

EUROPEAN COMMISSION DG EDUCATION AND CULTURE
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WP3: Training needs assessment
Analytical Specifications and Allocation of Work



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Analysis of the Research Driven Clusters in Tuscany (Italy)

The official statistic sources of Tuscany region show an universe of high tech enterprises equal to 9.681 unities, or 2,6% of the total of the active enterprises to the 31/12/2008.

Compared to the to national level (2,7%) the Tuscany region is on the average for quota of high-tech enterprises.

Among these companies, 3.559 are belonging to the manufacturing sectors and 6.077 enterprises of the tertiary sector.

The orientation toward tertiary activity of the enterprises of our region is more besides accented than in the rest of the country: a few more than the 63% of the enterprises high-tech operates in fact in Tuscany, against a 57,1% at national level. The sector mostly represented in terms of active enterprises is that of the electronic elaboration of the data (29% of the enterprises).

The recorded occupation in the high-tech sectors in Tuscany is equal to 47.438 unities (employed), that represent the 4,5% of the total one of the employees of the enterprises to regional level; The division of the number of the employees among the compartments manufacturing and tertiary introduces then him in our region for the manufacturing compartment that employs the 66,6% of the total. The sectorial distribution show that four principal areas involve altogether almost the 80% of the employees: the mechanical sector (21,8%) pharmaceutical (20,7%) electronic elaboration of data (20,7%), medical and optical apparels (19,9%).

1. Technological districts in National Research Program 2011-2013

The National Research Program 2011-2013, approved on 3/23/2011, the "Technological districts" (the document uses the term "high technology districts") represent one of the main infrastructures of Italian economic system.

Formerly, the NRP 2005-2007 specified that the initiative:

- had to be taken by the regions;
- the proposal should be accompanied by a feasibility study;
- must be coherent with the strategic areas of interest identified by the Government;
- There must be participation of the leading companies of the sector, with territorial Department;
- There had to exist public research centres on the field of interest;
- must define a governance structure responsible for coordinating the TD that guarantee the participation of various stakeholders;

- should define a system of financial actors, strategic purposes of start-ups and spin-offs;
- had to define the legal entity responsible for the coordination of initiatives;
- There should be a medium-long term prediction of self sustainability of the TD.

In 2011-2013 NRP, the Ministry of scientific research defines the guidelines for the strengthening and reorganization of technological districts, confirming the indications of previous NRP.

2. Research driven clusters in Tuscany

The technological districts are "territorial-based aggregations of enterprises, universities and research institutions, led by a specific government focused on a number of defined areas and delimited scientific strategic technology, designed to develop and strengthen the competitiveness of the territories and settlements of excellence, connected with existing in other areas of the country".

In accordance with the national policy, in 2011 the Tuscany Region presented a regional program of Development 2011-2015, identifying five different developmental strategies for the industrial districts, based on currently present industrial excellence:

- ICT and communications technologies
- Life sciences
- Technologies of cultural heritage
- Renewable energy Technologies
- Railway Technologies for high speed and security of networks

2.1. ICT and telecommunications Cluster

Reference context:

Tuscany has a long and established tradition of excellence in ICT sector. The region is home to universities and research centres in Italy and Europe. The main Italian companies in the industry and some of the major multinationals in the world have invested in Tuscany, initiating collaborations with universities and by funding important research projects in the field of information technology, satellite systems, radar and satellite, electronics systems, Radio Frequency IDentification (RFID) second generation applications for cultural heritage and the surveillance and robotics, to name a few.

The environment strongly oriented to research, both basic and applied, not only constitutes a vital resource for the development of several large Italian and foreign companies that cooperate or have cooperated with the Tuscan University, but has also helped build several start-up and spin-off



focused on the development of highly innovative products and often on the curve of the technological frontier.

