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# Special research&innovation

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# An intelligent European growth

## Special research

Since 2008 Europe has been involved in the global economic crisis: the old continent is not able to keep pace with such countries as Brazil, China and South Korea that, each year, reach higher growth and innovation rates when compared to the European ones. The loss of competitiveness also generates the increase of other social challenges in a social and economic situation that can be defined as stagnating in some of its aspects. It is evident that research and innovation are to be considered as the crucial

assets for the European social development and to reach a greater competitiveness, as scientific and technological progress go hand in hand with the resolution of social challenges. The European Union has reali-

zed the strategic importance of innovation as a factor of growth and international competitiveness and the new 2014-2020 scheduling represents the most concrete answer. Why has the European Commission decided to change its course? “The answer is contained in Europe 2020, affirmed professor Ezio Andreta, President of Apre (Agency for the Promotion of European Research) and, in particular, in the specific will to focus on a new European growth that proves to be “smart”, “sustaina-

PH. APRE



**Ezio Andreta,**  
President of Apre

PH. WARRANT



**Fiorenzo Bellelli,** President  
of Warrant Group

The participation to Horizon 2020, promoting the research through transnational projects between industry and universities, will offer the companies the possibility to reactivate the main enabling and propelling factors of innovation

# &innovation

ble” and “inclusive”, therefore, innovative. The tool specifically designed to carry on this growth is Horizon 2020, the new 2014-2020 framework program for research and innovation that will include the old framework program for technologic research and development (FP7), the old framework program for competition and innovation (Cip) and the European Institution for Innovation and Technology (Eit). Horizon 2020 marks a strong discontinuity with the previous framework program and it is not limited to supporting research but the whole process starting from the idea to the market”. This point of view is also shared by Fiorenzo

Bellelli, President of the advisory company Warrant Group and advisor of Apre. The attendance to Horizon 2020, by promoting the research through transnational projects between industry and universities, will offer the companies the possibility to reactivate the main enabling and propulsive factors of innovation: access to know-how, development of human resources, support to the dimensional growth and strengthening of the network of knowledge. Horizon 2020 should not be seen as a mere opportunity to obtain funds in order to finance one's own current activities, but also a possible strategy for growth and re-collocation”.

The keyword of the new framework program will be “simplification”: this will be turned in simpler rules for attendance, shorter processes of approval, smoother reporting procedures and faster refunds. The support given to the attendance of Smb will have a fundamental importance, thanks to the introduction of a new and ad hoc financial tool that will allow for a support of the entire manufacturing process: starting from the feasibility plan to the entry on the market, to the pilot plant and test, to the marketing activities.



## Innovating to compete in Europ

The University of Bari obtains funds for three research projects

A single university, three important research programs, a total financing of over 30 million euros. the growth of the University of Bari does not stop its soaring towards total excellence in the Italian and European research. Thanks to this new result, with which three among its projects won the Miur (Ministry of Education, University and Research) national bid addressed to the Converging Regions of the South, the path is drawn: the one that involves the competition with the most prestigious universities in Europe. "It is a breath of fresh air for our young researchers, explains the pro-rector Augusto Garuccio, as these funds will allow us to modernise our laboratories and strengthen our research skills on the international field. We are well ahead and we are going to accomplish these changes by 2014". Thanks to these funds, the departments in the areas in which the three projects are developing, biological-medical, physical-

chemical and environmental will be able to rely on a new wind of change, "as technological research is useful only if it represents the state of the art, underlines the pro-rector, and can prove its quality only if it is given all the tools needed to be competitive at an international level". In order to understand to what extent the university of Puglia is already competitive, consider that the Cern team that discovered Higgs' Boson, incorrectly defined as "the particle of God", includes also a team of researchers from Bari who gave their contribution to the project performing a fundamental part of the analysis device which allowed for the discovery. "Over these years the University of Bari invested much on the development of the technological transfer and on innovation, specifies Garruccio, opening new paths and opportunities not only through the creation of spinoffs, but also of technological, production districts as well as laboratories. The technological scien-

tific pole Magna Grecia of Taranto (Pst) was developed under the initiative of scientific institutions, local and production authorities already existing in the city of Taranto, in order to face the environmental emergencies of the city and, more at large, of the Euro Mediterranean area. Thanks to is particularly advanced laboratories and scientific equipment, the technological and scientific pole Magna Grecia is going to propose technologically suitable and innovative solutions aimed at facing the environmental degradation of the involved areas, stimulating new work opportunities for young graduates and engineers involved in the green economy sector. In particular, Pst is going to develop new research and technology in the environmental sector, to favour the new entrepreneurship, mainly young, in the territory of Taranto as far as these technologies are concerned and to involve in this process of development the research national system, benefiting of the fundamental support of both public and private institutions (for example the Municipality, the Province, Asi, Chamber of Commerce, Industry, Handicraft and Agriculture, Industry Association, Environmental District, etc.). The situation of the Taranto area is well known at a national level after the provisions adopted by the local magistrates and the reactions that ensued therefrom. The strong acknowledgement of the issue by the city of Taranto as a whole imposes the definition of a proper relationship between urban and economic development of the city and the preservation of both environment and the health of citizens, as well as of the work of thousands of local emplo-



Augusto Garuccio



**The Castle of Taranto**

years. There is a deep awareness of facing a “serious” patient that must be treated with “proper medicines”. The technological scientific Pole can then represent the “focal point” of this intervention. The intervention of the research system is supposed to involve not only the scientific aspects of air, earth, water pollution, but also the legal, economic, health, socio-cultural aspects and many others. The research system has been operating on the territory of Taranto for about three years (university, polytechnic, Cnr and Arpa) and it proposes the creation of a technological scientific program expressly dedicated to the environment. This pole is currently carrying on the organization of its specialised laboratories and the launch of a master course in the environmental sector. Finally, Laboratorio Sistema is a proposal of intervention aimed at the strengthening of research infrastructures of the Chemistry, Physics, Earth Sciences, geo-environmental and pharmaceutical departments of the University of Bari “Aldo Moro” for the integrated development of sciences and technologies of advanced materials as well as for the development of innovative devices. The



**Mar Piccolo**

strengthening project envisages activities aimed at the acquisition of scientific and technological equipment and at intervention of adjusting of both buildings and plants. The program of activities will lead Sistema Laboratorio to become a regional, national and European reference for the integrated development of science and technologies of materials and devices. The main activities involve the development and characterisation of integrated materials and bio-materials for application in electronics, op-

toelectronics, bioelectronics, sensors, as well as in the pharmaceutical – biomedical and stone fields. The activity connected to the scientific research is also complemented by a training program realised through the activation of two II level master courses. The project envisages a managerial structure with professor Luisa Torsi as responsible of the strengthening project, professor Francesco Fracassi for education relationships and professor Emanuela Schingaro for the training program.

