



Collaborative Platform to Support Research and Technology Transfer – NEXT

NEXT Open Book Apulia Region



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Apulia: a long bridge across the Mediterranean

The efforts by the regional government in recent years on the issue of “international relations policy” allow us to conclude that in Apulia we have come a long way indeed. We have set up a dialogue with many countries, which has intensified over time, enabling us to work together towards common goals in areas such as rural development, business promotion on behalf of SMEs, infrastructure, transport, mobility, security and cultural issues. We have launched cooperation initiatives with China, Russia, Canada and the United States, as well as with Greece, Macedonia, Turkey, Montenegro and Poland, and we have undertaken fruitful discussions with Croatia, Bulgaria and Romania. The new powers devolved to the Italian Regions allow for the implementation of regional policies that are more aligned to a new phenomenon linked to the globalisation of markets: territorial internationalisation. Internationalisation is the only way to beat the challenges of globalization. In recent years we have tried to make up for lost time, by immediately launching integrated initiatives for international business promotion, funded with regional, national and European Community resources. At the same time we have worked on reorganising the functions of the regional government in order to take on the new institutional role that the region intends at the international level. That’s not all: we have also put a lot of work into making incentives available for intelligent and innovative projects that will improve industrial processes and products, as well as strengthen the tourist industry. Regional investments have focused on research and development, improving the manufacturing capacity of companies, advancing information technologies and international business activities.

Thanks to these efforts, in recent years, Apulia has experienced an important recovery in its economy. We have put in place a series of special measures to stem the effects of the crisis we are currently witnessing. Significant progress has been registered in many of the region’s manufacturing sectors, especially where investments have been made in business process and product innovation.

As the Bank of Italy recently pointed out, investments in Apulia, by way of EC funding, have put a much greater emphasis on investments in research and innovation which account for 15% of the public funds involved, compared to 8% in the other regions of southern Italy. In addition, the geographic location of Apulia makes it a fundamental reference point for neighbouring territories, an important crossroads towards the Adriatic and the Mediterranean. This location provides the region with key opportunities for growth both by projecting it towards becoming a logistics platform for container traffic in the new routes of global trade (especially due to recent investments in the Port of Taranto), and by improving institutional, trade and business relations with the countries of the Mediterranean Basin. In recent years we have set ourselves a goal: assist companies to enter international markets, overcoming the difficulties caused by the drastic fall in internal demand. We have addressed the needs of companies in every business sector, both traditional and innovative, concentrating our attention on the smaller firms, especially those that would not normally manage to go overseas alone. In principle, a product has success on the markets if it costs less or has more added value, than its competitors. Being unable to lower labour costs we must necessarily concentrate on the second factor, by creating innovative products. This explains our

focus on industrial research, which is funded by numerous regional incentives and initiatives. The region has likewise devised a range of aid packages for large, medium, small and micro enterprises, interested in investing in Apulia.

The Apulian policies for Research and Innovation

In 2009 the adopted Regional Strategy for R&I has enhanced the experience of the previous programming period 2000-2006. The Regional Governments of Italy, since 2001 with the constitutional reform of Art. V, have a concurrent commitment with the National Government on the issue of R & I; and our regional policy is therefore a young regional policy, but that has allowed us to learn from the previous programming period and prepare the current one with clearer points of reference.

The theme of the Regional intervention for the benefit of enterprises is an important issue: in the previous programming period, in fact, many of the regional public resources were allocated to measures to upgrade the university system, therefore the supply side.

In this programming cycle whereas, we have set the goal to increase the capacity of absorption of technologies by enterprises, and, in implementing this effort, a real turning point in the strategy of regional policy has been marked.

Interventions in support of public research of course still go on existing: such as, for example, the intervention “**Research networks of public laboratories**” which funds the upgrading and strengthening of the equipment for research with the aim of putting together the same capacities but residing in separate public bodies, making critical mass of skills, modernizing equipment and laboratory contexts in which these skills can be developed. An intervention in favor of research public institutions but whose final destination is still the productive system.

Another line of action of this strategy has been to optimize the outcome of a series of efforts accumulated in the last 20 years of national policies in the field of R & I, that gave birth to the so-called interfaces for the technology transfer such as science parks , the Relay Centres of the European Commission, competence centers: there are many subjects that seem to all have the same mission, Technology Transfer (TT), and not yet owning an optimization of this chain of the Transfer of Knowledge.

As promoters of these interfaces are Universities, the Region of Puglia has decided to start this process of optimization of the TT chain with the consolidation of **ILO - Industrial Liason Offices**, points of access to the academia expertise.

The ILO Office model is widespread in Europe too but the characteristic of the Apulian ones is that of having realized them in a logic of network.

The last element deployed right across the regional strategy is the human capital, that’s to say the ability to consider human resources as a tool for transferring knowledge.

The new programming cycle 2014-2020 is being finalizing, having defined the new regional strategies for R&I having in fact already explored, experienced new approaches.

SmartPuglia2020: a learning process

The Smart Specialisation Strategy for the new programming period in a “Less developed” Region

Puglia is a Southern Italian Region, whose GDP per capita is the 68% of the Italian average and the 65% of the European average (EU15 countries), and therefore it falls within the category of “Less developed regions”, former Converging regions. In those regions the share of own and national financial resources dedicated to support innovation and R&D is lower than the national average and in Puglia innovation policy is largely dependent upon EU funding.

The presence of more than 338,000 active companies (often SMEs and micro enterprises) makes Puglia one of the driving forces of southern Italy. A snapshot of the sectors shows an entrepreneurial fabric that is especially strong in commerce, agriculture and construction sectors. Bari is the leading province in Apulia both for the number of companies (39.8% of the total) and for the workforce (45.5% of the total number of employees).

The EU financial programming period 2014-2020 for Cohesion policy requires that regional authorities wishing to receive money to be invested in research and innovation actions have to adopt a **Smart Specialization Strategy** (*from now on S3*), in order to identify their priorities and select adequate investment models and sources supporting their activities.

In addition to that, the **Europe 2020** strategy, in its Digital Agenda Flagship initiative, has recognized the enabling role of ICT sector and its enormous potential in boosting economic development in the EU, a trend confirmed by the Juncker Commission that has included the Digital single Market initiative as one of the EU ten main priority, appointing a specific Commissioner for this portfolio.

The above mentioned framework is reflected also in the structure of the EU Cohesion policy, supported by **European Structural and Investment Funds** (*from now on ESIF*), in the Horizon 2020 program and in the Connecting Europe facility – digital branch program (*CEF digital*): three different EU funding sources all designed to contribute in different way and through a complementary set of actions to the goals of Europe 2020. As regards our paper, more specifically to the achievement of the goals of the two Flagship initiatives “A Digital Agenda for Europe (DAE)” and “Innovation Union”.

The first two of them (ESIF and H2020) can be used to meet the goals of the Regional Digital Agenda, e.g. by investing in a better access, use and quality of ICT, as stated mainly in **thematic objective 2** if we refer to the ESIF regulation or in the ICT related bi-annual work programs if we refer to Horizon 2020. In addition, a closer look to the other ten thematic objectives in the ESIF regulation could reveal that all of them are directly or indirectly related to the concept of “digital growth”.

In this context another ex-ante conditionality applies: each and every region of Europe that intends to get EU money to development and implement its **digital agenda policies** measures and to promote the DAE goals has to produce to the EC a **Strategic Policy Framework for Digital Growth**.

Puglia Region decided that its Smart Specialization and its Digital Agenda Strategies must be inter-related, believing that the long term competitiveness of Puglia highly depends on a proper planning of ICT investments. Moreover, for **Puglia region ICT is a fundamental factor both as an enabling technology and as an area of specialization in itself**.

Smart Puglia2020: our vision

In March 2014 the Apulian Government adopted **SmartPuglia2020**, the Apulian Strategy for research and innovation based for the 2014- 2020 programming period. It was also presented by the President of Puglia Region, Nichi Vendola, to the EU Commissioner for Regional Policies, Johannes Hahn, on 1 April 2014 in occasion of a meeting in Bruxelles.

SmartPuglia2020 is a long-term strategy which aims to progressively and collectively strengthen the dialogue and listening capabilities of regional policy makers by means of an intelligent, inclusive and sustainable use of technologies. Based on the awareness of the huge social and environmental difficulties Puglia is currently facing and on the need to identify a new model for a responsible economic development, the Strategy foresees – on the one hand - a strong integration among several “cross-cutting” policies namely the ones on research, innovation, competitiveness, internationalization, training and employment and – on the other hand – a close link with other regional “vertical” policies like the ones for environment, transport, welfare and healthcare.

SmartPuglia2020 aims to boost competitiveness and create jobs, to promote a broader concept of innovation and to exploit regional strengths, both actual and potential, using them as leverages:

- to reinforce the competitiveness of the Apulian productive systems coupling know-how and creativity with technology and strengthening their **clustering process**;
- to praise **talents and competences** as key aspects for development;
- to support **societal and environmental challenges** through smart public policies capable of matching needs with new products/services;
- to promote **digitalization** as a booster of the smart specialization of regional and local communities, as well as an useful tool for open government;
- to create **better connected, broader networks** for the improved circulation of knowledge, even beyond regional borders.

During the past years the capacity of the Apulian innovation system of investing in industrial research and experimental development has significantly increased, in terms of amount of private and public investment and processing of Development Plans by the public research system and its infrastructures, large, medium and small enterprises already existing and newly established (high-tech start-up) and public-private aggregations (productive districts and technological ones)

Since 2011 Puglia has been strongly committed in building a **new generation of innovation policies** based on a “*demand, user and citizen driven open R&I*”: a good example of them are the “living labs initiative” and the pilot action for pre commercial procurement experimented in the the ambient assisted living sector).

The essential distinctive character of the Apulian innovation policy is the constant research of the right mix between a **demand-side approach**, namely a new role for the public sector in promoting technologies that can represent an effective solution to challenges of citizens and enterprises (*lead markets*) and a **supply-side approach**, to allow the emergence of the so called “**entrepreneurial discovery**”. That is to say the dynamics typically belonging to enterprises which are in the market (*niches of interesting specializations*). The role that Apulian Clusters play is crucial for this purpose as the Apulian technological capabilities have been outlined through an in deep analysis of the implementation of their Action Plans.

The cluster policy in Puglia pursues the goal of creating a critical mass of expertise able to generate effects (in scale, scope and spillovers) that may lead to smart specializations beyond the regional level, considering the **5 main societal challenges** identified by the Region (Sustainable cities and

territories; Health, well-being and sociocultural dynamics; Sustainable energy; Creative industry and development; and, Food security and sustainable agriculture).

