

Project no.: 229514 KEEN-Regions

KEEN-Regions

Knowledge and Excellence in European Nanotechnology Regions

REGIONS OF KNOWLEDGE Maximising the benefits of research infrastructures for regional economic development

D 1.2 – Business investigation report

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RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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0. WP1 goals

The goal of WP1 is to assemble a database of general knowledge about each research driven cluster in order to have accurate information about all the clusters. This knowledge will be used to define a SWOT analyses for each area, highlighting both potential areas of growth, as well as policies and techniques to be transferred to other locations on a local or on a trans – regional lever. It will also be used in WP2 to foster mutual learning and collaboration between local sites.

To gather the data needed in order to enhance the mutual knowledge and to define the SWOT the second analytical task foreseen is the 1.2 “**Business investigation**”

Within the task the main activity is represented by a collection of data concerning:

- Market Assessment
 - Information on nanomanufacturing companies (companies which fabricate nanotechnologies), including the number, type, and capacities of each company.
 - Information on pre-existing and potential nanoconsumers (companies or businesses which purchase technologies or products made with nanotechnologies) in each area, including the number and the sectors.
- Research Business Matching
- Research and business collaborations already established for each research driven cluster and the business technical needs by means of interviews and through the involvement of the business components of the consortium.
- Private Funds/ Initiatives for Nanotechnology
- Analysis of the available business incubators, venture capital and business angels for each research driven cluster.

1. The methodology

This task was performed in particular by the partner representing the business community (CRACA, GAIA, MINALOGIC) which in charge of being the interface with local companies (working in the micro-nano sectors as well as working in sectors potentially involved by the nanotechnology development). The Information collected was afterwards analysed by GAIA.

As the economic structure, the business context as well as the approach toward the companies vary considerably from one region to another, it was agreed that the business investigation activity had to be organised on a “regional/local base”.

Moreover it was established to use two main types of sources to gather the required information:

- **Primary sources**, i.e., direct communication with identified companies in the previous step: through an ad hoc poll and/or direct interviews.
- **Secondary sources** such as the public administration databases for R+D programs, R+D agents that work with companies in R+D projects (technology centres, university departments), sectoral clusters, etc.

2 – VENETO

2.1 The Methodology

As far as the definition is concerned at local level the Veneto partners decided to identify four different typologies of companies related with nanotechnology:

- The **nanoproducers**, companies which directly produce and commercialise nanoparticles, powders, nanotubes etc;
- The **transformers**, research centres or companies which do not sell directly into the market nanoparticles but whose core business is to transform nanoparticles in order to develop technical innovations for many application areas;
- The **nanconsumers**, companies which have already incorporated into their products and processes, technologies and components derived by nanotechnologies;
- The **potential nanconsumers**, companies which could greatly benefit from nanotechnologies but without existing linkages to the sector.

During a Regional meeting in July 2009, was than decided to skip the *nanoproducers* category as they are not relevant (in terms of number of entities) and “not standard” in features (in terms of size, number of employees etc.) for our region. On the other hand, it was agreed to concentrate the analysis in deepening the existing relationships among “transformers” and “nanconsumers” or potential “nanconsumers”. In Veneto such companies are represented mainly by SMEs working in the manufacturing sector. Once decided the target and accordingly to the methodology decided by the consortium, the concerned data were gathered

2.2 Primary sources – The companies feedback

Concerning the first source, CRACA, that represents the business side for Veneto Region, collected 40 questionnaires completed by companies interested in nanotechnology applications. The companies have been identified through a targeted mailing promoting the participation to some local events focused on regional R&D support funds and the presentation of the potentialities of nanotechnologies.

The main outputs of the questionnaires are summarised hereafter. According to the answers, 40% of them are limited company (SRL), 35% general partnership (SNC) and 20% individual companies.

Our Region is characterized by micro or small companies, that do not have corporate offices outside Italy, but 45% of them are present in the foreign market with a percentage of 10-20% of their turnover. The majority of our companies work on traditional fields, even if most of them have invested in innovation in the last two years.

More than half of the companies interested in using nanotechnology are mechanical, followed by chemistry/plastic, textile, leather, sensors, gold and packaging. Around 15% of the companies belong to a productive cluster.

Results: the Potentiality towards nanotechnology

It is to note that companies do not have clear ideas of what nanotechnologies and their fields of applicability are. A lot of the interviewees do not know if other companies working on their same sector use them. This could be the reason why the majority (72,5%) of the companies who answered the questionnaire do not use them and just some of the interviewees had occasional contacts with them.