Description of the district:

The Technological District for the ICT and the telecommunications constitutes the means to put system the present excellences in the territory maximizing the opportunity of partnership and the collaborations between the varied actors dell' innovation and of the technological transfer. L' caution that comes given to these technologies is declined in specific manner on three fields of intervention and recognizes specific areas of excellence to exploit in transversal and multidisciplinary optics with the other excellences technological presents in Tuscany.

The present segments of excellence in Tuscany and in connection to the applications above cited are:

- artificial sight, digital libraries and natural interaction;
- telecommunications, you systemize to microwaves, wireless, systemize of sensors to RFID;
- electronics and microelectronics; - systems and applications for satellites;
- systems and components radar and antennas, radar imaging;
- applications for domotic, robotic, virtual reality, and-health, bioengineering and biomedicine;
- applications for the areas: space, aeronautical, naval, of the transportations and of the defence;
- technologies, systemize and applications for The cultural assets;
- Fibers and optical communications,
- Fotonic and laser;
- nanotechnologies;
- remote sensing and monitoring;
- information technology and development software;
- technologies and applications for the safety;

Specific objectives:

Technological activity consists of four lines of action:

1. industrial research and experimental development. Industrial research and experimental development, also through contract research in partnership with the research system, constitutes an important driver of acceleration of product innovations and trying to keep the Tuscan system of ICT on the frontier of innovation. Strategic alliances and the integrated activities of R & d are also organizational models that allow companies synergistic approaches to innovation, jeopardizing the territorial excellence system.

2. technology transfer System. The system of technology transfer, through the poles of innovation and the development of qualified services market, represents the attempt of qualification of the



enterprise system of ICT through the valorization of immaterial components of the value chain, as well as through the development and enhancement of human capital in all its articulation, professionalism and distinctive competence. The rationalization of the system of technology transfer is achieved through the enhancement of infrastructure installations and materials research and testing implemented at public laboratories and mixed public-private research.

3. financial engineering support. The dynamics of knowledge spillover and propagation of knowledge found through spin-offs and start-ups the first vehicle of entrepreneurial innovation acceleration.

4. Mobility. Development of the project of creation of a geographic information infrastructure for accessibility in the regional territory, in order to have a widespread and diffuse information that allows an efficient transport system, integrated, flexible, secure and sustainable to ensure transport and logistics services functional development.

2.2. Life sciences Cluster

Reference context:

The biotechnology sector in Tuscany originates in a consolidated industrial and academic tradition in the pharmaceutical sector, thanks also to the importance and quality of resources coming from 3 University (Florence, Pisa, Siena), from schools and Research centres on the regional territory. Tuscany excellence in life sciences covers various application fields. In particular there are bits of strength in the field of vaccines and, alongside this, silhouetting the biomedical excellence with applications of optoelectronics, biomechanics, diagnostic and minimally invasive surgery.

The sector is characterized, moreover, for the presence of settlements of some of the most important multinational companies and local small and medium size, some of which are leaders in their market segment. This sub-fund is enriched in recent years thanks to the establishment of many new spin-off, either industrial University.

Description of district:

The technological district for life sciences is the attempt to put the system at present in the territory of excellence maximizing opportunities for partnerships and collaborations between the various actors of innovation and technology transfer.

The district covers, for a majority, the technology Area of life sciences and biotechnology applied to health care (or healthcare biotechnology) and pharmaceutical industries.

In this sector, are detectable 3 categories of actors:



- large pharmaceutical corporations, which focus on the "downstream" phases of the process, starting from the clinical development of new drugs until the adoption and commercialization;
- biotech companies, "research" specializing "upstream" of the process, generating new candidates and focusing on proper research, reaching at the early stages of preclinical development and/or prototype;
- biotech companies "service and support", which provide the tools, methods, technologies with which to accomplish certain tasks in the process of research, development, production and control.

The application of biotechnology sector "health care" can be divided by type of product in three categories: Therapeutics, Diagnostics, medical devices (medical devices).

