that has been distributed to some 400-growth wish companies. This carries the endorsement of leading private sector sponsors.
- § Developed over 40 learning bites of best practice for dissemination to the growth wish business community.

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