Italy: The Perfect Platform for Aerospace

International Paris Air Show

19 June 2019, Paris

Business Opportunities in Italian Aerospace Industry

Selected companies and clusters

Project Coordination
ITA Trade Agency - FDI Partnership and Sector-based Analyses
Invitalia - Inward Investment Program

PROJECTS

APULIA | GROTTAGLIE AIRPORT TEST BED: ITALIAN CENTRE OF EXCELLENCE FOR REMOTELY PILOTED AIRCRAFT SYSTEM TRIALS

PROPOSER: Aeroporti di Puglia S.p.A. - Distretto Tecnologico Aerospaziale (DTA) - Puglia Sviluppo S.p.A.

SECTOR: Aerospace

INVESTMENT TYPE

- ✓ Greenfield manufacturing
- ✓ R&D

BUSINESS ENVIRONMENT

Apulia is a dynamic region of the South East of Italy where companies have been involved in the aeronautics sector since the 1930's. Today, Apulia plays a leading role in the aerospace industry in Italy and boasts a significant industrial concentration, with over 560 companies (MNEs, SMEs, start-ups), occupying over 7,550 employees, active throughout the region in various fields of R&D and manufacturing that make up the entire aerospace supply chain, from the production of aircraft components to space software.

Continuous investment in innovation, as well as in skills, have turned Apulia into a centre for excellence in aerospace, making it the only Italian region in which the following sector specializations co-exist: fixed-wing, rotating wing, aerospace software (Leonardo Group); production of sections of the fuselage and tail wing in carbon fibre for the Boeing 787 Dreamliner Project (Leonardo Group); propulsion engines (GE Avio Aero); design and assembly of aircraft components in titanium and carbon fibre (Dema Brindisi for Bombardier); microsatellites and propulsion systems for space stations (Sitael); Design and production of ultra-light carbon fibre aircraft (Black shape); R&D Centre for Additive Repairs (GE Avio Aero and Polytechnic University of Bari).

The aerospace industry is one of the most strategic sectors within the regional economy that has acquired a strong position in the international market in recent years thanks to its ability to strike up positive business relations with key players, contractors and OEMs, some of whom have chosen to invest in Apulia and contribute to the increasingly positive export performance (in 2018 the regional sector exports totalled 561,6 million euros, accounting for almost 10,2% of national exports).

In Apulia, there are two clusters involved in the aerospace sector and both of them actively seek to foster competitiveness and international business, stimulate and support research and training:

- DAP – Apulian Aerospace Business Cluster with over 70 associates (businesses and universities);
- DTA s.c.a r.l. - Apulian Aerospace Technological Cluster, a non-profit making consortium which brings together key industry players, universities, as well as public and private research centres active in Apulia.

BRIEF DESCRIPTION

In the near future, both aircrafts with pilots on board and remotely piloted aircraft systems will be operating in the same airspace. This poses not only the need to develop new aircraft platforms and associated ground systems, but also to define new rules and develop new

technologies and products for all forms of air traffic control and management, in order to operate safely in the sky.

In 2014, with the backing of the Italian Government, the Italian Civil Aviation Authority (ENAC) devised a plan to qualify the Grottaglie Airport, based near Taranto in the South-east of Italy, as an integrated platform (airport, controlled airspace, systems for control and performance measurement, technological and logistical services), which aims to address these problems by creating facilities for testing, developing and offering innovative services, products and solutions for the aerospace sector.

In particular, Grottaglie Airport, thanks to its infrastructure, favourable location and facilities, represents an important test bed for companies and institutions interested in:

- conducting simulations and test trials, on the ground and in-flight, for manned and unmanned aircraft systems;
- carrying out test trials for ATF&M (Air Traffic Flow & Management) systems for product and service development and certification;
- developing products and solutions for territory observation and data management.

More recently, the Italian Ministry of Transport also designated Grottaglie airport as Italy's first and only spaceport, which, based on the project assigned to ENAC for completion, is due to be ready for operating suborbital flights in 2020.

Aeroporti di Puglia S.p.A. (AdP) which manages the regional airport network, has been carrying out significant investments in the Grottaglie Airport infrastructure and has created a range of solutions and services (hangars, office space, etc.) for companies interested in locating at the airport.

Based on a Memorandum of Understanding between the Apulian Technological Aerospace Cluster (DTA) and Aeroporti di Puglia SpA, for the creation of an international research hub at Grottaglie Airport, significant research and training activities are already underway with programmes involving RPAS/UAS simulation and testing, as well as cybersecurity.

To facilitate investments in Apulia and stimulate the growth and development of the Grottaglie Airport hub, the regional government has devised a wide range of flexible incentive schemes, available through the regional government agency Puglia Sviluppo.

BUSINESS PROPOSAL

The Grottaglie Airport Test bed initiative generates interesting investment opportunities for key industry players, SMEs and innovative start-ups, involved in business sectors such as UAV systems, software systems and cybersecurity, who want to be located in or around a strategic airport infrastructure, offering the possibility to carry out simulations, test trials, on the ground and inflight, for manned and unmanned aircraft systems.

Key advantages

- Grottaglie Airport is a fully-serviced strategic airport infrastructure, authorised for UAV simulation and flight trials, designated as Italy's first and only spaceport, ready for operating suborbital flights in 2020;
- Apulia is a hub for innovation thanks to the work of its more than 415 private and public entities, including universities, business and technology clusters and laboratory networks start-ups, all of which are active in R&D;
- DTA is a key player in the aerospace sector in Apulia and can assist companies in the development of highly specialised R&D programmes and training activities;

- the Apulia regional government stands out for its commitment to supporting investment in research and innovation, focusing mainly on smart technologies and providing a significant boost to hi-tech sectors, including aerospace;
- Puglia Sviluppo, the regional development agency, can assist potential investors in Apulia to access a raft of incentives, as well as assistance throughout the initial setting-up phase in identifying business locations, local business and research partners and so on.

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APULIA | AEROSPACE INTERIORS IN COMPOSITE MATERIALS

PROPOSER: CETMA

SECTOR: Aerospace

INVESTMENT TYPE

- ✓ Industrial/technological partnership
- ✓ Funding

DESCRIPTION

The aim of the project is the development of aerospace interiors in composite materials, using recycled carbon fibres (RCFs) as reinforcement. RCFs are a very attractive secondary raw material having mechanical properties similar to those of virgin ones. In addition, they are cheaper than the virgin ones: a price reduction ranging from 45% and 55% is estimated. The RCFs could represent a great opportunity for the suggested application, in substitution/integration of semi-structural composite components produced using glass reinforcements, providing a winning solution to the impelling need of the aviation industry to satisfy the target of CO_2 reduction, associated to a reduction of fuel consumption that can be obtained reducing the aircraft weight. It is important to underline that a mandatory issue to contemplate, in order to exploit the fully potentiality of RCFs, is the sizing restoring, degraded during the recycling process.
The sizing protects fibres during handling, lets an adequate wettability during impregnation stage and increases interfacial shear strength between the fiber and matrix resin, making the fibres suitable as reinforcement for composite components.
CETMA, based in Brindisi, has established a high level of know-how for the proprietary sizing treatment for RCFs, in order to make them technically and technologically competitive with virgin fibres.
The investment required ranges from 100,000 € to 500,000 €.
The TRL of the technology is between 5 and 6.