The **actions** foreseen in the programming period 2014-2020 aim:

- to create **critical masses**, connecting technological competences of clusters, infrastructures, societal challenges through cross-cutting key enabling technologies (KETs);
- to enhance the growth and the strengthening of productive sectorial specializations with suitable “vertical” public policies as well as through a **non technological approach** (i.e. new services, creativity and eco-innovative solutions);
- to support the connection of Apulian actors at national and international level for the development of long networks for Research and Innovation of technological chains, within the main three **priority innovation areas**

- **Sustainable manufacture** (*intelligent factories, aerospace, mechatronics*)
- **Health and Environment** (*green and blue economy, agrofood, cultural heritage and tourism*)
- **Digital, creative and inclusive communities** (*Cultural and creative industry, services, social innovation, design, non R&D innovation*)

Sustainable Manufacture

PPPs	Research infrastructures
<p><u>TECHNOLOGICAL CLUSTERS:</u></p> <ul style="list-style-type: none"> ○ Aerospace (DTA) ○ Mechatronics (MEDIS) <p><u>PRODUCTION CLUSTERS:</u></p> <ul style="list-style-type: none"> ○ Aerospace ○ Mechatronics ○ Nautical ○ LAPIDEO ○ Fashion ○ Furniture timber ○ Logistics <p><u>PPPs:</u></p> <ul style="list-style-type: none"> ○ Advanced materials (RISMA, TEXTRA) 	<p><u>PUBLIC INFRASTRUCTURES</u></p> <p><u>European level:</u></p> <p><u>National level:</u></p> <ul style="list-style-type: none"> ○ BEYOND NANO (PON) <p><u>Regional level:</u></p> <ul style="list-style-type: none"> ○ EMILIA – Experimental mechanics for aerospace ○ GREEN ENGINE – Technology for sustainable propulsion ○ RIVONA – Reducing Flight and Nowcasting risk ○ SENS&MICRO LAB - Sensors and advanced microsystems for aerospace <p><u>PRIVATE RESEARCH CENTERS:</u> CETMA, CENTRO LASER, OPTEL, ALENIA, AVIO, AUGUSTA, BOSCH, GETRAG, MERMEC, NUOVO PIGNONE, OSRAM, PLANETEK, MASMEC, CRF</p>

Health and Environment protection

PPPs	Research infrastructures
<p><u>TECHNOLOGICAL CLUSTERS:</u></p> <ul style="list-style-type: none"> ○ Agrofood (DARE) ○ Human Biotechnologies (HBIO) ○ Renewable energies (DITNE) <p><u>PRODUCTION CLUSTERS:</u></p> <ul style="list-style-type: none"> ○ Environment and reuse (DIPAR) ○ New energy ○ Sustainable building (DES) ○ Agrofood ○ Floriculture ○ Fishery and aquaculture ○ Tourism <p><u>PPPs:</u></p> <ul style="list-style-type: none"> ○ Coast monitoring (RITMA) <p>.....</p>	<p><u>PUBLIC INFRASTRUCTURES</u></p> <p><u>European level:</u></p> <ul style="list-style-type: none"> ○ CENTRO MEDITERRANEO CAMBIAMENTI CLIMATICI ○ LIFE WATCH <p><u>National level:</u></p> <ul style="list-style-type: none"> ○ MAGNA GRECIA , B&H, etc <p><u>Regional level:</u></p> <ul style="list-style-type: none"> ○ LIC ○ AFF – electronic nose ○ LAIFF – functional food ○ SELGE – Germplasm ○ TEGUVA – Genomics for viticulture <p><u>PRIVATE RESEARCH CENTERS:</u></p> <p>CHEMITEX, ITEL TELECOMUNICAZIONI, LORAN</p> <p>.....</p>

Digital, creative and inclusive Communities

PPPs	RESEARCH INFRASTRUCTURES
<p><u>TECHNOLOGICAL DISTRICTS:</u></p> <ul style="list-style-type: none"> ○ HIGH TECH (DHITECH) <p><u>PRODUCTION DISTRICTS:</u></p> <ul style="list-style-type: none"> ○ INFORMATICS ○ COMMUNICATIONS ○ CREATIVE PUGLIA <p><u>PPPs:</u></p> <ul style="list-style-type: none"> ○ AMBIENT ASSISTED LIVING (INNOVAAL) ○ SILAB-DAISY ○ MLAB ○ 	<p><u>PUBLIC INFRASTRUCTURES</u></p> <p><u>European level:</u></p> <ul style="list-style-type: none"> ○ CECC, LIFEWATCH <p><u>National level:</u></p> <ul style="list-style-type: none"> ○ TEDAT, <p><u>Regional level:</u></p> <p><u>PRIVATE RESEARCH CENTERS:</u></p> <p>IBM, EXPRIVIA, SELEX, PLANETEK, SITAEL, WIND, OBJECT WAY, ALSTOM</p> <p>.....</p>

An example of policy being developed from past experiences

In Puglia a twofold cluster approach has been implemented as we have in our territory some Productive clusters (“Distretti produttivi”) and Technological clusters (“Distretti tecnologici”).

The Regional Law n. 23 / 2007 disciplines the status and the functions of **Productive Districts**, underlining how crucial is the role they play as stimulus for the creation of networks of enterprises, linked around a thematic productive sector or productive chain, aimed at overcoming the weaknesses of production systems affected by the economic crisis or with the need to determine their strategic repositioning. The Productive Districts initiative focuses on clustering regional companies in different value chains producing either low-tech or high-tech products. The regional administration defines productive districts as **enterprise driven networks** operating in the same value-chain or producing the same product. These Districts involve also several regional research institutions such as universities, polytechnic universities and research centers , together with industry associations and unions. The cooperation between companies and research institutions within the district is geared towards the development of innovations and the enhancement of competitiveness and internationalization of the whole sector. Till now **18 “Distretti produttivi”** have been identified **in Puglia** detailed as follows (in brackets the number of companies they aggregate): Aerospace (42); Wood and furniture (84); Sustainable building industry (181); Marine industry (108); Fashion industry (230); Logistics (111); Stone industry (201); Renewable energy and energy efficiency ‘La Nuova Energia’ (263); Environment and recycling (141); Mechanical industry (101); ICT (72); Quality agro-food ‘Jonico-Salentino’ (187); Quality agro-food ‘Terre Federiciane’ (683); Floral industry (227); Communication and printing & publishing industry (127); Puglia Creativa (207 companies and NGOs/associations); Software industry (94); Tourism industry (229).

Technological districts, on the contrary, have been identified as the main instrument of cooperation between the National Government and Italian Regions to achieve a development based on the knowledge economy. They are **knowledge driven clusters** characterized by a high-technology-content activities, as they include both research activities and industrial production and promote knowledge transfer and exchange. This process started in 2005 and currently there here in Puglia **6 Technological Districts**: DARE – Regional Agrofood Cluster; MEDIS - Apulia Mechatronics Cluster; DHITECH - High Tech Cluster; Di.T.N.E. - National Technological Energy Cluster; DTA - Technological Aerospace Cluster; H-BIO – High Biotechnologies. There are also **6 Public Private Partnerships** recognized by National Government: TEXTRA - Lab on Innovative Materials and technologies for the transport industry; MBLab - Bioinformatics Lab for Molecular Biodiversity; INNOVAAL - Research, Development, testing and Validation of Innovative Technologies and Services for "Ambient Assisted Living"; RISMA - Integrated Research System for Environmental Monitoring; RITMA - Innovation & application for Advanced Materials in Italian Manufacturing; SILAB-DAISY – Service.

In the 2007-2013 programming period, Puglia Region implemented a specific Action Plan for Research and Innovation, aimed, *inter alia*:

- at strengthening research, technological development and innovation. It was also intended to support its clusters policy and the quality of the so called “Networks of companies”;

- at building “Regional innovation partnerships” able to put in connection the aggregate demand of technologies expressed by the Productive Districts of Puglia and the local public and private scientific excellences.

In 2014 Puglia Region has also launched an action that intends to be “preparatory”, as its goal is to prepare regional stakeholders towards a more active and effective participation to Horizon 2020 calls in the near future and to facilitate the emergence of their excellences and capabilities in research and innovation activities: this action is named “**Regional Technology Clusters**” and can count on a budget around 30M€ Its final purpose is to stimulate regional stakeholders to go beyond the boundaries of their individual technological capabilities and this way to implement integrated technological chains that:

- are consistent with at least one of the **three priority areas** of innovation identified in SmartPuglia2020 (*Sustainable manufacture, Health and Environment, Digital, Creative and Inclusive Communities*);
- meet the regional needs of innovation related to the five identified **societal challenges** (*Sustainable Cities and territories, Health, well-being and sociocultural dynamics; Sustainable Energy; Creative Industry and development; and, Food security and sustainable agriculture*);
- focus on the list of the most relevant **Key Enabling Technologies (KETs)** available in Puglia (mapped by ARTI, the Regional agency for technology and innovation);
- offer interesting opportunities to develop a critical mass of expertise so that it should be possible to configure new specialization skills and competencies to be integrated with the National Technological Clusters in the national and international markets.

We should also mention the specific commitment undertaken in favour of the “Distretto Puglia Creativa”, our cluster active in the creative sector, through the participation in one of the actions of ECIA - European Alliance for Creative Industries, managed by the European Commission, namely the **ECCL Creative Cluster Lab project**. In this framework, pilot training sessions for cluster managers, innovative events and specific actions for collaboration and networking among several European clusters have been tested. To make an example, in May 2013, within the framework of the 2013 Apulian Innovation Festival, Puglia Region with other project partners organised a Crossover Creativity Lab (bilateral meetings and a Creative Camp) and a training session on “Processes in Creative Industries Cluster Management” with a special focus on the principles of benchmarking cluster organisations and its related indicators, on the ESCA benchmarking process and the recommendations that should be adopted by each cluster to obtain the Cluster Management Excellence BRONZE Label. All these actions resulted in an encouraging cross-disciplinary collaborations among clusters that is crucial for generating innovative ideas, services and products. The dialogue and the exchange of ideas among different domains of creative and traditional industries are the cornerstone of their fruitful collaboration and cross-fertilisation. From these findings several recommendations have emerged and the Apulian Technological District DARE (Agrofood) was benchmarked according to the specific protocol developed and implemented by the “European Secretariat for Cluster Analysis”: the DARE cluster was eventually awarded with the **European Cluster Management Excellence BRONZE Label** on February 27th, 2014.

Furthermore, representatives of Puglia Region attended the **European Innovation Summit**, in Bruxelles (Brussels) from 30th September to 2nd October 2013. On that occasion the Region organized a dinner debate at the European Parliament with Apulian Technological clusters, with the aim of discussing “*Policies and funding programs supporting clusters at regional and European level*”. The topic was identified thanks to the joint path that Puglia and its regional clusters had

previously undertaken. The Brussels mission was also coherent, and thus funded, with the Apulian SMEs Internationalization Plan for the years 2013 and 2014. .