## From waste to raw material: the biotech frontiers of agroenergy



The European project of the University of Foggia



A multi-disciplinary group of researchers, an ambitious project that moves forwards the agroenergy frontiers, opening to opportunities that could highly influence the social, economic and environmental sphere. It is called Star\*AgroEnergy and it is the feather in the cap of research at the University of Foggia: the European project, afferent to the 7th Framework Program, entered its third and final year of activity, reaching the maximum number of researchers

envisaged in the team. Today there are 14 members involved, from different countries and fields, and in the following months they are supposed to work on the development of local bio-economics, agroenergies and green chemistry in order to obtain renewable energy from production activities that are complementary to agriculture. "We aim at valuing the raw materials with an agrarian origin, deriving not only from dedicated cultivations, but more and more from agricultural residues and agrobusiness byproducts, explains professor Massimo Monteleone, favouring an integrated model of rural development". Biomasses are at the core of a new system focused on the recovery of waste to reduce the emission sources responsible for the climate alteration and to reach a positive energy balance. The European Union shares these two priorities and it granted Star\*AgroEnergy funding equal to 3.5 million euros, allowing for a strengthening of the research facilities, with the creation of a laboratory and a technological platform, as well as the increase of the bonds with the territory "in order to understand the needs for innovation and direct the strategies so as to support the launch in this sector".



## Research and innovation for health and nutrition

The University of Palermo is working in agriculture, veterinary and food farming industries

The "Plass" platform, Platform for Agrofood Science and Safety, financed as part of the Pon Conv Fesr Ricerca e Competitività program, through the University of Palermo, the Cra and the University of Foggia, has the aim of creating a widespread multidisciplinary scientific-technological network, dedicated to nutrition and health through infrastructural strengthening and a more efficient interaction between research facilities in the medical sciences, agricultural, veterinary and food farming industries of the Regions. Plass offers itself as a national hub for a European research infrastructure in strategic

sectors within the Eu (nutrition and food safety). Economic effects for the regions, working in the agricultural and agroindustrial sectors, are expected in terms of innovative products and processes in the context of a bio-based economy. Plass's strategic goals are: to reinforce the facilities through the purchase of new equipment; to protect research potential (new food formulations, main ingredients, pharmaceuticals and diagnostics of health and consumer safety); to stimulate the foundation of innova-



tive businesses (spin-offs and start-ups); to improve competitiveness in the productive world, in connection with high technology districts and their networks; to create a hub for European infrastructure; to invest on training qualified personnel in the Research and Technology Transfer industry. University of Palermo participates in Plass through its departments of Agricultural and Forestry Sciences, Bio-Chemical and Pharmaceutical Sciences, Chemical, Management, Mechanical Engineering, and Land and Sea Sciences.





# University and business: networking for innovation

Life science, the pride and joy of the University of Pavia

Text by **Lodovica Bulian**

**F**ifty financed European programs in all disciplines, including Life Sciences and Ict. This is the oldest university in Lombardia and one of the oldest in Europe: yet, notwithstanding its classic origins, the University of Pavia has been taking, for some time, the path of innovation and research, in its mission aimed at knowledge transfer and technological development. Together with their portfolio of international patents and their transversal cooperation in science with industries, they founded in February 2007, together with the Chamber of Commerce, the Municipality and the Province of Pavia, the company Polo Tecnologico Servizi Srl (PTS): this is a portal aimed at the interaction between research and market, which aims at accelerating the growth of the local and national production systems promoting the founding and development of new innovative enterprise and favouring the foundation of high research density enterprise. “Besides stimulating cooperative processes between business and university, the Polo Tecnologico aims at promoting advanced training supplying gratifying professional opportunities to graduates and post-docs”, explains professor Rino Cella, department of Biology and Biotechnology. A direct expression of the quality of the research within the university are the 23 accredited spin-off businesses, of which 9 were founded in 2012, working in life sciences, pharmaceuticals, Ict as well as industry and clean-tech.

Indeed, “in 2011 and 2012 the University of Pavia proved that it strongly believed in technology transfer as a springboard to industrial development, directly investing a share of capital in two university spin-offs”, notes Cella. The University is also one of the main players in the foundation of the Parco tecnico scientifico di scienze e tecnologie per la vita, winner of the Aster competition “Agreements on Territorial Development for New Enterprise”: a project aimed at improving the networking of business, research centres and health facilities in the area; indeed life sciences, scien-

ce & technology based activities and intensive research, by nature “must benefit from the close and active cooperation between the worlds of business and research”. Furthermore, in Pavia there is also the private technological area Durabo, a forerunner in Ict which acts as a complementary centre for businesses interested in investing in innovation. “The university in Pavia - explains Cella - is like a tank full of knowledge, research and human sources characterized by a qualified combination of graduates, post-docs, and researchers available to businesses who want to work on innovation”.



PH. LAILA POZZO

Central building of the University of Pavia

## Joining the Trentino WU 2013 with the local university

Companies and universities get together through sports and innovation

An important international showcase awaits Italy and the region of Trentino with the 26th Winter Universiade, to be held from 11 to 21 December 2013. The event will feature 61 participating countries with over 4,000 college athletes. The Universiade: an international sporting event second only to the Olympics in terms of the number of sports disciplines and organizational complexity. For this grand event, the University of Trento is taking the lead on several fronts, from designing the torch to dealing with the funding and coordination of 7 research projects in the field of engineering, Ict and management, and



organizing an international conference. The “International Interdisciplinary Conference on University Sport: Inspiring Innovation”, to be held in Rovereto on 9 and 10 December, before the games begin, will gather world-class experts at the prestigious Mart (Museum of Modern and Contemporary Art) with the aim of exploring the role of college sports in supporting innovation and the social and technological challenges of the globalised world over the next decade. The theme will be investigated from three different perspectives: research, education and career. Alongside the participating companies, the European Institute on Innovation and Technology (Eit) has also become an active partner of the university, after establishing one of its six Ict Labs in Trento a few years ago. More detailed information is available on the website [www.conference2013@universiadetrentino.org](http://www.conference2013@universiadetrentino.org)