BUSINESS PROPOSAL

The business proposal is linked to the development of new products for aircraft interiors, based on recycled carbon fibres, at two different levels:

- Development of semi-finished products, such as semi-pregs, pre-pregs;
- Development of aircraft interiors components.

The partners involved will be semi-finished composite products producers and aircraft interiors manufacturers.

Key advantages

- Know-how developed for sizing of RCFs;
- Possibility of using an high value secondary raw materials;
- Lower cost in comparison with virgin carbon fibres;
- Weight and CO_2 emission reduction.

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APULIA | HIGH INSTRUCTIONS LEARNING THROUGH VIRTUAL REALITY

PROPOSER: MTM Project Srl

SECTOR: Aerospace

INVESTMENT TYPE

- ✓ Industrial/technological partnership
- ✓ Funding

DESCRIPTION

HIL VR (High Instructions Learning through Virtual Reality) is the most powerful Virtual Reality and Machine Learning software, integrated in a unique Platform, for the training of technical staff which, through the use of VR procedures (for learning) and the Machine Learning algorithms (for checking of training), allows the operator to carry out training, simulate and repeat “in real life” what has been learned.
The project is also made up of AURES (Augmented Reality and Remote Support). Aures is the Smart Glass and Smartphone software system for service, maintenance and production assistance through Augmented Reality. With Aures, it is possible to view, step-by-step, the operative procedures in VR that need to be followed, to access remote access and video calls, to record videos and take photos and store them on the cloud/server.
MTM Project, is a well-established innovative Italian SME located in Monopoli, which develops projects in collaboration with Bari University (scientific partner), Confindustria Bari, Apulian ICT Business Cluster, Apulian Aerospace business cluster.
Our software is suitable for the technical training of workers in the aerospace, automotive and manufacturing sectors. It is ideal for training company technicians on: complex procedures, security, routine and specialist maintenance, production and maintenance.
We are interested in finding an international partner, either as an investor in the business or as a distributor licensee.

BUSINESS PROPOSAL

We are interested in finding an international partner, either as an investor, willing to invest between 600.000-1.000.000 Euros, or as a distributor licensee.
For investors, we are willing to offer a share in the company.
In the case of licensees, we will offer an exclusive contract with the highest percentages in the sector able to satisfy both. The target investors can be technology companies, commercial distributors, and professional investors.

Key advantages

- For HIL VR, Having a single integrated system for industrial training, progress control and tests available
- HIL VR reduces the times and costs of training. It promotes self-learning and E-learning. It improves the organisation of staff. It encourages the sharing and conservation of the know-how within the company.
- AURES reduces intervention time and costs thanks to the remote assistance. It is totally “hands-free”.
- We have several large customers. We have passed the launch phase, we are at an advanced stage of development.

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APULIA | MULTIFUNCTIONAL PANELS AND COMPOSITE ISOGRID/LATTICE AEROSPACE STRUCTURES INTEGRATION

PROPOSER: SATOR

SECTOR: Aerospace

INVESTMENT TYPE

- ✓ Industrial/technological partnership
- ✓ Funding

DESCRIPTION

The main goal of the project is to minimize the mass of satellites and spacecrafts by incorporating cables, power bus, connectors, sensors and thermal control components into composite panels, featuring multifunctional properties, and then inserting them into the CFRP lattice primary structure, just like a tile. Electrical components are embedded into composite panels during carbon thread stitching process, so achieving high level of integration. The design allows easily accessible, removable and modular electronic systems with high grade of debris protection. The benefits of such technology include a 70% reduction in electronic enclosure and harness, a 50% reduction in spacecraft volume required for conventional components and a reduction in labor required for spacecraft assembly, showing up an extremely robust system applicable to several missions. Panels can be easily allocated in load bearing CFRP ANISOGRD/Lattice structure's cells. The novel systems' integration concept overcomes the actual one based on lumped mass distribution concept (ref. http://www.satorsrl.it/multifunctional-structures/).

- Place/Site: Grottaglie/Taranto or best site for investor (as alternative);
- Partners involved: ARES Consortium, University of Roma 2 – Tor Vergata -
- Investment required: Min. 1,3 Mln € - Max 2,4 Mln €
- Project Phase: self-funded prototyping (TRL 4: Component functional verification in laboratory environment)

BUSINESS PROPOSAL

SATOR is looking for big aerospace companies/system integrators/industrial partners as investors and proposes a framework agreement for the technical development and business concept start. The partnership would facilitate the development and manufacturing phases due to engineering requirements, research platform and test facilities availability for ground and in-flight or in orbit test. Furthermore, the investor might be a direct selling client or the final customer, being an end user.

Key advantages

- Big market opportunities in aerospace sector (satellites, launchers, aircrafts)
- Fast and high R.O.E. and R.O.I.
- Low number of competitors
- Rapid Break Even Point achievement
- Low capital investment

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APULIA | SEAGULL

PROPOSER: NOVOTECH

SECTOR: Aerospace

INVESTMENT TYPE

- ✓ Industrial/technological partnership
- ✓ Funding

DESCRIPTION

The SEAGULL is a high performing two seater light hydroplane with a hybrid propulsion system, easy and economical to use, operating in complete autonomy from any conventional infrastructure but can be easily operated also from “marine” or private boat structure.
It features a very innovative and automatic retractile morphing wing, making it possible to pass from aircraft to boat configuration. The integration of methods and technologies from the aerospace and naval sectors are combined to create a unique product relying on a wide use of high performing composite materials and eco-friendly production processes. Such new mobility system is thought for promoting the communication between people and go beyond the current barriers of the public and private transports.
Investment required: 1,500,000 Euros
Project Phase:
The design started in January 2018 and now the aircraft is completely designed, tested in water tank and wind tunnel. Also a full scale fuselage mock-up and a wing folded test bed, have been used to verify the main capability of the project. Manufacturing of some component are in progress and the complete flying vehicle is planned to be ready at the end of 2020.

BUSINESS PROPOSAL

We are looking for investors, interesting in investing in a very innovative and promising personal transportation system that is currently suited to use on water, but potentially can be converted in a ground operated system also with capacity to VTOL operation.
The commercial challenge is the production of a new mobility system that is multi-scope (Reconnaissance, surveillance, sport, tourism, training activities), economical (accessible) and eco-friendly (materials and production processes).

Key advantages

- The development of innovative electromechanical actuation mechanisms enabling a folding wing to be able to make the transition from the aircraft to the boat configuration;
- The production of an integrated and lightweight aerostructure, thanks to a wide use of composite materials through out of autoclave and as much as possible automated production processes;
- Development of the hybrid propulsion system.

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LAZIO | GAUSS ACTIVITIES FOR MICROSATELLITES

PROPOSER: G.A.U.S.S. Srl (Group of Astrodynamics for the Use of Space Systems)

SECTOR: Space technology in particular for field of Small Satellites

INVESTMENT TYPE

- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT

The space industry is undergoing a dramatic transformation. Demand for large geosynchronous communications satellites has fallen dramatically as companies prepare to launch constellations of hundreds or thousands of, less expensive broadband satellites in low and medium Earth orbits. In this environment of small satellites, smaller GAUSS has been active for more than 20 years. GAUSS launched from 2000 to now 9 microsatellites, 8 CubeSat and 6 Pocketcube in the frame of UniSat Program.