A similar experience of policy coherence between Research and Innovation, on the one side, and Internalization, on the other, in a strategic sector for the development policy of the Region was carried out through the European event **Space4You, space as driver of competitiveness and growth**, organized in Bari on 27th and 28th February 2014.

A learning process for policy makers, stakeholders and the main actors of the regional innovation chain

The path to define our S3 started in 2011 and several actions at European, national and local level have been undertaken.

Firstly, we joined the **S3 platform**¹ in December 2011. In May 2012 a meeting held in Seville by the S3 platform enabled Puglia Region to compare its approach with those of other European Regions; after the first peer review we attended several meetings on different topics organized by the Platform, involving each time the most relevant Apulian In-house company or Regional agency depending on the topic of the meeting (i.e.: InnovaPuglia was involved as regards the Digital Agenda for Europe and ARTI as regards evaluation and monitoring activities).

We had the opportunity to compare our specialization areas with other **Italian Regions** thanks to a national project ² promoted by the Department for Development and Economic Cohesion of the Italian Government.

With the support of Formez – the Italian Centre for Services, Assistance, Studies and Training for the Modernisation of the Public Administration -, we established an **institutional capacity empowerment project** involving several Regional Departments, our regional agencies and in-house companies, in order to improve the awareness of a common vision coming from our S3 as well as the capability to integrate our policies.

A **continuous dialogue** with all stakeholders and socioeconomic partners has been assured during this process.

And, finally, a **public consultation** on the first version of S3 was launched by the Region and closed in April 2014.

In this sense, SmartPuglia2020 is not a static document, written in the stone. It is a **dynamic and continuously evolving tool**.

Today Puglia is classified by the Regional European Scoreboard as moderate innovator (2012 data). We are convinced that Puglia is more than this. We still lack the capacity to cooperate and to transform our innovation driven public-private networks into integrated hubs of knowledge and to adopt a user driven innovation approach. But we have in the region several excellences and outstanding talents along with the ability to innovate and quickly respond to changes; we are rich of

¹ The **S3 platform** is an initiative managed by IPTS of Seville with the aim to provide support to national and regional policy makers to successfully develop and implement their S3 and related EU cohesion policy operational programmes (OP).

² A similar initiative has been established at national level by the Department for Development and Economic Cohesion.

smart people and therefore we are sure that they will be able to transform the vision SmartPuglia2020 in reality.

The Apulian Research System

Apulia is a territory with a strong network of university and independent research laboratories, flanked by centres of excellence in education. This has made it possible to create a new research model where education and research structures work together with local companies for testing and developing new materials, processes and technologies.

Collaboration between research and industry is one of the major strengths of the Apulian government's model, which has fostered the setting up of the regional Technological Clusters, on the basis of an agreement with the national Ministry of Education, Research and Universities (MIUR).

The main objectives for “clustering” are to develop integrated systems for research-education-innovation, with a strong emphasis on technology, to create of a network of qualified laboratories and to develop interdisciplinary competencies and capacities, capable of fostering new business set-ups. The agreement between the regional government and the MIUR has also brought about the development and strengthening of the technological clusters and other public-private aggregates, which have the objective of pursuing research projects that can stimulate regional economic growth.

Universities and Research centers present in Puglia are:

- **4 Universities (3 public, 1 private)**
- **1 Polytechnic**
- **30 networks of public research laboratories**
- **6 Technological Districts**
- **6 Public-private aggregates**
- **7 ILOs**

Swot analysis

STRENGTHS	WEAKNESSES
Apulian research, technological development and innovation system	
<ul style="list-style-type: none"> • Ranking in the Index of Regional Innovation: in 2014, the region was included in the group of moderate innovators. • Research System: the presence of some important research centers of national and international relevance (CNR, ENEA, CMCC, Center for Biomolecular Nanotechnology, IAMB). • Higher education: presence in the region of leading performances in the educational university system. • Research Infrastructure: the availability of networks of public and private laboratories international technological frontier equipped. • Districts: presence in the region of the Technological Districts and productive districts in knowledge-intensive sectors. • Dynamism of medium and large companies: the larger companies located in the area are able to promote investment programs in R & I with positive effects on the induction of regional SMEs. • Consolidation of existing networks of collaborations between enterprises and universities • Regional Strategy for Smart Specialisation: provides tight integration between "cross" policies for research and innovation and interventions for competitiveness, internationalization, training and employment in addition to the reinforcement of the "vertical" policies for environment, transport, welfare and health. 	<ul style="list-style-type: none"> • Innovative capacity: in 2011 the expenditure on research and development is lower than that of the Southern Italy, as well as the one of National and European average. • Advanced training: despite the increase, people aged 30-34 with tertiary education represent a lower level than the target of Europe 2020. • Graduates in science and technology: reduced percentage of the number of university students that conclude positively a course of study in science and technology. • Poor attractiveness of the university system, also with reference to the capacity to attract foreign students • Employed in high knowledge intensive sectors: the share of employment in these sectors is lower than the National and the European average • Lack of integration between the different actors of the regional system: companies, universities and research centers, government, financial institutions

List of the main research infrastructures

Public research Labs

Nr.	Name	Domain	Lead organization
1	SENS&MICRO LAB -Regional laboratory for the realization of sensors and advanced microsystems for the aeronautic sector	Aeronautics, space and avionics	CNR National Research Council
2	RIVONA -Reduced risk of flights and airport nowcasting	Aeronautics, space and avionics	CNR National Research Council
3	GREEN ENGINE - Technologies for sustainable propulsion	Aeronautics, space and avionics	University of Salento
4	TEGUVA - Application of genomic technologies for the production of new varieties of seedless table grapes with enhanced nutraceutical characteristics	Agrifood	CRA - Agricultural Research Council
5	SELGE - Regional network of laboratories for the selection, characterization and conservation of germplasm for the prevention of the spread of pests of quarantine and economic importance	Agrifood	University of Bari
6	APULIAN FOOD FINGERPRINT - Enhancement of apulian food products by analysis of nuclear magnetic resonance, mass spectrometry and electronic nose	Agrifood	University of Bari
7	LAIFF - Network of laboratories for innovation in the field of functional food	Agrifood	University of Foggia
8	PIASS- Platform for Agrofood Science and Safety	Agrifood	University of Foggia
9	LIFEWATCH	Biodiversity, ecosystems	University of Salento
10	BioPOP - Network for the use of controlled cancer tissues characterized by the development of new diagnostic, pharmacological and biomedical approaches (Apulian cancer biobank)	Biotechnology for human health	IRCCS Bari
11	NaBiDiT - Biotechnology for diagnostics and for the development of innovative therapies	Biotechnology for human health	University of Salento
12	BIOSCIENCES & HEALTH (B&H)	Biotechnology for human health	Università degli Studi di Bari Aldo Moro
13	2HE - Human and environmental health research center	Biotechnology for human health Environment	Università del Salento

Nr.	Name	Domain	Lead organization
14	CARSO Consortium - CORE FACILITY OF PROTEOMICS	Biotechnology for human health	University of Bari
15	Centro Euro-Mediterraneo sui Cambiamenti Climatici scarl(CMCC)	Climate change modelling	CMCC
16	PHOEBUS - Plastics technology for the realization of solar cells and organic sources for high efficiency, uniformity and brightness lighting	Energy	University of Bari /Polytechnic of Bari
17	BIOforIU Multidisciplinary infrastructure for the study and appreciation of marine and terrestrial biodiversity in the perspective of "Innovation Union"	Environment	Università del Salento
18	Re.Ca.S.: computing network for SuperB and other applications	ICT	Università degli Studi di Bari
19	AITECH - Technologies applied to the diagnostics and conservation of the built heritage: innovative tools, products and procedures	New materials and new technologies for productive systems	CNR National Research Council
20	TISMA - Laboratory of innovative techniques for the welding of advanced materials	New materials and new technologies for productive systems	Polytechnic of Bari
21	TRASFORMA - Advanced research techniques for the study and implementation of the molding with flexible tools of light alloys through the use of controlled-friction surfaces and welded sheets of different thickness	New materials and new technologies for productive systems	Polytechnic of Bari
22	WAFITECH - Regional laboratory of new nano and biotechnologies for water filtration: design and construction of biomimetic membranes for industrial, commercial and environmental applications	New materials and new technologies for productive systems	University of Bari
23	Regional laboratory for the synthesis and characterization of new organic and nanostructured materials for electronics, photonics and advanced technology	New materials and new technologies for productive systems	University of Bari
24	VALBIOR - Network of laboratories for the development of new technologies for the exploitation of residual biomass from productive system of the Region of Puglia	New materials and new technologies for productive systems	University of Bari
25	VOC and Odor -Assessment of emissions of volatile organic composites and odour impacts generated by new materials and new technologies by productive systems	New materials and new technologies for productive systems	University of Bari
26	MITT - Innovative materials and nanocomposites processing technologies for structural and functional applications	New materials and new technologies for productive systems	University of Salento

Nr.	Name	Domain	Lead organization
27	Laboratory of surface modification technologies of natural fibers for revitalizing the textile sector in Puglia	New materials and new technologies for productive systems	University of Salento

Institute for Microelectronics and Microsystems IMM-CNR -Regional Laboratory for the Realisation of Advanced Sensors and Microsystems -SENS&MICROLAB

The aims and the activities are focused in the implementation and improvement of a Laboratories Network for the set-up and use of Key Enabling Technologies (KET) for the realisation of micron and sub-micron devices for innovative Sensors and Microsystems, at the beginning for the aerospace, but also for agro-food, environment, bio-medical sectors, including all the steps for design, materials preparation and characterisation, device preparation and electronic development bringing to the smart integration of the final microsystem, in a frame of portability, low cost and low power consumption. A direct consequence of the infrastructure is to promote, by means of training of young researchers on innovative topics related to productive sectors, the born of technological spin-off for the industrialisation of the research products realised in the projects (sensors, Microsystems, MEMS, ecc.)