In the field of therapeutic:

- development of innovative strategies of producing drugs already on the market (offering lower costs and better quality)
- Innovative development of medicines with known therapeutic approach – discovery and of new approaches therapeutic development

2.3. Technology Cluster for cultural heritage

Reference context:

Tuscany certainly doesn't start from scratch in the enhancement of their cultural heritage. However, mature awareness that culture can be a powerful engine of development as it is a distinctive element, not replicable elsewhere. However, as all over the world, if not is evaluated and renewed with intelligence and foresight, is likely to produce a descending. The cultural inertia is a risk by avert for a region in which you live well and that, therefore, more than others can be exposed to an unwitting decay than dynamic cultural contexts at national and international levels.

The valorization of cultural heritage in our region can count on recognized excellence in the development of technologies and methods for knowledge of materials and techniques, implementing diagnostics mechanisms of degradation, the conservative intervention, the fruition (real and virtual), communication, safety and security, documentation, monitoring, preventive conservation, climate controls, and more. In Tuscany, in particular, there are sectors of research, innovation and manufacturing activities which have developed and articulated in recent decades in terms of technologies for cultural heritage conservation or for their use.

In the first place there is knowledge, safeguarding of assets and the sustainability of processes of valorization, compared to which research and technological development are the engine of innovation and growth of the productive sectors involved. That is, for the restoration, about three hundred companies on assets protected and a dozen vendors of tools and special materials. Counting high-tech Diagnostics, restoration and documentation, approximately fifty



companies. Analytical services, high-tech enterprises, a dozen other parties, universities, research institutions.

Description of the district:

A district technology for cultural heritage must first enable forms of collaboration among existing actors or entrants in order to develop initiatives of pre-industrial development of cultural products and services, as well as to the Tuscan territory attraction of visitors and investors. It is not undersell, privatize or commercialization culture, but to rebuild the existing heritage by opening it in forms of Exchange with the contemporary.

The district must therefore be positioned relative to the context described above, the actors in the game and skills present in the territory. In this perspective, some application fields of the innovative technologies must be selected. For example, the district can focus the development of technological applications on:

- "traditional" cultural (archaeological heritage, landscape, historical-artistic) object of preservation, protection, enhancement;
- cultural activities (cinema, music, publishing, Theatre), which form the so-called cultural industry;
- "new" cultural heritage, i.e. internal or external environments for experimental and cultural functions;
- buildings and prestigious places (eg. "constrained" by the State), the subject of redevelopment in destinations and thus require skills typical of restoration and Diagnostics the consolidation of old buildings, along with more modern systems design architectural and engineering, but also of sustainable mobility.

Specific objectives:

1. enable and select a district governance system capable of attracting public and private resources aimed at the development of innovative projects in the theme of restoration and advanced training, innovative use of cultural heritage, digital systems and card access, security, cultural heritage, intelligent buildings, the recovery of derelict sites, technology etc.

These are: map actors and skills and share a system of governance (with slender bodies and differentiated functions), identify specialized competence centers and headquarters of the Central District and representative; contribute to funding for national, European and international under an umbrella municipality and with the aim of generating measurable results.

2. develop and pursue a strategy of transmitting a message development of interdisciplinary innovation in conservation of cultural heritage broad-spectrum (art, landscapes, and monumental), in order to promote the Tuscany even for a "new cultural and technological approach" to both the culture is an idea of sustainable cities in terms of mobility and architecture.



This is to encourage an approach for comparing projects ideas, selection of partners, detailed fund-raising and promotion, results monitoring system. In particular, distinguishing between pilot projects (e.g. technology transfer from research to companies and end-users along the production chain), interdisciplinary projects (by connecting multiple dies), infrastructure for advanced interactive services (in response to a real demand and no responses)

3. increase the ability to transfer the results of research and experimentation in products and services qualifying pre-industrial offer high added value at national and international levels (e.g. authentication and diagnostics of notable works, digital archiving).