DESCRIPTION

GAUSS Srl an Italian limited liability company based in Rome, founded in 2012 as a spin-off of the Scuola di Ingegneria Aerospaziale of University of Rome, active in the space technology field.

GAUSS aims are the research, the development and the implementation of aerospace projects, and the educational aspect and the execution of related cultural initiatives.

GAUSS activities range from structural design and mission analysis to the realization and launch of complete micro-satellites and CubeSats, their deployers, launching platforms and main subsystems (OBC, Radio, customers payloads etc.), IOD/IOV and ground segment services. The UniSat satellite is used also as a platform carrier and deployer for third-parties satellites in orbit.

Next launch is planned for 2020.

BUSINESS PROPOSAL

We propose investments to develop a constellation of 3U microsatellites which have for the basic model the following characteristics: LEO or GEO Orbit, structure dimension of 10x10x35 cm, electric power 20watt, telecommunication UHF VHV S-band, attitude pointing less than 5 degrees. The price for one 3U basic model, including launch is about € 800k.

Key advantages

Fast and easy manufacturing (10 pieces every 3 months), 4 launches per year, using Soyuz-Fregat.

Lean design and low cost realization.

Multipurpose constellation (telecommunications, remote sensing, in-Orbit demonstration etc.).

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LAZIO | I.A.S. – INTELLIGENT ADAPTIVE STRUCTURES

PROPOSER: E.S.D. Srl

SECTOR: Avionics / Aerospace

INVESTMENT TYPE

- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT

I.A.S. was designed for active structural monitoring, in the avionics and aerospace sectors; a natural extension of the project is passive structural monitoring, in civil engineering (bridges, dams, oil pipelines, gas pipelines, etc ...); in railway engineering (monitoring of locomotives, tracks, noise barriers, etc.); in naval engineering (monitoring of the weight distribution on cargo ships during the loading phases of containers and during navigation).
Customers.The potential customers are mainly medium and large companies operating in the avionics and aerospace sectors; other reference targets (for the natural extension of the aforementioned project) are the companies that operate in civil engineering (bridges, dams, oil pipelines, gas pipelines, etc.), rail and ship transport.
The "ENGINEERING FOR SUSTAINABLE DEVELOPMENT S.R.L. - ESD S.R.L. "was born in 2017, as a start up of the Department of Mechanical and Aerospace Engineering of the University of Rome" La Sapienza ". The company carries out research, development, implementation and marketing of innovative products and services of high technological value, with use in the renewable energy, mobility, avionics and calculation tools sectors.

DESCRIPTION

Intelligent Adaptive Structures is a system that uses optical sensors (FBG). The sensors are incorporated in the structure to be monitored or superficially applied to it. The system has been designed to monitor the points of effort on a "wing box" of an aircraft. The information coming from the sensors, continuously and in real time, is sent to a computer that calculates the appropriate response in real time, providing the pilot with the possibility of intervening manually or in automatic mode.
In addition to providing continuous monitoring of the structure, the system also allows scheduled maintenance of the monitored elements.
The scope of the I.A.S. it is essentially that of "Smart Structures" (intelligent structures), ie those structures capable of monitoring their state over time and reacting appropriately according to the stresses to which they are subjected.
State of the art: pre-prototype.

BUSINESS PROPOSAL

The commercial proposal can be summarized in 4 phases:

- Search for an industrial partner - financial, for the development of the prototype; the figure for development is around € 700k.
- Development of the prototype within 8-10 months.
- Registration of the patent - utility model, of the prototype.
- Type of license transfer, to be agreed.

The business idea.

The utility model, once patented, can be marketed in several ways, some of which can be chosen as an alternative to others, considering the opportunity for financial gain at the moment:

- Issue of a license for a consideration, to third parties, of the rights to produce and sell, by third parties, the utility model, with periodic remuneration (royalties) recognized to the ESD.

Key advantages

Compared to traditional electric sensors, the IAS offers numerous advantages:

- A large number of sensors can be connected to a single optical fiber, thus reducing network and installation complexity;
- Reduced dimensions and weight;
- Total absence of background noise;
- Safe in potentially explosive atmospheres;
- No mechanical failure and high fatigue resistance;
- Immunity from electromagnetic interference;
- Immunity to radioactive environments;
- Resistance to atmospheric agents and corrosive environments;
- Resistance to high temperatures;
- Possibility of engineering support with integrated sensor;
- Possibility of being incorporated into the structures at the time of their manufacture.

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LAZIO | I.MODI

PROPOSER: Survey Lab s.r.l

SECTOR: Earth Observation, Infrastructures and Structures Monitoring

INVESTMENT TYPE

- ✓ Brownfield (expansion/renovation)
- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT

In Italy specifically, the potential demand for interferometry monitoring products is significant; with an estimated + 10 – 15% annual sector growth (the estimate is based on insights from direct interviews with market players and potential users). The main players in Italy are diverse and include multiple entities with distinct involvement along the value chain. They range from satellite data originators and distributors seeking to expand towards product development and provision, to more traditional user-oriented operators that have acquired interferometric know-how through collaborations and agreements with players focused on processing techniques. The competitive landscape assessment has shown that the main market operators do not currently offer significant added value benefits to their customers (specifically in the downstream/user end of the value chain) and do not seem able to differentiate their products. The Market Volume for EO services composition is approximately: public customers, including R&D agencies, lead with a total market share of 65 % while around 30 % of revenues come from other industrial customers (4% comes from international organizations). As far as the I.MODI thematic area is concerned, the business volume is already huge. Indeed, by summing up Land Motion & Ground Government, Urban areas, Infrastructure, Landslides and Earthquakes, we come up with over 16% of the total revenues generated.

DESCRIPTION

I.MODI (Implemented MOnitoring system for structural DIsplacement) is an added-value service that integrates Earth Observation (EO) technologies, ground based data and ICT to create easily accessible visualized data for all kinds of users, including non EO professionals. The I.MODI project aim is to develop a service which employs EO data into standard procedures, devoted to structural damage assessment; thus contributing to implement mitigation and prevention actions for potential failures. I.MODI is a Survey Lab (Sapienza University Spin Off) project, and it was financed by the European Commission under the H2020 SME-Phase 2 (Small-Medium Enterprise) Instrument Program. It was developed in Rome (Italy), where the Survey Lab headquarter is located. We need about 750,000-1,000,000 €. Our service is at the marketing stage; we have already used I.MODI to monitor buildings, roads and dams on Italian territory with research conventions, public entities and engineering firms. We have also identified a critical need in order to better exploit market opportunities, specifically the need to tailor made in each specific market the link between Survey Lab as a service provider and the potential end-users of our services. We have a strong technical capacity to deal with EO applications and to develop useful new services based on advanced technologies. It is now necessary to develop in each specific end-user market a “brokerage capacity”, defined as the capacity to develop a stable and profitable connection between Survey Lab’s services and our specific clients. Moreover, we would like to patent our newly developed tools which optimise I.MODI performance.