## More Europe and more innovation

The growth of Friuli Venezia Giulia starts from here

Text by **Lodovica Bullian**

“The commitment is to put innovations on the market, to effectively apply the results of research work. Especially in a territory like ours, where innovation must be the value added to lead both the more consolidated sectors as well as the emergent ones out of the crisis, attracting new business opportunities. The goal is to create more enterprise, more jobs, more wealth”. Sergio Bolzonello, vice president of Regione Friuli Venezia Giulia has very clear ideas about this: the research and industry combination represents the fuel to start up growth again, also at a local level. But to feed it, the opportunities offered by community funding must be exploited to the full. “We must improve our capacity to participate to the European calls for proposals, especially in view of the imminent Horizon 2020 framework programme”, declares Bolzonello. And if Europe indicates the road to innovation then Friuli Venezia Giulia is ready to tread it, starting

from the creation of favourable conditions for the installation of new industries. And this is why “innovation must be stimulated in all sectors – specifies the vice president – above all incentivizing projects entailing aggregation between enterprises, through the network contract format”. But it is by way of a strong accelerated boost to develop the logistic system, together with an advantageous geographical position, that Friuli Venezia Giulia has, with determination, taken the path towards the internationalization of its economic and productive system, as an antidote to the sluggish domestic economic scenario.





# Ferrara: a high-productivity scientific Academy

Unife increasingly oriented toward the search for excellence, directed at the international panorama

The University of Ferrara, one of Italy's oldest founded in 1391, counts around 18,000 students, more than half of whom off campus and around a thousand foreign, and offers a very wide range of courses. Ferrara is a real university town that has made specific urban development choices and established the European network of university town called Unitown to promote shared initiatives and positive relations with the townsfolk. The University considers research as its major strategic activity, and the results achieved in this sector have brought it both national and international prestige. According to the 2004-2010 Quality of Research Assessment report (Vqr) by Anvur, Agenzia Nazionale di Valutazione del Sistema Universitario e della Ricerca, among Italy's medium sized universities Unife is classified third in the field of research. The University also boasts a high level of scientific production, producing high quality research products, demon-

strated by the excellent assessments received by each of the individual faculties. For example: in the classification by segment, the Geosciences area of the Physics and Geosciences Department is first out of 26 and overall third out of 48; the Medical Sciences Department, biological sciences area, is first in the Region, along with the Engineering (civil, industrial and IT) and Law Departments. The University's Economics and Management Department (juridical sciences, economics and statistics) are second in the Region. "The Anvur report – affirms Rector Pasquale Nappi – confirms the excellence of the research conducted here and how Ferrara is becoming the ideal place for establishing high quality study programs, through its ongoing process of integration with some of the most advanced international level research. Results that show the measure of the work the University of Ferrara is doing, despite immense national scale problems, to assure the highest standards of re-

search. The results of the Vqr report will also be used by the Ministry of Education, Universities and Research (Miur) as the basis for distribution of 90% of the Universities Ordinary Financing Fund (FFO) quota for research for the year 2013". In the field of international research, there are 40 projects established under the 7th European Union Research and Development Framework Program (2007-2013), compared to 17 under the 6th Framework Program (2002-2006), which bring Ferrara a total of almost 9.1 million Euro in research funding. In the passage from the 6th to the 7th Program the number of projects co-financed by the European Union has more than doubled. This is a further demonstration of how Unife is orienting not only its strategic policies, but its search for scientific excellence even more toward the international scientific panorama, confirming itself as a University that while internationally competitive, is deeply rooted in its territory.



The university campus

PH: VIDEO MASTER MULTIMEDIA

# A new horizon for research

Horizon 2020: Italy's challenge after 25 years

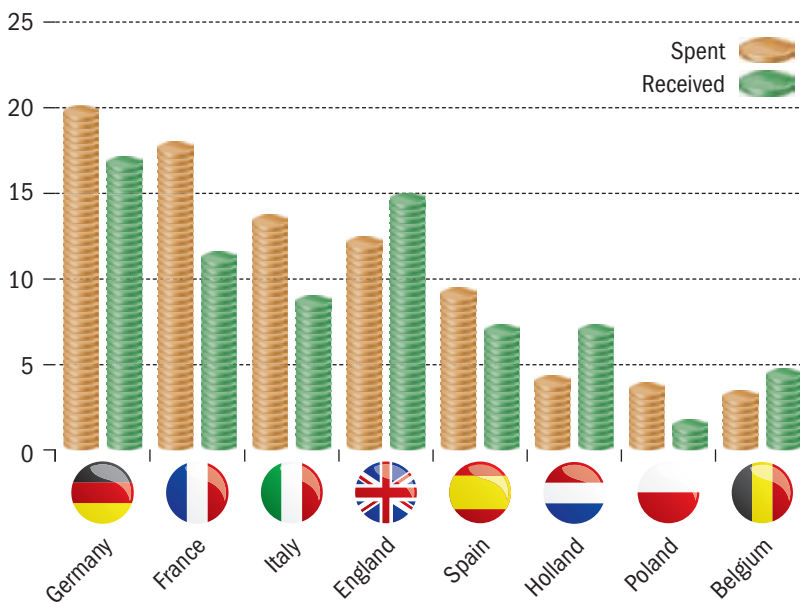


**G**rowth, profitability and competitiveness are the pillars of the strategy of any business, from the smallest working on a local scale to the biggest operating on a global scale. And it is now common knowledge that said factors depend on the capacity of a business to introduce innovative solutions for products or services on the market having the capacity to attract actual or potential customers. Italian enterprises are on the market, often with success, thanks to their innovative expertise in terms of design, creativity and flexibility. But the global market is being increasingly dominated by enterprises and economic systems that give pride of place to impressive scientific-technological innovative factors. Italian legislation has put important

financial facilities for Research and Development into the field over the last decade, as a support, and at times essential, to accomplish these activities: but rarely have these facilities been engines to drive innovation. On the other hand, we are experiencing a situation under certain aspects in the reverse at a European level: community research funds have in fact always been oriented towards scientific excellence, technological innovation and international cooperation, but have been an obstacle which Italian enterprises have too often been unable to surmount. The last page of a 25 year long story will be written on 31 December 2013, with the conclusion of the VII European Union Framework Programme. It has been an important story recognizing