The infrastructure is organised in a network of 6 regional nodes:

- Institute IMM-CNR in Lecce (central node)
- Institute IMIP-CNR in Bari
- Institute IPCF in Bari
- University of Salento in Lecce
- University of Bari in Bari
- ENEA Centre in Brindisi

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1. Institute of Atmospheric Sciences and Climate (ISAC) National Council of Research (CNR) - RIVONA

RIVONA aims at improving flight safety in airport area through reduction and mitigation of meteorological risks, airport nowcasting and contribution to integrate aircraft airborne platform instrumentation. Flight risks of meteorological cause are originated by storms and their effects: microburst and consequent wind shear, hail, destructive precipitation, electrical phenomena including lightning and turbulence. Direct consequences are either flight accidents or economic losses due to airport activity reduction. The project faces these two problems with activity in risk reduction and airport management. Wind shear alert system will be produced by a ground network of two C band Doppler radars and a cloud Ka band mobile radar. A network of ground sensors (microwave disdrometers and microbarometers) will also operate. Alert for aircraft icing conditions

and aquaplaning on the run ways will also be produced. On the Brindisi airport a nowcasting system will be developed. Ancillary to the main project will be the integration of an airborne platform instrumentation for research and remote sensing. Three CNR institutions are involved having operative units in Apulia Region: Istituto di Scienze dell'Atmosfera e del Clima (ISAC-Lecce), the Istituto di Ricerca sulle Acque (IRSA-Bari) and Istituto di Studi sui Sistemi Intelligenti per l'Automazione (ISSIA-Bari).

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The aim of the research Laboratory was to create a network in order to support the research activities and development of new technologies for green combustion and propulsion with low environmental impacts.

The Green Engine is a scale test-rig facility addressed at testing and developing gas burners components, combining field functioning conditions approximation with a wide measurement accessibility, also by means of its equipment with optical accesses, especially suitable for laser based measuring techniques.

The experimental test bench is finalized to the study of combustion phenomena, both in diffusive and in premixed functioning, with an integrated analysis of various aspects such as thermal-fluid-dynamic, chemical kinetics, vibroacoustic and constructive aspects, materials and sensors. It is equipped with High speed digital imaging systems both for visible and Near Infrared range acquisition, Intensified CCD, Photomultiplier and filter for species analysis, exhaust gas analyzer. It is also equipped with a dilution tube system for the dilute exhaust gas analysis.

One of the main research field is the study of the instability of combustion. It refers to self-sustained combustion oscillations at or near the acoustic frequency of the combustion chamber, which are the result of the closed-loop coupling between unsteady heat release and pressure fluctuations. Condition monitoring of combustion systems based on the capture and processing of flame images are largely applied in this field and numerous post-processing techniques are undergoing study applying methods that are capable of converting geometrical and luminous data into reliable information on the state of practical combustion systems.

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The TEGUVA network aims to develop innovative technologies and protocols for the genetic improvement of table grapes of Puglia. The infrastructure, created in this network, includes

multifactorial expertises ranging from agronomy, to chemistry and genomics, aiming to obtain new varieties of seedless table grapes with better morpho-productive and nutritional characteristics. The infrastructure provides advanced technology services, including: improved technologies for the extraction of nutraceutical compounds (polyphenols, carotenoids and aromatic compounds) from table grapes; breeding programs to obtain new varieties with the most interesting and desired features; consulting services to companies engaged in the genetic improvement of the vine; tools for the rational use of water resources in the cultivation of varieties of table grapes.

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SELGE research infrastructure is a network of 11 public research laboratories (among Universities and Public Research bodies) and performs innovative researches in field of genomic, transcriptomic, metabolomic, genetic, biochemistry, plant protection, germplasm valorization and food safety and quality. The SELGE Network offers its services to Research laboratories, Professional organizations, Public authorities coordinating agricultural practices, accredited private laboratories in phytopathological diagnosis and food analysis, nurseries consortia, associations of producers.

Genomics and genotyping: parallel massive sequencing of DNA and RNA (by Illumina Technology); primary and secondary bioinformatic analysis for genomic, transcriptomic and small RNA analysis; identification of molecular markers for assisted selection and breeding; molecular traceability in food typical produces.

Phytosanitary diagnosis: development of innovative diagnostics, molecular diagnosis (EPPO Protocols) for quarantine phytopathogenic organisms (viruses, fungi and bacteria); identification and molecular, microscopic and bioassay characterization for fungi, bacteria, nematodes and insects of agricultural relevance.

Cellular and metabolomic analysis: spectroscopic and HPLC search for nutraceuticals; confocal cytology for the identification of biotic /abiotic stress and varietal characterization; search for secondary metabolites and mycotoxins in fruit, fresh vegetables and derivatives; nutraceutical characterization in olive oil and wine.

Germplasm valorization: certification of vegetables by clonal and phytosanitary selection; sanitation of germplasm infected by pathogens; quarantine containment of imported vegetables; germplasm conservation of in vivo and in vitro; establishment of new varieties.

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University of Bari, Department of Chemistry - Apulian Food Fingerprint (AFF)

Apulian Food Fingerprint (AFF) is a project and a network of laboratories coordinated by the Department of Chemistry of the University of Bari. This network offers services and solutions to problems that can arise in the field of agro-food, having the companies and institutions operating in such field as its target. In particular, the AFF staff believes that for the integral development of the typical agricultural food production, it is necessary to focus on research, innovation, protection and valorization of quality. In the last few years, several regional, national and EU measures have been taken, aimed to certify quality production, by conferring appropriate brands. However, often the productions of typical food are threatened by the fraudulent use of quality marks, making it necessary to develop methods able to certify unambiguously the information reported in label.

AFF intercepts these issues and intends to pursue the valorization of Apulian food products, by means of Nuclear Magnetic Resonance (NMR), High Resolution Mass Spectrometry (HRMS), Isotopic Ratio Mass Spectrometry (IRMS) and Electronic Nose (EN) analyses, in synergy with uni and multivariate statistical tools: indeed, all these techniques allow us to define the food "fingerprints", i.e. complete metabolic and isotopic characterization, useful for the certification of the geographic origin, of the agronomic technique used, and more in general of quality, and consequently for the protection of both the local production system and the consumers.

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University of Foggia - La.I.F.F.

We recognize the opportunity and urgency of essentially aiming towards strengthening the tendency for innovation as a vehicle for the completion and/or consolidation of the process of internationalization, and towards the implementation of network and production chain integration strategies. The competitive edge of agri-foodstuffs centre is known as the *functional foods* sector. In order to tackle the persistence in our local area of factors that can delay the takeoff of the functional foods sector, it is absolutely necessary that we develop scientific research and training, by setting up links and agreements between universities, research bodies and businesses. These links should take account of the plurality of opportunities and instruments available regionally, nationally and Europe-wide. The aim of the LAIFF network is therefore to increase the dynamism between the production and scientific research sectors, focusing on stimulating demand for innovation and organizing the supply. To this aim, the network of public-sector laboratories allows the effective development of a systemic organization between different research centers. Together with the agri-foodstuffs companies, it is able to transfer know-how and, thus, rapidly scale up the results of the research. We believe that a system structured into such a network can also allow latent demands and needs to emerge that producers cannot yet express, due to a lack of adequate interrelation and infrastructure.

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**University of Foggia, Department of Agricultural, Food and Environmental Sciences -
PLASS - Platform for Agrofood Science and Security**

Pl.A.S.S. is a Research infrastructure, having a national and European interest, in the field of food, nutrition and food security which combines the nutritional aspect with the one of improving the welfare of citizens and the prevention of disease. The market capacity would absorb the results of research by incorporating them into innovative products and processes within the wider context of bio-based economy. The infrastructure services are grouped into homogeneous MultiLab (integrated laboratories) that can be aggregated into 4 “Core facilities”: 1. Agriculture and food security; 2. Nutrition and healthy quality of food and agricultural products; 3. Technological quality of process and food traceability; 4. Food and health.

Pl.A.S.S. platform allows to produce excellent research using high-throughput technologies and convergent technologies (biotech-based) valorised by the interaction between the medical sciences and neurosciences and the agricultural, veterinary and agri-food sciences. A structural strengthening of Pl.A.S.S. infrastructure is in progress thanks to the financial contribution given by the MIUR within the project PON “R&C 2007-2013” - Strengthening of Scientific and technological structures and equipment.

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University of Salento - LifeWatch

LifeWatch is the European e-Science infrastructure for biodiversity and ecosystem research. It is a distributed infrastructure whose construction has been considered a European level priority in the ESFRI roadmap since 2006. The main purpose of LifeWatch is to serve the biodiversity and ecosystem research community in its work to support the understanding and rational management of our ecosystems by policy makers, resource managers, the private sector and the general public.

LifeWatch is unique in the framework of biodiversity research as it is only infrastructure building an online research centre where scientists can find the data they need to run frontier research together with tools and facilities to handle, analyse and model them, generating scenarios and drawing conclusions. LifeWatch brings together in a single virtual research environment data coming from observatories, physical infrastructures and research labs scattered all over Europe and beyond, and ranging from the biomolecular to the satellite scale. Therefore, LifeWatch capitalises on existing data, optimises financial resources and offers opportunities to early career researchers.

LifeWatch interface with its data provider and user community is the Service Centre, a core component of the E-Biodiversity Research Institute, dealing with the provision of services, so as to facilitate the use of the infrastructure, provide information and support, with a particular focus on young scientists, foster users’ engagement in the services’ development, and draw new communities of interest related to the infrastructure.

LifeWatch is currently finalising its application for the ERIC in order to become an intergovernmental consortium for European research infrastructures.

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Tumors Institute G Paolo II, Scientific Hospitalization and care institution, IRCCS BARI - BIOPOP

Cancer Research is one of the major fields of interest for its scientific and biomedical perspectives. In particular, the search for tissue biomarkers predictive of prognosis, chemoresponsiveness, toxicity, is intensive and leading to the synthesis of new « targeting » drugs, new imaging tracers, etc. All these research areas require the availability of human tissues to be characterised from the morphological, biological, molecular, genetic point of views. Frequently, this availability represented a great bottle-neck because of poor quality storage and banking conditions that health structures can guarantee. The Network for Biobanche Oncologiche Pugliesi is aimed to organize at regional level a net of human biobanks where tissue samples of oncological interest are stored and characterised for main biomolecular characteristics.

The need to organise such a Network is based on the assumption that Puglia is a very active Region in the field of scientific and biomedical research with its Academies, IRCCSs, IZZs, Pharmaceutical Companies, Biomedical Industries.

The Actions of BIOPOP infrastructure are:

- Inventory of cancer oriented-biorepositories in Puglia
- Development of common standard Operating Procedures
- Quality Certification of a Central Regional Biobank at IRCCS Istituto Tumori Bari
- Coordination of the Network through a WEB site

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University of Salento - Biotechnology for diagnostics and for the development of innovative therapies- NaBiDiT

The aim of the NaBiDiT lab is to improve, promote and facilitate the transfer of research results; from laboratories of universities and research centers to hospitals and nursing homes. To develop of new technologies, more economical and easily manageable, cutting-edge treatments that involve minimal intervention and early on the patient. The field of interest is the Nanomedicine, translational science whose aim is to make available new therapies and diagnostic tools at low cost

exploiting nanotechnology. Nabidit has the objective to provide the Puglia Region research and development in line with European and world standards

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With Directorial Decree No. 254/Ric. of 18 May, 2011, Italian Ministry of Education, University and Research (MIUR) began the implementation of projects for the improvement of structure and infrastructure of universities and public research organisations in the Convergence regions as Apulia.

