Mentoring European Knowledge of the Chemical Regions

BEST PRACTICE SOLUTIONS FOR THE DEVELOPMENT OF CHEMICAL REGIONS

Examples from Lombardia, Saxony-Anhalt and Asturias

MentorChem

EUROPEAN RESEARCH AREA
REGIONS OF KNOWLEDGE

www.mentorchem.net

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1. Introduction

The Project “Mentoring European Knowledge of the Chemical Regions” (MentorChem) is a cooperation between the regions Saxony-Anhalt, Lombardia and Asturias in the framework of the pilot action “Regions of Knowledge” supported by the European Commission GD Research from January 2004 to June 2005. The main aim of the action is to demonstrate the central role of knowledge in driving regional development and how regional actors can effectively participate in formulating their regions future. Furthermore, it is the objective to increase collaboration on interregional basis to enable learning between European regions and the identification of models and activities that can be implemented in different regions. The cooperation approach of the project emphasize an innovative-pragmatic mentoring model, which is based on a classic approach of identifying the weaknesses-needs of disadvantaged vs. developed regions and the exchange & modelling of best-practices.

In the past 15 years the chemical industry had to cope with big structural changes and globalisation and European integration will be a challenge also in the upcoming decade. The companies face an increasing competition especially from Eastern Europe or Asia. Some part of the production will move out of Europe and the industry has to focus on innovative and high-technology products in order to remain competitive. Big companies react on these developments with the concentration on the core business, which leads to the outsourcing of several activities. This process is accompanied by the creation of many SMEs that develop in the surrounding of the international companies. The specific relation between big and small enterprises and the use of the regional potentials is becoming an important factor for the competitiveness. An active regional policy can play a supporting role for the development of the chemical sector in providing good framework conditions and policy measures oriented on the networking and bundling of regional competences. The region and the enterprises can develop innovative Public Private Partnership solutions for the further development of the cluster and the industry formulates its demands for a coordinated research and innovation policy in the region.

Behind this general background of the structural changes, the discussion in the project MentorChem has come to the result that the international exchange of experience about successful policies for the support of the chemical sector is very important. There is a strong connection between the global competition and regional adaptation strategies.

Especially the cooperation between enterprises and regional authorities has become an important factor for the competitiveness. The assessment of successful policy instruments or measures can help to improve regional policies based on the interregional transfer of best-practice. The chemical sector has good chances to develop prosperously in the future if the industry can combine the established infrastructure and production with the regional innovation potentials. This question has been examined in the past for instance in the Regional Innovation Strategies projects (RIS). The development of the chemical cluster and the intensive networking among the relevant stakeholders is another element that is important for the exchange of experience.

In the course of the MentorChem project, the partners have identified, analysed and discussed several best-practice solutions for the development of the chemical cluster, with the objective to learn from each other and to draw conclusions for the transfer of policy instruments. This brochure contains examples that have been positively assessed and that should be presented to a broader public audience that has a particular interest in this topic.

Besides this description of best-practice, the project MentorChem has focused its exchange of experience on three topics: the exchange of experience between the chemical sites initiatives CeChemNet (Saxony-Anhalt) and AIQPA (Asturias), the identification of regional research competences in chemistry and regional strategies on REACH. The results of this cooperation are published in separate publications.

All information can be accessed on the project web page: www.mentorchem.net

2. Lombardy Region

2.1. Meta Clusters

Research and Technology Innovation are an important competitive factor not always exploited by small and medium enterprises because of their dimensional and financial limits. Often these managing difficulties are common to a great number of SMEs belonging to the same productive spinneret: a collaboration among them could be the right way to find the modalities and resources to face and solve these limits.

Lombardy Region is the first Region in Italy that promoted measures, which establish 21 industrial clusters: the Regional Law n. 317 del 5/10/91, art. 36: "Intervention for innovation and development of SMEs” and the Regional Law n.317 art. 36 that defines the industrial cluster as “*a territorial system with a high concentration of SMEs and with an important productive specialization of the enterprises group”*.

Coherently with these measures, the main features of Lombardy Industrial clusters are:

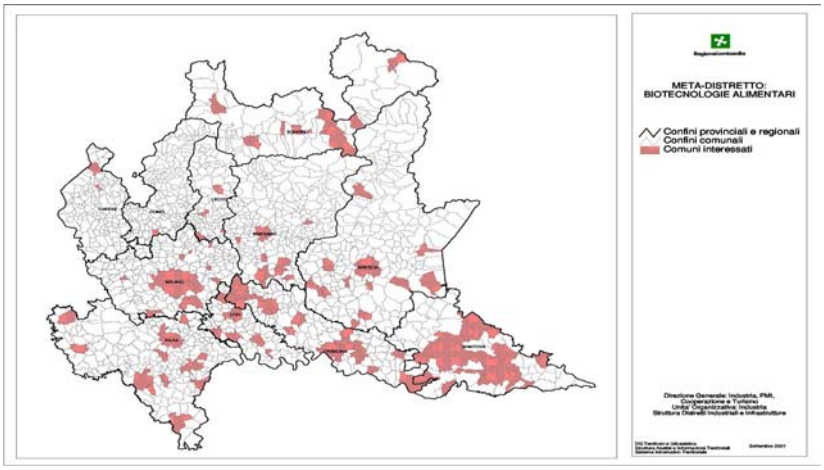
- Highly specialized production activities
- Service Centers for enterprises (promotion, marketing, training, purchases, etc.)
- Advanced technological laboratories serving enterprises in the clusters and focusing on research, development and quality improvement
- Development of inter-company experimental projects on product, process and market

Lombardy Region continuously engagement in meeting the needs and new demands of Lombard SMEs drives the introduction in 2001 of the Meta-cluster concept: not territorially limited areas with a strong inter-sectorial integration according to their production. The criteria of physical continuance of an areas used to describe specialized cluster has been removed, to prioritize a new concept of network system and interaction among the productive companies and the services within the cluster area. Meta-cluster becomes hence sectorial fields, developing strategies oriented to excellence and exploiting the added value of new technologies.

The main aim of Meta-Cluster is the identification of productive excellence areas and the stimulation of technological cooperation between Scientific Research Centers and Companies. In fact two main factors feature the Meta-Cluster structure: the level of local industrial development in a specific sector of production and the presence of Research Centers.

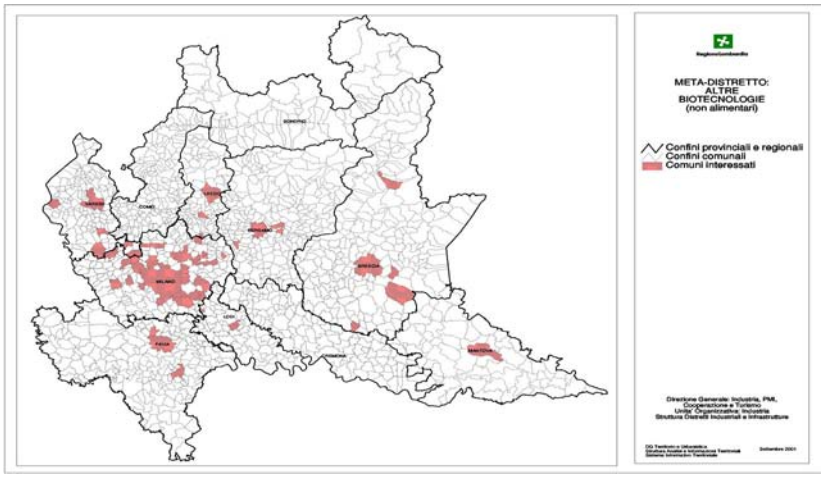
LOMBARDY REGION META-CLUSTERS ARE THE FOLLOWING:

- **Biotechnological food – META CLUSTER:**



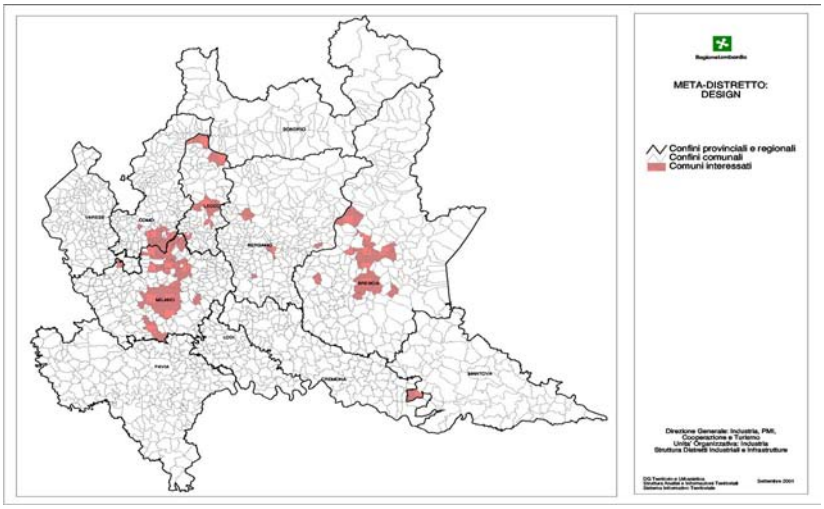
Spread over 121 municipalities:
> 11 Research Centers
> 30.455 Employed people

- **Non-food biotechnologies – META CLUSTER :**



Spread over 58 municipalities:
> 26 Research Centers
> 46.266 Employed people

➢ Design – META CLUSTER:

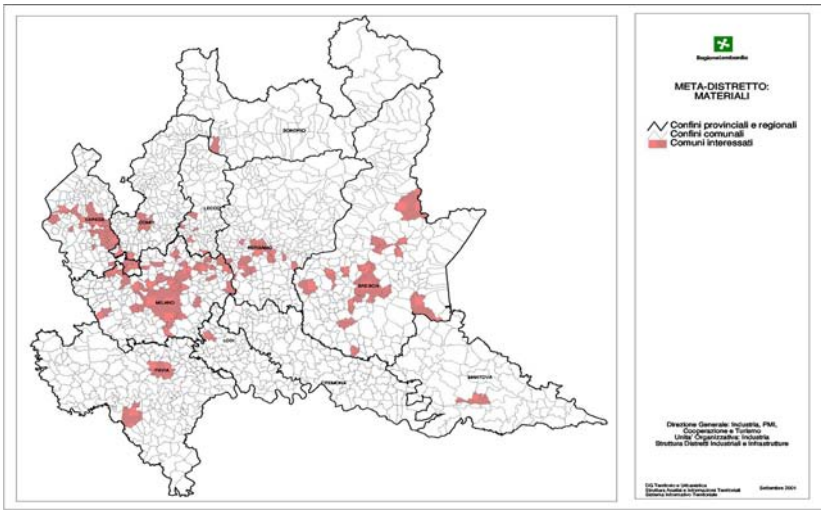


Spread over 65 municipalities:

> 11 Research Centers

> 44.958 Employed people

➢ Advanced Materials – META CLUSTER :

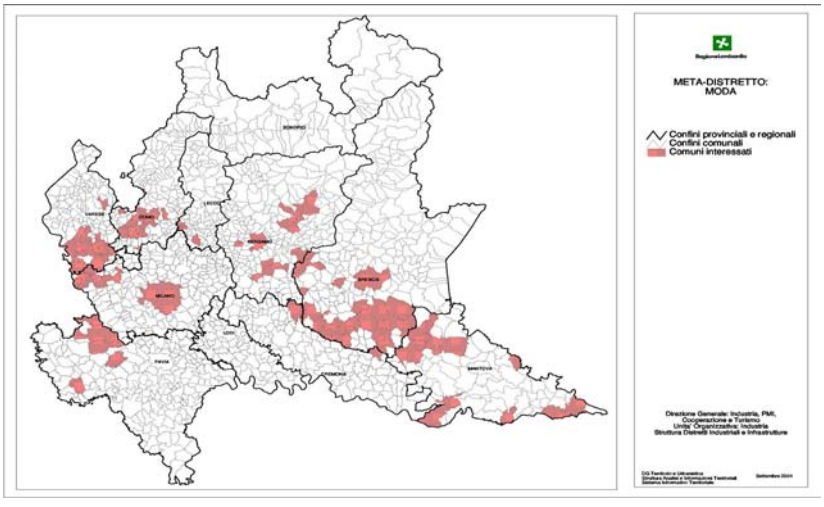


Spread over 103 municipalities:

> 29 Research Centers

> 32.748 Employed people

➢ Fashion – META CLUSTER :

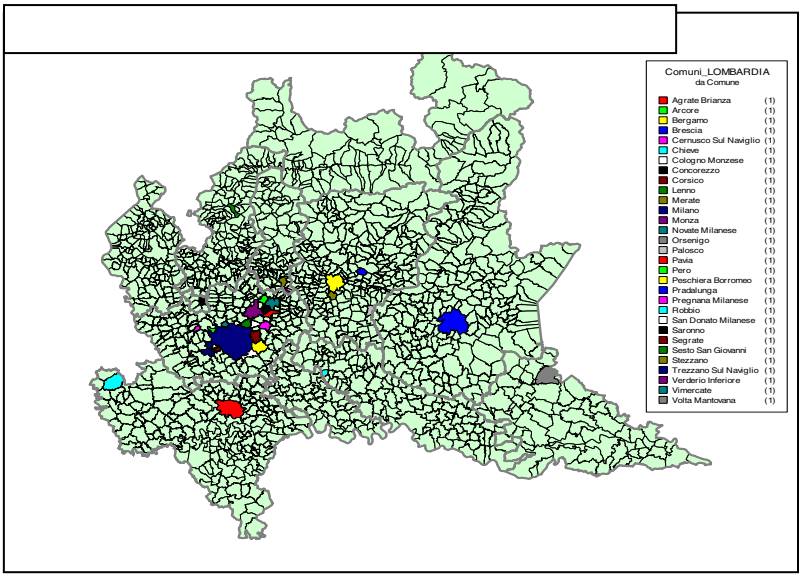


Spread over 126 municipalities:

> 4 Research Centers

> 120.406 Employed people

➢ **ICT**: meta-cluster of new constitution



The Meta-Cluster strategy aims at achieving three main goals:

1. Increasing the productive potential:
   - > strengthening relations between Research Centers and Companies
   - > stimulating research and development
2. Developing excellence areas:
   - > developing technological cooperation between local and international firms
   - > exceeding pioneering stage
   - > structuring firms
3. Facing competition:
   - > strengthening local and international competition

Very important for the development of the cluster is the presence of economic “leaders” able to drive the development of the cluster: relevant productive Companies which impact on the regional economy, as well as specialized companies and Services/Research Centers dedicated to the sectorial cluster.

An other essential feature of Meta Clusters is the availability of investments, able to maintain the cluster at a maximum of technological and competitive level. In 2003 Lombardy Region (General Direction Industry) launched a call for proposal open to research and industrial projects in the meta-clusters. This financing measure is dedicated to SMEs promoting Research and Development projects, to be implemented in one of the Meta-cluster thematic area of the Region.

The total amount available for this Meta-Cluster call is 25.000.000,00 € split in the five thematic areas for 5.000.000,00€ each.

The evaluation provided by the experts identifies the New Material area as the most promising and the readiest to be analysed, even if the study of an action plan for the other areas is an essential condition for the development of a regional policy concerning the technological clusters.

2.2. Regional Programme Innovative Action Minerva

In the framework of the “Innovative Action Minerva”, Lombardy Region introduced experimentally - for the first time in the “Objective 2” areas (areas with structural difficulties) - the Technological Voucher. The voucher represents the innovative financial tool chosen by Lombardy Region to support the enterprises innovation process and the new enterprise creation (start up and spin off) in interactions with the research and development centers.

Through this EU approved Programme Lombardy Region wishes to pursue the following objectives:

- enhancing the technical-scientific aspect of the productive system
- elaborate innovative strategies between public and private sector
- encouraging the development of new technologies in order to enhance the competitiveness of the Lombard productive system.

The PRAI MINERVA features three ”**transversal**” initiatives:

1. A “Regional Forum for Innovation”, grouping stakeholders in key subjects related to research and technology transfer
2. An “Expertise Repertory” and a “Competency Portal”
3. A pilot survey on technology and foresight monitor, focusing on critical, key and qualifying technology

Within the “transversal” actions, Lombardy Region started the “Expertise Repertory” that, together with CENTS (Centers’ Network for Technology & Science Evaluation System) originated QUESTIO, that aims at showing off and enhancing the research excellences in Lombardy Region. It mainly supports the interactions between the Research System and the Industrial System in order to improve their performances.

Moreover PRAI MINERVA counts four “**vertical**“ experimental initiatives, dedicated mainly to the industrial system in “Objective 2” areas:

1. A pilot action entitled “*New practices for supporting start-ups and spin-offs and enterprise innovation*”, to experiment innovative methods for creating technological enterprises and implementing technology transfer processes
2. An award for SMEs to prize their planning and creativity efforts
3. A support for Market-Place development in connection with the diffusion of ICT based tools
4. The support to SMEs (also in the context of their cooperation with the University/Research world) in order to enhance their participation to European Programmes (i.e. 7th Framework Programme), also through the establishment of trans-regional networks

Since 2003, among the “vertical” actions of Minerva (such as call of proposal for start up and spin off, and for the enterprises innovation) there were experimental forms of service centers selection and innovation contributions to enterprises and physical persons (delivery of approx 200 “Technology Vouchers”). In particular these “Technology Vouchers” cover two main measures: Measure 7.4.a (*Supporting Innovative Start-up*) and Measure 7.4.b (*New processes supporting enterprise innovation*).

Measure 7.4.a “Supporting innovative start-up”

The beneficiaries of this measure are “would-be entrepreneurs” or new enterprises (max 12 months old). The measure is structured in 3 consecutive phases:

1. The entrepreneur presents a project idea and he is awarded a 3.000,00 € Voucher that he can spend at a Service Center to get a feasibility study on it. If the idea is validated he enters to phase two
2. The entrepreneur is awarded a 7.500,00 € Voucher that he can spend at a Service Center for having a Business Plan developed. After a further selection he reaches phase 3.
3. The entrepreneur receives a grant from Lombardy Region for a maximum amount of 25.000,00 €, covering the 50% of the eligible expenses of his project

Measure 7.4.b “New processes supporting the enterprise innovation “

This Measure addresses enterprises developing projects in the field of technological transfer or innovation. The Programme is constituted by two phases:

1. The entrepreneur benefits of a consulting support (10.500,00 € Voucher) for the development of an innovative idea in the field of technology and innovation
2. After an approval of his proposal, the entrepreneur receives the financial support to realize the proposal developed in the first phase (35.000,00 € Voucher)

TECHNOLOGICAL INTEC VOUCHER

After the success of the “Minerva Innovative Action”, Lombardy Region proposed to modify regional law 35\96 introducing “Vouchers” in the whole Lombardy territory to promote innovative enterprises and sustain innovation diffusion and consolidation. Through this Programme Lombardy Region experimented different actions supporting the acquisition and development of skills in the fields of Research, Technological Innovation and Information Society.

Lombardy Region Technological Voucher is the financial instrument chosen by the Regional Government to finance the acquisition of consulting services enhancing the entrepreneur “freedom of choice” with reference to the centers that supply the service required.

The technological Voucher is:

> a “financial title” issued by the Regional Government

> a nominative, non transferable grant

The INTEC VOUCHER is the new innovative measure supporting the technological competition attitude of the Region. The granted voucher can only be spent in qualified Centers, selected by Lombardy Region through “Questio - Quality Evaluation in Science and Technology for Innovation Opportunity” System. This system includes:

> Lombard Universities (officially recognized by the State)

> Research centers, both public and private performing research, innovation and technological transfer services in Lombardy

> Financial companies (if included in a special list of companies authorized by public authority)

The procedure to receive an INTEC Voucher is composed by three steps:

> Application: the beneficiary has to select the supplier of the required service in the “Questio” list and fill in the dedicated form

> Admissibility control

> Voucher allocation: the voucher amount is allocated directly to the centre providing the service of consultancy or assistance

There are four action covered by the INTEC Vouchers:

1. Technological Due Diligence

   Consulting services to evaluate innovation and competitiveness level of technologies proposed for an entrepreneurial or technological transfer project

2. Business Evaluation

   Consulting activities for the evaluation of economical and financial aspects of project concerned with Innovation or technological transfer

3. Research Vouchers

   Scientific research through cooperation partnerships. Selection of qualified personnel to perform scientific and technical research

4. Patent Assistance

   Assistance at National and European level during the patent procedure

Main objectives of the measure are:

> Increasing SMEs’ propensity to innovation and supporting new start ups

> Connecting research and enterprises sectors assuring an effective match between demand and offer

> Simplifying administrative procedures for funding calls

This objectives are applied in specific sectors, considered particularly important for the regional economy, such as biotechnologies (food and not food), electronics, mechanics, electro-mechanics, textile, chemicals, industrial design, new materials, ICT, Environmental technologies, robotics, artificial intelligence, low-zero emission industrial technologies.

2.3. NEXT

Lombardy represents more than 1/5 of the whole national economy. Being member of “The Four Europe engines”, Lombardy is one of the richest EU region, with a GDP 35% higher than the European average. Italian R&D activity is mostly concentrated in Lombardy that counts 12 universities and 74 courses, attended on average by 250.000 students. Every year almost 9.000 students get a degree in technical and scientific subjects, with a range of more than 60 specializations. 30% of the Italian private researchers in enterprises are located in Lombardy.

Lombardy supports the highest expenses in scientific research, 22,4% of the Italian ones, with private expenditure which is more than 33% of the national level and it produces 45% of the technological Italian export. From 1986 to 2000 more than 35% of the total national patents have been registered in Lombardy.

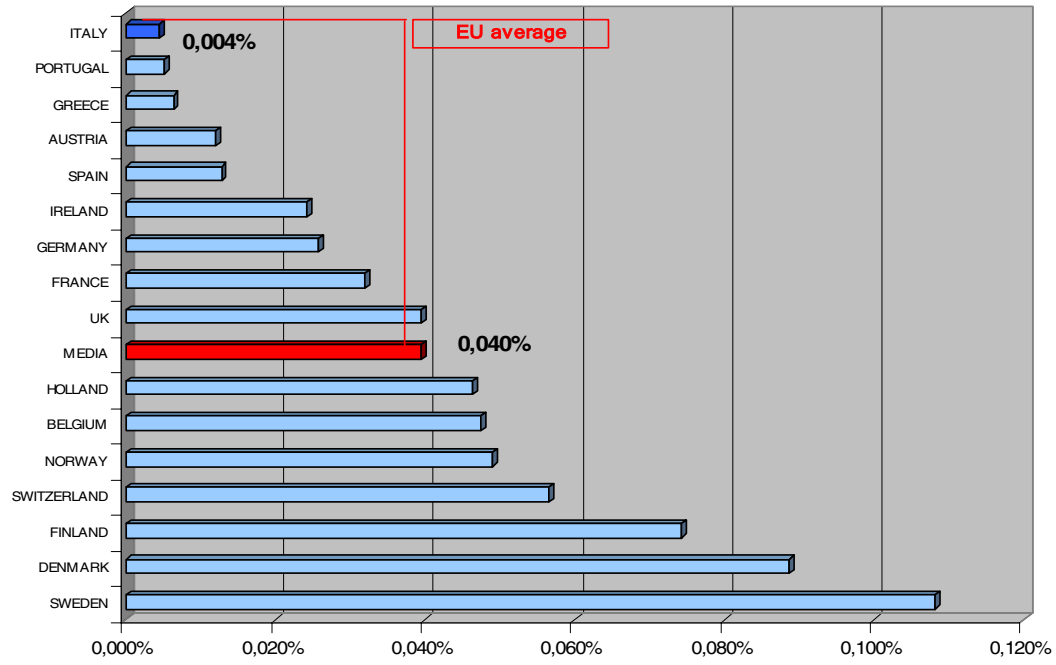
Moreover the Lombard market is well-known for its exclusive “metadistricts” (food biotech, non-food biotech, fashion, design and new materials), expression of a new reality that goes beyond the traditional manufactured boundaries and optimizes the whole value chain. The “metadistricts” involve 57.159 local units (equal to 45% of the Lombard manufactured units) for a total of 274.833 employees (equal to 62,3% of the Lombard employees in the manufacturing sector).