Italy with projects of absolute excellence, but the country system could certainly have done better. During this period of time Italy, off to an early start with the Europe of 9 and now at 28, has never been able to compensate for all the investments it made. The balance between funded projects and costs born by the country with its contribution towards the overall budget of the Framework Programme has always been negative. On a macro scale, this means that for 25 years Italy has contributed towards funding the research of its competitors all around Europe. We must wait until 1 January 2014, for the kick-off of a new challenge and a new seven-year period of research and innovation, such being the day when Horizon 2020 officially begins and which, with an endowment worth 72.2 billion, will inaugurate a new programme of integrated funding intended for the activity of research, development and demonstrated innovation. Our enterprises must certainly consider this conspicuous endowment as an opportunity for funding but above all as an essential engine to drive innovation, to rapidly transform district economy into that of the networks through cooperation in research. Horizon 2020 will be funding 100% of the research work and 70% of the innovation activities for capital account, to all the participants. Said sum will be paid as a down payment before the projects have officially begun, with a quota equalling 40%: said quota being renewed with the state of progress of the works. Ta-

## Percentage of European budget received and spent





king heed of these twenty-five years, Italy must face this new challenge by benefiting by experts, with the intention of not submitting many proposals but of better quality. “There are two basic ingredients for facing this test: start in time and tackle the challenges with passion and determination, the same passion and determination one shows when coping with the routine work of everyday”, these words were uttered by Isella Vicini, specialized in European projects since the IPQ (1985-1989) and current manager of the European Funding Division (EFD), at Casalecchio di Reno (Bologna), one of the seven business areas in the Warrant Group, which has been providing assistance for access to the principal European programmes for funding since 2008. The European Cooperation projects normally start from the intuitions of an individual party, academic or industrial whatever, in reply to a call for proposal published annually by the European Union covering pre-established priority issues. “The success of a project is linked with the best scientific solution, the best team put into the field, the economic and scientific impact expected upon completing the project and lastly the cost bud-

get. Satisfying all these aspects in an organic manner, setting up the best possible European team, is not something that can be improvised during ones spare time. Each project must have a scientific coordinator, one or more core-partners and at least two end-users. Consortia must be international and comprise at least 3 of the 28 member countries. It is therefore no wonder that the best performing countri-

es in fact benefit by consultancy companies or experts in European projects able to play all three roles in the research projects. EFD can boast a rate of success exceeding the domestic average over the last year, particularly focused on the NMP (nanotechnology, materials and productions), energy, environment, food and ICT (Information Communication Technology) issues.

#### **European Funding Division - EFD:**

Set up in 2008 and managed by Isella Vinci, the European Funding Division (EFD) at the Warrant Group offers assistance to private and public organizations, at a domestic or international level, for European Project planning, design, definition, submission and project management. The team comprises 10 resources coming from the industrial, academic, public and consultancy sectors with scientific, academic or legal education, attached to the offices in Casalecchio di Reno (Bologna), Correggio (Reggio Emilia), Roma, Bergamo and Brussels. The three roles played by EFD in developing European projects are: coordinator (administrative and financial), partner and consultant. It has been on the board of directors of Apre - Agenzia per la Promozione della Ricerca Europea since 2009.

#### **Warrant Group:**

Founded by Fiorenzo Bellelli in 1995 at Correggio, a small town in the province of Reggio Emilia, Warrant Group lends assistance to enterprises in the financial consultation sector. WG offers a careful programming of research and innovation projects, commercial and productive internationalization and selection of an appropriate financial instrument, either facilitated or standard. “Officina dell'innovazione” a non-profit consortium and research body, was set up by them in October 2013.

## The Ecosole project

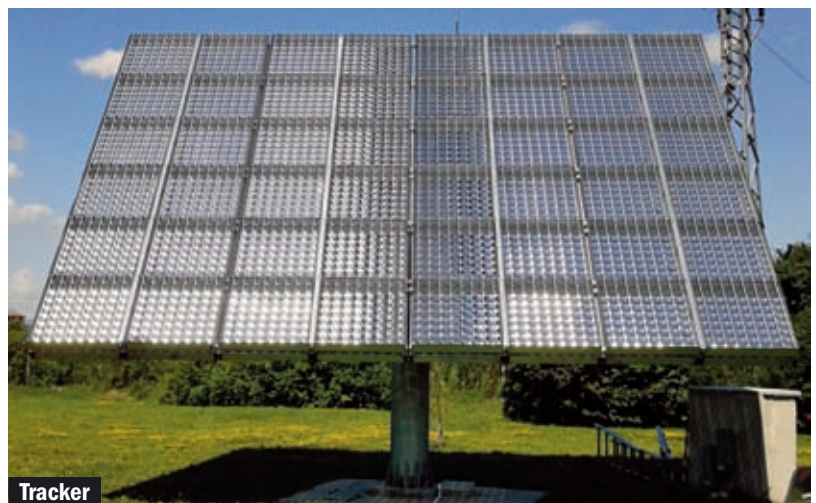
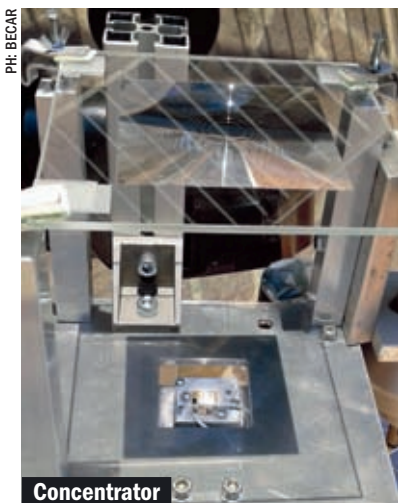


From Becar (Beghelli Group) high concentration photovoltaic generators

The Ecosole project is focused on design, development, industrial prototyping and field experimentation of high solar concentration photovoltaic generators. The purpose of the project is to demonstrate the competitiveness of the Hcpv (High Concentration Photovoltaic), through the use of photovoltaic cells with high conversion efficiency and high concentration factor (>1000X), the effective production of photovoltaic modules, construction of self-adapting solar trackers and power conversion optimization. High concentration photovoltaic generators offer great advantages when building large-sized solar farms in geographical regions with a high direct insulation (such as desertified areas). The advantage of these systems as against standard photovoltaic systems derives from a greater conversion efficiency (+50%), improved exploitation of the surface area due to a high yield, simple, rapid installation of large solar farms without the necessity of cooling water, power generated continually throughout