BUSINESS PROPOSAL

We offer an innovative service (I.MODI) which represents a valuable tool in situations where numerous buildings or big infrastructures need to be monitored, with the aim to prioritize more detailed investigations on critical structures. Our target groups are public and private customers who operate in the following market segments: buildings, roads and dams.

Key advantages

- It costs less than traditional monitoring, saving up to 80% per year;
- Fast and systematic control over large areas and extensive infrastructures;
- It permits back analysis, until 1992, of the displacements of a structure or infrastructure;
- It provides customized solutions based on user needs;
- Identify critical issues without inspections and instrumentation installed on structures.

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LAZIO | IOT SOLUTION TO IMPROVE RESILIENCE OF BUSINESS-CRITICAL INFRASTRUCTURES

PROPOSER: Smart Structures Solutions

SECTOR: Space data for industrial infrastructures

INVESTMENT TYPE

- ✓ Funding

BUSINESS ENVIRONMENT

The targeted application addresses the problems/issues the owner of distributed infrastructures (pylons of power lines, poles/towers used for broadcasting and telecommunication purposes, etc.) usually face in the management of their asset, especially for what regards the inspection/maintenance activities.
Traditional inspection/maintenance procedures envisage periodic assessment of the status of the infrastructure; such processes, whereas proven in the past to be effective, have some limitations connected to their period nature:

- Impossibility to have assessment between two successive inspections;
- Impossibility to promptly identify and being alerted about the occurrence of damages/anomalous situations;
- Impossibility to assess the current status in case a severe/extreme event hit the infrastructure (or a portion of it).

DESCRIPTION

The proposed IoT solution is designed to solve the limitations affecting these existing procedures: it aims at continuously monitoring, in a remote way, damage-sensitive parameters of the critical infrastructures. In such a way, in case a damage/anomalous situation occurs, the system will alert the owner which will have the capability to promptly react, before the damage/anomalous situation leads to a catastrophic failure.
Our IoT solution is based on data acquired by local sensors, transmitted to Control Centre and processed by proprietary algorithms, capable to extract information about the integrity of the monitored infrastructures. Sensors' data are supported by information/data provided by space asset.

BUSINESS PROPOSAL

The shareholders are looking for an investment of 1 million of Euro: this amount will allow to scale-up the company and deals with first orders, consenting the investor to have the control of the company and a percentage of shares between 51% and 60%.

Key advantages

The proposed business idea is capable to improve the resilience of critical infrastructures (such as power, broadcasting and telecommunications infrastructures) for enabling:

- Predictive / On-condition maintenance, which allows an improved management of the asset and the possibility to optimize of the inspection interventions;
- An improvement of the service availability through a reduction of the out-of-service;
- A reduction of the financial costs connected with risk of failures.

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LAZIO | JANUS 2.0

PROPOSER: Space Engineering S.p.A.

SECTOR: Aerospace, avionic SatCom terminals

INVESTMENT TYPE

- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Other

BUSINESS ENVIRONMENT

Space Engineering, whose Headquarters and Industrial Plant are based in Rome, is currently the Italian industrial footprint of Airbus Defence and Space. The Company is 100% part of the Airbus Group since 2015. The Janus product line, fully designed and built by Space Engineering, is one of the most successful product stories for SpEng. The growing interest in avionic SATCOM terminals for LOS/BLOS ISR missions able to flexibly use either Ku or Ka frequency band on a single antenna aperture has been pushing SpEng in the design, manufacturing and test of a low profile switchable Ku/Ka multi-reflector system named “Janus”. Starting from the first version, Janus 1.0, Space Engineering has been keeping on updating the antenna design, developing the second generation of the Satcom Terminal, Janus 2.0

DESCRIPTION

As of today, the entire Janus line of products includes:

- The Janus Aero 1.0: designed for aeronautical applications and next to be installed on UAVs;
- The Janus Aero XS: for aeronautical applications on platforms with tight size constraints, e.g. helicopters;
- The Janus Aero 2.0: the evolution of the Janus dual-band that will fit below standard radomes.

It is worth mentioning that Janus 1.0 was used on May 2017 on-board an ATR-P 72A MPA to provide continuous video surveillance of the G7 Summit area in Taormina, Italy. Janus is the unique concept patented by Space Engineering to enable remote switch between Ku and Ka band. The switch is performed by mirror rotation with a dedicated RF chain for each frequency band. The compact size and low weight combined with its high throughput both in reception and transmission make Janus Aero the ideal solution for several types of Mission Patrol and UAV applications. In addition to dual-band (Ku/Ka) configuration, Janus is also able to operate in a single-band configuration (Ku or Ka) by disembarking the unnecessary RF chain. Janus Aero 2.0 (current TRL 4/5) has all the features of Janus Aero 1.0 with improved electrical and mechanical performances. It should be available ready to fly in Q1 2019.

BUSINESS PROPOSAL

Janus Aero 2.0 is the evolution of Janus Aero 1.0 targeted to all type of institutional ISR missions, and all type of aircraft platforms. It has all the features of Janus Aero 1.0 with improved electrical and mechanical performances. Janus Aero 2.0 accomodates below standard ARINC 791 Commercial Off-The-Shelf radomes (e.g. Carlisle, Panasonic, Boeing, etc.). The target of Janus Aero 2.0 is to be the best compromise between institutional and civil BLOS ISR missions that require maintaining a good quality of a multiple polarized satellite channel also at very low or high elevation angles.

Key advantages

- Dual band
- Remotely switchable
- Third axis/high tracking performance
- Very light
- Excellent RF performances
- ITAR free

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LAZIO | MIPRONS (MICRO PROPULSION FOR NANO SATELLITES)

PROPOSER: Miprons Srl

SECTOR: Aerospace propulsion

INVESTMENT TYPE

- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT: Propulsion systems for nano/micro/mini satellites.

DESCRIPTION

Nanosatellites, due to their small dimensions (10x10x10cm), do not permit the integration of high performance propulsion systems (high Thrust, Specific Impulse and Delta-Velocity).
This does not allow manoeuvres as orbit changing, swarm constellation forming, de-orbiting, life-time extension, etc., in particular, in “commercial-reasonable” time.
Miniaturized effective propulsion systems would, therefore, enlarge the fields of application of the nanosatellites and would permit greater/heavier payloads to the micro/mini satellites.

BUSINESS PROPOSAL

Development of an innovative micropropulsion system for nano/micro/minisatellites that maintains miniaturized dimensions and very high performance.
The propulsion system is internationally patented (Minotti, A. “SPACE PROPULSION SYSTEM”, PCT/IB2018/055595), effective as of 2017.
The MIPRONS srl is the exclusive licensee.