This is to select a limited number of projects on technologies for the restoration and preservation of cultural heritage, digitisation of cultural heritage and Broadcasting Archives found in Tuscany, saving applied to cultural heritage, for new media and technologies exploitation linked to the world of entertainment and can configure a range of content and format for an international audience adjustable

4. consolidate the existing specializations in multidisciplinary and multimedia forms of visibility in situ and remote, structuring a international multidisciplinary laboratory of higher education and research and collaborations with other Italian companies, pointing to the medium term to be the natural venue for an authority on European cultural heritage.

2.4. Energy efficiency, renewable energy and green economy Cluster

Reference context of district:

The recent experience of the earthquake in Japan has shown with his drama the main boundary of the nuclear option, clearly directing the choices of the regional administration, can be summarized as follows:

-definition of an integrated action plan, focusing on the growth efficiency in primis buildings and industry, and aimed at the achievement of the objective of 50% of electricity produced from renewable energy to 2020, as a response to the refusal of nuclear and uncontrolled oscillations of hydrocarbon prices. The process of globalization that affects the reduction of emissions of gases and the fact that realistically the energy produced in a place is not said is then consumed in the same place, making it ineffective the concept of energy self-sufficiency;

-support to existing companies, the emergence of new businesses and grow a qualified employment in the sector of the green economy. The container will be the technological district of renewable development and networking of a system of companies able to operate in the production of plants or plant parts or materials to promote the efficiency of enterprises and housing and to produce electricity and heat through the use of renewable energy sources.



The Tuscany region aims therefore to develop an energy policy that includes a mix of energy sources, spread throughout the region, with a strong orientation to the development of renewables and energy efficiency in order to contrast to climate change.

Of no less importance is the theme of energy costs for businesses. There is however, for a region, tools can facilitate a conditioning energy costs.

The effort will be aimed at creating conditions for attraction of company focused on forms of compensation and cooperation enabled from time to time.

The Tuscan territory as a whole has both a network of universities capable of stimulating research on new technologies for energy efficiency and renewable energy production, is a complex of excellence of the green economy, to develop up to realize a new development model.

Along the coast of Tuscany and in the hinterland, also, are localized or may find location, strategic installations such as:

- power stations of Piombino and Livorno, which is an ongoing negotiation with the Manager for their possible redeployment;
- The OLT regasification plant, off the coast of Livorno (3.5 billion m³ of methane a year, whose entry into operation is expected by 2011);
- the Algerian gas pipeline Galsi (8 billion cubic metres per year) on which the port is expected on the coast of Piombino towards the 2015-2016 (in this work will be linked methanisation of the island of Elba);
- the regasification plant in Edison at Rosignano Solvay industrial complex (8 billion m³ of gas per year) for which the Ministry of environment issued the positive environmental impact assessment, but whose implementation has not yet been defined by the proponent;
- the partial resurfacing long-distance Colunga (Emilia Romagna) – Calenzano by Terna spa.

Description of the district:

The district intends to locate a set of effective action to promote the increase of energy efficiency of homes and businesses and the achievement of the objective of 17% of renewable energy in 2020, aiming at 50% electricity from renewables.

Everything in order to facilitate the construction of a district energy technology renewable energy and green economy, featured, on the one hand, by the creation of a network Tuscan universities, research centres, innovation poles, able to catalyse and stimulate research and experimental development on energy efficiency and renewable energies; on the other hand, by the construction of a new model-centric development of green economy of renewables. The district will represent the context within which it generates a real transfer from the stage of research and experimental development to production.