the insulation hours, possibility of using the land where the installation stands in other ways. The Ecosole project is coordinated by Becar Srl, a research and development company in the Beghelli Group already operating for several years in the photovoltaic sector, in a consortium comprising famed European research institutes and enterprises: Enea (Portici solar research centre in Napoli), Universidad Politecnica di Madrid Upm (solar research centre in Madrid), Fundacion Tecnalia Spagnola (alternative Energy R&I), Ben Gurion University Israel (Pv research centre Negev desert), German Oec AG (optical design), German Evonik Industries AG (optical component production), Plamtex Slovenia (plastic moulding) and Aurel Spa (hybrid technology development). The European Funding Division at Warrant Group has been working as a consultant since the project's concept and still assists the consortia in project management. The new high concentration photovoltaic module comprises 72 high performing cells (>40%) on which

glass special lenses concentrate the sun over 1,000 times. Each module has a power of about 200W. Over 120 modules, with peak power exceeding 25kW, are assembled on a solar tracker, measuring about 110 square metres, on a pole that keeps them aligned with the sun with an angular precision grade of less than a tenth. Energy is converted by innovative devices rendering the numerous modules independent one from the other to guarantee maximum production under all conditions. Trackers can be easily installed as a matrix on all types of land, rapidly building plants with a range of MW power. The project, the only one led by Italians and classified in first place amongst the 12 projects funded by the call Energy2011, is valid for 3 years, ends in the second half of 2015, is co-funded by the European Union under the VII Framework Programme (Ener/FP7/295985) and is entitled "Elevated Concentration photovoltaic solar energy generator and fully automated machinery for high throughput manufacturing and testing".



# The Helm project challenges production

Italia at the forefront in ceramic composites technology



Born from an idea by professor Andrea Lazzeri, research professor at the University of Pisa civil and industrial engineering department and manager of the Instm (National Interuniversity Consortium of Materials Science and Technology) unit, the Helm project challenges the latest manufacturing technology bringing improvements to quality, production and costs of low density ceramics; materials that, in strategic industrial sectors like transport and energy, represent a highly promising innovation. The protagonists of this avant-garde project are the radiofrequencies, microwaves and high-frequency electromagnetic heating methods that are soon to replace the currently used traditional production procedures and estimated to reduce overall production times by around 60%. The idea of Helm was innovative enough to have it selected at the first stage of the 7PQ Call-2011, from among 162 proposals in the nanotechnology sector: the only project backed by twenty international companies with exclusively Italian coordination and direction. Indeed, the Pisa Instm is the Group leader with the support of the Warrant Group as administrative coordinator and project dissemination and exploitation manager. “The consortium working on the Helm project – comments professor Andrea Lazzeri – is an extraordinary example of cooperation between universities, research centres and industry, which includes several small/medium businesses. With the synergy of these strengths we’re achieving significant results in scientific fields that have direct applications in industry. And on this level, Helm is absolutely strategic: the demands of industry and the market are the main drivers in the development of high-frequency electro-magnetic thermal tech-

nology. Helm is targeted at the most important niche markets for C/SiC or SiC/SiC and EG composites. CmC are advanced materials in which Euro-

pe has global leadership. Industry needs new solutions to stay competitive: the market demands high-performance, low-cost products”.

The Helm project sets out to study and demonstrate new industrial solutions and manufacturing processes to reduce production times and costs and improve the quality and performance of advanced ceramic materials, such as light ceramics and fibre-reinforced ceramic composites

**Project name:** High-Frequency Electro-Magnetic Technologies for Advanced Processing of Ceramic Matrix Composites and Graphite Expansion.

**Number:** 280464

**Call:** Nmp.2011.4.0-1

**Duration:** 36 months

**Starting date:** 1st June 2012

**Co-financing:** 7,151,000 Euro

**Topic:** Fp7-Nmp

**Coordinator:** National Interuniversity Consortium of Materials Science and Technology

**Partners:** CNR (National Research Council), Supsi (The University of Applied Sciences and Arts of Southern Switzerland); Schunk Kohlenstoff-Technik GmbH; Herakles Sa; Warrant Group Srl; Sairem Iberica Sl; Eads Deutschland GmbH; Fundacion Tecnalia Research & Innovation; Archer Technicoat Limited; Erbicol Sa; Fricke Und Malah Microwave Technology GmbH; Baltic State Technical University Voennmekh Named After D.F. Ustinov; Brembo Sgl Carbon Ceramic Brakes Spa; Cvt GmbH & Co Kg; Fundacion Circe Centro de Investigacion de Recursos y Consumos Energeticos; S necma Propulsion Solide; Timcal Sa; Universidad de Alicante; Steinbeis Advanced Risk Technologies GmbH; Petroceramics Spa

**Website:** [www.Helm-Project.Eu/](http://www.Helm-Project.Eu/)

**What is INSTM?** The National Interuniversity Consortium of Materials Science and Technology (Instm) has been an affirmed reality in the field of national and international research for more than 20 years. In Italia it is the largest of the interuniversity consortiums, grouping together 45 universities, in practical terms all those that conduct research on advanced materials and related technology. What the Consortium does is bring together and concentrate the efforts of individual research groups to achieve the ‘critical mass’ of interdisciplinary skills capable of taking on highly competitive innovative research projects, as well as acting as an authoritative point of reference capable of attracting funding for the universities and the dissemination of information on material science and technology and innovation in general. The success of this strategy is confirmed by the large number and quality of the national and international projects in which Instm has taken part. To date, the Consortium has taken part in 225 projects, 83 of which financed by the UE (including Helm), distributed equally between the IV, V, VI and VII Framework Programs. In the VII Framework Program, Instm has a 17.56% share of the financed projects, one percentage point above the national average.



## The Italian innovation winning in Europe



Newspec, namely 13 companies grouped in a big consortium, will begin their business in December

Text by **Lodovica Bulian**



**F**or the first time the made-in-Italy research and innovation stand out in Europe: this happened thanks to Newspec (New cost-effective and sustainable polyethylene based carbon fiber for market volume applications, no. 604168), the Brembo project that has won the first place in the ranking of candidates admitted to co-financing by the European Union Commission as part of nanoscience, nanotechnology, materials and new production technology, of the VII Framework Programme for innovation and technological development. Newspec will start on December 1 and is an Italian victory, sprung and grown within a great Italian excellence, a crossroads of international know-how, knowledge and innovation: **Kilometro Rosso**, the science and technology park at the outskirts of Bergamo, which houses the alive engine of Newspec, Brembo Spa, and Warrant Group, which is responsible for coordinating the scien-



**Roberto Vavassori**

PH: BREMBO

tific project.