Key advantages

Scalable miniaturized propulsion system, with high performance, adoptable to nano/micro/mini satellites, in particular:

- Combustion chamber’s characteristic dimensions of the order of:
  - 6 mm, for 3N of thrust, and specific impulse greater of 330s;
  - 20 mm, for 20N of thrust, and specific impulse greater of 330s;
- Orbit changing in the range 4<degrees<33, depending on the payload and thrust (1<Units<3+3[1] and 1<Thrust [N]<10);
- Time for orbit changing in the range 1<days<10, depending on the degrees, thrust and payload;
- Life extension, at 300 km, in the range 1<years<5, depending on the payload and thrust (1<Units<3+3[1] and 1<Thrust [N]<10); [1]3 units for propulsion system and propellant, plus 3 units of payload (optics, antenna, etc..);
- Pressure less equal than 50atm;
- Launch pressure, 1atm;
- Green, safe and easily manageable propellant;
- Cheap realization.

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LAZIO | RANGE EXTENDED HYBRID – R.E.H.

PROPOSER: E.S.D. Srl

SECTOR: Avionics/Aerospace

INVESTMENT TYPE

- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT

R.E.H. was designed for aircraft handling, in the avionics and aerospace sectors; other applications are in the automotive sector.
Avionics: In this sector there are interesting applications for unmanned aircraft, to extend flight autonomy, in the civil sphere for land and sea drones and in the military for surveillance drones -> https://doi.org/10.1139/juvs-2013-0005
Automotive: this sector is certainly in the process of development and transformation; currently the problems related to electric mobility are many: recharging times for accumulators that are too long, an electricity grid that is still not well distributed, accumulators that offer low autonomy and that quickly degrade. The hybrid in series allows an extension of the electric mobility, offering in fact a solution to the current problems.
The size of the market is national, European and international.
Customers: The potential customers are mainly, medium and large companies operating in the automotive and avionics sector.
The "ENGINEERING FOR SUSTAINABLE DEVELOPMENT S.R.L. - ESD S.R.L. "was born in 2017, as a start up of the Department of Mechanical and Aerospace Engineering of the University of Rome" La Sapienza ". The company carries out research, development, implementation and marketing of innovative products and services of high technological value, with use in the renewable energy, mobility, avionics and calculation tools sectors.

DESCRIPTION

Range Extended Hybrid is a system that as a whole has the function of flying a drone. The system consists of a high energy density gas turbine, a lithium battery pack (it can also be a hybrid battery pack, with batteries and ultracapacitors), an electric motor, inverter and dedicated electronics (various controllers). The peculiarity of the system is the turbine placed in series with the battery pack. In this configuration (series system) the turbine has the exclusive functionality of recharging the battery pack (or supplying energy and an electric generator in the event of peak energy demand) and therefore does not directly contribute to the movement of the drone (RANGE EXTENDER); the recharging of the accumulators is programmed when the state of charge (SOC) of the same is lower than a predetermined threshold value (chosen for safety reasons and duration of the battery pack). This consideration and the design constraint lead to the switching on of the turbine unit only for a stretch during the eventual path taken, depending on the power of the installed battery pack. Since the turbogas unit can be supplied with LPG or natural gas, the pollutant reductions are significantly higher. The system aims to solve the following problems: extension of the duration of the battery pack, considerable reduction of battery pack degradation thanks to programmed charge cycles, considerable reduction of polluting emissions compared to similar hybrid systems.
State of the art: pre-prototype

BUSINESS PROPOSAL

The commercial proposal can be summarized in 4 phases:

- Search for an industrial financial partner for the development of the prototype; the figure for development is around € 650k;
- Development of the prototype within 6-8 months;
- Registration of the patent - utility model, of the prototype;
- Type of license transfer to be agreed.

The business idea.

The utility model, once patented, can be marketed in several ways, some of which can be chosen as an alternative to others, considering the opportunity for financial gain at the moment:

- Issue of a license for a consideration, to third parties, of the rights to produce and sell, by third parties, the utility model, with periodic remuneration (royalties) recognized to the ESD.

Key advantages

Compared to other hybrid systems (diesel or petrol), the use of the range extended hybrid guarantees:

- Significant reduction of NOx, CO2 and total absence of polluting particles and black coal.
- Consumption reduction.
- Lower weight and less bulk of the system.
- More robustness and reliability.

The R.E.H system is also scalable for every design requirement.

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LAZIO | VIRTUALMIND – AEROMECCANICA FLY 360

PROPOSER: Eng. Davide Angelelli – Virtualmind Aeromeccanica

SECTOR: Aerospace probe

INVESTMENT TYPE

- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT

- Video surveillance;
- Security infrastructure;
- Anti-terrorism operations;
- Public policy;
- Defense.

DESCRIPTION

Background:

Fly360 The project was designed to bridge the gap between civil aircraft of small dimensions and ultra-professional systems by high production and operating costs. Currently there is only one competitor that does not have the same recording characteristics at 360 ° but only an HD front camera. The Fly 360 as well as having on board 360 and IR camera camera also possesses an innovative ground station.

Innovation:

Fly360 ° is a revolutionary project, the result of integration and synergy of many Italian and international patents, which wants to produce a new UAV technology. The first product in the world capable of integrating into a nano-UAV of small and very light, 170mm and 190g, an omnidirectional camera, for a 360 ° spherical shooting.

Fly360 is aimed at professionals in the defense and security markets, at least in the first stage, but it has very interesting features and capabilities for the market "prosumer" civil. Its payload, integrated into the bearing body, is constituted by an omnidirectional mini camera with two lenses, able to resume spherically what surrounds it and a thermal front camera. Particularly suitable for forensic analysis, in which the use of a small size plane means able to resume everything that surrounds it, makes it an ideal tool for "frizzing" the scene in a totally aseptic.

The larger version, "Cheyenne 360" already realized and in production is proposed for Search and Rescue (SAR) and for the control and monitoring of infrastructure. This version incorporates an omnidirectional camera with very high resolutions> 30Mpixel and a thermal front camera.

Both versions have a powerful onboard control unit, coupled with a smart software and great precision, which allows you to "drive" the drone with a simple I-Pad.

Also is possible assign "missions" planned, to provide the pilot on the ground, through the remote video signal and telemetry avionics onboard, through a Ground Station with GPS tracking drone in real time. you can also reset the waypoint and change the route, also started the mission.

Our patent provides realization of a series of UAVs, both rotary wing fixing, which are not more or less effective copies of mass products from China, but provide a high degree of specialization to each product, which meets versatility criteria , security, ease of use, offering a standard qualitatively and technically superior to what is currently proposed.

Technical considerations:
The pilot will be more focused on the operation of investigation and control, with no lapses in attention, recording the entire image area for analysis in real time or later operation.
Features:
Nano UAV Omnidirectional 360 ° x 360 °; 2 Optical Resolution 360 ° video> 4 k, IR> 2k Wireless, Realtime Streaming, Stereoscopic Vision 170mm Dimensions, Weight 199 gr
Advantages:
It's possible to obtain various types of: using stereoscopic glasses remotized signal that offer operators or users of the images also the depth of field thanks to the stereoscopic vision, in addition to the vision omnidirectional 3d for an absolute quality, a second two-dimensional vision replicable on external monitors or FPV for have an eye on the entire spherical field that surrounds the camera into a single image two-dimensional spherical omnidirectional 2d.
Applications:

- Video surveillance - Security Infrastructure;
- Anti Terrorism Operations - Public policy - Defense.