Bioscience and Health (B&H) infrastructural project has been submitted by University of Bari to MIUR.

University of Bari has been received for the «Bioscience and Health» a total amount of €13.000.000,00.

The aim of the infrastructural project is to encourage the growth of the public research system while enhancing the competitiveness of the organisations involved on a national and international level.

This is based on structural improvement, on the development of new laboratories and the purchasing scientific and technological equipment.

Actually in the “B&H infrastructure” there are 8 INTEGRATED TECHNOLOGY PLATFORMS.

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The Centre 2HE arises from a project funded entirely by contributions PON R & C, aimed at strengthening the infrastructures and facilities at the University of Salento. At the same time the project aims to the formation of specialized figures connected with the research, the management of research and internationalization.

The subject areas are related to Science and Technology for human health and the environment. In particular including:

Health and wellness

Advanced diagnostics

Environment and Ecology

Green Chemistry

Aquaculture

The main objective is to identify new synthetic and analytical protocols as well as products and processes capable of revolutionizing the commercial sectors with particular reference to advanced

diagnostics; development of advanced chemical sensors; study and implementation of chemical processes operating catalysts with low environmental impact and development of methodologies for photo catalytic reduction of pollutants; production of innovative know-how for the production of energy from renewable sources.

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The Illumina platform is the elective tool for studying the genome and transcriptome through DNA microarrays and next-generation sequencing. BeadArray technology is deployed on either of two multi-sample array formats for DNA or RNA-analysis applications. The DNA microarray can also be used for genotyping use in forensic medicine (DNA testing), in diagnostics and pharmacogenomics. The SNP microarrays can also be used to track the profiles of somatic mutation in cancer cells.

The Illumina platform includes a sequencing module "next generation". It is based on the synthesis (SBS) technology that is the most successful and widely-adopted next-generation sequencing platform worldwide.

It offers a highly efficient, accurate and scalable solution that sets a new standard for productivity, cost and accuracy among next-generation sequencing technologies.

Expertise and services for Institutions and Industries:

- Global analysis of gene expression for human RNA, or other species;
- Genome-wide expression profiles from low-abundance or partially-degraded human RNA samples, especially those from formalin-fixed, paraffin-embedded (FFPE) tissues;
- Whole-genome scanning for efficient, high-throughput analysis of genetic and structural variations, SNP genotyping and Copy Number Variation;
- Genome-wide methylation profiles using Infinium Methylation Assays quality;

DNA-Protein Interaction Analysis (ChIP-Seq).

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CMCC's mission is to investigate and model our climate system and its interactions with society to provide reliable, rigorous, and timely scientific results, which will in turn stimulate sustainable growth, protect the environment, and develop science driven adaptation and mitigation policies in a changing climate. CMCC collaborates with experienced scientists, economists, and technicians,

which work together in order to provide full analyses of climate impacts on various systems such as agriculture, ecosystems, coasts, water resources, health, and economics. CMCC also supports policymakers in setting and assessing costs, mitigation, and adaptation policies.

CMCC benefits from the extensive applied research experience of its consortium members: Istituto Nazionale di Geofisica e Vulcanologia (INGV); Università del Salento; Centro Italiano di Ricerche Aerospaziali (CIRA S.c.p.a.); Università Ca' Foscari Venezia; Fondazione Eni Enrico Mattei (FEEM), Università di Sassari, Università della Tuscia, Università degli Studi del Sannio.

CMCC research activities are distributed among six research divisions that share different knowledge and skills in the field of climate science: The Numerical Applications and Scenarios (ANS) Division; The Climate Impacts and Policies. An Economic Assessment (CIP) Division; The Impacts on Agriculture, Forest, and Natural Ecosystems (IAFENT); The Impacts on Soil and Coast (ISC) Division; The Scientific Computing and Operations (SCO) Division; The Climate Services Division (SERC).

The **Ocean Lab (Operational Coastal Oceanography Laboratory)**, created in 2012 in Lecce, is part of the activities of the ANS Division, and houses a team of scientists who use advanced technologies applied to the study of coastal seas and the development of tools for supporting the activities performed at sea. Inaugurated concomitantly with the launch of the projects IONIO (IONian Integrated marine Observatory) and Tessa (TEchnologies for Situational Sea Awareness), the Ocean Lab performs activities that combine applied technological, engineering and scientific components to areas of intervention including, among others, prevention and control of pollution, sustainable fishing, and transport safety. The work carried out at the Ocean Lab generates products and services such as, for example, the development and production of short term ocean forecasts, models and applications in the field of maritime safety (i.e. oil spill modelling and decision support system development), coastal modelling (i.e. sediment transport) and climate impacts assessment in the coastal area.

CMCC operates its own **Supercomputing Center** (located in the "Ecotekne" Campus in Lecce) whose HPC facilities have been ranked, since 2008, in the 500 most powerful supercomputing systems in the world (316th at November 2013). Currently, there are two operating IBM supercomputers: Athena, the most powerful one (about 8000 Intel Xeon Sandy Bridge cores, 160 TFlops peak performance) and Calypso (960 IBM Power6 cores, 18 TFlops peak performance). Thanks to Athena, the CMCC HPC infrastructure is the third most powerful computational facility in Italy.

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National Nanotechnology Laboratory (NNL) of CNR-NANOSCIENZE INSTITUTE - PHOEBUS

The National Research Council (CNR) a public organization who is in charge to carry out, promote, spread, transfer and improve research activities in the main sectors of knowledge growth and of its applications for the scientific, technological, economic and social development of Italy.

The Nanoscience Institute, is a new institute of CNR devoted to frontier research in nanoscience and nanotechnology, established in 2010 from three former laboratories of INFN: NEST-Pisa,

NNL-Lecce, and S3-Modena. The institute main tasks range from fundamental science to emerging technologies as well as applied projects of direct industrial and societal interest.

National Nanotechnology Laboratory (NNL), is an interdisciplinary Center for research and technology development at the nanoscale. NNL is a well-recognized center for development and application of innovative nanotechnologies concepts, covering different areas of expertise with a multidisciplinary approach. Inorganic and organic materials are studied and employed for advanced applications in electronics, photonics, energy harvesting, life sciences, nanomedicine, security. NNL consists of around 160 people, including researcher, technicians, research fellows and students and has participated in many European and national projects. Through intense and interdisciplinary activity NNL's R&D has developed close collaborative relations with dozens of Italian and foreign universities, research bodies and just as many industrial companies, obtaining excellent results, both from a scientific and industrial point of view.

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**Institute of Biomembrane and Bioenergetics (IBBE)- National Research Council (CNR)-
Multidisciplinary infrastructure for the study valorisation of marine and terrestrial
Biodiversity in the perspective of the Innovation Union -BIOforIU**

BIOforIU is an infrastructure for the study of living organisms and of the mechanism underlying biodiversity and its maintenance; an infrastructure based on the synergy of different ESFRIs with complementary interests/approaches in the field of Biodiversity.

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University of Bari - computing network for SuperB and other applications - Re.Ca.S

The infrastructure is presently under completion, since the ReCaS project (still ongoing) involves the construction of new sites (Cosenza) and the empowering of existent ones (Bari, Catania, Naples).

The final distributed infrastructure will be composed of four data centers located in the cities cited above.

Computing resources connected by high-performance networks, e.g. Infiniband, 10GB Ethernet, Fibre Channel. Such resources will be equipped with distributed/parallel high-performance filesystems accessible through different protocols.

The data center located in Bari will provide 12000 CPU core and 5PB of storage space by the first half of 2015. It hosts an open-source cloud computing platform of IaaS/PaaS level currently in production and providing services to research communities, public bodies and SME.

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A.I.Te.C.H. is a multidisciplinary laboratories network devoted to develop research for the demand of technologies in the diagnosis and preservation of the built heritage, including both monumental and minor buildings. It is based on the integration of skills, laboratories and research activities owned by the Italian CNR (National Council of Research) and the Salento University. The network covers the following fields of activity:

- Development of innovative instruments and non-destructive methodologies for diagnosis and monitoring of in-situ interventions
- Experimental activities for correlations research between non-invasive and destructive diagnostic investigations
- Integration of procedures for diagnosis and monitoring activities
- Optimization of products and methods for stone surface treatments
- Characterization and laboratory assessment of properties and performances of products and materials for stone preservation and building repair
- Definition of the best practices for conservation and restoration works, taking into account the experimental materials and products, the stone supports and the structural features of historical buildings and monuments.

These activities are carried out with the partnership of public institutions and SME, that are also the potential users of the research products and facilities of the A.I.Te.C.H. network. They range from the public institutions in charge of the safeguard and the preservation, to the companies in the fields of the building stone and restoration products.

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TISMA is a network of three laboratories (Research Unit) focused to stimulate the development of new skills, processes and technologies vital for the regional economy and for the industrial fields. The research activities of TISMA are founded on welding processes such as laser, electric arc with low and high intensity (Capacity Discharge Welding), and using the heat generated by friction (Friction Stir Welding). Combining simultaneously these welding sources, a wide range of new

materials, such as those used in aviation and aerospace, with low weldability and difficult to weld with traditional welding techniques, could be welded in homogeneous and heterogeneous joints. The skills of the research team are available for the big regional industries and small/medium companies interested to the applied researches for production systems, testing and controls

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**Polytechnic of Bari- Dipartiment of mechanic mathematic and Management -
Advanced research techniques for the study and implementation of the molding with
flexible tools of light alloys through the use of controlled-friction surfaces and welded
sheets of different thickness -TRASFORMA lab**

The TRASFORMA lab deals with the industrialization of innovative sheet forming processes based on the use of flexible media (oil and gas), aimed at the production of complex part in light alloy. It is also equipped with tools and measuring devices for laser welding and cutting, post forming sheet operations, tribological surfaces properties investigation, mechanical and technological material characterization.

The research lab is composed by the following laboratories (Research Units): Advanced Forming & Manufacturing (RU1), Forming Research (RU2), Tribolab (RU3), High-Power Fiber Laser (RU4).

The research lab offers the following services: flexible sheet forming processes (warm and cold hydroforming, gas and superplastic forming) for the production of complex parts in light metal alloys (aluminium, magnesium, titanium); Fiber laser cutting and welding for the Tailor Welded Blanks (TWB) production; theoretical and experimental techniques for the analysis of the tribological properties of contacting surfaces in relative motion and under different lubrication conditions (dry, mixed and lubricated), experimental techniques for the morphological characterization of surfaces and micro-mechanics of surfaces and coatings, mechanical, metallographic and technological characterization of conventional and innovative materials (both in the welded and in the as received condition); numerical/experimental optimization of laser welding, laser cutting and investigated metal forming processes.