In fact, Newspec, which bears the colours of the Italian Brembo, was born from the needs and demands of its various partners, and comes after another important success: Helm, the other project that has received the European funding to reduce the time and the energy consumption in the processing of the

ceramic compounds, with an extension of its applications in areas hitherto neglected. Now the reflectors are all focused on the Consortium established for Newspec, which, guided by Roberto Vavassori of Brembo, involved 13 companies belonging to 7 Eu Member States that in the next four years, with a budget of 7.4 million Euro, will work together to develop new carbon fibres, currently very little used as expensive, starting from cheapest polymers such as polyethylene, which is a sustainable and low-cost material. This material is composed by 70% of carbon and has technical characteristics of high workability and flexibility and in addition it is currently one of the most competitive materials on the market. This innovative process wants to make it more accessible the use of carbon fibres, thus responding to the transverse requests from different industries, from avionics to automotive, wind and the sportsman fields.





The so many and multiple application outcomes will involve such an achievement to have convinced Bruxelles to consider the Newspec as the first project, in its purpose, worthy of the Eu funding. "To obtain the authorization from Europe, the scientific technological valence must combine with a team of excellences – Isella Vicini, the Director

es to be known in Europe. "We will study the application of this carbon fibre within the ceramic composite products - Professor Massimiliano Valle, the managing director of the company, states -. Working to these large-scale projects, our ambition is to make a major leap, using our know-how to do more and more business, expanding within the in-

industry and in the production of energy. "In parallel with the research contracts with the client companies, Petroceramics wants to bet on strengthening its know-how, on which it continues to invest independently. "25% of our turnover comes from ideas and innovation developed internally. Progressively, we aimed at enhancing the skill-



of the European Founding Division of the Warrant Group says. So it's required a structured and heterogeneous network of relations to be able to set up a credible and successful project. Yet finding companies or excellent research centres in Italia is not so difficult; the important is to be able to coordinate the efforts, and especially begin searching these companies in advance." An important role related to the selection of materials will be that of Petroceramics, the spinoff company from the avant-garde academic research of the Università Statale di Milano, now settled within Kilometro Rosso. Even if it is already a point of reference in the study of materials for braking systems, for which it boasts a strategic partnership with Brembo and with Brembo Ceramic Brake Systems Spa, and ceramic components for the manufacturing and aviation industry, thanks to Newspec, Petroceramics looks beyond the national boundari-

ternational market. Following this project we have strengthened our organization, recruiting some new highly qualified roles. The new materials are one of the main cornerstones of innovation in almost all the fields of technology and the ceramic composites play for a long time a leading role in the automotive, avionics, sensors, biomedical

Is gained and financed in-house, filing 6 patents in the last three years and, in some cases, progressively manufacturing high added value components. To maintain this level, we believe it's essential to be settled in an important technology park and stay included in the main circuits of the national and international research."



Il laboratorio Petroceramics

PH: MARIA ZANCHI



## Carbon fibre: Italian cutting edge technology

The Lamborghini super sport car excellence enter the arena for the Newspec project

Text by **Lodovica Bulian** - Photo by **Cristiano Frasca**

In the Group of 13 enterprises called to implement the intuition of Newspec (“New cost-effective and sustainable polyethylene based carbon fibres for volume market applications”, project nr. 604168), there is an absolute spearhead in the development, production and application of carbon fibre materials. Its identity guarantees lightness, power and innovation; its research goes beyond sector limits to sprint at the pace of aerospace research: this is the way nowadays Lamborghini dictates the rules of perfection, concept, design and technology. Carbon fibre, a synonym of cutting edge technology and dynamism, is the material with which, 30 years ago, the parent company of Sant’Agata Bolognese revolutionised the history

of the sector, rewriting its parameters and transforming the wall separating 0 from 100 kilometres per hour into a faint and thin border, capable of crumbling in something less than three seconds. Because, in the selective universe of the super sport cars, today excellence is decided by the power-to-weight ratio, which Lamborghini researches and cultivates since 1983, when it first introduced carbon fibre components in its production. The added value that the know-how of Lamborghini shall bring to the European Newspec project shall be the analysis and comparison of materials alternative to Pan, the one currently used to manufacture carbon fibre: the company, in fact, with its two development centres, the Seattle lab in the United States (Acsl

- Advanced Composite Structures Laboratory), site of the osmosis between aerospace and automotive industries, and the research centre in Sant’Agata (Acrc - Advanced Composite Research Center), is a world leader in the research on composite materials, with partners like the Boeing aerospace giant and the Washington University. “The objective, with the scientific co-ordination of Warrant Group Srl within the ambit of Newspec, shall be finding alternative solutions to the production processes for carbon fibre - explains Luciano De Oto, director of the Advanced Composite Research Centre - to reduce both the costs of the raw material and the environmental impact of the production processes. Our task, therefore, shall consist of identifying precursors, evaluate and compare them, from laboratory tests up to verifications in 1:1 scale”. Because, De Oto emphasizes, “to be able to compress the variable costs of carbon fibre should open the way for remarkable advantages in terms of global competitiveness”. Lamborghini, the repository of international patents, is the sole company in the world fully managing in-house the complex process of the production of carbon fibre reinforced composite materials, from design to prototyping, from test and validation procedures to mass production. “We are not an university, but – De Oto states – architects of change. Since our first experiments with carbon fibres the world has changed, and today the use of composite materials has become widespread. The power-to-weight ratio remains our excellence - he specifies - innovation is played through strict parameters; outside them you are excluded from world competition”.



Luciano De Oto

# For a sustainable development of the planet

The Efeve project: from Bonfiglioli solutions with a high technological content

With co-financing from the European Union for the VIIth Framework Program under the heading FoF “Factories of the Future”, the Efeve Project (Development of a new Technological Energetic, Flexible, Economical, Versatile, and Ecological process to make super strong and lightweight components, n.Fof/NMP/2012/7-314582) is the European project for nanosciences, nanotechnologies, materials, and new technologies of production, dedicated to the theme of the development of innovative technique to forge/cast through the experimentation of an unpublished process of “Squeeze Casting”. Starting off on November 1, 2012 and carried out by a consortium composed of 5 Pme, 7 big companies, and 3 institutes of research, Efeve focuses on the development of nano-reinforced alloys of aluminum and magnesium, and the related casting and molding process. Even though the idea was totally European, the challenge launched by it is global, in that it refers to the manufacturing sector;



that of casting, which across the globe counts over 7 million companies and employs circa 8% of the active population. Efeve proposes to make a heavy contribution to the increase in energy efficiency in the manufacturing sector, responsible for 36% of CO2 emissions at global level and 1/3 of energy consumption. The project is coordinated with Tecnalìa, one of the main research centers, and transfers technology to Spain in collaboration with Efd of the Warrant Group, which, in addition to supplying support for the administrative and financial management also carries out the role of dissemination and exploitation manager. In addition to the Warrant Group, the Ita-