BUSINESS PROPOSAL

Currently in the final testing a larger version with 160 cm diameter.
The development of nano-UAVs version requires 1.7 million for the pre-production phase in the edition of 50 first pieces. Additional funds are required for the production.
The sale price is between 9 and 11,000 euros the price of production of 5,500 euro for the 170mm version to 27,000 for the class 800 version with triple optical and 30k recording system.
The system includes double ground station Flybag in EPP and accessories.
Other possible approaches to system integration or Manned or Unmanned vehicles are to prototype.

Key advantages

It's possible to obtain various types of: using stereoscopic glasses remotized signal that offer operators or users of the images also the depth of field thanks to the stereoscopic vision, in addition to the vision omnidirectional 3d for an absolute quality, a second two-dimensional vision replicable on external monitors or FPV for have an eye on the entire spherical field that surrounds the camera into a single image two-dimensional spherical omnidirectional 2d.

CONTACT INFO

www.virtualmind.it
www.aeromeccanica.it
Real 360: Virtualmind 360 (http://www.virtualmind.it/360/difesa.mp4) Real 720° - Panoptes 360® © International Patent

PIEMONTE | NANORACKS – SPACE OUTPOST EUROPE & BEYOND

PROPOSER: NanoRacks – Europe Srl

SECTOR: Aerospace and beyond (e.g. life sciences, material sciences, etc.)

INVESTMENT TYPE

- ✓ Brownfield (expansion)
- ✓ R&D
- ✓ Industrial/technological partnership
- ✓ Funding

BUSINESS ENVIRONMENT

NanoRacks procured a significant part of its first commercial AirLock on board of the International Space Station from Thales Alenia Space – Torino Establishment. From this an international business development partnership has been established with Thales Alenia Space and ALTEC. NanoRacks – Europe is based at ALTEC industrial site in Torino. From this, Nanoracks has chosen to establish its company in Piemonte to serve European and Asian customers. So far, NanoRacks is getting ready to enter in its projects with Politecnico di Torino (PoliTO) with the Department of Mechanical and Aerospace Engineering and with university spin-offs (IXTAl srl, etc.) form Università del Piemonte Orientale. At national level, the company entered in initial relations with the National Research Council of Italy (CNR) and University Sapienza in Rome.

DESCRIPTION

Looking forward, NanoRacks using its proven experience and leadership (It is currently the largest commercial user of the International Space Station with customers in over 30 countries) aims to become the market leader in utilizing the microgravity of space for advances in the fields of life sciences, biopharma and agriculture. For the past several decades there has been glimpses of how powerful taking gravity out of the equation is on new biopharma and agricultural products. Today, with greater access to space and with miniaturization of off-the-shelf research hardware, these critical and mature industries are ready to utilize microgravity as a cutting edge research and manufacturing tool. And NanoRacks positions to be the key partner for companies world-wide focused on three hubs: Italy, the States and UAE.

BUSINESS PROPOSAL

To enable to next phase of growth, NanoRacks is raising $20-25M in a Series-B investment in order to:

1. Enable the global life sciences, biopharma and agricultural sector to undertake commercial research on NanoRacks owned in-space and on the ground research hardware;
2. Developing a NanoRacks platform, the Outpost, in-space demo on a discarded upper stage of an Atlas 5 vehicle in 2020.

Key advantages

The two-year goal is to create a world class in-space research Center in Piemonte to allow for bio-medical breakthroughs and advances in microgravity life sciences and agricultural. NanoRacks is bringing together researchers from Europe and China who have done groundbreaking research in space and will seek to be the key partner in future research and products. One example is Chinese research that has created microbes in space that can be

“planted” in the desert, allowing crops to take hold in barren land. Until now, this market was government driven and dependent on the US Space Shuttle, which offered only a few days in space. With the growing commercial use of space, NanoRacks will own, operate and use laboratory hardware in-space known to researchers, allowing an era of applied commercial space research to take off. The expected products are patents, intellectual property and new proteins, compounds and biologicals.

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CLUSTERS

APULIA

FACTS AND FIGURES

566 companies active in aerospace sector (large companies and SMEs) with over 7.555 employees.
Regional sector export in 2018 amounted to 561,6 million Euros.
Main business sector specializations:

- Design, construction and assembly of aircraft and their components;
- Design, production and testing of structures in carbon-fibre composite materials, metals and ceramics;
- Technologies for sensor and mechanical systems;
- Quality control;
- Aircraft interiors;
- Intelligent engine, aeronautical & space systems;
- Microsatellites;
- Propulsion systems for space stations;
- Space software;
- Ultralight carbon fiber aircraft;
- R&D centre for additive repairs;
- Test, case and frames;
- MRO;
- Remote tracking.

INFRASTRUCTURES AND CONNECTIONS

- ✓ 2 international airports (Bari and Brindisi), serving over 40 international destinations;
- ✓ 1 industrial cargo airport (Taranto-Grottaglie), recently adopted as a test-bed for remotely piloted aircraft and designated as the first spaceport in Italy for the development of sub-orbital flights;
- ✓ 1 local airport (Foggia), with connections to Tremiti Islands;
- ✓ 3 major ports: Taranto (container shipping; the 3rd largest commercial port in Italy for cargo traffic); Bari (passenger and container traffic); Brindisi (passenger traffic);
- ✓ Extensive road and railway networks, linking the region to major north-south corridors and high-speed rail network;
- ✓ 1 logistics Interport located in Bari.

INDUSTRIAL BASE

Apulia is a dynamic region of the South East of Italy where companies have been involved in the aeronautics sector since the 1930's. Today, Apulia plays a leading role in the aerospace industry in Italy and boasts a significant industrial concentration, with over 560 companies (MNEs, SMEs, start-ups), occupying over 7,550 employees, active throughout the region in various fields of R&D and manufacturing that make up the entire aerospace supply chain, from the production of aircraft components to space software.
Continuous investment in innovation, as well as in skills, have turned Apulia into a centre for excellence in aerospace, making it the only Italian region in which the following sector specializations co-exist: fixed-wing, rotating wing, aerospace software (Leonardo Group); production of sections of the fuselage and tail wing in carbon fibre for the Boeing 787 Dreamliner Project (Leonardo Group); propulsion (GE Avio Aero); design and assembly of aircraft components in titanium and carbon fibre (Dema Brindisi for Bombardier); Microsatellites and propulsion systems for space stations (Sitael); Design and production of ultra-light carbon

fibre aircraft (Blackshape); R&D Centre for Additive Repairs (GE Avio Aero and Polytechnic University of Bari).
The aerospace industry is one of the most strategic sectors within the regional economy that has acquired a strong position in the international market in recent years thanks to its ability to strike up positive business relations with key players, contractors and OEMs, some of whom have chosen to invest in Apulia and contribute to the increasingly positive export performance (in 2018 the regional sector exports totalled 561,6 million euros, accounting for almost 10,2% of national exports).
In Apulia, there are two clusters involved in the aerospace sector and both of them actively seek to foster competitiveness and international business, stimulate and support research and training:

- DAP – Apulian Aerospace Business Cluster with over 70 associates (businesses and universities);
- DTA s.c.a r.l. - Apulian Aerospace Technological Cluster, a non-profit making consortium which brings together key industry players, universities, as well as public and private research centres active in Apulia.