Nevertheless, it is important to underline that 55% of them agree that the use of nanotechnology can bring competitive benefits to their business and nearly 60% of the companies have the will to know and use nanotechnologies in the future, while nobody discards it.

Another relevant aspect to consider is that 38% of the companies take into consideration the possibility of fostering research projects or investing in nanotechnology in the future. Just 12,5% of them exclude this possibility.

The sectors the companies that are planning to work on nanotechnologies have a stake in are surface treatments, coating and mechanical components ultra functional.

Results: the Needs of the business community

According to the answers to the questionnaire, the internet turns out to be the most appropriate instrument to inform companies about nanotechnologies, followed by trade unions, specific training courses and research bodies/universities.

The main difficulties in using nanotechnologies are the lack of knowledge about them, the lack of specific competences inside the companies and the lack of public funding. Moreover, some of the answers reflect that another common problem is that the technology is too expensive and advanced for their needs.

The majority of the companies interviewed do not know any research bodies that deal with nanotechnologies, so they consider fundamental the possibility of a direct meeting with research centres and laboratories or a visit to their company of an expert in this field to understand what nanotechnologies are, why they could be useful for their business and how to use them.

2.3 Secondary sources – Companies' participation to R&D programmes

This analysis has been based on the result of the two main calls for proposal launched within the Agreement signed by the Veneto Region with the National Ministry for Education and Research. After the signature of the agreement in fact, two calls for proposals has been launched by the MIUR (Ministry for Education, University and Research) in close collaboration with the Regional Government. With a total amount of 26 M€ of public contribution these calls has represented the starting up of an huge research programme directly involving companies and therefore linking the research activities to the market needs.

In total 44 application has been positively evaluated and more than 150 companies have been involved in the research activities. The overall amount of investment mobilised by the initiatives have been more than 100 M€, with a multiplying effect of about 4.

Sectors concerned and nanotechnology applications developed

Considering the role of the companies involved we can identify a few nanotransformers and many nanoconsumers, as foreseen since the beginning this is the situation in Veneto and both analyses confirmed this initial statement.

If we look at the sectors concerned, we can see that:

- Electronics,
- Metal-Mechanics,
- Plastics and
- Textiles

represent together the 67% of the initiatives. Other traditional manufacturing sectors are also represented but with very few initiatives: Eyeglasses, Jewellery, Shoeware, Glass and Leather counts together only the 15%.

Anyway the high tech and high growth sectors are hardly ever present in both calls and, even this is in line with the strategy set up by the Veneto Region, aiming to develop knowledge to be integrated into new products for the manufacturing sectors, this could be a problem on a longer term. To give a numeric example, Energy, Biotech and Medical application counts only for the 6% of the total initiatives. To avoid this potential problem, in the last years, new initiatives and tools have been developed, as described in the next section 1.3.

2.4 Final considerations

The response showed by the business side to the calls for proposals, multiplying its financial effect by almost 4 times, can be seen as a measure of the expectations these companies have for nanotechnology applications. Anyway, this result seems not consistent if compared to the outcomes of the primary sources analysis.

The main reason is that behind the reaction to the calls we can see mainly big or medium companies which are ready to invest in such initiatives and prepared to see them in a medium term perspective. Smaller companies, on the other hand, need more to be accompanied in this process in order to define precisely the objectives of the

initiatives and the path to reach these objectives. In this last case the focus is more on development and technology transfer activities than research, except in very few cases where the companies are young, small but very innovative ones. Therefore, in order to profit as much as possible from the potential of research infrastructures in the area, it would be worth to define and implement measures taking into account the different level of request and the different level of support needed by the interested companies.

3. BASQUE COUNTRY

3.1 The Methodology

The Basque partners identified three different types of companies related to nanotechnology:

- **The nanoproviders:** companies that are suppliers of nano raw material and manufacturers of machinery and tools for the manufacture of micro and nanotechnology components.
- **The intermediate users:** nanocomponent suppliers and companies that incorporate nanoelements to conventional materials.
- **The final value chain users:** companies that incorporate nanocomponents to manufacture equipment for conventional products, companies that implement improved processes through the use of nanotechnology and nanocompanies that incorporate nanocomponents to their products.

3.2 Primary Sources – The companies' feedback

In 2009 the NanoBasque Agency began an analysis prospecting about the micro and nanotechnologies in the Basque business fabric.