Specific objectives:



1. on the side of the production of energy from renewable sources, Tuscany will reach the objective Of improving energy efficiency and the use of renewables, the 50% of electricity production from renewable sources by 2020;

2. employment and production side, the identification of the characters of a Tuscan system of green economy for the part relating to renewable energy and support to productive sectors, such as ecoedilizia where they have recorded positive experiences, thanks to the tax deduction of 55% for energy efficiency in housing. The region intends to develop the ecoedilizia, according to a logic of supply chain, promoting a sustainable urban design, the use of eco-sustainable materials, including wood, and measures of energy efficiency of buildings. Will be promoted the installation of equipment for the production of electricity and heat using biomass, agricultural and Forestry Department, whose production is necessary to create of court dies

3. on the side of energy technologies, realization of a network of research capacity of universities of Tuscany and consequent transformation of the products of research patents, spin-offs, transfer to the system of enterprises (including any industrial developments, currently lacking in Tuscany, for the management of waste). This will be implemented through the creation of a regional network of research and experimental development on energy efficiency and renewable energy sources and the definition of renewable energy technology, including through the junction with the innovation poles and research facilities on the territory. This objective will be implemented in synergy with respect to the provisions of the energy industry Cluster.

4. on the side of environmental sustainability, diffusion of eco-innovation (technological, managerial, organizational) and exploitation of eco-efficient behaviors of public and private, since the aspects that have the broadest scope for improvement, such as saving and energy efficiency.

2.5. Railway technology, high speed and security of networks Cluster

Reference context:

In Tuscany there exists a widespread presence of both public and private actors operating in the field of technologies and services for rail transport (e.g., research centres and production, certification of rolling stock, signaling and safety systems, maintenance centres, railway engineering centers, etc.), which refers to the presence of a productive and technological cluster, which in the metropolitan area only between Pistoia and Florence occupies over 2,600 employees complementary settlements, also in the provinces of Livorno and Arezzo.



The region also to its geographical positioning, represents a joint natural for the main communication backbone, logistics and transport. Always in Tuscany have been and will be implemented some of the most important infrastructure for high speed, as well as the new high speed train, which was awarded to the most important Italian company (AnsaldoBreda) present in the territory, historically the local productive lead induced mentioned above.

Furthermore, the forecast increase in rail traffic, both goods that passengers, especially at the national and international, involving market scenario is favourable to production achievable in Tuscany, on condition to achieve technological transfers (also patentable), management improvements and a system of industrial relations in accordance with the challenges posed by globalization of the transport sector.

Description of the district:

The orders in progress for the production of both regional trains high speed represent an important opportunity to launch a network system among universities, accredited laboratories, large, medium and small businesses able to allow, with the support of regional policies on research co-financed by ERDF funds and those FAS, technological developments, the development of new skills and ultimately, greater competitiveness for the whole productive system railway in Tuscany. All the described system must be supported by a series of structures aimed to train service, bearing in mind security, certification, engineering and maintenance representing, with financial returns, outstanding support to innovations and new technologies.

Therefore, both the "train" that the technologies and services related to infrastructure and networks assume undoubtedly, than in the past, continual improvements of systems design, testing, as well as the ability to integrate technological subsystems increasingly complex and, therefore, a steady industrial development in terms of efficiency, productivity, quality, sustainability and reliability in delivery times.

Specific objectives:

1. Activate a system of governance for public-private development of district technology able to program the system actions and the management of network structures of general interest (research laboratories and experimentation Center, certification and qualification structures, railway engineering services firms, intermediate maintenance centres), by an agreement of program focusing on production of trains with innovative features in particular, regional and security technologies and networks
2. Promote the re-positioning of industrial capacity and of the production chain from local products mature innovative products resulting from technologies for high speed, identifying "projects" which involve the entire district system, instrumental to the development of new installations, changes of



production layout, innovation in supply chain management, innovative test systems in large, medium and small enterprises cluster's District

3. supporting the technological evolution in the design of mechanical parts (chest structures, carts) and plant (equipment, wiring, paintings and electronic connections), and in the productive integration of all the subsystems "train product", supporting pre-competitive projects of industrial research and technology transfer, with the involvement of qualified laboratories and universities, to allow improved design tools and testing of the entire production cycle and its subsystems

4. Encourage innovations, process and product specialization by SMEs of rail induced in the fields of carpentry, lighting, furniture, equipment and components, including through the creation of integrated systems and methodologies for project management, supply management and logistics, aimed at the reduction of processing time, the Elimination of unproductive steps and improved financial sustainability of orders.