R&D NETWORK

3 major Universities (Bari, Foggia, Salento) and 1 Polytechnic University (Bari), which offers a Degree course in Aerospace Systems Engineering
Research centres:
National Research Council (CNR), present in Apulia with 6 research institutes, including

- NANOTEC – Institute of Nanotechnology
- CNR- IMM (specialized in Microelectronics and Microsystems)
- CNR-ISSIA (specialized in Intelligent Systems for Automation)

CETMA – Technologies design and materials European research centre
ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development
OPTEL - specialized in high technological microelectronic and mechatronic solutions.

INCENTIVES AND FUNDING

Regional Contract Programmes: regional grants scheme supporting business innovation and investment projects for existing companies or for new companies to be located in the region, with investment budgets falling within the range between 5 million and 100 million Euros;
Integrated Incentives Packages (PIA): regional grants scheme supporting business innovation and investment projects for existing SMEs or new ones to be set-up in the region, with investment budgets falling within the range between 1 million and 40 million Euros;
Tecnonidi: regional grants initiative which supports investments projects for innovative start-ups and SMEs, with a high-technology content aimed at introducing new products, services and/or business solutions, with investment budgets falling within the range between 25,000 and 350,000 Euros.

SITES AND BUILDINGS

2 Business Incubators located in Puglia Sviluppo's premises in Modugno (BA), suitable for service industry and digital start-ups and Casarano (LE), suitable for research and manufacturing activities.
DTA-Apulian Aerospace Technological Cluster and DAP-Apulian Aerospace Business Cluster based in Mesagne (Brindisi).

SUCCESS STORY

Leonardo Group is a global high-tech aerospace, defence and security company which operates. As a strategic risk sharing partner for the Boeing Company, Leonardo develops and manufactures a significant share of the airframe for Boeing's "787 Dreamliner" aircraft in composite materials. Leonardo Group chose to invest in Apulia to create its international center of excellence in the field of composite materials, by setting up two state-of-the-art manufacturing plants in the region to carry out production for the "787 Dreamliner" project: in Foggia, Leonardo converted an existing facility for the production of the aircraft's horizontal stabilizer; in Grottaglie, Leonardo made an important greenfield investment to set-up an innovative plant for the production of two central fuselage sections, using "one piece barrel" technology.

Avio Aero is a GE Aviation business that designs, manufactures and maintains components and systems for civil and military aviation, which has made two significant investments in Apulia within the past 5 years. In November 2016, Avio Aero, together with the Polytechnic University of Bari, launched the first laboratory in Italy devoted
to the development of repair procedures for aviation engine components using innovative technology based in laser systems. The components involved in the research will come from various engines, including the GE90, which drives the Boeing 777 and the GEnx, used on the 787 and 747-8 Dreamliners. In addition, at the Avio Aero production facility in Brindisi, which is specialized in the assembly and maintenance of aviation engines, the company has invested in new technology for the production of components for the low pressure turbine for both versions of the GEnx engines and has set up a new additive manufacturing area.

SITAEL is a world leader in the design and construction of micro-satellites, which has invested in a greenfield research and manufacturing facility in the town of Mola di Bari. Among its various project activities, Sitael was selected by ESA to develop and built the ESEO (European Student Earth Orbiter) satellite which was successfully launched into orbit in December 2018 from the Vandenberg Airforce base in California (USA) and is intended to measure the levels of radiation present in the low Earth orbit and tests technologies for future ESA missions. Sitael, part of Angel Group, not only developed the satellite platform, performing systems integration and qualification, but also coordinated the teams involved in the ESEO mission project, representing ten European universities from eight ESA member States: Estonia, Germany, Hungary, Italy, Netherlands, Poland, Spain, UK.

All of these investment initiatives were supported by regional government funding.

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CAMPANIA

FACTS AND FIGURES

Campania Aerospace Cluster:
The Campania region has historical traditions in the aviation field: for about 100 years, it has developed these skills, benefiting from mild weather that allowed the processing outside of large aircraft parts made of wood and canvas and good weather for flying.
140 SMEs
Regional sector Export € 455 million.
Revenue: € 3 billion
Over 16,000 employees
Annual turnover that has reached nearly € 2 million.
10 key players: Leonardo, EMA, GE Aviation, MBDA, Vitrociset, Alenia Aermacchi, Magnaghi Aeronautica, Atitech, DEMA, Telespazio.
3 supply chains in the production sector: Aerospace, Aeronautics, Defense and Security.
Technology and business sector specialization:

- Technologies for sensor and mechanical system;
- Advanced materials;
- Microsatellites;
- Propulsion system for space;
- Intelligent Engine, aeronautical and space system;
- Design, construction and assembly of aircraft and their components;
- Robotics and additive technologies (machine product, powder handling, post processing);
- Aircraft interiors.

INFRASTRUCTURES AND CONNECTIONS

- ✓ 2 International airports (Napoli e Salerno). Napoli is the first airport in Southern Italy and the sixth national airport, 8.577.507 passengers in 2017. is the first airport in Italy to use electric buses, thanks to a partnership between Gesac and Handler, started in winter 2018;
- ✓ 2 civil airports: Capua and Caserta/Grazzanise;
- ✓ 3 commercial ports: Napoli, (21.923.377 ton) is one of the most important ports in Europe, it stood at the 12th place among the busiest ports in Europe for number of passengers; Torre Annunziata (450.000 T.) ; Salerno (12.900.000 T.).

INDUSTRIAL BASE

In the economic system of Campania Region the aerospace production chain plays a leading role representing an element of development of the territory both in terms of industrial presence and for the high content of technological knowledge required by the production processes. The large operators are joined by a network of small and mediumsized subcontractors able to use technologies, implement production processes, guarantee the technical standards of quality and precision required by the aerospace industry. Campania is the second region of Italy behind Lombardy (this year we estimate a turnover of 1.6 billion) and the first for the number of employees: a good 8,404 of these. Campania has a market share of 22%. Sector of aerospace industry sees some large companies of international importance (Leonardo, EMA, GE Aviation, MBDA, Vitrociset, Telespazio, OHB-CGS, Atitech) around which revolves a local system of small and medium enterprises: such a structuring of the

supply chain, found in each of the reference sectors, is the result of interaction and competitive methods based on the development of major production programs.

8 large companies (including Alenia Aermacchi, MBDA, Magnaghi Aeronautica, Atitech, DEMA, Telespazio), and 140 SMEs . The district has defined a feasibility study to be developed over a three-year period founded on ten highly innovative R & D programs. http://ris3.regione.campania.it/index.php/priorita/aree-di-specializzazione/aerospazio.

R&D NETWORK

High-tech districts (Distretti ad Alta Tecnologia - DATs) operate to increase competitiveness of strategic sectors for regional development, orienting research towards innovative products and processes and promoting innovation.
11 research centers (including CIRA, CNR, ENEA).

1 High tech districts : DAC Campania AEROSPACE DISTRICT. DAC pursues all of its goals in a meta district view. He is one of the founding members of the National Technology Cluster Aerospace (CTNA). It has also implemented important actions to ensure its involvement in most prestigious national and international aerospace platforms, such as ACARE Italia, EACP network, Platform Space SPIN-it

5 Campania University with engineering courses

- Italian center for aerospace research (CIRA) composed of institutions as the Italian Space Agency (ASI);
- European Aerospace Microfusions Pole (PoEMA) to strengthen the aerospace sector and create in Irpinia a center of excellence for investment casting lost-wax technology.