To do so, Basque companies were invited to participate in a questionnaire on the basis of having micro and/or nanoactivity and, once the analysis of the questionnaire was finished the results were sent to all the participating companies, as agreed. In the frame of a confidential agreement, the answers contain general information about the micro/nano activity and information related to the individual activity of each of the companies was not disclosed.

The main outputs of the questionnaires are summarised hereafter. According to the answers, there are 68 companies at the moment working on micro and/or nanotechnology in the Basque Country. And 85% of them have a steady activity. And a 7.3% have a random activity, though having a specific interest in micro and nanotechnology.

We must also say that most of the companies working on nano are placed in the Basque region of Gipuzkoa (50%), followed by Bizkaia with a 34% of them and, in last place Araba with just a 16% of the companies working on micro and/or nanotechnology in the Basque Country.

Results: The Potentiality towards Nanotechnology

In the Basque Country micro and/or nanotechnology are developed in the frame of collaboration. Only one company develops full micro/nano activities by itself and, additionally, 16 companies partially carry out these activities. The rest of the companies need the collaboration frame to develop micro/nano.

Therefore, 90% of the companies are working in collaboration and 74% of the products/processes are the result of these collaborations.

Another relevant aspect to consider is that companies carrying out developments and applications in micro/nano are acting like business developers or manufacturers, representing a 77% of them.

Finally, it must be pointed out that 16 companies already commercialise products, most of them are currently in project phase. And, it is expected that the number of companies with products in the market will increase by twice in the next five years.

Results: The needs of the business community

Companies in the Basque Country are aware of considering the micro/nano activities in long term and to be very highly resource consuming. They know that micro/nano activities are likely alternatives to reach a differentiated market position. Nevertheless they point out as main barriers:

- The resources and funding available both during the R&D and industrial development phases,
- And the time to market, which is too long.

As pointed out before, it is a key reference for the Basque companies to get into collaborations, because they concentrate 69% of the known collaborations. Occasionally, some weaknesses relating to the absence of certain suppliers of equipment and services are pointed out and that forces in some cases to go abroad.

3.3 Secondary sources – companies' participation in R&D programmes.

To take advantage of this opportunity, the Basque government has set up the nanoBASQUE strategy which covers and frames and extended number of tools, mechanisms and actors belonging to the scientific, technological, industrial, political and social areas. And, it also contains the policy that is addressed to the Basque industrial development.

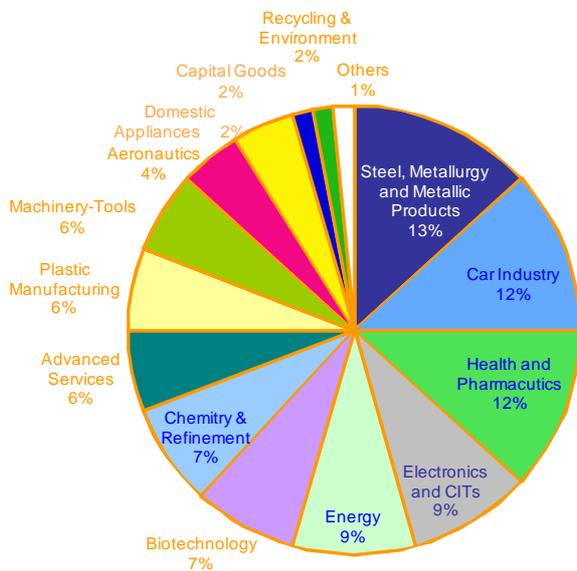
The Department of Industry, Innovation, Trade and Tourism also has funding programs managed by SPRI. They are support programs based on projects within the Science, Technology and Innovation Plan (PCTI 2010) aimed at companies from the Basque Country and at Basque Science and Technology Network, and they have helped with the following analysis.

Sectors concerned and nanotechnology applications developed.

Considering the activities carried out by the company during the project execution we find out that 44% of the companies can be considered as developers, 35% as manufacturers and 26% of them as users of the technology. If we look at the sectors concerned, we can see that:

- Steel, Metallurgy and Metallic products,
- Car Industry and
- Health and Pharmaceutics

Represent 37% of the initiatives. Other industrial sectors working on micro/nano that we can find are Electronic and CITs, and Energy both with a 9% and Chemistry and Refinement companies with a 7%.



Therefore, we can say that micro/nano activity is highlighted in the intermediate production-sectors (steel, metallurgy and metallic products) and in the final production sectors (car industry and Health and Pharmaceutics).