In addition to the huge potential of Lombard market there are big development margins which characterize the Early Stage Italian market, especially if compared with the development stage of the most important European Countries. The Lombardy Region controlled Company “Finlombarda Gestioni SGR” (Society of Save Management) is the management company authorized by Bank of Italy to set up, promote and manage closed-end funds.

NEXT is a closed-end fund of funds, managed by Finlombarda, that focuses on the development of Lombard SMEs: it is dedicated to institutional investors, with a target financial dimension of 60 Millions Euro.

NEXT has been instituted to develop a Venture Capital Market in Lombardia, specifically dedicated to innovation, R&D and new technologies. In addition to the huge potential of Lombard market there are big development margins which characterize the Early Stage Italian market, especially if compared (see table below) with the development stage of the most important European Countries.

Early Stage Investments / GDP (2002)



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The recent evolution of fiscal rules makes of Italy one of the most favourable country for venture capital investors. From a recent EVCA research emerges that Lombardy Region is a "investment friendly" location, as expressed in the table below:

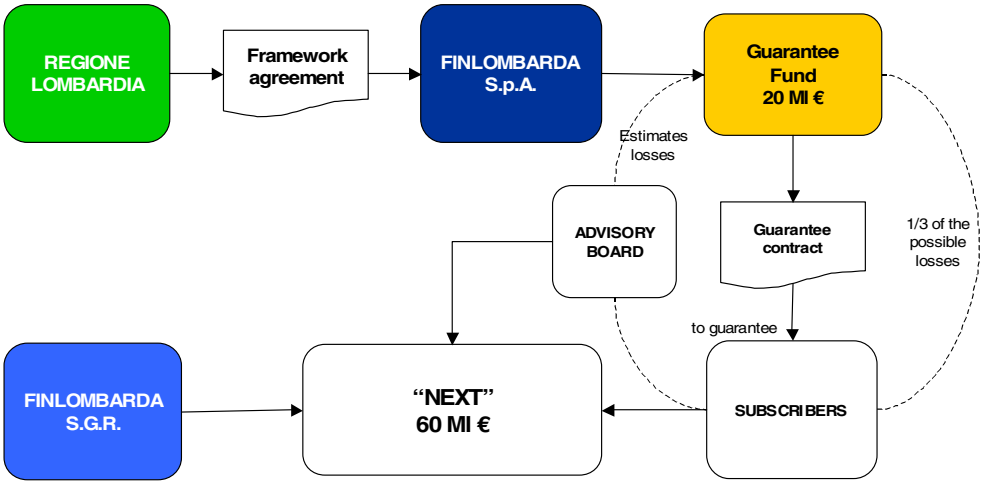
Country	Score
UK	1,2
IRELAND	1,58
LUXEMBOURG	1,67
HOLLAND	1,79
ITALY	**1,96**
GREECE	1,96
AVERAGE	**2,04**
FRANCE	2,09
SWEDEN	2,09
BELGIUM	2,14
SPAIN	2,17
FINLAND	2,25
PORTUGAL	2,32
GERMANY	2,41
DENMARK	2,48
AUSTRIA	2,53

Legenda
1 very favourable
2 favourable
3 less favourable

In fact the legal structure of a closed-end fund not only allows the institutional investors (even foreigners) to avoid the constitution of permanent structures (i.e. LLP) but also avoids the VAT payment on fees and carried interest. The fund capital gains are taxed only at 12.5%, considerably less than the European average which is of 18.6%.

The peculiar characteristic of NEXT, first and unique in Italy in its gender, is a guarantee offered to its investors on the subscribed capital. The guarantee system sum up to 20 Millions Euro, granted by Lombardy Region with a specific regional law (art. 6, comma 11 of Regional Law n. 25/2000). The guarantee is accorded to Next subscribers to reduce eventual losses at the end of the fund's life. The amount of losses will be calculated by an Advisory Board matching subscribers cash-flows in and out. If the Advisory Board verifies the existence of a loss, Finlombarda grants to subscribers 33% of this amount in one *tranche*.

Regional Guarantee system



NEXT is both a fund of funds and co-investment fund; therefore it invests in other venture capital closed-end funds, subscribing their shares, or directly co-invests in companies (in partnership with at least another qualified operator). NEXT purpose is to support technology transfer processes focusing on profitable economic sectors. The focus of the instrument are innovative applications in fields such as biotechnologies, electronics, chemistry, new materials and ICT, environmental technologies and robotic.

2.4. Material ConneXion

Material ConneXion is a good expression of Lombardy Region trend to foster excellences. Founded by George M. Beylerian in 1997, Material ConneXion is the world's most extensive collection of new and innovative materials and processes. It provides architects, engineers and designers from all disciplines access to the latest and most exciting materials coming from a broad range of industries that are often overlooked or inaccessible. Material ConneXion main location is in New York, two other affiliates are in Milan and Cologne.

Material ConneXion has created a unique materials library utilising an original methodology of selecting and cataloguing materials: it is an onsite and virtual database of over 3.000 materials coming from large and small, local and global manufacturers. Material ConneXion scouts the world, looking for innovative materials and discovering brand-new items.

The materials are organized into eight categories: polymers, metals, glass, ceramics, carbon- and cement-based materials, natural materials and natural material derivatives.

The aim of this library is creating an access to the best new and innovative materials and finding an innovative way to make them available to design professionals, entrepreneurs and to everybody who may be interested. The exhibition area of the Library can be visited in order to find the better solution for the realisation of products.

Every month Material ConneXion library is enriched with new materials selected by an interdisciplinary jury of experts from among hundreds sent continually by manufacturers or discovered by specialized technicians. The selection of new materials depends solely on the discretion of the jury, whose evaluation is based on intelligence, innovation, technical composition and advanced applications of the material. Each month this material specialists convenes to review approximately 20-30 materials that have been pre-selected by the Library Director as potential “interesting materials”. Each material with its unique properties is presented to the jury who evaluates it according its innovative contributions to industry, environment or science. Once a material is selected for inclusion, it is catalogued according to its type and applications. Its properties are also summarized in a clear and concise description that is useful and comprehensible to the lay user.

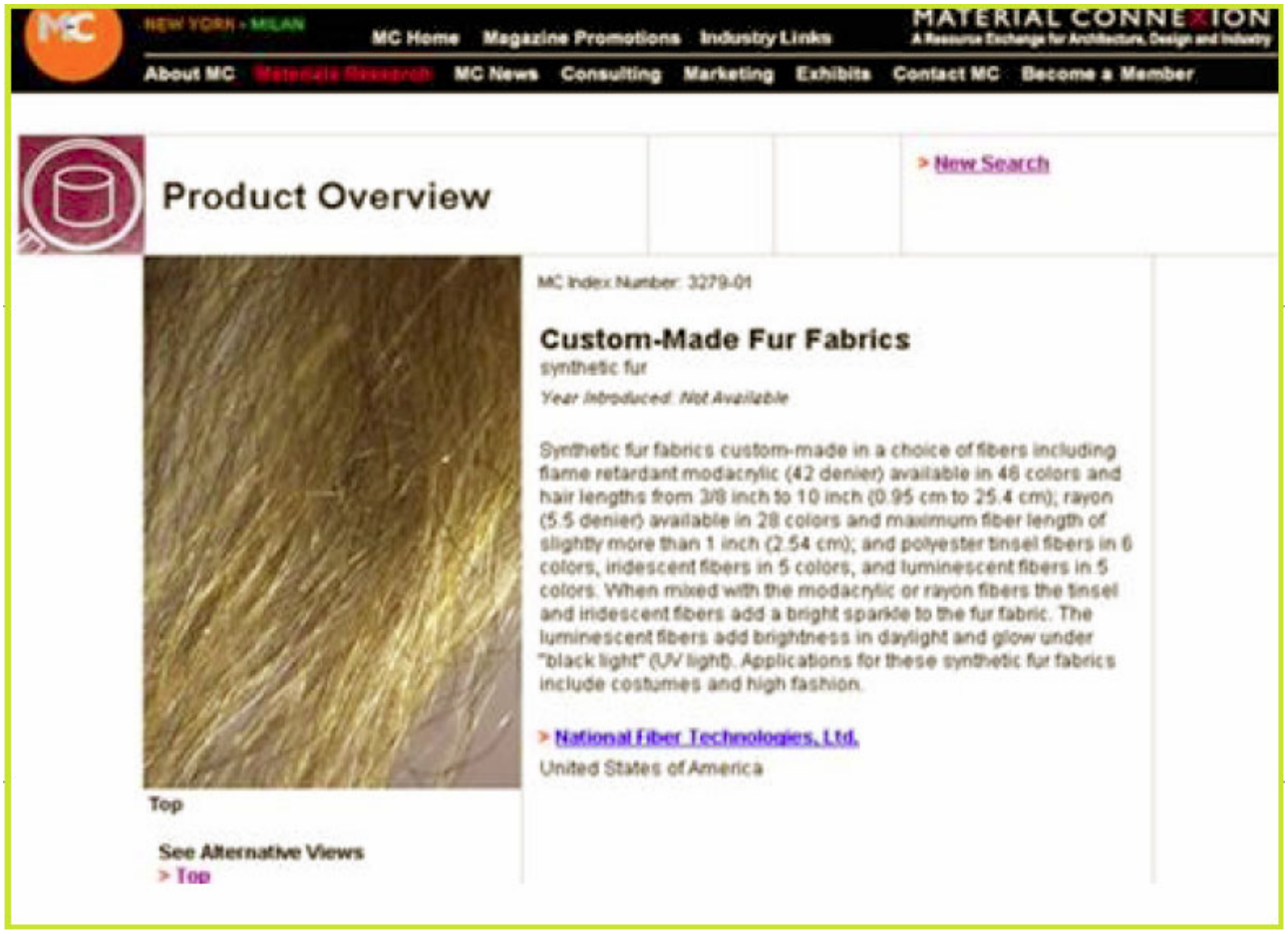
The physical library is made up of “Materia Tabula” panels. Each panel presents a sample of the material for physical inspection, a graphic representation of the material’s categorization within the library, and a description of its technical properties.

The materials collection can be consulted (by annual membership) either on-site in the New York / Milan / Cologne archives, or on-line via the virtual library (www.materialconnexion.com).

A team of senior materials experts and marketing consultants specialists are available to supply further deepening of materials characteristics and provide a *lingua franca* that translates technical nomenclature into simple language for easy comprehension by non-technical users.

The membership allows access to the materials database, research activities, promotion, training and consultancy on every information related to materials and processes included in the database.

The digital database allows user-determined research of materials, based on keyword investigation. Specific material pages include the material’s cataloguing number within the library, as well as its description and images. Also included is a link that connects directly to the web page of the material manufacturer. Members can directly access to manufacturer information online via the Material ConneXion database.



Material ConneXion Milano, in operation since July 2002, is the first international affiliates with headquarter at the Milan exhibition centre, promoted by Lombardy Region.

This new branch has a materials display Library, operational and technical offices and a wide exhibition area opened to the public that offers a range of membership options. Each virtual and onsite membership provides information and services to creative firms as well as corporate, cultural and consumer-based businesses that seek new materials for their projects and products, establishing contacts between material producers and potential users.

In addition to access to the online database by personal password, membership allows the consultation of the Library both in Milan, Cologne and New York, with the assistance of specialized personnel who can provide complete information about the materials and processes on display.

Every month, the library is enriched with 40 new materials selected by an international jury, that are featured as the most interesting new materials from the point of view of innovation, technical characteristics and possible applications. In addition to activities related to the Library, Material ConneXion Milano provides consulting, research, educational and promotional services targeted to the specific needs of its clients and offers companies that produce materials the opportunity to meet with a variety of material specialists and introduce them to new markets that they have not yet reached.

Material ConneXion Milano takes part to numerous fairs in Italy and abroad, organizes seminars and workshop on specific themes in order to promote the knowledge of materials in different fields and in order to find out new applications and markets. It also curates exhibitions that feature the latest developments in materials. They are used for the benefit of employees, customers and the public. Furthermore, Material ConneXion Milano organizes design competitions in order to promote new materials and applications and to explore new ways of using materials, creating new scenarios of development and new types of products.