Fausto Carboni

lian companies involved in the project are: Bonfiglioli riduttori, Modelleria Brambilla, and Imprìma costruzioni. The company Bonfiglioli Riduttori Srl – founded in 1956 on an idea by entrepreneur, Clementino Bonfiglioli – designs and carries out innovative and reliable solutions for the control and transmission of power in the industry and in the operating machines that are semi-moving and for renewable energy,

promoting across the world a sustainable and shared development, through a dynamic service, that is responsible, punctual, and close to the client. The ability to identify new opportunities for insertion into new markets like the electro-movable (in that it is hybrid and the electrical becomes the thrusters required by stringent laws), along with the knowledge that respect for the environment is a very important priority, constitute some the characteristic traits of the company. “These choices - underlines Fausto Carboni, general manager of the business unit Mobile&Wind – are accompanied by a specific company organization in

the diverse business units (industrial, moving machines earth-wind and solar) offering responses to the diverse markets maintaining unaltered the high level of experimental intervention in the complex industrial applications in the great windmills of the North Sea and in the great solar plants of the world. Thousands of applications in diverse fields and in all the countries of the world, make it necessary to have a flexibility of thought able to re-elaborate and improve that which has been acquired without being contented ever with the level reached. In the Efeve Project, Bonfiglioli has the responsibility to support the demonstration of the new technology developed by applying it to a significant component using the wind sector, in particular the body of an adaptor was chosen, used to control the positioning of the pitch drive of a wind turbine of 1.5 MW. Bonfiglioli will also be responsible for the study of material and the physical mechanical and functional characteristics of the components, from the tests in the laboratory that are necessary for the validation, just as in the process of the production of the same.



## Modelling the future



For over fifty years serving the automotive industry

For three generations Modelleria Brambilla has been designing and making quality equipment for the production in series of casting for aluminium and cast iron foundries. Founded in Carpi (Modena) in 1951 by Eugenio Brambilla (who had already been working in the industry since 1930), it moved to Correggio (Reggio Emilia) in 1990. The property is owned by the brothers Aldo and Giancarlo Brambilla, whose children also work in the company, ensuring continuity. From artisanal activity the Modelleria Brambilla evolved into a business producing and exporting all over the world, working mainly for the automotive industry and for the motorcycle market. Molds, core boxes and models designed and produced by Modelleria Brambilla are used for the production of cylinder heads, engine basements, gear boxes, collectors and other complex casts for competition-level propulsion systems, for series or industrial vehicles. Among their clients are BMW, Ferrari, General Motors, Teksid (Fiat Group) and indirectly, through high-technology foundries, Ford, Volkswagen

and other important automobile companies at a world-wide level. The participation of Modelleria Brambilla in the Efeve project is part of the company policy to keep a high and updated level of product technology, which represents a fundamental component for the development and continuity of the company. "When the people from Warrant suggested we enter the Efeve consortium - says Giancarlo Brambilla - even before the economic and financial aspects, I was attracted by the opportunity to expand our network with good prospects for our international marketing. I was also impressed by the possibility of setting up fruitful new projects with partners, which I hope will continue well beyond the project. Last but not least, I was fascinated by the possibilities of finding out about emerging technology and the opportunity of cooperating with universities and international centres of excellence. I hope that I can also add to this list of positive outcomes from this project new markets, maybe even highly specialized niche markets and integration of our current production".



PH: BRAMBILLA

Aldo and Giancarlo Brambilla

## New generation constructions



The management of construction sites in response to market needs



Imprima Costruzioni is a construction company at a worldwide level, together with a young and closeknit staff driven by effort, passion and professionalism. Thanks to this, the company, founded in 2001, has become the full expression of a new generation of businesses, inspired by criteria such as efficiency, quality and safety. "Imprima fully interprets the two key aspects of a construction company: the management of construction sites and market needs", these are the words of the two owners, Lazzaro Gilberti and Diego Torri, who brought together their experiences and abilities, involving technical personnel and workers in the growth, leading the company to develop and consolidate close relationships with important entre-

preneurs. But at the same time, the objective of Imprima is also to expand its horizons and interests through the participation, research and development of research projects at a European level. Participation in the Efeve project represents for the company the maximum fulfillment of this goal, participating in change, and developing innovation in the field of construction. In the Efeve project, Imprima Costruzioni, as the only representative of the construction industry, is carrying out a technical support role in the component development of the sector, in the more general research and development of new processing techniques, in fusion in foundries and, lastly, in the development of innovative aluminium alloys.

## The ProEbike project



The story of a passion



The staff at Cicli Lombardo

PH. CICLI LOMBARDO

he managed to make a hundred. Today, over 60 years have passed and Gaspare's passion has been passed on to all of his family. Bicycles at Cicli Lombardo Spa are now produced at 500 per day, and they involved the whole workforce of the tiny village of Buseto Palizzolo, in the Province of Trapani. This is how Emilio, Gaspare's son, accepted the invitation offered to them by the Warrant Group asking them to be partners in a brand-new consortium and decided to venture into the ProEbike (644759), the European Iee project- Intelligent Energy Europe, which is working to demonstrate and test across Europe the intelligent use of electrical bicycles for the transportation of goods. The goal of the project is to demonstrate to the public bodies and private stakeholders how the electric bicycle can substitute for motored vehicles when delivering merchandise, pharmaceuticals, or meals to old people, improving the quality of service.