3. Regional policies and support of innovation

One of the major themes of development policies of the Tuscany region is to support the processes of technology transfer and innovation in favor of the productive system, aimed at improving the competitiveness of enterprises.

The main programmatic references and consequently the main levers of intervention support regional innovation poles to relate to the 2007/2013 POR CREO and PRSE 2007/2010 and 2011 – 2015 PRSE.

In particular, in the last act to address long-term research and innovation the Tuscany region has allocated 521.7 Mln euro, 70% of which for industrial research, experimental development, innovation and technology transfer.

Programmatic documents there are numerous elements of strengthening the regional innovation and technology transfer:

a) 2007-2010 PRS

Axis 1

-intervention lines 1.2 and 1.3 "support to technology transfer by qualification of competence centers" has promoted creation of innovation poles, or aggregations of research centres and enterprises "with the aim of coordinating initiatives and foster dialogue between research and

productive world, to make more and more targeted, flexible and effective interventions for innovation, in line with the level of the different productive realities."

Axis 3

-line of intervention 3.3.

(Infrastructure Fund for economic development)

-Support Prse

b) 2007-2013 POR CReO

Axis 1

-the intervention line 1.2 "support for the qualification of the direct transfer system to foster innovation processes in the system of enterprises"

Axis 5 line of intervention "infrastructure for economic development"

-piuss

-Mountain territories

Axis 6

-Technical assistance

-studies and research 18

c) 20011 PRS-2015

-policies of research and innovation set out in the Act of address

d) qualification of technology transfer processes

a. TECNOrete: regional network of technology transfer to companies formed by the region of Tuscany, provincial administrations and by operators of service centers businesses that carry out activities, direct and indirect, of technology transfer.

It was signed on 5 June 2009 through a memorandum of understanding and is open for accession by all institutional subjects present on the territory that in any way wish to participate in processes of innovation promotion of regional production system.

b. Incubation Network: regional network to support the activities of enterprises and centers performing and/or coordinating the entire cycle of incubation activities of the enterprise.

4. The Innovation Poles as strategic frames for technology transfer

The concept of Innovation Pole is inspired by the EU guidelines for research, development and innovation (2006/C 323/1) which defines "innovation poles" as "groups of independent enterprises – start up of innovative enterprises, SMEs and business as well as research organizations – active in a particular sector or region, designed to stimulate innovative activity, by encouraging the intensive interaction the common use of installations and the exchange of knowledge and experience, as well as contributing to the effective transfer of technology, networking and dissemination of information among enterprises that make up the pole.

Here the main differences between "Technological district" and "Innovation poles":

	Technological districts	Innovation poles
Objectives	Activities of research and development with territorial connections	Sharing of facilities and technological transfer between players who adhere to the pole
Sustainability	Medium/long term sustainability is guaranteed by the involvement of institutional investors and financial professionals entering the governance of the district and replace public finance	Sustainability is guaranteed on medium term management of installations and supply/acquisition of qualified services from the companies that adhere to the pole.
Governance	Representative of enterprises, research and institutions.	Representative of institutions and enterprises who sell businesses
Projects	Few big industrial research projects	Many acquisitions of industrial research qualified
Effects	Medium-long term	Short-medium term

Each Pole adopts a program of transfer of knowledge, technological expertise and scientific triennial period, accompanied by specific business plan, for the achievement of the following operational objectives:

- stimulate and acknowledge the demand for innovation of companies adhering to the pole and, in General, SMEs technology and application of reference;
- accompany companies access to specialized services with high added value, to support the diffusion of innovation among businesses of the pole and outside firms;



- facilitate access by companies to the scientific and technological knowledge, and networks and resources in national and international scope in the field of scientific research and innovation of industrial interest;

- ensure the sharing of equipment and laboratories

Each pole has a system of governance through which public and private actors, traceable to reference sectors cooperate district to achieve objectives. In this perspective, there are:

Chairman of the technological district: experienced entrepreneur, appointed by the Committee to address, among the companies participating in the District, with the agreement of the President of the Regional consilium; is responsible for the coordination of the activities of the district, the preparation of major acts of district (strategic development plan and its annual work programmes), the representation and communication externally, chairing the address Committee (in which, for the purposes of deliberations, his vote in case of equality is double).