Target sectors of the research lab are: Transportation (Automotive, Aeronautics, Aerospace). Electronics. Sports Facilities, Biomedical, Architecture and Design.

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**University of Bari, Department of Biosciences, Biotechnologies and Biopharmaceutics -
WAFITECH**

WAFITECH is a technological platform composed by a network of Apulian public research laboratories who join their scientific and technological expertise in:

- 1) devising and fabricating innovative biomimetic membranes of water filtration to comply with technical specifications required by both public and industrial end users and
- 2) providing services expert advice ranging between the engineering and production of recombinant proteins and the fabrication and characterization of artificial polymeric fibers.

The composite membrane devised by WAFITECH is an amphiphilic biomimetic water filtration membrane made by amphiphilic copolymers with incorporated aquaporin water channels, proteins with an extraordinarily permeability and selectivity to water, hereby taking the cue from nature in terms of water filtration.

The biomimetic membranes realized by WAFITECH represent an innovation in high impact technologies such as those related to the desalination for drinking water production, wastewater reclamation and reuse, production of ultra pure water dialysis, drug deliver and ocean energy applications (production of salinity gradient energy, a sustainable form of energy).

WAFITECH research activities are also aimed at developing trademark registrations, patents and industrial spin-offs. An added value is that of attracting and training young researchers with promising perspectives in the timely area of the nano- biotechnologies of materials.

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University of Bari, Department of Chemistry - Regional Laboratory for Synthesis and Characterization of New Organic and Nanostructured Materials for Electronics, Photonics and Advanced Technologies

The aim of this research lab is to develop and coordinate a laboratory network involving several regional laboratories [from Universities and the National Council of Research (CNR)] specialized in the design, production and characterization of innovative materials for advanced technologies, with special attention addressed to photonics and electronics. The capabilities to design and produce innovative materials with high and specific performances is a key point in the development of advanced technologies. Special attention has been addressed, in the past ten years, to the development of organic materials being able to associate mechanical properties of polymers with those of electronic semiconductors. A new field of application is born, named “plastic electronics” where the electric circuits and optoelectronic and photonic devices, usually based on silicon technology or other inorganic semiconductors, have been replaced with the corresponding plastic and polymeric versions. One of the most important advantages of this technology is represented by the lowering of production costs owing to the possibility of processing from solution, besides evaporation, also on flexible supports. At the same time, the development of nanostructured organic, inorganic and hybrid materials (i.e. nanocrystals, quantum dots) is affecting deeply optic and electronic technologies as well as the bio-medicine field and recently also the field of the artistic heritage defence

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METEA Research Center - Valorization of Residual Biomass-VALBIOR

VALBIOR targets two goals. First aim is the valorization of residual biomass of production processes. Either solid biomass (cellulosic residues of the agro-forestry industry, or wood-industry) or oily residues are considered. In a second activity, the abatement of organic pollutants in wares is targeted.

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University of Bari, Department of Chemistry - VOC and ODOR

The emission of Volatile Organic Compounds (VOC), which generally results from materials and/or industrial activities, can represent the cause of acute and/or chronic pathologies for exposed people. As some VOC are smelling compounds, regardless of the damage to health, they can cause annoyance for their bad odor. The emission of VOC represents not only an important indicator for the evaluation of air quality but even an element for the estimation of the environmental sustainability of the new materials and technologies. At the same time, the toxicological aspect resulting from the exposition to VOC is very important in relation to the impacts on health. The aim of this 'Networks of Public Research Laboratories' is the creation of a high performance laboratory (both mobile and fixed) able to perform chemical, olfactometric and toxicological analysis of the VOC emitted by materials and industrial processes. The laboratory allows conducting sampling and chemical-olfactometric analysis directly in the field by providing high added value services to the territory on the following issues: evaluation of VOCs emissions in outdoor and indoor environments, emissions from materials and consumer products, odor emissions and VOCs characterization in human exhaled breath.

The integration of the instrumental equipment of the laboratory 'VOC and ODOR', unique at international level, allows to carry out a comprehensive assessment of VOCs levels in different gaseous matrices, combining the chemical characterization and the sensory perception of odor emitted, in order to determine also risks and damage from exposure to human health.

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University of Salento, Department of Engineering for Innovation - Innovative nanocomposite materials and transformation technologies for structural and functional applications - MITT

The MITT network was established under the "Networks of Public Research laboratories " sponsored by the Apulia Region to promote the development of high-tech industries and innovation technology. The MITT network is focused on the development of new nanocomposite materials for structural and functional applications by:

- Processing of polymeric materials and nanocomposites
- Structural, optical and functional characterization
- Scale-up processes in laboratory scale.

The network of laboratories MITT provides the set-up of a chain which allows to:

- Move from raw materials to medium-scale prototypes for subsequent phases of materials characterization
- Change and develop innovative technologies for the production of polymeric materials and composites easily be industrialized.

The research activities of the MITT network are focused on:

- Nanofillers synthesis and characterization (Carbon nanofibers, Carbon nanotubes, Organoclay functionalization)
- Polymer nanocomposites synthesis and nanofiller dispersion in thermosetting and thermoplastic composite matrices
- Composite and nanocomposite characterization by mechanical, rheological, thermal, dynamic-mechanical , spectroscopic and morphological analysis

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Technological Districts



DARe is a company founded in 2006 to become the Apulian Technological District with the aim to promote innovation in the regional agrofood sector, affirming its role in the specific field of the technological transfer.

The creation of technological districts in some carefully chosen geographic locations in Italy is one of the S&T Italian policies the Italian government adopted since 2002 in order to promote

enterprises innovation capability through systemic aggregations at territorial level. On this bases, in 2005, the Apulian Region applied for the creation of three new districts which could address the S&T need expressed by the regional productive system. DARE was among those.

The main criteria adopted for the creation of such a technological districts were:

the availability of a well structured project incorporating extended foresight studies in the chosen area of interest, the definition of vision, mission and of the regulatory processes for the management, rules for the protection and distribution of intellectual property (governance);

the coherence of the project with the strategic fields identified in the guidelines of the national S&T policy;

the participation in the district of public stakeholders (University and/or research bodies) provided with the necessary experience in the field of interest and a background of collaboration with industrial partners;

the presence in the proposed district of private relevant stakeholders, i.e industries, willing to establish a joint collaboration with public actors, and whose activity is mainly located in the same regional and local environment;

the existence of a group of individual leaders, with proven experience in the field, belonging to the private and the public partners.

DARE is promoted by all the Universities located in Puglia, the most important national research centres, one bank, local authorities, Business associations and chambers of commerce, private companies operating in the agro food sector (94).

DARE was created to bridge the gap between research and the business world. The business model starts from the understanding of the demand for innovation by SMEs that is then elaborated into realisable projects.

Since its creation, D.A.Re. implemented activities for the benefit of its partners and the overall agrofood market, providing services able to:

rise awareness about innovation trends and opportunities to be grasped by SMEs and research centres;

promote and manage collaborative projects funded by regional, national and European entities;

audit enterprises in order to turn their innovation needs into technological solutions;

encourage private investments to start-up new companies (i.e. academic start-ups);

organise training courses in the field of innovation management;

stimulate new partnerships in order to strengthen multi-disciplinary projects (i.e. Food and health)

In the period between 2006-12, DARE was involved in 69 different projects/R&D/TT contracts for a total amount of 60 million.

DARE is a member of the Italian FoodBest Consortium. The consortium is working for applications call for a Knowledge Innovation Community Food that will be promoted by the European Institute of Technology in 2014. The KIC will represent the Food Cluster of European excellence. The European Consortium also includes Denmark, Holland, France, Germany, England. Adhere to FoodBest Italian University of Bologna, CNR, Trunks, Barilla, Coop Italy, Amadori, Inalca, Granarolo, Bolton Food, Caviro, Carpigiani, Whirlpool, Ferrero-Soremartec, Orogel, Eridania Federalimentare;

DARE is a member of Agrifood Cluster (CL.AN) and is part of its Management and Coordination Board with Federalimentare, ASTER, Fondazione Parco Tecnologico Padano, Tecnogrande SpA,

Technology Cluster for Innovation Agroindustriale of the Molise Region, District Technology and AgroBio fishing eco-friendly of Sicily, Research Consortium for Technological Innovation, Quality and Food Safety Abruzzo, ENEA, CNR, CRA, National Institute of Health, University of Bologna, Barilla, Soremartec, Granarolo, Inalca ICE, Tecnoalimenti, La Sapienza University Cluster Agrifood (CL.A.N.)

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info@darepuglia.it ; +39 0881 779640**DHITECH High Tech Cluster****DHITECH S.c.a.r.l.****High Technology Cluster**

was established in 2005 in the framework of a program agreement signed by the Italian Ministry of Education, University and Research and Apulia Regional Government.

Dhitech is a limited liability consortium of public institutions and private companies that operate in the Apulia Region and carry out joint technological researches.

Its partners are: **Università del Salento; C.N.R. - Consiglio Nazionale delle Ricerche; Università degli studi di Bari; Istituto Italiano di Tecnologia; Politecnico di Bari; Provincia di Lecce; ENGINEERING Ingegneria Informatica Spa; EXPRIVIA Spa; TMicroelectronics Srl; ALENIA AERMACCHI Spa; Nuovo Pignone Srl; TRE Spa - Tozzi Renewable Energy; GE Avio Srl; Clio Spa; Ghimas Spa; LINKS Management and Technology Spa; Ospedale San Raffaele Srl; Confindustria Lecce; NA-IF Srl.**

Our mission

The main mission of the Dhitech is to promote innovation within the regional SME system, in the framework of the regional, national and EU policies thanks to joint activities of public research institutions and private companies.

The aim is to enhance technological transfer and the creation of new high-tech enterprises.

Nowadays, the DHITECH is carrying out its own 2012-2015 Strategic plan, funded by the “PON-Ricerca e Competitività” Program of Italian Ministry of Education, University and Research in accordance with the Apulia Regional Government and within the actions of the European Fund for Regional Development.

The aim of the strategic plan is to promote and organize an “**Ecosystem of Innovative High Tech Entrepreneurship**”, fostering the innovation and technology transfer process and the establishment of start-ups and spin-offs.

Socio-technical systems

On the basis of research partners’ scientific excellence, operating in the main productive areas of the regional economic system, the DHITECH has addressed its activities to the following technological areas:

- Molecular nanotechnologies for Health and Environment;**
- Tissue Engineering for the Regenerative Medicine;**
- Information and Communication Technologies for Products and Services.**

Living Labs

The Dhitech will pursue its goals mainly by means of the Living Labs, where junior and senior researchers, SME, Public institutions and final users work together to define research products, test their effectiveness and evaluate their business capabilities.