3. Saxony-Anhalt

3.1. The further development of the Cluster Chemistry / Plastic in Saxony-Anhalt and Central Germany

Economy – a successful and growing chemical industry

Saxony-Anhalt has a critical mass of chemical industry with concentrated production in the region and in neighbouring areas in central Germany. There are over 300 enterprises in the chemical sector (DG 24 Chemical industry plus DH25 plastic and rubber) that employ 20.600 people and which produce about 5 billion € of turnover. The chemical sector is very important for the regional economy in terms of productivity, international turnover, employment creation and research and development.

The turnover per employee in the chemical industry (DG24) is almost 60% higher than the average in the processing industry in Saxony-Anhalt and even 9% higher than the German average of the chemical industry. In the past years the growth rates of turnover, export and employment are above the average and they promise to grow also in the future. These successful developments have also a positive effect towards the surrounding service providers.

Some multinational enterprises have settled in the 90s and invested a big amount of money, such as Dow Chemical in Schkopau and Elf in Leuna. The big enterprises have taken an active role for the establishment of the chemical cluster in Saxony-Anhalt. They are involved in a constant dialogue with the political level. Furthermore the enterprises of the chemical industry and especially the important chemical sites have successfully established a cooperation between the enterprises to work together in several areas of joint interest (Central European Chemical Network – CeChemNet).

Science – international competitive research competences

There are several research institutes in Saxony-Anhalt that are working in chemical relevant areas, such as the Martin-Luther-University Halle-Wittenberg, the University of Applied Science Merseburg. Furthermore the Fraunhofer Institute for Mechanics of Materials in Halle is very active in the development of the pilot plant centre for polymer synthesis and processing on the Value Park in Schkopau

A new technology centre for nanostructured materials (TGZ III) will be built in Halle for joint research projects of the Max-Planck Institute of Microstructure Physics, the Martin-Luther University Halle-Wittenberg and the Fraunhofer Institute for Mechanics of Materials. The Fraunhofer Institute for Factory Operation and Automation will open a Virtual Development and Training Centre (VDTC) in Magdeburg.

Also the synthesis of new active substances is a big challenge for the chemical sector in the future. The Leibniz Institute of Plant Biochemistry in cooperation with the Institute of Chemistry of the Otto-von-Guericke University in Magdeburg and the Institutes of Process Technology, Bioengineering, Pharmaceutical Technology and Biopharmacy in Halle and the fine and special chemistry of the TGZ Bitterfeld-Wolfen possess special competencies in theses research areas.

For the science it is important to achieve integration into regional added value chain. Research should support the development of new and innovative products and processes. Furthermore the research institutes have a strong impact for the development of human resources. In the relation between the enterprises and the academia there needs to be a common understanding about the objectives for higher education and research in order to coordinate the research efforts with the future production needs. It is very important to have a research which is competitive at international level and that is integrated in international partnerships in order to have an intensive exchange of experience and access to finances.

Politics – consensual development of joint strategies

Due to the importance for the region there is a strong cross-political support for the development of the chemical industry. The regional government has initiated the so-called “Strategy Dialog Chemistry” together with the Association of the chemical industry (VCI-Nordost). The strategy dialog was a joint effort by the administration and the enterprises to agree a long-term strategic policy for the support of the development of the chemical industry. Under the leadership of the Minister President, this dialogue has a high political priority. Several topics have been discussed such as investment support, the settlement of new enterprises or the improvement of general framework conditions.

An important task of the strategy dialog was the formulation of joint political positions related to national or European legislation that affects the chemical industry.

These common positions were then promoted by the regional government in the political debate at federal level in the Bundesrat (Federal Council) or directly with the European Commission. Therefore this dialog was an important way to formulate the regional interest towards other actors at different levels but also to bring the regional experience and knowledge into the multi-level decision making process to increase the practicability and efficiency of new policies.

Long-term Cooperation and sustainable partnerships

A general assessment of the different dimensions of the cluster chemistry in Saxony-Anhalt shows the unique position in the regional economy. The chemical industry is based on a long tradition in the region and benefits from a broad public acceptance. The chemical triangle in central Germany, where Saxony-Anhalt is the centre gives to some extent a room for identification and self-consciousness. Due to the successful implementation of several cooperation projects such as the Regional Innovation System (RIS) or the innovative actions of the EFRE. there is a functioning network of the relevant stakeholders in the chemical sector.

The core of the cluster is a modern and fast growing chemical industry that has established an intensive cooperation among the chemical sites and the enterprises. An extensive feedstock network connects the production sites and creates network structures that have been extended to other areas of joint activities. The competences of chemical park management have been bundled in the CeChemNet initiative that brings an added value to the chemical enterprises and is a strong stakeholder of the cluster process. The transfer of the former publicly financed project CeChemNet into a private model, financed by the chemical sites in the region could be the starting point for the establishment of a more active cluster organisation. During the past years the name “CeChemNet” could successfully be established as a trademark for the marketing of the chemical industry outside of Saxony-Anhalt. There is a German/English brochure about the core competencies and offers of the chemical sites for interested investors or other enterprises.

Furthermore the cluster chemistry has an excellent link to the political sphere. The “Strategy Dialog Chemistry” serves as forum for strategic discussion for the joint development of activities that support the development of the chemical industry in the long-term. Therefore the chemical cluster has a direct interface to the regional development policies and influences the regional economic policy formulation. The Regional Innovation Strategies have been an example in this area.

The political and economic impact of the chemical cluster is not only limited to the region Saxony-Anhalt. There is a strong trans-regional cooperation in Central Germany (Saxony-Anhalt, Saxony and Thuringia) that is supported by the Regionenmarketing Mitteldeutschland. The Cluster Board Chemistry brings together the relevant stakeholders from administration, politics, science and industry from the three regions in order to develop joint activities and to support the networking process.

The interim result of this process is the formulation of the chemical initiative Saxony-Anhalt for Central Germany – that has been presented during the major conference in November 2004 in Leuna.

The chemical cluster in Central Germany has also a national dimension. It is the objective to organise a national conference on the development of the chemical sector in East Germany in the end of the year 2005. This approach is developed in close cooperation with the national ministries and supported by the chemical association of chemical industry. This conference should articulate the needs of the chemical cluster towards the national level in order to formulate concrete proposal for joint actions or the improvement of framework conditions.

Finally, the chemical cluster is integrated in European and international networks. The cluster has taken an active role in the establishment of the European Chemical Regions Network that unites 20 European regions from 10 different member states. The cluster benefits from this cooperation by the initiation of interregional exchange of experience and the joint positioning towards the European political level in the framework of the chemical relevant European policy making, such as REACH. The chemical cluster is promoting its competences (such as in chemical park management) at European level to increase the internationalisation of business, attract new investments and establish new business opportunities.

Chemistry Initiative Saxony-Anhalt for Central Germany

The latest stage of the cluster process has been the formulation of the “chemistry initiative Saxony-Anhalt for Central Germany” that has been presented on the cluster conference in November 2004 in Leuna. This initiative brings together the different dimensions of the cluster in the region to develop a coherent approach for the further development of the cluster. This strategy has been actively developed by the chemical industry in close consultation with the relevant stakeholders. The conference has articulated a strong political support for the initiative.

The Chemistry Initiative has the following thematic focus of activities:

1. Cluster development Chemistry / Plastic in Central Germany

- Joint further development of the transregional cluster process chemistry / plastic initiated by the Regionenmarketing Mitteldeutschland under participation of industry, science and politics for the improvement of framework conditions for the chemical industry
- Trans regional support from regional governments (Ministries of Science, Economy, etc.) for the establishment of a permanent working group “Cluster board / cluster management)
- Clarification about legal and financial framework conditions for the support of a trans-regional cluster process
- Support of the cluster process from the federal level / Preparation of a chemical sector conference chemistry / plastic for the new Länder in 2005

2. Formulation of future business support measures

- Development of long-term strategy about objectives and instruments of the future business support for the chemical industry in central Germany
- Development of priority areas for the support of growth and employment of the chemical industry in Central Germany, especially in relation to the future use of national funds (Gemeinschaftsaufgabe) and the European Structural Funds in the period 2007 to 2013

3. Infrastructure Framework conditions

- Development of transregional industrial related infrastructure for chemical locations and integration in transnational networks und special consideration of EU Enlargement (fast implementation of important infrastructure projects of the federal government: highways, railway and waterways)
- Ensure the provision of competitive utility costs (water, disposal, waste etc.) as well as competitive energy prices

4. Sustainable Guaranties for the raw material basis of the chemical industry

- Participation in strategic discussion about the long-term raw material access / EU enlargement as well Ukraine and Russia
- Further development of pipeline network towards the new member states in Eastern Europe – raw material network, European development corridors

5. Interregional Cooperation

- Further development and thematic support of the European Chemical Regions Network (ECRN) as well as initiation and implementation of concrete projects of industry and science based on the European contacts
- Using market proximity and knowledge of Eastern Europe as location advantage – support for the contact establishment in Central and Eastern Europe / Support for joint activities for the establishment of interregional contacts
- Exchange of experience / promotion of competences of successful cluster development in the other European chemical regions

6. Development of research competences chemistry /plastic

- Strengthening of research by further supporting of innovation oriented development of chemical sites: research support especially for SMEs / support of cooperation between science and industry by financing R&D networks through a special innovation tax reduction (Innovationszulage)
- Establishment and further development of important research institutions in the area chemistry and plastic in the new Bundesländer with transregional importance and international visibility
- Support for the initiation of international research cooperation

7. Long-term development of human resources for the chemical sector

- Concepts for the “demographic change”, provision of qualified work force in connection to intelligent “interim solutions” for transition period
- Models for international training and education / staff exchange (Participation in European Projects such Leonardo, Socrates and Mobility funds)

- Support of natural science in the regional schools
- Staff costs development behind the background EU Enlargement

8. Marketing Activities of the chemical triangle Central Germany

- Coordination about a particular profile for marketing activities in the chemistry area (Länder, Regionenmarketing, Cluster board chemistry / plastic, Chemical Parks, enterprises and networks), joint strategic orientation of marketing activities, such as:

  Chemical triangle Central Germany – Settlement offensive chemistry / plastic

  Cluster map Chemistry / plastic in Central Germany

  Chemical gate Central Germany (stakeholders, competences, events)
- Coordinated activities of municipal and regional economic policies, concentrated measures
- Publication about the cluster process and the chemistry initiative in a joint progress report

3.2 Pilot Plant Centre for Polymers Synthesis and Polymers Processing. Cooperation between research and industry for the support of innovation.

The idea – providing services for SME

The unification of Germany has caused a dramatic transformation process for the chemical industry in East Germany. Big investments have been completed in order to strengthen the international competitiveness of the chemical enterprises. Furthermore the creation of new structures and the provision of favourable framework conditions was another challenge for a positive economic development.

The development of chemical parks has been a particular approach for the restructuring and modernisation of the chemical industry in East Germany. Today after 15 years of structural change, Saxony-Anhalt and Central Germany has re-established its position as leading chemical region in East Germany and is competing successfully with other chemical locations in Western and Eastern Europe as well as the world.

Most of the enterprises located in the chemical parks are subsidiaries of large corporations, normally without important research capacities. As far as the rubber and plastics processing industries are concerned, a large number of small and medium-sized enterprises are working in Saxony-Anhalt, Saxony and Thuringia, which contribute substantially to economic development and employment. There are only a few large-scale companies with 200-400 employees but a large number of small enterprises with an averaged number of employees of 20-30. These small enterprises normally have a lack of own research and development capacities. Therefore rising competition caused by the globalisation is likely to affect them particularly strongly.

In order to withstand the competition especially with the East-European countries and Asia, and to boost the innovation process, both, the rubber and plastics processing industry as well as the enterprises in chemical parks, have a strong need for accessible research capacities on site. Hence, the appropriate solution is to establish service providers for small businesses.

The decision to build the Pilot Plant Centre for Polymers Synthesis and Polymers Processing (PAZ) in Central Germany was a result of such considerations.

The concept and the management of the centre have been assigned to the Fraunhofer Institutes IAP (Institute for Applied Polymer Research) in Golm and the IWM (Institute for Material Mechanics) in Halle. The Fraunhofer Institutes ensure the practical orientation of research that is of particular importance for SME.