3.4 Final considerations

Companies know that micro and nanotechnologies offer a huge economical potential, having a double impact over the economical development in the Basque Country to generate wealth and increase competitiveness: they add value to existing processes and products, and they also open new business opportunities to develop new processes and products.

Micro/nano activities are likely alternatives to reach differentiated market positions and companies are aware to consider it in long term and to be very highly resource consuming.

Furthermore, the companies' interest in nano and/or micro activities is more related to strategies looking for reaching new market positions than for defensive purposes. 97% of them begin their micro and/or nano activities to foster new technological developments.

In the other hand, 64% of the companies have not got an in depth knowledge about micro and/or nano. And, although the knowledge of the potentiality of the nanotechnology is enough to initiate the micro/nano activity, the support of the technological centres and service-oriented companies are both conclusive for the Basque companies to develop such micro/nano activities.

It is also clear that in the Basque Country the company size and the need to provide technology are the two main factors that decide the micro/nano activity.

And, another thing to consider is that collaborations and the role of the scientific-technology offer are and will be key aspects in the Basque companies.

Finally, it would be worth for the companies to define and implement specific measures taking into account the different level of request and the different level of support needed by the interested companies, increasing therefore the resources and funding available both during the R&D and the industrial development phases.

4. RHÔNE-ALPES

4.1 The Methodology

In 2005 the French government launched a policy aiming at encouraging the setting up of clusters. 71 clusters were set up in many different scientific and economic fields. Clusters are non profit organisations whose members are mainly small and large companies and laboratories. The aim of the cluster policy is to foster cooperation between cluster members through their commitment to cooperative R&D projects towards market and economic development. Twice a year the Ministries in charge of the cluster policy launch a call for proposal. Cluster members must find partners within the cluster to develop and present R&D projects for labialization by the cluster of origin. Once the projects are registered and selected both by the cluster governance and the central state they are presented to the funding partners: the local authorities and the interministerial fund.

Minalogic brings together 168 members: 124 companies (81% of which are SMEs), 15 research centres and universities, 15 local authorities, 10 economic development organisations and 3 private investors. Since its launching in 2006 137 R&D projects have been financed.

The technologies developed at the cluster are applicable to all business sectors, including more traditional industries. The role of Minalogic is to respond to the business community's need to identify new value-added services that can be integrated into existing products in fields that include health care, the environment, mobility, the media, and the textile industry.

Contrary to the other partner regions in KEEN the fact that there is in Grenoble a constituted cluster facilitates and encourages the cooperation between research and industry in micro and nanotechnologies no matter in which of the fields of micro and nanotechnologies.

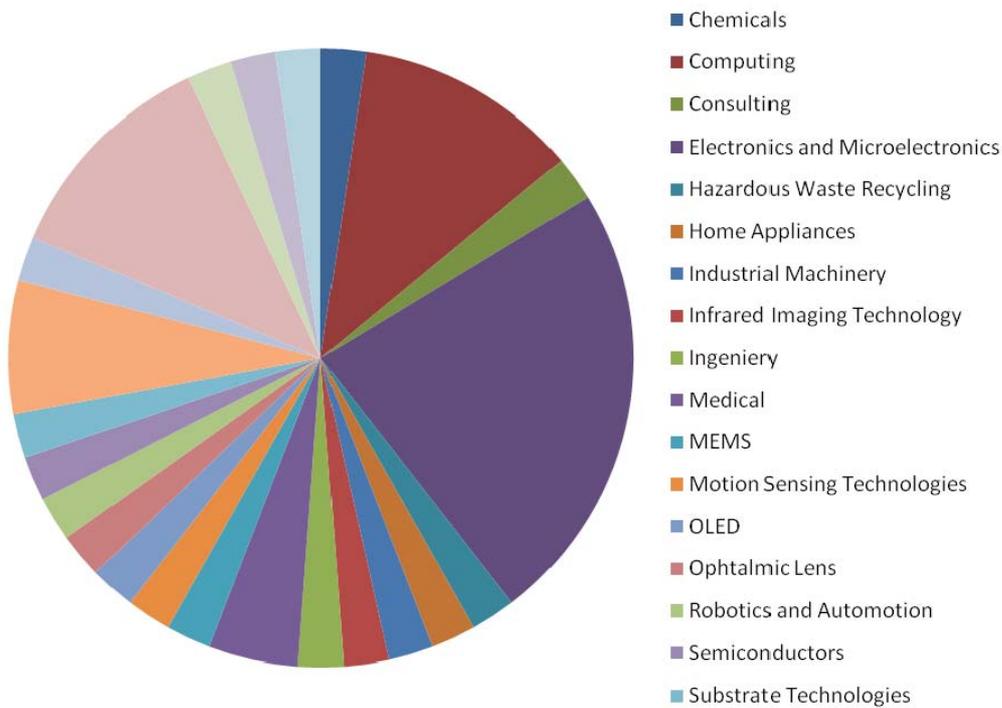
Within the cluster divers seminars are proposed to the members (IP, brainstorming on new projects) to foster their cooperation. An SME circle has been set up which aims at focusing on the problems specific to SMEs and at finding suitable solutions.