It was in the fifties when Gaspare Lombardo began to repair bicycles, taking advantage of his free hours, when his work as a blacksmith allowed it. A passion which soon became a worry. In Sicilia, in the first years after the war, the workers in the marbles quarries of Custonaci were forced to

go to work on foot bringing with them a big hunk of bread, which was to last them the whole week until they returned home. What could be done to help these workers? Gaspare began right then to build new bicycles: until the end of the first year, alone, and



When on May 30, 2012 the partners of the project Acticospack (315720) went to Brussels to define the strategy that they would follow in the immediate future, on the day of negotiations for the project in front of the European Commission, the only missing company was Lameplast. The day before, a terrible earthquake – 5.9 on the Richter scale – destroyed a vast area in the Region of Emilia, reducing to rubble also the small village of Rovereto, in the Province of Modena, where Lameplast has its production headquarters. But only several months later, the request from Itene, the research center in Valencia, which was still not well known, supported by the Warrant Group, arrived on the desk of President Giovanni Ferrari. The letter stated that they were seeking a company with a technical profile that was perfectly in line with the characteristics of Lameplast, to participate in a European project together with

other international partners. The company did not have experience in the field of European projects, but it did have a great ability in the innovation and production of containers for pharmaceutical use. Within 48 hours Itene sent its “welcome on board” and a few months later the project received financing. Today Lameplast is actively involved in the Acticospack project, thanks to the work of its research

and development team coordinated by engineer Enrico Salvarani with the collaboration of engineer Filippo Fangarezzi. The goal of the project is to eliminate preservatives in pharmaceutical and cosmetic products by the use of active packaging solutions, substituting them with others of natural origin which are to be introduced directly into the packaging. This will allow for a notable reduction in their use.

## The Acticospack project

The strength of a company in constant movement



Lameplast



Lameplast production

PH. LAMEPLAST

## A year-long journey

2013 - the Year of Italian Culture in the United States: an interview with Ambassador Andrea Meloni, general director for the promotion of the Country at the Italian Ministry of Foreign Affairs

### Can you describe what kind of initiative is the Year of Italian Culture in the Usa and what was the spirit behind it?

“The Year of Italian Culture in the United States has just come to the end of its tenth month, and this is the perfect opportunity to make a few comments on such a major initiative for Italia’s image abroad. It is a series of events sponsored by the Italian Ministry of Foreign Affairs under the high patronage of the President of the Italian Republic, conceived from the very beginning as a valuable tool to strengthen Italia’s friendship with the United States with the objectives of promoting Italian culture, enhancing scientific and technological research and facilitating the penetration of Italian products. The aim was to somehow reconcile different needs. Italia’s most recent contribu-

tions in the field of science and technology - particularly in the aerospace, nanotechnology and biotechnology industries - were presented without obscuring the typical idea of Italia in the popular imagination, including the Usa, which has always been primarily associated with the great masterpieces of all time, from ancient times to the present day, ranging from the Resting Boxer, a wonderful bronze sculpture from the Hellenistic period, through to the works of Caravaggio and Michelangelo, and the production of De Chirico. It is impossible to express the wealth of such a wide-ranging programme that involved more than 40 Usa cities so far, paying tribute not only to art, but also music, celebrating the bicentenary of Verdi’s birth, theatre, with productions by Milano’s famous Piccolo Theatre, and cinema, with Open Roads: New Italian Cinema, the leading North American showcase for contemporary Italian cinema”.

### How was it possible to promote aspects of Italian culture and production at the same time?

“We have focused on sectors of production that best represent the Italian ability to combine artistic creativity, craftsmanship and technology investments, such as clothing, cars, furniture and food. By way of example, we could mention the participation of many Italian biotechnology professionals at the 2013 Bio International Convention, held in Chicago in April, an opportunity to meet and promote scientific and industrial cooperation

with the most interesting American companies in the sector; the exhibition held in Washington Dc on ‘The New Silk Trais’, dedicated to the use and technological transformation of this precious fabric; the culinary journey offered by Italian chef Massimo Bottura to select guests in New York, Washington Dc and Los Angeles; and finally ‘Barrique: The Third Life Of Wood’, a project involving the exhibition of furniture designed by international designers and created alongside members from the San Patrignano rehabilitation centre with recycled wood from wine barrels”.

### What solutions have been taken to organise and fund such a demanding initiative?

“The Year is the result of a public-private partnership with a prevalence of private sponsors, a viable alternative to large public investments, which are no longer conceivable in the current economic situation. Italian companies that decided to share the spirit, values and objectives of the Year of Italian Culture in the United States by linking their brand to this event were offered the opportunity to join the committee of supporters of the whole initiative in different ways, ensuring the continued presence of companies alongside the Ministry of Foreign Affairs and other bodies involved, plus the ability to identify and support, within the cultural programme, the events and occasions that would be more suited to their business strategy and their own entrepreneurial situation”.

-L.O.-



PH: MINISTERO AFFARI ESTERI

Andrea Meloni



# Rebuilding the cornerstones of excellence

Education, hospitality, and partnership: the bet at the Università del Salento

Text by **Lodovica Bulian** - Photo by **Francesca Martello**

**R**esearch, innovation, internationalization: Italian universities are starting from here to try to rebuild an engine to develop and grow their territory. This is only too well-known to the Università del Salento, which today is harvesting the fruit of a road that it undertook five years ago towards a new horizon of internationalization and towards the creation and development of companies with a high innovative content. With the experience gathered after an intense collaboration begun both in research as in education with foreign universities, the Università del Salento has woven over these years a conspicuous network of international agreements with universities in Europe, the United States, Australia, and China. This has led in turn to the definition of an educational road to be traveled together and joint degrees. Just think that the participation in the European Community's "Erasmus" and "Leonardo" programs mobilizes around 300 students for each academic year. "We have activated a series of routes for internationalization – continues the dean – in terms both of the offering of courses, and in terms of hospitality, tightening our relationships with European universities and also those beyond Europe, all the way to China and India. Today we offer six degrees in English, and students from abroad continue to come in ever greater numbers to our university, due to its excellent educational offerings, and also the space to live it. But all our efforts are focused on continual improvement to support high-profile research activities, both basic and

applied, which in some sectors have been internationally recognized as excellent". There are in fact 39 spin-offs that have been born from the Università del Salento, which today are employing more than 400 graduates. This reflects the multidisciplinary nature of the university from whose transfer of academic knowledge, impressive enterprises have arisen in all sectors. Standing out are the diverse pilot projects that have bloomed under the Department of Engineering at the university. "Projects from our spin-offs are on a supranational scale and are able to attract European investment funds. And it is our duty to seek to intercept all the existing resources to keep the value of our research at a high level in a moment in which

the south of Italy is suffering from great cuts in financing for the Regions", the dean underlines. At the same time, with a strong acceleration impressed on the processes of industrial collaboration, the university of Lecce continues to reinforce its ties with the local and national production fabric, creating a virtuous circle which through the synergy of the institutions, spin-offs, and companies, constitute a decisive lever of development for the entire territory. "We have created a stable and long-lasting collaboration – explains Laforgia – with the local entrepreneurial system. The many contracts stipulated by private and public industry offer a point of reference and a 360 degree support for the productive system."



**Domenico Laforgia**