Technological address Committee:

- presets strategic programme development;
- orients the selection of priority directions of research and innovation within technological scopes reference and application guidance (functional needs innovation of the regional productive fabric);
- translates technical and scientific analysis and economic-industrial with respect to border research and national and European technology platforms in key District address documents;
- evaluates requests for cooperation and participation in financing, calls for proposals
- monitors the progress of activities, projects and research topics both in district terms of technological development that impact on industrial competitiveness regional.

Technical Secretariat:

Manager of the corresponding innovation pole (with the exception of railway industry technological district), responsible for the operational management of activities the President and the address Committee.

Forum: district consisting of all members of the District and open to the participation also other stakeholders. Meets at least 2 times a year for a comparison of lines activities of the district, examines the status of project activities, socializing and gathering results proposals.

The poles were made with reference to the following areas:

1. Fashion (textiles, clothing, leather goods, footwear, tanning, Goldsmith)
2. Paper
3. Stone
4. Marine and sea technologies
5. Furniture
6. Renewable energy technologies and energy saving
7. Life sciences
8. ICT technologies, telecommunications and robotics
9. Nano-technologies
10. Technologies for the sustainable city
11. Optoelectronics and Space
12. Mechanical, with particular reference to the automotive and transport mechanics.

4.1. Fashion Pole

Lead Partner: Next Technology Tecnotessile, Prato

Activities:

- Programming of the innovation process in the short, medium and long term for the fashion industry in Tuscany
- Operationalizing innovation projects with business (product, process and service)
- Carry and transfer in new knowledge and technologies developed elsewhere
- Growth and development of new skills and knowledge useful to fashion chain

4.2. Paper Pole

Lead Partner: Lucense SCpA-Lucca

Activities:

- development of the laboratory for offering evidence, supports and services for the improvement of products and production processes, as well as production equipment
- experimentation and validation of innovative technologies for disposal of waste and sludge and pulper for the valorisation of by-products
- development of projects to foster the creation of new products or new uses of existing cardboard products (Thin City Laboratory)

- development of methodologies and technologies-also with ICT-solutions for the improvement of design, process management and business operations, safety in the workplace
- development and dissemination of advanced telematics services and solutions in support of companies and settled in DiCa Polo Tecnologico Lucchese, and prospects for innovation linked to the band Bus Network Lucchese
- promotion and development of projects-including through pathways to social responsibility-aimed at recovery and enhancement of cultural heritage ' paper ' (On paper) and to enhance the image and the uniqueness of the district.

4.3. Stone pole

Lead partner: CoSmaVe-Consortium for the development of the marble APUAN-VERSIL activities, Pietrasanta (LU)

Activities:

- Stimulus to innovation
- Promotion of services to support businesses
- Communication tool of the proposals for technological innovation
- Design/follow-up of extractive activities with innovative technologies and experiments in the cultivation of ornamental stones and materials also in the Gallery building
- Improvement studies, planning, safety extraction areas
- Definition of acceptable thickness through the characterization of materials (tests)
- Process Innovation to realize the extractive areas infrastructure
- Advice for the protection of water resources in relation to the extraction
- Studies/research on stone materials historical monumental restoration and urban housing recovery
- Applications of stone in architecture

4.4. Nautical Pole

Lead partner: Navigo Scarl-Consortium for the development of the marble APUAN-VERSIL activities, Pietrasanta (LU)

Activities:

- Stimulus to innovation

- Promotion of services to support businesses
- Easing Vessles
- Study techniques for eco-sustainable products – services