A specific Living Lab will be activated in each technical area of the High Technology Cluster.

Three Living Labs are part of the European Network of Living Lab – ENoLL:

- "Puglia Smart Lab" focused on Knowledge Intensive Services.
- "TIE Living Lab" (TECHNOLOGY INNOVATION ECOSYSTEM) an entrepreneurial-minded Community.
- "KLIO Lab" Knowledge-based Lifecycle Innovation.

Education

Within the 2012 – 2015 Strategic Plan, the District is also managing a **II level master school**, involving 61 students with a degree in engineering, physics, chemistry, biology, economics and management. This two years course is based both on educational activities and on-the-job research training.

The professional profile pursued is an **Innovator/Entrepreneur**, able to evaluate the innovation and business capability of research products, in order to transfer them in a high-tech enterprise or to set up a start-up company.

The national and international context

Dhitech’s activities are oriented towards the socio-economic growth of Apulia Region considering both national and EU context.

The **Dhitech** is hence active member of the governance board of the **National Technological Cluster for Smart Communities** and partner of the **National Technological Cluster of Future Manufacturing**.

Following to the new EU program **Horizon 2020**, the Dhitech is carefully focusing on future objectives and establishing new relationships with other European Clusters.

We believe the role of the Dhitech to be effective for several local companies (ICT, Aerospace, Manufacturing, Biomedical, Biotechnology, Electronics, etc) and able to **sustain the economic and social development of the Apulia Region**.

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Di.T.N.E. National Technology District of Energy

The first National Technology Cluster was set up (formed) on August 1, 2008 in Brindisi, by Cittadella della Ricerca. It is based on the excellence of the most important Italian universities, centers of research and some companies actively involved in the sector, willing to invest in the industrial research, and agreed to play an important role for the development of both renewable energy and production of electricity, in Puglia Region. The aim of this cluster is:

- to support in the Energy's field development of research in the productive sectors
- Encouraging technology transfer they need to actually 'national production and international trade
- Promote the link between the world of research, world production of goods and services, the world of credit and land

DiTNE, in synergy with DHITECH (for hi-tech) in Lecce, District of Mechatronics of Bari and DARE of Foggia (for food) , will help to create in Apulia, a public-private research network and technology transfer in the field of energy. DiTNE promotes development and production of new components, constituting in this way, a strong and strategic choice for sustainable industrialization at the national level as well as in the Apulian Region.

The Cluster deals with:

- To support the institutions that promote scientific and technological research to stimulate interest, coordination and the start of events and projects relating to energy both at the national and international level.
- To join all subjects involved in the supply chain of the technologies to harness energetic sources, renewable energies and linked research.
- To support, through scientific and technological excellence, in the Energy's field, development of research, focusing itself on the infrastructural consolidation and technological transfer dealing to the needs and expectations pronounced by national

productive sector operators, as well as European shared strategies for competitiveness, innovation and sustainable development.

- The main research areas are:
 - components and energy conversion systems;
 - CO2 reduction and reuse systems;
 - new technologies for smart grids;
 - innovative components and systems for renewable energy;
 - efficiency and energy saving;

The cluster also proposes to provide strategies, tools and technologies to revitalize the market for renewable energy sources in Italy. It is important to note that renewable energy sources, with their characteristic widely distributed throughout the country, can considerably increase its contribution to the energy balance of the country under the "local energy clusters": in this way founding a National Cluster gets even more importance.

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MEDIS

MEDIS was established on 25th October 2007 by the following members: Politecnico di Bari and Università degli Studi di Bari (public shareholders); Centro Studi Componenti per Veicoli (Bosch) SpA, Confindustria Bari, Getrag SpA, ITEL Telecomunicazioni Srl, Magneti Marelli Powertrain SpA, Masmec Srl, MERMEC SpA (private members); Centro Laser Scarl, Centro Ricerche Fiat Scpa, Sintesi SpA (private research centres). Over the last years the company's structure has changed with the entrance of the National Research Council (CNR) and Università del Salento among the public shareholders and the exit of the private partner Synthesis SpA. The District government structure relies on the limited liability consortium company MEDIS, having the 51% of its registered capital held by the public shareholders as a statutory requirement. It is governed by two bodies: the "Shareholders Assembly" and the "Board of Directors" composed by four components, two expressed by the public shareholders, the other two by the private shareholders. In line with the regional strategy the District is open to the participation of other entities, public and private, operating in Apulia as well as universities, research centers, business organizations, companies or consortia with their own laboratories consistently engaged in mechatronic technology and research. Since its inception MEDIS aims to play a key role in overcoming the main weaknesses of the mechatronics segment of Apulia Region, such as: the lower level of technology compared to the most advanced industrial systems, the small size of the average enterprise, the relatively small size of research activities, the dependence of local industries from external multinational strategies,

positioning relatively peripheral to central Europe and the Asian markets, and production costs significantly higher than competitors in Eastern Europe and outside Europe.

In this view **MEDIS** immediately identifies two strategic action levels:

- Increase the competitiveness of large systems based on external capital, as well as local companies acting on: the scale of production efficiency, higher productivity, product specialization within THE large multinational networks of supply, incremental innovation and quality of the products as well as sufficiently high levels of automation;
- With reference to local companies, boosting the research competitiveness by increasing the quality of the firm (technological level of the products, operation management, reliability), the development of independent capacity to design new projects with consequent enhancement of product specialization, the diversification of markets and the increase in exports.

MEDIS aims at forming a Corporate Research Centre, where business members are committed to play research within the District letting their researchers integrating their skills with those of the public members and researchers by working in close collaboration for the implementation of joint projects. For industrial partners, the presence and collaboration to the research processes of the District means to have a favoured access to high-level talents, the possibility to support their innovation processes profiting of research projects at the technological frontier, as well as to have access to high-quality scientific infrastructure in order to strengthen the capacity of R&D enterprise district, raising the technological level of the offer as well as its differentiation. The action of aggregation performed by MEDIS has three main purposes:

- Making Apulia Region leader in the development of mechatronic research-based products, with a network of scientific excellence in the field of mechatronics technologies, able to compete on a global level (**medium term**);
- Consolidating and developing applied research for production of mechatronic components especially through individual patent titles (**short medium term**);
- Supporting Apulian SMEs developing high added value products based on mechatronics, within the logic of the supply chain, with particular reference to industrial districts (**short term**).

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DTA - Aerospace Technological Cluster

Since its inception **DTA** aims to play a key role to promote innovation and applications of advanced materials for the development of manufacturing (in particular textile clothing-footwear, furniture and stone industry) and construction.

It focuses its activities from the outset, but not uniquely, the following strands and themes of technological research , new technologies and innovative methods for the design and construction of components with advanced materials and structures for aerospace use ; new technologies for components of systems for monitoring and safety in the aerospace industry ; new methods and technologies for the realization of integrated operations management , management of the life cycle of products and infrastructure protection in the aerospace industry ; technologies of aero- turbine engines ; aerospace products and processes of SMEs .

With reference to the aerospace industry, the DTA contributes to:

- Protect and strengthen national technological excellence from the territorial specializations.
- Develop and strengthen national expertise in research and innovation by creating a critical mass of resources for research and technological development in the areas of technology and industrial priority.
- Supporting the competitiveness of Italian companies throughout the supply chain to expand and diversify their customer base globally.
- To promote the development of productive chains is strong in its core markets of aerospace aerospace both adjacent valuing the fall-out technology (especially smart applications).
- Building a "World Class National Aerospace Cluster" by leveraging its experiences and other existing regional districts and skills system of University and Research;
- To support regional governments in the promotion of initiatives to support entrepreneurship and the creation of new jobs.
- To increase the attractiveness of public and private investments and ensure adequate returns in the European funding programs of the national contributions.
- Support the CTNA in positioning itself as the leading European cluster to establish strategic partnerships and long-term with other aerospace cluster in order to support the members in competing effectively on R & D projects at national and international
- Develop and attract a workforce of qualified engineers and researchers internationally.

The aerospace is a sector requiring an high technological content, in which the investments in R&D make up a relevant quota of the expenditure. The aerospace cluster is relevant for the Region not only for the staff and added value, but also for the integration and development of skills, processes and technologies, that are essential for the regional economy as a whole. The commitment of the aerospace industry, to achieve the strict standards required by the global market, is developing

technologies, that are transferred to other production fields often; while the needs of enterprises have stimulated the University to implement R&D activities.

Today, Apulia is one of the Italian regions in which the aerospace industry is too relevant both for the production units and staff. It can boast well-known manufacturing skills and relevant research activities. The total staff exceeds 3,700 units. The 2007 turnover is about 700 euro. Every figure highlights the relevant weight of Apulia out of the national total (about 10%) both in terms of employment and turnover. In the last years, the Apulia aerospace sector has experienced a significant growth phase.

The aeronautical cluster of Apulia is characterized by large and small enterprises, the most part of them is situated in the Brindisi's province. In particular, Apulia is the only Italian region where the various sectors are represented at one time: fixed-wing (Alenia), rotary wing (AgustaWestland), engines (AVIO) and aerospace software (Space Software Italia). They are companies associated to the Finmeccanica Group for the largest part. The largest enterprises employ a total staff of 2,900 (of which over 15% graduates) in plants strategic for their respective brands, and in fact some of them are centres of excellence (manufacturing helicopter structures and components). In recent years, the plants of Grottaglie (TA) of the Alenia Composite, for the production of the new Boeing 787's fuselage components, have been very important performance for the employment point of view with a staff of about 700, whereas the strategic functions are underrepresented. The largest enterprises commit to research activities, with specific regard to material research, have a staff of nearly 400 in the plants of Foggia, Brindisi and Taranto.

The small and medium enterprises operating in the aero-space cluster mainly, have a total staff of 850, including two medium enterprises, Salver and GSE with over 150 staff, four small-to-medium enterprises with about 50 staff and more than a dozen with less than 50 employees. About 50 people deal with R&D activities. Some of these enterprises are able to manage an integrated product and to market it at international level. Instead, others are able to manage just some phases of the production cluster. The enterprises of the aero-space sector, mainly spin-offs of the university, beyond collaborating with the large enterprises, have their own products to offer on the market.