Location and Structure of Fraunhofer Pilot Plant Centre (PAZ)

The development of the Pilot Plant Centre meets the concerns of the overall strategic development visions of the polymers chemical and polymers processing industry in the region. At the same time, it will form an integral part of the second stage of expansion of the Innovation and Technology Centre in Merseburg (mitz), in order to facilitate synergy effects through a close linkage between non-academic research and the innovative character of the young enterprises.

Due to the favourable infrastructural conditions for the location of the PAZ the “Value Park” in the Chemical Park of Schkopau has been chosen. Besides the unproblematic integration into existing security management and the existence of characteristic chemical supply and waste management, there is an opportunity for a direct connection to the pipe-line system for monomer supply.

In the Pilot Plant Centre various processes of polymer synthesis and polymer processing can be realised. It offers the unique opportunity to large enterprises and in particular to SMEs together with the researchers from the Fraunhofer Institutes IAP in Golm and IWM in Halle to develop new products and new solutions for technical processing.

The goal is to maintain the high technical level of all processing lines with state-of-the-art techniques, with a high level of automatisation and on-line-process monitoring. This is necessary in order to achieve high performance with preferably small staff expenses. With focus on processing and technology development, further expansion will be oriented towards multi-functional synthesis and processing modules, e.g. the synthesis lines “emulsion and multifunctional polymer plant” and “bulk polymerisation”.

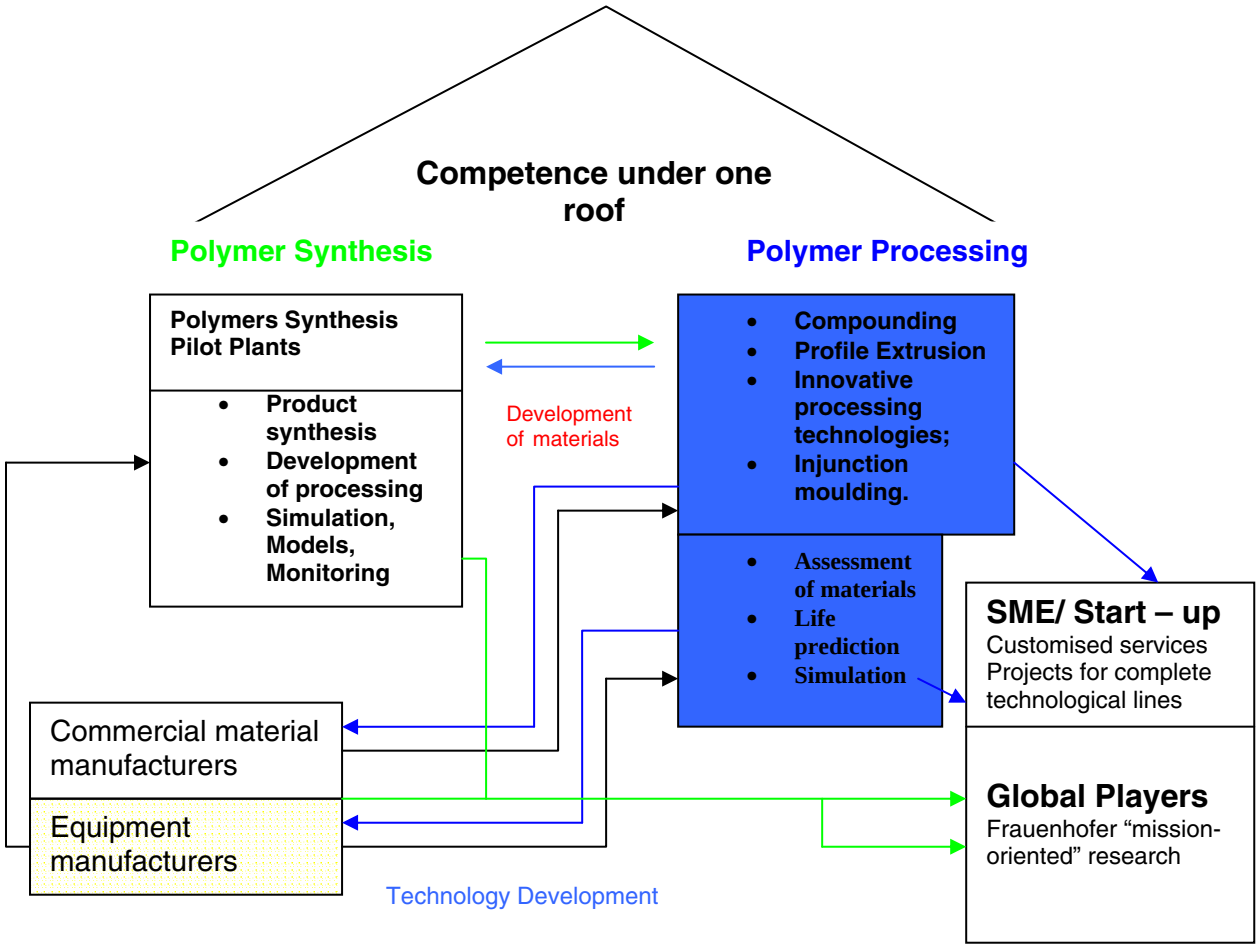
In this respect, the Pilot Plant Centre (PAZ) should gain acceptance and be of interest not only for typical chemical enterprises (polymer synthesis, plastics processing), but also for enterprises in the field of chemical plants construction – both, as a potential supplier of modules and a cooperation partner for the development of new innovative technologies.

The managing bodies of the Fraunhofer**,** with their typically “mission-oriented” research for regional und supra-regional clients, partners of small and medium-sized enterprises**,** as well as the educational centre**,** should become representative elements of the pilot plant centre.

The following chart demonstrates the idea of cooperation development and the centre's position in the regional environment.

Frauenhofer Pilot Plant Centre for Polymers Synthesis and Processing (PAZ)

From synthesis row material to customised materials



Internal close cooperation between polymers synthesis and polymers processing industries is an excellent basis for joint and efficient project work in the field of material- and technology development for large and medium business enterprises. The envisaged development of networks ensures innovative research approaches by providing corresponding inputs from business, and thus the integration of SME and start-ups into the innovation processes.

Furthermore, it guarantees tangible results within a restricted time-frame and their accelerated transfer into practice. The formulation of complete solutions for potential clients will be enabled by the integration of areas of applied basic research, conducted in competent laboratories within the institutes, and through intensive cooperation with regional academia (e.g. Joint appointment of a C4- professorship for Reaction Techniques at the Martin-Luther-University in Halle. The envisaged development of a centre of excellence will attract young researchers, and create awareness for education and training in relevant academic courses, contributing to the expansion and networking of national and international competences.

Classification of PAZ within the Cluster policy of the Land Saxony-Anhalt

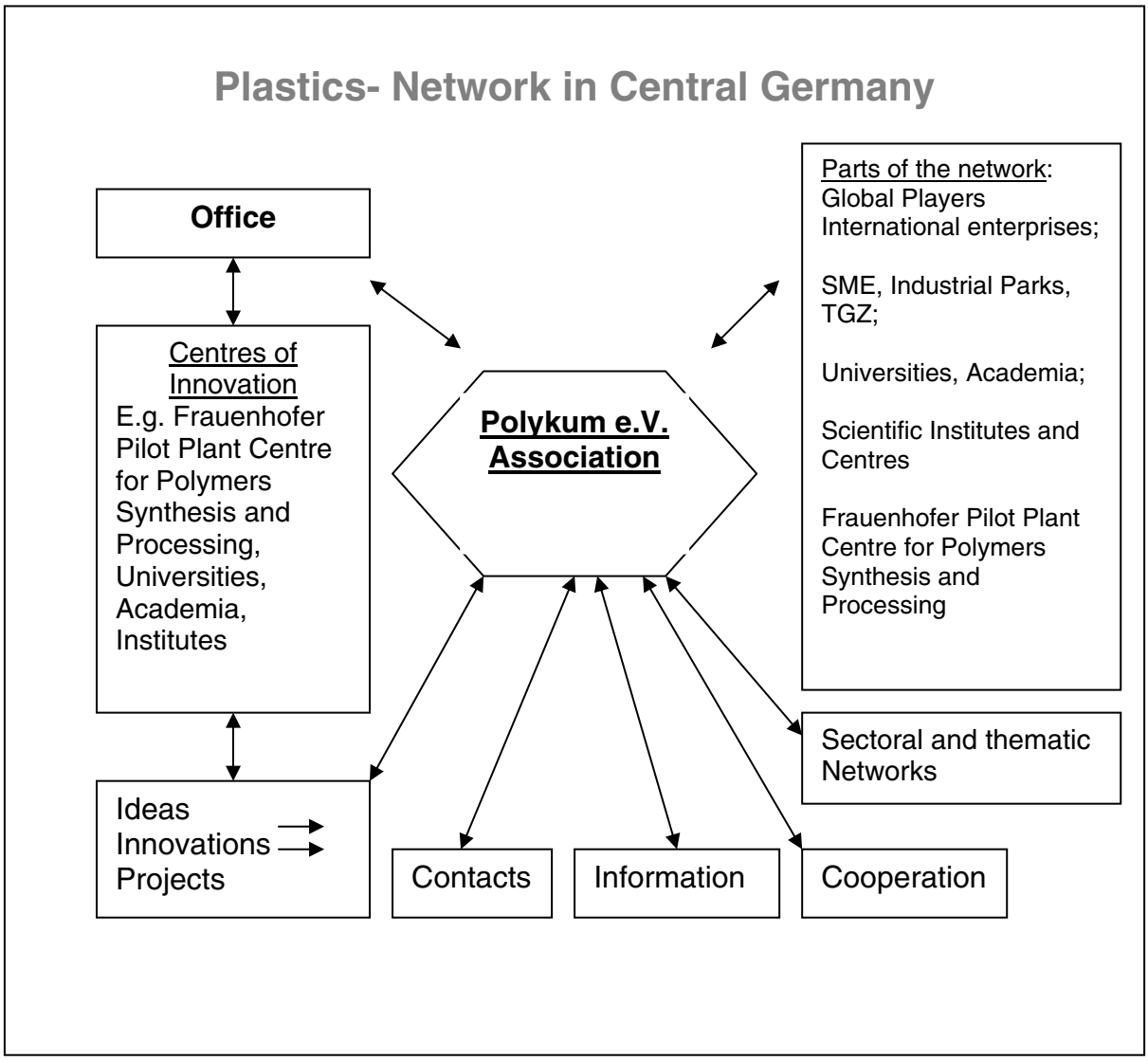
The integration of PAZ, research institutions in the area of Central Germany, as well as industrial enterprises in cooperation networks (Cluster)**,** will ensure the use of opportunities, which are created by the PAZ in the field of innovation for and with the industry. The specific goal is to open the centre for small and medium sized enterprises and to overcome the barriers between science and research.

Particular importance will be given to the integration of the scientific environment in the process. The Fraunhofer Pilot Plant Centre is mainly equipped with industry-compatible pilot plants and can only deal with key scientific themes where personnel capacities are concerned. Due to the fact that surrounding universities, colleges and non-academic institutions possess required small technical tools and a number of measuring instruments, it is of particular importance to integrate these potentials for the successful realisation of the pilot plant centre concept. Supporting this bundling is one of the significant tasks of the work of the network.

The organisation of the innovation processes will be supported though the cooperation with the polymers producing enterprises, mainly located in the chemical parks. These are integrated into a CeChemNet network, which combines the chemical parks in Leuna, Schkopau, Bitterfeld, Zeitz und Schwarzheide.

CeChemNet has strong connections with the Association for the Support of Polymers Development – Polykum e.V. that was established in August 2002 in order to prepare and to organise the utilisation of PAZ by industry.

Polykum e.V has established and now organises the "Plastics Network of Central Germany", which unifies academic and non-academic research institutions form Saxony-Anhalt, Saxony and Thuringia, as well as polymers producing and processing enterprises from the three regions. Polykum e.V. takes over the task of integrating these enterprises in Plastics -Network of Central Germany and their coupling with the scientific environment and the PAZ.