4.5. Furniture Pole

Lead partner: Centro Sperimentale del Mobile di Poggibonsi

Activities:

- Product innovation (from enterprise strategies in product engineering)
- Innovation process (from audits of potential competitive temporary management)
- Market Innovation (international marketing to e-commerce)
- Qualified specific Services (by creating new businesses to collective marks)

Polo renewable energy technologies and energy saving

4.6. Renewable energy technologies Pole

Lead Partner: Lugo

Activities:

- Facilities to businesses
- Stimuli to the definition of strategic objectives for enterprise in innovation theme
- Scouting of useful technologies partner companies
- Provision of networks of companies to prepare complex products (aggregations for cluster)
- Entertainment activities to foster the growth of enterprise culture
- Initiation of applied research projects with the direct involvement of the recipient undertakings of experiments and innovations to be taken in the production processes

4.7. Life Sciences Pole

Lead Partner: TLS – Tuscany Life Science

Activities:

- Interface with universities and institutions
- Services of pre-incubation and incubation, start-up Assistance

- Access to and availability of laboratory equipment and Instrumentation
- One-stop finance and Constitution aggregations for access to EU funding
- Testing and market research for new products
- Technology transfer
- Services for the management of intellectual property
- Business Intelligence
- Marketing and promotion
- Training Activities
- Consultancy (certification, work, security, etc.)
- Internationalization Services
- Scientific and technical Research to contract

4.8. ICT Pole

Lead partner: Polo Tecnologico di Navacchio

Activities:

- Stimulus to innovation
- Promotion of services to support businesses
- Technology transfer
- Services for the management of intellectual property

4.9. Nanotechnology Pole

Lead partner: ASEV, Agenzia per lo Sviluppo Empolese Valdelsa

Activities:

- organising briefings:
- organizing conferences/national and international events
- Scouting in enterprises for the detection of potential or latent needs expressed
- mediation between demand and supply of innovation
- monitoring of the competence centres associated with the Polo and external stakeholders
- scouting the needs expressed and dormant companies
- analysis of the needs of enterprises
- match requirement-skills
- facilitation of the meeting between the company and competence centre
- development of projects for individual companies
- providing technical services:

- Training

4.10. Technologies for sustainable cities Pole

Lead partner: University of Florence

Activities:

- Promote the use of good practices in building design and construction
- The theme of industrial areas
- Intelligent networks and distributed generation
- Restore existing building heritage
- Energy-environmental certification and its market value
- The use of resources (water and waste)
- Grow the culture of business and public administration through concrete actions

4.11. Optoelectronics and Space Pole

Lead Partner: IFAC-CNR

Activities

- Processes and Applications in Industrial Sensors
- Applications in Biomedical Instrumentation
- Applications in lighting technology
- Applications in technologies for cultural heritage
- Applications in Aerospace technologies

4.12. Mechanics Pole

Leader: Compolab

Activities:

- Stimulus to innovation
- Promotion of services to support businesses
- Communication tool of the proposals for technological innovation

5. Potential training need areas

From the analysis above, it emerges a quite articulated situation of innovation in Tuscany. Many clusters are already formed, other are still on the starting phases, some enterprises are well organized for internal research, while some others still count on external laboratories. The industrial sectors are differentiated as well.

For this reason, at this stage, our enterprise' training needs of the RDC cannot still be homogeneous. It seems very important though to:

- Promote the exchange experiences between enterprises: seminars, study visits, conferences, reports, maps and a guide on good practice.
- Train the management on the financial opportunities offered by the public authorities at regional, national and European level
- Involve all the employees on the strategic research projects carried out by each enterprise, through an "ad hoc" training

In order to match the results of the R&D with market requests, finally, it emerges the necessity of training a team of experts for the development of feasibility analysis concerning market opportunities for new products in innovative areas.

This new profile will correspond to a trade-off between a researcher and a marketing manager, is going identify the factors of success and failure of the research projects in each sector, adjusting the scientific purposes to the market orientation.