The aero-space research is carried out at the University of Bari, the Polytechnic of Bari and the University of Salento, and also in research centres such as: CETMA, ENEA, CNR-IMM, CNR-ISSIA and Consorzio OPTEL. Considering that much of the research linked to the aero-space cluster indirectly concerns also other fields (in fact, discoveries and applications can affect also other sectors) it is not easy to detect the number of researchers operating in Apulia in the overall aerospace cluster. A very careful analysis has detected about 500 researchers operating in Apulia, and involved directly or indirectly in research activities relating to the all aero-space sector. 300 of these researchers work in the university (200 at the University of Bari and 100 at the University of Lecce) and over 200 at research centres, situated in the province of Brindisi, mainly. The most important research topics are: new materials, sensors, mechanics and engines. Too relevant is the study of space technologies. All these are topics affecting several fields. Among enterprises, the university and research centres, the total number of researchers in Apulia is about 900

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H-BIO

The mission of H-Bio district is to promote the creation of public-private networks in the biotech sector through the provision of documents, studies, position paper, strategic development plans targeted to public and private stakeholders at regional, National and European level.

To support the technology transfer to enhance the economic valorization of the results of scientific and technological research achieved in organizations belonging to the cluster and the development high level training. Promotion of industrial PhD through exchange of trainees between public research laboratories and companies. Training courses related to soft skills such as: patent activities, enterprise creation, quality certification. Support to technology transfer and enterprise development.

It is involved in Italian and European networks, such as **ALISEI** National Life Science Cluster; **PROTEOMICA** – National Network; **IMPRIMAT**--- European Network; **ENCALS**---European Network for the Cure of ALS; **LeukemiaNet**--- European Network of Excellence

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Public-Private Aggregates



INNOVAAL

Public-Private Aggregation for Research, Development, Demonstration and Validation of Innovative Technologies and Services for “Ambient Assisted Living”

INNOVAAL, in its district concept which includes 16 companies and 4 Public Research Institutions, is a 'Public-Private Aggregation recognized and admitted for funding from the Ministry of Education following the selection on the Call "PON for Research and Competitiveness 2007-2013 for Convergence Regions Campania, Puglia, Calabria, Sicily. Notice 713/Ric. Axis I - Support to structural change. Operational Objective: Networks for the strengthening of the scientific-technological potential of Convergence Regions ", with particular reference to" the creation of new Districts and / or Aggregations "

The establishment in Puglia of a Public-Private Aggregation in the field of Advanced Technologies and Services for Ambient Assisted Living, the first in Italy, is largely motivated by interesting boundary conditions for both already implemented policies and industrial and business reality and for the technical and scientific competences already presented in territory. Only favoring the union of public and private components in a logical system, which necessarily includes the Users, it could be able to meet the Technological and Social challenges in the sectors in which the Aggregation will operate.

INNOVAAL combines and integrates:

- i) actors (the so-called "owners of the problem" and able to give directions and make decisions) that are looking for solutions and actively promote the followed approach
- ii) a set of academic partners that have demonstrated significant previous experience in their respective fields and that are crucial to do research and make innovation;
- iii) a set of research organizations with high technological capabilities that facilitate the transition from research to pre-competitive development;
- iv) a large group of companies that ensure the relevance of the developed products and services, having the chance to move towards an emerging market;
- v) a set of non-profit organizations that ensure the involvement and direct contact with the end-user at an early stage of implementation of activities

INNOVAAL will operate in its overall vision, developing business in the ICT sector (in a more innovative and internationally accepted meaning which includes hardware and software) with well-defined themes of Innovative Technologies and Services for AAL, treating and developing advanced technological solutions in operational contexts that consider:

The Society (Living well in the community)

The House and Household Environments (Living well at home)

The Workplace (Living well and Actively at work)

in the following strategic areas and related sectors of action, applications, and issues to be deal with, all stemming from the analysis of user requirements (User Centered Design):

Inclusion

Assistance

Safety

Health and Well-being

INNOVAAL, along with AitAAL (the Italian Association Ambient Assisted Living), both with offices in the Puglia Region, has played a key role in the national territory in coordination actions that led to the formulation of the proposal for the National Technological Cluster "Technologies for Living Ambient (TAV)", "putting in place a **meta-district strategic vision**. An experience that, starting from the work previously initiated to launch a National Technology Platform for Technologies for Quality of Life and Social Innovation (which has allowed to define an Italian roadmap in the field of AAL, reported in the "**First White Paper - AAL in Italy**"), has allowed to strengthen the interactions between different actors in the country and the exchange of good practice between different regions.

In this system alongside other collaborations with high growth potential:

Network of Regional Public Laboratories including, in particular, the Regional Laboratory for the Development of Advanced Sensors and Microsystems (SENS & MICROLAB);

The different type of Districts operating in collateral sectors, including for example:

- Wireless Technology District Turin (Piedmont)
- Technological District Habitech (Trentino Alto Adige)
- Technological District Veneto Nanotech (Veneto)
- Technological District Micro and Nanosystems (Sicily)
- Technological District DHITECH (Apulia)
- The National Cluster "Technologies for Smart Communities".

The participation in the context of the **Italian Association on Ambient Assisted Living (AitAAL)** also provides network sharing with other Italian regions and other national and European structures.

In the European context must also be labeled with the following network initiatives that represent a very effective vehicle for consolidating relations and exchanges in the process of internationalization and weave initiatives at European level:

- The **European Innovation Partnership Active & Healthy Ageing** and the network **CORAL** (Community Of Regions for Assisted Living), inside of which began cooperation in the logic of "Research-Driven Clusters" among European Regions: East Sweden (Sweden), Noord Brabant (Netherlands), Baden Wurttemberg (Germany), Basque Country (Spain)
- **Networking of European Living Labs (ENoLL)**
- **European Alliance for Innovation (EAI)**
- **European Institute of Technology (EIT)**, through the node **ICT Labs**

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TEXTRA - Public-Private Laboratory Innovative materials and technologies for the transport industry

It includes as Public members, ENEA National Agency for new technologies, energy and sustainable economic development , Polytechnic of Milan , University of Salento; as Private ones , Avio SpA , Consortium CALEF , Consortium CETMA , Consortium PROCOMP , MER MEC SpA , with the aim to carry out industrial research activities on innovative materials and technologies for the development of components of transport carriers in the different segments of the railway, automotive, aerospace and ships.

Research activities: application of advanced materials in the transport sector; development of visual information systems for the processes of factory in the transport sector; industrial design services, structural and process engineering, qualification of materials and components, prototyping; promotion of partnership among stakeholders in the transport sector for joint research activities; development of entrepreneurial initiatives for the exploitation of research results

Training activities for researchers specializing in the use of advanced materials for innovative

applications in the field of transport; in the design, development and integration of Visual Information System in the transport sector

Contacts

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RISMA - Public,Private Aggregate for Integrated Research Systems for Environmental Monitoring

To provide services for the prevention of coastal and hydrogeological risk through new monitoring instruments, performing monitoring plans and the construction of physical models.

It is specialized in methods and technologies for the management of natural resources and for the investigation of the morphological evolution of the area and in environmental monitoring and management; measurement instruments; optoelectronic and electronic sensing system development

Research activity in: 1. technologies and methods of investigation of the morphological evolution of the territory (monitoring of landslides, monitoring of the shoreline, monitoring of high coasts, climate monitoring marine weather); 2. methods and technologies for the management of natural resources (monitoring of groundwater, search sands and management tools of artificial beach nourishment) 3. technological development interventions in support of the application areas of intervention (development of sensors and fiber optic sensors, development of sensors and sensor systems in integrated optics, development of communication systems, control and monitoring of sensor networks) **Training activities:** interdisciplinary master's degree in design and management of environmental monitoring systems

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RITMA - Public--Private Aggregate for Innovation & the applications of Advanced Materials in Italian Manufacturing

RITMA cluster is specialised in the following technological areas: pmaterials and bio-based composites, polymer based recycled materials, eco-innovative fabric; multifunctional solutions rotomoulding-based, multifunctional composites, eco-innovative solutions for stone sectors, advanced production systems.

Research activities Development of innovative polymer,based materials, with low environmental impact, and advanced technologies in order to increase the level of innovation and competitiveness of manufacturing industry and construction at national and EU level.

Training activities for researchers specializing in research and development for textile, clothing, footwear and furniture sectors for the acquisition of following knowledge advancements to develop innovative industrial products: methodologies for product development, technical design and prototyping techniques reverse engineering, polymeric materials, composites and fabrics and characterization physicochemical mechanics of materials.

Contacts

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SILAB-DAISY Service Innovation Laboratory by DAISY

To carry out basic, applied and industrial research, experimental development, advanced training and knowledge transfer in the field of information technology and communication, in order to enhance the scientific resources in the region of Puglia and encourage links with scientific institutions in other countries, strengthen the process of technology transfer in business, government and local public bodies and offer competitive conditions for attracting businesses and the strengthening of productive activities highly innovative.

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MBLab – Bioinformatics Laboratory for Molecular Biodiversity

MBLab is born to create a Centre of Excellence in Italy focused on advanced and complex issues relating to biodiversity addressed by bioinformatics tools (mainly with in silico approach) and to provide specialized training high,level (post,graduate and post,doc) in the field of bioinformatics to talented young researchers (graduate and postdoctoral) with a multidisciplinary curriculum.

Its main research activities **are related to**

- the creation of an advanced platform for researchers specializing in the context of clinical applications related to biodiversity and food
- the creation of specialized data also built according to an innovative paradigm (social database)
- Bioinformatics tools for the study of meta genomics
- Tools and methods of bioinformatics for the assessment of biodiversity in the agri-environment quality and traceability
- Tools for assessing biodiversity in human egg cells

Contacts

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Industrial Liason Offices: ILOs

In order to encourage the spread in the region of tools effective in the process of knowledge transfer and to increase the competitiveness of companies by triggering development dynamics through the driving force of technological innovation, the Department of Economic Development of the Region of Puglia has promoted the project "regional network of Industrial Liaison Office (ILO Puglia)" intervention co-financed by the European Union under the ROP Puglia, in order to

- Equip the five Apulian universities of stable offices for the enhancement of their scientific endowment (ILO - Industrial Liaison Office);
- Use the research endowment already available in universities and not yet exploited for product innovation, growth of new business and employment in sectors with a high content of knowledge through patents, licenses and spin-off;
- Increase the impact of the costs of universities in research on overall economic development and entrepreneurship of Puglia and enhance collaboration between public organizations

The model of technology transfer adopted leverages on :

- the central role of universities as the main engine of production of scientific knowledge and as first element of the process of technology transfer;
- the networking of common tools and standardization of procedures for cooperation between universities rationalizing the use of resources;
- a regional network able to coordinate the offices belonging to and sustainable in the long term;
- a stronger role given to the intellectual property in all its forms as a tool to exploit the results of research;
- actions to encourage the creation and especially the growth of spin-off from the research;
- make such offices equipped of a system of negotiation and operational tools for performing operations of Technology Transfer from Research to the market

ILO Office - University of Bari



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