Of particular importance are the contacts facilitated through the network between polymers producers (mostly in chemical parks) and polymers processing enterprises (supplier - client - relation).

In order to organise cooperation between the Pilot Plant Centre and scientific environment in the region the network will focus on the establishment of a "bound" (sub-cluster) of cooperating partners.

In this respect areas of responsibility in important fields (with a structure of working groups) will be established. The working groups will be managed by specialists form the Pilots Plant Centre or from regional research institutions. The laboratory services of the Pilot Plant Centre will be combined with those of the scientific fields in the region. Thus, the network (cluster) with its body – Polykum e.V. – functions, on behalf of the Fraunhofer Pilot Plant Centre (PAZ), as an intersection between SME and R&D capacities in the region.

The compound between the Pilot Plant Centre and the scientific environment (sub-cluster) will develop to a competence region in plastics and to a plastics competence centre Halle-Merseburg in its core.

Besides its importance for the plastics manufacturers and plastics processing enterprises the scientific sub-cluster has particular effects on the whole Federal Republic and Europe. In this context, the Pilot Plant Centre is looking for its users in this extended geographic area.

On the one hand, this will contribute to a better use of the PAZ capacities and therefore to its financing, and on the other hand, it will ensure its integration in the international research landscape.

For more information see:

http://www.pioneers-in-polymers.com/rd5/index.html

www.polykum.de

3.3 ECTS Chemical Worker

The project “ECTS Chemical Worker – Certification of Online- and Being-Present-Training in First and Further Education of Chemistry-Workers” is a Leonardo da Vinci project running from 2003 to 2006 with the aim to enhance both mobility and working-/equipment safety in the chemical industry. The project partnership includes 21 companies and institutions from 9 different European countries (Germany, Austria, Netherlands, Great Britain, Czech Republic, Poland, Italy, Sweden and Finland).

The partners taking part in this project are

- Enterprises of the petrochemical, chemical, and pharmaceutical industry. Some of these companies work globally.
- Educational companies with international experiences in vocational training and education of operators and maintenance people (in the following text only mentioned as operators) in automated plants of the petrochemical, chemical, and pharmaceutical industry
- Scientific facilities for evaluation concerning educational contents and their assessment (procedures of certification)

With the project, a basis of a European reference model for education and training of operators in automated plants of the petrochemical, chemical and the pharmaceutical industry will be compiled, applied and tested including the certification of educational results. Thus first results for the internationalisation of vocational education will be gathered on the basis of ECTS for academic training in Europe for the development of human resources in the petrochemical, chemical and the pharmaceutical industry (in compliance with the "Bruges"-process and the coalition agreement of the German Federal Government).

The project on hand aims to work out referential basics concerning a European evaluation and transfer system for vocational training. The project partners want to give examples how to use these basics in vocational training and education for operators and maintenance people working in automated plants of the petrochemical, chemical, and pharmaceutical industry.

The necessity for the project results from the fact that technical systems in highly developed industrial nations (OECD) have almost similar state of development, whereas human resources are developed quite differently. In order to support the increasing mobility of workforce a tool for a better comparability of skills, abilities and competences is needed.

The general aim and tasks of this pilot project is to:

- Point out and formulate requirements of operators working on highly automated technical systems especially in chemical plants
- Collect, test and create training modules which can be used for operator's education and training European wide
- Develop and test the transfer of trained abilities and skills of operators into every day activity on real equipment (ECTS certification).

Furthermore the following objectives have been formulated:

- Compilation and description of important necessary competencies of operators in the oil-processing, the chemical and the pharmaceutical industry
- Compilation and description of requirements for the training of operators resulting from the required competencies
- Gathering and evaluation of available training components for gaining, strengthening and maintaining the necessary action competence
- Examination of the transnational suitability of the available training components
- Detection of gaps in the system of available training components and submission of suggestions for their elimination
- Collection of assessments to proof the acquired knowledge and abilities
- Development of a content-wise justified comparability of competence acquisition of operators in the partner countries involved-first elements of a future ECTS certification
- Suggestions for the transfer of the knowledge into everyday business

The detailed work plan of the project is described in the table below.

Step	Tasks	Timeframe
0	Kick-off-meeting (all of the participants)	Dec. 2003
	Presentation of the project in national counsels	Jan. 2004
1	Draw up a list containing competencies used for operating automated plants of petrochemical, chemical and pharmaceutical industry	Jan. - July 2004
	Draw up a list containing training modules in order to realise the competencies mentioned above	Jan. - July 2004
	Supply tested training modules for being-present training	Apr. 2004 - Jan. 2005
	First meeting for results	Oct. 2004
	Meeting between National counsels and Project administration	July 2004
2	Test training modules of other project partners (in English language) and translate them into other languages	July 2004 - Jan. 2006
	Work out and test assessments to certificate competencies of operators	July 2004 - Jan. 2006
	Second meeting for results	July 2005
	Meeting between National councils and project administration	July 2005

Step	Tasks	Timeframe
3	Compare the assessments to certificate competencies of operators with other training and education sections in the states of participants (first stage of ECTS for operators)	Jan. 2004 - Apr. 2005 July 2005 - Apr. 2006
	Transfer experiences from ECTS into project	Apr. 2004 - Jan. 2005 Oct. 2005 - July 2006
4	External evaluation and assess training modules	Apr. 2006 - July 2006
	Show deficiencies and future necessary jobs	Apr. 2004 - Oct. 2006
	Final meeting (participants and National counsels)	July 2006
	Give suggestions for an European model for education and training of operators in automated plants of petro-chemical, chemical and pharmaceutical industries and their assessments (Certification of competences of operators in these industries)	July 2006

The project ECTS Chemical Worker is an innovative cooperation based on a broad partnership from all over Europe. It brings together representatives from education providers and enterprises, which ensures the practicability of results. These advantages should give a positive outlook for the generalisation and mainstreaming of results. Therefore the dissemination of the project activities is important for the future.

More information about the project and the progress of the work can be found on the project web page: www.ects-chemie.de.

3.4 CeChemNet - Chemical Parks and Basel II: Advantages for successful investment financing

CeChemNet - Central European Chemical Network

Chemical enterprises, specialised service providers, research and education institutes from the Central German Triangle jointed their forces in the regional network “CeChemNet” – Central European Chemical Network for the development of a new quality of cooperation and bundling of competences in various areas of work of the local chemical sites. Today, the CeChemNet can be seen as the core and the driving force of the cluster process in Saxony-Anhalt.

The partners of the network are: InfraLeuna Infrastructure and Service GmbH, Dow Olefinverbund GmbH- ValuePark Schkopau-Böhlen-Leuna, Preiss - Daimler Chemiepark Bitterfeld - Wolfen GmbH, BASF Schwarzheide GmbH, ZSG Zeitzer Standortgesellschaft mbH, isw Gesellschaft für wissenschaftliche Beratung und Dienstleistung GmbH, der BVCT Bildungsverbund Chemie und Technik e.V. and the Association of the Chemical Industry– Landesgruppe Nord-Ost.

Chemical Site Management Expertise

The “Central European Network” is an interdisciplinary network that combines a wide range of expertise, specialised engineering excellence and successful site management. It focuses regional capacities in chemical site development, creates synergies with its raw material procurement alliance while promoting the cross acquisition of know-how in its six chemical facilities.

The approach of the network is based on the development of the chemical industry in Central Germany, which is primarily concerned with traditional chemical locations. All sites are characterised by a specific development scheme caused by the process of privatisation. The result of the transformation process is the development of specific know-how for the management of complex processes for the restructuring and the development of chemical sites.

The key priority is to apply the network’s chemical site management in two areas:

- CeChemNet is committed to attract new companies to invest in the Central German Chemical sites to develop and expand existing operations;

- The network business partners aim to advise and support companies from Eastern European chemical sites to solve their problems in restructuring and developing projects.

In this context the CeChemNet offers its activities to outside investors, developing a network of tailor-made strategies for outside companies to settle in the Central German chemical triangle. With its outstanding expertise the network provides an innovative compendium of practicable solutions in site management especially to the regions in Eastern-Europe, which face similar restructuring processes as Central Germany. Its range of services includes experience with renovating contaminated industrial sites, identifying, systemising and describing of existing or needed expertise and outlining the technical, organisational, financial and promotional potential for developing sites.

Chemical Parks and Basel II

The communication with capital providers is a key issue for a successful corporate financing. In the framework of the network of the central German Chemical Sites “CeChemNet” the site companies offer their support for an active finance communication between enterprises and banks to interested investors. Especially the new regulation on own capital reserves for credits in the framework of Basel II and the growing importance of risk optimization in the credit business related to the rating process is an upcoming challenge especially for the SMEs in Saxony-Anhalt. The enterprises have a strong orientation on outside capital and their own capital rate is often below 10 per cent. This strong dependency needs to be decreased in order to ensure the entrepreneurial room for manoeuvre.

The chemical enterprises have started a dialog with representatives from politics and finance in order to raise the awareness of the special situation of the enterprises at the chemical sites. High level representatives from the Ministry of Economy and Labour and the Ministry of Finances from Saxony-Anhalt, Association of Chemical industry (VCI Nordost), chemical enterprises and site companies as well as public and private banks and rating agencies have been invited to discuss these issues for a better information of the particular situation and the development of joint positions for the future.

The core statement is that the enterprises located on the chemical site have clear advantages that should be communicated to the banks and rating agencies in order to improve the rating position and therefore reduce the cost for the financing of new investments. The qualitative assessment should take into account the specific conditions of the chemical industry, such as the feedstock base, the supply with media, the availability of outsourcing partners and services, authorization procedures and the integration into networks. This leads to clear advantages based on network synergies, economies of scale, short ways, overall risk management or secure sales relation such as industry typical take-or-pay contracts.

This successfully established dialog with the relevant stakeholders will be further developed in the future in order to ensure a good preparation of the SMEs for the introduction of the new rating procedures and a proper financing of further investments. A catalogue of the summary of advantages of enterprises on chemical sites is available and will be used for information and marketing.

More Information under www.cechemnet.de

CeChemNet
Central European Chemical Network

4. Asturias

4.1. Association of Chemical and Process Industries of Asturias, AIQPA

In 1998, IDEPA (Institute for Economic Development of the Principality of Asturias), together with the Chemical Engineering and Environmental Technology Department of the University of Oviedo, encouraged the creation of a business association of chemical industries in Asturias.

Two years later, the Association of Chemical and Process Industries of Asturias (Asociación de Industrias Químicas y de Procesos de Asturias, AIQPA) was founded with the main objective of promoting the approach and cooperation among the different businesses linked to the chemical and process industry in Asturias and fostering their economical, technological and commercial development.

Considering this mission, AIQPA is not only the kind of association which defends business interests, but also the one which cooperates with the Regional Administration on technical issues in order to foster the Asturian chemical industry development.

IDEPA believes that AIQPA will contribute to the chemical industry cohesion in our Autonomous Region, whilst the Association itself thinks it is of the most importance that Asturias identifies itself and develops its own image as one of the European Chemical Regions. Having this very important mission AIQPA has assumed in mind, the Association and IDEPA have kept a close relationship from the beginning, which is demonstrated by the significant support the Institute gives to AIQPA in economic, infrastructure and human resources terms.

Nowadays, the Association represents the most remarkable and interesting associative initiative in the regional chemical industry and gathers together some of the most representative chemical companies in Asturias:

- some enterprises of great tradition in the region:
  - *Industrial Química del Nalón, S. A.*
  - *CEASA (ENCE Group)*
  - *Fertiberia*

- three well-known multinationals:
  - *Bayer*
  - *Praxair*
  - *Du Pont*

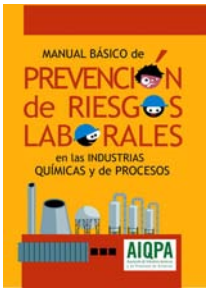
- other chemical process companies of minor volume or recently set up:
  - *Rioglass*
  - *Roko*
  - *Asturpharma*

From the beginning, the Association has organised several seminars, conferences and working panels related to a wide range of subjects, such as safety, environment, human resources, quality and innovation, which have been attended not only by associated members, but also by other chemical and process companies, professionals, academicians and university pupils.