Minalogic provides the following services to its members: networking, guidance for the preparation and submission of projects, collaboration resources, Intellectual property, information on financing sources, technology watch, and communication.

Minalogic fosters research-led innovation in intelligent miniaturized products and solutions for industry. It is organised in two subclusters: one specialized in Micro- and Nanotechnologies and one on Embedded Systems on Chip.

- Micro- and Nanotechnologies:
 - Micro- and nanoelectronic hardware technologies (Materials, Systems and technologies, manufacturing science, equipment)
 - Physical design (CAD) tools and libraries
 - Packaging techniques including "system in package" and "package on package"
 - Solid state electronic components (MEMS, Sensors, Large-surface components)
- EmSoc:
 - Modelling/validation
 - Implementation tools and methods
 - Software infrastructure for embedded systems
 - Basic technological building blocks
 - Multiprocessor platforms
 - Integration of these technical components into projects sponsored by major corporations such as Schneider Electric, France Telecom and ST Microelectronics

ACTIVITY (Grenoble)	%
Chemicals	2
Computing	13
Consulting	2
Electronics and Microelectronics	24
Hazardous Waste Recycling	2
Home Appliances	2
Industrial Machinery	2
Infrared Imaging Technology	2
Ingeniery	2
Medical	6
MEMS	2
Motion Sensing Technologies	2
OLED	2
Ophtalmic Lens	2
Robotics and Automotion	2
Semiconductors	2
Substrate Technologies	2
Technology Research	8
Textiles	2
University	13
Vacuum Systems	2
Wireless Solutions	2
X-ray optics	2



4.2 Final considerations

From knowledge creation to technology transfer, Minalogic is active along the entire innovation value chain. It is thus a sustainable competitiveness cluster with a huge potential.

Minalogic leverages the strengths of Grenoble's innovation ecosystem, which offers an extraordinary convergence of technological research and industrial applications. For Minalogic partners, these unique conditions have the potential to generate significant competitive advantage.

The cluster strives to achieve two primary missions:

- Secure a position as the number-one European and one of the top three global centres devoted to embedded systems on chip. The cluster's vocation is to drive cooperation by rallying sources from industry, research and education around two major fields: micro and nanotechnologies and embedded systems on chip.
- Transfer these technological advances to industries likely to bolster their competitive advantage through intelligent miniaturized solutions.

By fulfilling these missions, Minalogic will contribute to developing a new high-tech branch that will enhance the level of differentiation and competitiveness of industry and thus staunch the flow of economic activity –and jobs– overseas.

The industrial competitiveness strategy adopted by Minalogic entails shifting the playing field away from a rationale driven solely by production costs— which ultimately spurs businesses to move to low-cost countries— toward an environment that offers significant opportunities and potential: innovation. The goal is to harness the power of innovation to speed up new product development and reduce time-to-market, thus enhancing competitiveness.

In addition its main focus areas (Micro- and Nanotechnologies, EmSoc) Minalogic also supports transversal focus areas with the following objectives:

- To support product and market-driven industrial projects based on the technological advances produced by the clusters.
- To support structural projects that aim to promote and develop common resources for all cluster partners.

5. Final considerations

After analysing all three regions' business reports, it is clear that all companies know that micro and nanotechnologies offer a huge economical potential.

Collaborations and the role of the scientific-technology offer are key aspects for the companies, for which size is also an important factor to decide the micro/nano activity.



Therefore, it would be worth for them to define and implement specific measures taking into account the different level of request and the different level of support needed, increasing in that way the resources and funding available both during the R&D and the industrial development phases.

It is important to point out that Minalogic is already an active cluster in knowledge creation and technology transfer, which has two main missions: to drive cooperation by rallying sources from industry, research and education around micro and nanotechnologies and embedded systems on chip and, to transfer these technology advances to industry.