Some relevant examples are the following ones:

- «ADR, RID, IMO-IMGD 2003, common aspects and main differences».
- «Development of the IPPC Directive and medium-term implications for chemical companies». Dr. Fabián González. Head of Environment Department of Bayer Hispania Group.
- «Basic directive and elaboration of safety studies».

- «The new accidents reporting electronic system DELTA».
- «ATEX regulation: documentary implications and techniques in the development of projects and the management of the security».
- «SQAS. System of integral securing of quality, security and environmental management in logistic services».



Besides, AIQPA has organized some courses both for workers and professionals and has published some technical reports and handbooks, such as the «Safety and Prevention of Hazards in the Chemical Industry Handbook», in February 2005.

Some of the activities carried out by AIQPA through these years are the result of IDEPA's suggestions and incitements or cooperation agreements between both organizations. Thus, one of the most important projects carried out by AIQPA has been the National Chemical Industry Congress, «Trends of the Chemical Sector», held the 6th and 7th of November 2003 and organized together with IDEPA. Both national and international industries and public institutions, as FEIQUE (Spanish Chemical Industry Federation) and CEFIC (European Chemical Industry Council), took part in it. The Congress conclusions where published in a book distributed among the most important chemical companies at European level.

It is a challenge for AIQPA to give continuity to all these activities, and to create a forum of discussion about technological aspects that could influence the chemical sector.

In 2001, at the request of IDEPA, AIQPA presented a proposal to declare their opinion about the Green Paper on the Strategy for the Future European Policy about Chemicals, with a view to the round table that would be held in September 2001 and in which the Minister of Industry and Employment of the Principality of Asturias took part.

As a result of this initiative, AIQPA decided to define and announce their position about the proposal for a REACH Regulation (Registration, Evaluation and Authorisation of Chemicals) before the end of 2004. Previously, they carried out a wide compilation of information to deepen in the proposal contents and to know the opinion of other involved agents, both at national level and from the rest of the European Union. During this process, the Association came across some opinions in favour –such us those from ecological groups– and some against –above all from the industrial sector and entrepreneurial organizations–, and some assessments about the future Regulation application consequences on the chemical industry and the general economy.

In Spain, FEIQUE, the organization which has involved most in the REACH project, already handled some reports pointing to more than 11 000 million Euros loss and the destruction of more than 250 000 jobs through 10 years since the REACH introduction. However, there were no data about the consequences for Asturias. Therefore, the Association decided to deepen in the subject before defining their position, which was postponed to the first months of 2005.

As a result, IDEPA suggested that the Association should perform a technical report on the economic impact of the implementation of the REACH Regulation proposal on the industrial sector in Asturias, which is another example of the cooperation between IDEPA and AIQPA. Meanwhile, IDEPA organized the «REACH Regulation Meeting. European Regions View», in the framework of the *MentorChem* Project and following its spirit of interregional cooperation and knowledge and expertise exchange. It was held in Oviedo (Asturias) the 4th of May 2005, with the participation of high-level institutional representatives, industries and academicians from the three regional partners.

As for Asturias, AIQPA seized the event, the first of this type held in Spain, to present the results of the «Technical Report about the economic impact of the European REACH Regulation proposal implementation on the industrial sector in Asturias», which were compared to those of other European regions impact assessments.

More information on: **www.aiqpa.com**

4.2 Regional Technology Centres Network

The Government of the Principality of Asturias has created a network of technological centres with the main objective of increasing the number of innovation-related services available to Asturian companies. Technology centres of the network which provide services to the chemical industry are:

- the *Materials Technology Institute (Instituto Tecnológico de Materiales, ITMA)*, which provides RTD (Research & Technological Development) services, advanced technical assistance and professional advice about quality in the contexts of metallic materials, ceramic-refractories and plastic-composites;

www.itma.es

- the *Steel and Metallic Materials Technology Centre (Centro Tecnológico del Acero y Materiales Metálicos, CEAMET)*, dedicated to the identification, development, transference and sharing of technology, provides support and test services, technical assistance and specialized training in steel, cast iron, metallic materials and alloys technologies;

- the *Information and Communication Technologies Centre (Centro de Tecnologías de la Información y la Comunicación, CTIC)*, which works not only as a support element for companies from traditional sectors, specially SMEs, and with great difficulties dealing with e-business and advanced technologies, but as an active partner of other ICT companies for developing RTD (Research & Technological Development) projects as well;

www.fundacionctic.org

- and the *Industrial Design and Production Technology Centre (Centro Tecnológico de Diseño y Producción Industrial de Asturias, Prodintec)*, which fosters Asturian industry competitiveness by means of the application of technological advances for both products and manufacture processes, providing RTD services applied to industrial design and production.

www.prodintec.com

Technology centres must provide an effective link between businesses and research centres. Efforts must be made in Asturias to coordinate policies relating to research, development and innovation so that the whole set up technology centres can provide innovation related technology, expertise and forecasts for key sectors, together with existing research centres, some of which are linked to the chemical industry, such as the *Dairy Products Institute of Asturias (Instituto de Productos Lácteos de Asturias, IPLA)*, which is part of the National Research Centres Network of the Spanish Council for Scientific Research, CSIC, does milk research and provides services as external testing laboratory; the *Regional Agro-alimentary Research and Development Service (Servicio Regional de Investigación y Desarrollo Agroalimentario, SERIDA)*, which encourages the regional agro-alimentary sector through RTD projects; and the *National Coal Institute (Instituto Nacional del Carbón (INCAR)*, involved in scientific and technological research in coal, new carbon-based and nanostructured ceramic materials applications.

IPLA facilities view.

www.ipla.csic.es

www.serida.org

INCAR
INSTITUTO NACIONAL DEL CARBÓN
CSIC Consejo Superior de Investigaciones Científicas

www.incar.csic.es

Although it is quite clear that research centres must provide expertise in their own subjects, in specific terms, technology centres must meet the following objectives:

- create R&D and innovation-related links with businesses,
- transfer knowledge, support and confidence to small and medium-sized enterprises and/or business sectors,
- provide support to companies in terms of training, projects, quality control, procedural improvements, machinery, equipment, design and quality,
- provide forecasts at the request of industrial sectors in the region,
- create a connection between public research bodies, university and businesses, and
- develop new business activities and provide support for job creation.

The network of technology centres is a strategy designed to strengthen links with companies and business sectors. It aims to safeguard the future and ensure the sustainable development of Asturias, and is integrated with the regional industrial sectors. Subsequently,

- The engineering goods manufacturers and metallic materials sector is vitally important to the Principality of Asturias both in terms of companies and products. The *Steel and Metallic Materials Technology Centre (CEAMET)* and the *Industrial Design and Production Technology Centre (Prodintec)* have been created to provide support and innovation for the sector and are already running. Both centres are focused on Asturian SMEs in particular and are designed to make use of Asturias' resources. The *Industrial Design and Production Technology Centre (Prodintec)* has been set up in response to the increasingly important role design plays in competitiveness, since it has now become an innovation management tool.
- As far as the information society sector is concerned, the *Information and Communication Technologies Centre (CTIC)* has been created in response to the growth of computing, telecommunication networks and the audiovisual sector. This centre assesses the priorities for their development in other industrial sector companies, helps their own sector modernise and grow, and also works towards the expansion of ICT and the creation of skilled jobs in Asturias.

- The agro-food sector in Asturias is known for its great diversity, quality and prestige. In order to develop innovation-oriented policies, improve marketing and food safety, and anticipate the new demands and requirements of Asturian consumers, a variety of centres providing support for the sector have been created, such as *SERIDA*, *IPLA*, the University of Oviedo, along with a number of other laboratories. A technology platform integrated with other authorised national centres must be developed in order to coordinate all these centres.

Universidad de Oviedo

- The non-metallic materials sector is very important to Asturias due to the quantity and usage of such materials, and is supported by the research, innovation and service-support work performed by the *Materials Technology Institute (ITMA)*.

- The conventional energy sector is studied at the *INCAR* and the University of Oviedo.

- As far as the environmental sector is concerned, potential markets have been identified for companies providing environmental and industrial processing services as well as other sectors affected by the IPPC (European Directive on Integrated Pollution Prevention and Control). A cluster of companies coordinated by the *Asturian Environmental Foundation (Fundación Asturiana de Medio Ambiente, FAMA)* and the *Foundation for the Promotion of Applied Scientific Research and Technology in Asturias (Fundación para el Fomento en Asturias de la Investigación Científica Aplicada y la Tecnología, FICYT)* are operating in this sector.

fundación ambiente
fundación asturiana de medio ambiente

www.fundacionambiente.org

FICYT

www.ficyt.es
www.pctiasturias.com

- Finally, the chemical and process sector has shown a continuing steady growth during the first three-year period of this decade, even greater than that of other industrial sectors. Asturias counts on water and electric power as objective elements for this sector growth. Expertise and knowledge creation and transference needs have traditionally been supported by many different knowledge infrastructures settled down in the region together with a great effort from the regional Administration. The *Materials Technology Institute (ITMA)* and the *Steel and Metallic Materials Technology Centre (CEAMET)* in the materials area, and other research centres such as *IPLA*, *SERIDA*, in the biotechnology area, and *INCAR* in the carbon-based materials, are directly or indirectly linked to the chemical sector, as they are involved in related knowledge areas. Besides, from the point of view of new technologies development both for products and manufacture processes, and new information technologies application, the *Industrial Design and Production Technology Centre (Prodintec)* and the *Information and Communication Technologies Centre (CTIC)* are also key elements for the innovation process of this sector.

4.3 Professional Training of the Companies in the Asturian Chemical Sector

Detection of training needs

Work Organization

The most important companies in the Asturian chemical sector follow a trend in which the system of work is "unique", on the basis of multifunctionality. The objective is to implant self-managed work crews which are adapted to the characteristics of the processes in which the people involved organize themselves into self-managed shifts demanded by the tools necessary in order to complete their duties.

This is an organizational system which allows for development opportunities for all of its employees. This system allows them to:

1. Advancement and development in all areas of work (Multifunctionality). The employee carries out operative and management duties related to various disciplines (self-managed work crews), having room for development during the majority of their career which contributes to their progression.
2. Knowledge of what needs to be done in terms of learning of new competencies (both operative as well as management), that is to say that the worker must contribute in order to go to the next step (Personal Development Plan).
3. To have access to the necessary training in order to reach this progression throughout the professional career (Annual Training Plans).
4. Obtain the most objective evaluation possible regarding their contribution to the business.
5. The management of the business will be done through **added value processes** which are in continuous evolution, making the internal organizational necessities compatible with client satisfaction and worker expectations. In definite, the organizations are looking to have all the capabilities necessary for the efficient and effective functioning of the added value processes, and that the persons may work effectively and with satisfaction while simultaneously having the perspective of a growing future.

Personal Development Plan

People are involved in complex life systems. Modern communication systems and the low cost of technology allow fantastic access to information and communication. A “democratic process” is opened and it is the people, with their professionalism, who manage said information/training.

Each employee belongs to various work groups which carry out different operative and management processes. These workers would have a wealth of competencies which would increase in collaboration with the group.

The sum of competencies of the processes in which each individual participates yields the individual competency profile which will be associated to a study of the business development matrix (this consists of a matrix of various levels which a company employee may have in function of those competencies which are gradually acquired, said matrix is intimately related to the personalized salary of each employee).

The personal development of each individual in the organization contemplates the whole of the person: function (knowledge and know-how), being and willingness (know how), in such a way so that for each employee, personal interests and capabilities will be in balance with the business' needs.

Task Analysis

Each part of the company's business, that is to say each process, will have at their disposal a task analysis in which all the competencies to be covered by the different work groups participating in the process are described so that each one is carried out correctly.

The basic tool necessary to identify training needs is the "Task Analysis" which must be carried out for all the processes.

The final products of the task analysis are the training needs (functional or operative) necessary for the different work groups, and therefore for their different members, to fulfil the different works with which they have been entrusted. So, it is a basic tool for the definition of the necessary training and the certification the different members of the organization must have.

The Task Analysis for each process collects information regarding the same and indicates how and why the different tasks that make up the process should be carried out as well the training necessary in order for them to be done correctly.

Training Plan: Design and management

The different companies training plans consider the business' objectives as well as the necessities of the people who are going to be trained.

The companies’ training policies are planned, programmed, developed, documented and implemented assuring:

Initial Training. All employees must be trained and qualified before beginning a new job.

Refresher Training Courses. All employees should receive refresher training courses at adequate intervals, so that they may be permanently qualified to carry out operations.

Cross Training. All employees should receive continuous training, acquiring new competencies (in addition to the first competency, they begin to train in order to carry out additional competencies).

Personal Development Plan and Training Plan

Each individual’s training plan will be developed in function of the analysis of the Contribution that the company expects of them. It will be carried out periodically. The employee in conjunction with a superior, and in accord with their personal necessities and the key objectives to be met for that period, define the Personal Development Plan in the short term.

The **functional** part (“knowledge”, “know-how”) is focused by taking as basis the “Task Analysis” of the processes carried out in function of the company’s specific needs and has as objective:

- Ensure that the personnel is prepared to begin carrying out their competencies, so that training must be proported in all aspects related to the specific tasks of their job.
- Maximize each person’s functional capacities in order to progressively improve them.
- Implement new technologies.

Training which deals with the development of **being** and **willingness** (know-how), is aimed towards promoting the personal integration of each employee with the needs of the work groups to which they pertain, as well as improving interpersonal relations, effective communication and the resolution of problems, with the attainment of better results as the goal. Training in those aspects related with being and willingness is aimed at covering the objectives marked by the company’s directives.

Process for the Elaboration of the Annual Training Plan

The periodic nature of the Training Plan is fundamentally **annual** and is determined by the **necessities of the organization** based on the current Personal Development Plans of the members of the business.

Whoever is in charge of the training sessions should establish meetings in different surroundings in order to understand the personal and organization’s training needs..

The compendium of information resulting from this analysis will yield the first proposal for the training sessions that each of the members of the organization will receive. All of the information regarding the general training necessities will be collected in the **First Proposal for the Training Plan**.

Next, an analysis period is established in order to consider the presented observations, and to verify the validity and **viability of the plan**.

If no incongruence is found validation will follow, if, on the contrary, irregularities or incongruities are detected the opportune modifications will be carried out until a viable Training Program is achieved.

Once the definitive plan is approved, the Training Instructor will be in charge of **planning and programming** of the training activities which comprise the plan.

Throughout the year and, as the plan is being carried out, changes within the foreseen plan may arise so that it must be **revised** in function of the detected necessities. The changes that may arise throughout the year regarding the developed plan stem from: revisions of the process task analysis, personnel changes, hiring...

Information collected in the Annual Training Program

The Training Plan is a document in which the general and operative objectives, as well as contents, human and material resources, methodology to be followed, time, place, evaluation and target group of the training is detailed.

The following are the steps to be taken for the elaboration of the Annual Training Plan:

- Definition of the Plan’s general objectives.
- Division of the concrete objectives and timetables into stages defined by specific objectives and times. Listing of the training activities which comprise the plan.

- Didactic curriculum for each stage:
  - Each training session's objective. The answer given to **Why?**
  - Theoretical and practical contents that will be treated during the training session to reach the proposed objectives regarding **What?**
  - Methodology. Another aspect which should be determined during the development of a training session is **How to carry it out?** The methodology may be diverse (expository, participatory…) and must be adapted to the objectives to be reached in each case.
  - Resources. The material as well as human resources must be indicated in order to give the training activities. This answer **With what? With whom?** and **Can funding be obtained?**
  - Time. The ideal duration of the training session and the dates during which it will take place are to be analyzed in relation to the availability of the attendants, instructors… Thus the questions **When?** and **How much?** are answered.
  - Place. The location where the session will take place must be determined. This will determine **Where?**
  - Evaluation. Once the training has been carried out, the information obtained must serve as input for evaluating the results of the course. To do so, the question **How are the results measured?** must be answered. This evaluation may be done via tests, or via direct observation.

Execution of the Training Plan

The definitive **planning** of workers' training will be done by keeping in consideration the company's general objectives, giving priority to work loads and critical training.

A **process** for the **execution** of the different training activities which make up the plan will be established keeping these premises in mind.

The **training instructor** will be in charge of the **logistics** of the training managing the material as well as the human resources necessary for the teaching of each of the training activities as well as the steps needed to be followed for any aid or any grant which may be obtained in order to carry out the same.

In relation to the instructors' qualifications, the criteria which are to be used in each case for the selection of the ideal instructor for each training session must be determined and defined. The instructor may be from the organization itself or an external instructor specializing in the material being dealt with.

The trainers are selected in accord with one of the following criteria: a good theoretical knowledge of the material to be taught; proven practical experience in this material; experience with training (having received the Instructors’ Training course), and a minimum didactic capacity.

With all of this, the instructor will have at their disposal all the information necessary in order to prepare the agenda which will allow for the development of the training activity.

Once the training activity ha been executed, a **training register** will be made indicating the worker and instructor’s identities, each training course objective, and the date and length of the course. In this sense it is becoming more and more habitual for the companies to use computer applications which permit a register of the employee’s training background during their time with the company. These applications are not only being used to keep a register of the training, but as true training managers and even serve as platforms so that the employees may carry out a long distance on-line training.

Once the execution of the training plan for the year is executed, the various impressions regarding the different training activities are collected and the results obtained analyzed. This step is used to improve the planning, programming and executing of subsequent training plans.

Implications for the Supplier of External Training

The training supplier should have an ample knowledge of “Information technology” / “know-how”. They will be expected to get involved in the organization: in the objectives/ in the different projects. Both the company and the supplier have to work together: in their language and understanding that the client’s objectives are their priority, for them.

The supplier must maintain the training perspective and the client expects the jeans by which to carry the training out. There has to be a methodology of organization and ability to respond to the client’s needs, in terms of the training.

TRAINing and recruitment of new workers

The following are the principal ways used by the companies in the Asturias chemical sector to cover their recruitment of new workers:

Academic training in the chemical sector

In the Principality of Asturias there is a specific training offer to be found in the chemical sector composed, fundamentally, by the *university studies in Chemical Engineering* and the middle and superior grade training sessions of specific Professional Training consisting in the following:

- Laboratory (Middle Grade)
- Manufacturing Operative of pharmaceutical products (Middle Grade)
- Analysis and Control (Superior Grade)
- Environmental Chemistry ((Superior Grade)

The above studies generate each year a number of trained individuals of which the chemical sector companies can partake when they have need of hiring.

A la Carte *Training*

The Government of the Principality of Asturias, within the framework of the active employment policies based on the improving of human resources and the improvement of the company environment, said strategy connotes the establishing of a help line for *a la carte* training which subsidizes the companies' carrying out of training processes in accord with their needs, with the condition of a commitment to employ 60% of the participants during a minimum period of six months at full time.

Relief Hiring Mode

This is a method which is currently used very frequently by the Asturian chemical sector with the aim of rejuvenating and assuring the generational continuity within the sector.

This type of contract is an agreement with a worker, who is registered as unemployed in the corresponding Unemployment Office or an agreement with a company which offers a contract of a determined length of time, in order to substitute the company worker who agrees to a partial retirement. It will take place simultaneously with the part time contract agreed upon by the second party.

The length of the contract will be undefined or the same as the time remaining in the contract of the worker being substituted until the age of retirement is reached. If, upon the reaching of said age, the partially retired worker were to continue in the company, the relief contract which would have been for a determined period of time may be extended via an agreement by the implicated parties for annual periods, finishing, in any case, upon the finalization of the period corresponding to the year in which the total retirement of the relieved worker.

·In the case of a worker who is partially retired after having reached the age of retirement, the length of the relief contract offered by the company to substitute that part of the work day left vacant by the same, could be indefinite or annual. In the second case, the contract will be extended automatically by annual periods.

Funding

In the companies of the chemical sector, the training activities are carried out independently of the funding methods, since, in their majority these are considered critical actions in order to reach the company and employee objectives. In addition, their carrying out is not usually postponed, since they have been the fruit of an exhaustive and detailed and as a result costly analysis, funded by the companies themselves although the existing official grants may also be used.

Grants for the carrying out of ongoing training in Spain

The grants for workers’ ongoing training (training activities whose execution is planned, organized, and manager by the companies for their employees) are regulated by the Ministry Order TAS 500/2004, of the 13 of February (BOE March 1, 2004)

In general terms it may be indicated that the companies have at their disposal an **annual loan** in order to partially fund the ongoing training of their workers, which may be used via the bonus payment in the Social Security Quotas. This Initiative includes the Permissions for Individual Training or company authorization in order to facilitate the carrying out of the training activities by the worker and recognized through an official title.

The **quantity of the loan** which the companies have at their annual disposal goes in function of the company and the mass salary paid out by the same.

Annual Loan for Ongoing Training 2005 =

Quantity deposited in 2004 by Professional Training **x** % Discount

- From 6 to 9 workers: 100%
- From 10 to 49 workers: 75%
- From 50 to 249 workers: 60%
- For more than 250 workers: 45%

In general terms this aid in order to fund training activities supposes **another incentive** for the companies to carry out both short and long term established training plans.

Aids for executing occupational training in Asturias

The Government of the Principality of Asturias in an unequivocal commitment of promoting business competitiveness and empowering of the human resources in its territories establishes an annual help line for the development of *a la carte* training processes based on previous diagnosis of training necessities.

Said help line has as strategic objective the personalized response to the concrete responses of the net of Asturian companies through the funding of training activities which necessarily include the hiring of a minimum percentage of 60% of those participants who have successfully completed said courses, during a minimum period of six months and always on a full time basis.

5. Conclusions

The discussion in the MentorChem project has shown the variety of examples for best-practise solutions in chemical regions. Taking into account the different regional framework conditions, socio-economic and political structures, the three regions Asturias, Lombardia and Saxony-Anhalt have to face the same challenges of globalisation and European integration. The structural change of the chemical industry has a strong regional impact in terms of employment, growth and competitiveness. Furthermore, European legislation and standardisation are joint challenges, such as the reform of the European Chemical Policy (REACH) or SCALE. Therefore, there is the joint interest to find solutions for the support of a sustainable development of the chemical cluster.

The interregional exchange of experience is an important element to initiate the mutual learning between the regions. The identification of best-practice solutions helps to evaluate the past and present activities and to be aware about strengths, weaknesses, opportunities and threats. The comparative analysis with successful policies in other regions gives an impetus for the improvement of existing measures or even the implementation of new instruments.

The chemical cluster has the traditional strength of existing sustainable partnerships and established networks. These structures help to join the forces for the development of long-term strategic activities. The consensual cooperation is a precondition for the successful implementation of policy instruments. The ability of the chemical cluster to identify and articulate its priorities is a clear advantage in comparison to other industrial sectors. Development barriers and chances have to be identified in order to formulate proactive strategies. The dialog between the political representatives and the industry is a successful mechanism for the joint formulation and implementation of business support.

The presented best-practice solutions in this brochure open the opportunities for the partner regions and other chemical regions to participate in the interregional exchange of experience. This broad knowledge should be taken into account for the formulation of future strategies for the sustainable development of chemical regions. The pilot character of the MentorChem project gave the possibility to implement forward looking activities.

The organisation of the REACH Seminar in Oviedo in May 2005 was the first event of this kind in Spain and put forward a debate, which is from major importance for the chemical industry in Europe. The cluster process in Saxony-Anhalt has progressed with the development of the “Chemistry Initiative” that has been inspired by the successful meta-cluster strategy in Lombardy Region. Furthermore the intense cooperation between the chemical site initiatives CeChemNet and AIQPA has lead to the identification of several topics for the exchange of experience that will be further developed in the future. The general network between relevant stakeholders has created sustainable partnerships. The identification of regional research competences in chemistry is an important step for the facilitation of European research cooperation and supporting the development of the ERA. Based on the MentorChem partnership a new project application “Mentoring European Research in Chemistry” – (MERiC) has been submitted to the 2nd call of the “Regions of Knowledge” pilot action to further cooperate in this area and to participate in the bigger debate about the European Technology Platform “Sustainable Chemistry”.

The project partners have identified further topics for cooperation, which will be followed after the end of the project. The established partnerships between the partners will be lasting benefit from the pilot project in order to continue the interregional dialog.

IMPRESSUM

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