The Campania Region aims at investing in the 2014-2020 program period, through the activation of the Regional Operative Program, about 1 billion Euros in favor of research & innovation, as well as on a digital agenda and competitiveness.

INCENTIVES AND FUNDING

ZES Campania Strategic Development Plan: contains an exhaustive view on the areas identified, the portions of the territory involved, the list of existing infrastructures in the Zes, as well as the infrastructures connecting the non-territorially adjacent areas. It offers an analysis of the social and economic impact expected from the establishment of the ZES accompanied by data and elements that identify the types of activities that are intended to be promoted within it.

Regional Financial Economic Document (DEFR 2019-2021): the Region has defined the medium-long term strategy, aimed at promoting, also through a synergy with the central Government, the realization of an industrial policy capable of favoring investments of high financial importance and guaranteeing the attraction and / or permanence in the Campania region of multinational companies (development contracts, innovation agreements, regional program contracts).

Memorandum of Understanding with Mise, ICE-Agency and the Campania Region: The object is "Coordination, development of strategies and complementary tools for attracting investments, research and assistance to foreign investors in Campania and the experimentation of a governance system between central and regional administrations".

Agreement for Development: The Agreement for Development defines the interventions of primary importance to be carried out for the socio-economic development of Campania and is articulated in the following strategic objectives: • Environment Infrastructures; • Economic

and productive development; • School, University and Work; Tourism and Culture Safety and Culture of Legality.

Campania Regional Development Pact. Support for investment attraction and security - Resource planning. The provision was adopted in order to plan the implementation of a system action aimed at promoting the regional system and its opportunities in Italy and abroad.

Memorandum of Understanding between the Ministry for Economic Development and the Campania Region and for the Conversion and Re-industrialization of the Complex Industrial Crisis Areas: regional resources have been programmed for 23 million euros to promote projects of strategic importance for relaunching the competitiveness of the area and companies and supporting innovation processes.

Regional Law n. 22/2016 "2016 annual simplification law - Manifattur @ Campania: Industry 4.0": strategies and actions have been identified to encourage the establishment of innovative manufacturing enterprises, through investments in research, innovation and productive development, with particular reference to enabling technologies for the growth of the "Intelligent Factory" as an industrial model for growth of Campania.

Basket Bond - securitization transactions pursuant to Law 130/99 of receivables from small and medium-sized businesses in the Campania region, backed by guarantees on public resources.

Issue of minibonds backed by public guarantees:

Decontribution under Law 208/2015 - Implementation measures POR Campania ESF 2014/2020.

The measure has initiated measures to supplement the decontribution, in order to incentivize companies to invest in the Campania region, to foster growth opportunities and to combat unemployment in Campania, which presents historical problems and represents one of the most significant emergencies in the regional territory.

Tax credit for the purchase of new capital goods for production facilities located in the Campania region.

Campania Region has allocated a financial endowment equal to 116 Meuro for Axis 3 (OT3) of the Regional Operational Program Campania FESR 2014-2020.

IRAP defiscalization for innovative startups

SME instruments phase 1 - (feasibility studies)

SME instruments phase 2 (technology transfer)

OPEN INNOVATION A marketplace where industries and public sector could find the answers to their innovation needs. A talent showcase with brilliant inventions, discoveries, products. A collaborative environment to foster innovation.

http://openinnovation.regione.campania.it/

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LAZIO

FACTS AND FIGURES

Lazio Aerospace Technology Cluster:

- 250 companies;
- 23,500 employees;
- 5 billion euro turnover;
- 1,6 billion of exports;
- 10 Research Centres;
- 5 Universities;
- 3,000 R&D PhD & Specialists;
- 6 Incubators, Accelerators Technology Parks.

Main business sector specialization:

- ✓ Launchers (Vega, solid rocket motor for Ariane);
- ✓ EO, NAV & TLC SATELLITES:
  - Design & Assembling of payloads
  - Micro nano sats constellations
  - Applications
  - GovSatcomm
  - Space surveillance and tracking (SST)
- ✓ Manned and unmanned Space Exploration (incl. International Space Station);
- ✓ Ground Segment Control Centers;
- ✓ Safety &Security;
- ✓ Air Traffic Management;
- ✓ Homeland / Cyber Security;
- ✓ Aeronautical & stratospheric systems, interior design manufact;
- ✓ RPAS – UAV;
- ✓ Sub systems and components:
  - Propulsion (Guidance Navigation and Control, Attitude and Orbital Control Systems)
  - Thermomechanical (incl. Environmental Control and Life Support)
  - Electric power
  - Avionics and electronic systems
  - Optical / Electro-optical
  - Software
  - Structural components and mechanical equipment
- ✓ Key enabling technologies:
  - Micro & Nano-electronics;
  - Photonics;
  - Advanced materials (composite, ultralight alloys, nano-structured materials);
  - Advanced manufacturing technologies.

INFRASTRUCTURES AND CONNECTIONS

- ✓ 2 international airports (Fiumicino Leonardo Da Vinci, Ciampino);
- ✓ 3 commercial ports (Civitavecchia, Gaeta, Fiumicino);
- ✓ Main Highways: A1 Naples-Rome-Milan, A12 Roma-Civitavecchia; A24 Roma-L'Aquila.

INDUSTRIAL BASE

Lazio is the second region of Italy for GDP, equal to about 11% of the national total, and is placed by Eurostat among the twenty most important regional economies of EU.

LAZIO Aerospace Technology Cluster (DTA) was legitimated in 2004 by a Framework Agreement signed by Italy Ministry of Research and Lazio Region. In 2012, the DTA of Lazio was one of the founding partners of the National Italian Cluster for Aerospace Technology (CTNA).

Lazio hosts large groups of international excellence in electronics, sensors, avionics, components and innovative materials, "space" and satellite applications and services, but 85% of the business landscape is made up of SMEs subcontracting electronics, ICT, advanced materials and aeronautical and airport services. The numerous existing plants produce components for the Ariane and Vega launchers, satellites, radars and equipment for aircraft and helicopters.

Lazio is the only Italian region which hosts the whole aerospace value chain, a peculiarity that creates a competitive advantage at national and international level.

The sector demonstrates a great capacity for cross-fertilization towards downstream application markets, in order to generate demand for innovation along the SMEs value chain and to intercept potential resources from Public Procurement. The technological transversality is nurturing Lazio “Space Economy” to seize commercially exploitable opportunities in agriculture, telecom, cultural heritage, smart cities and healthcare market applications.

In Lazio there are 9 airports: among these, Fiumicino and Rome Ciampino constitute, by volume of aircraft, passenger and freight movements, the main reference point for the entire national airport system.

Lazio aerospace sector plays a leading role also in European projects, such as: COSMO-SkyMed, one of the most advanced satellite system in the word with many strategic applications for environment control and natural disasters’ management, ESA Vega launcher, 65% of which built in the province of Rome.

R&D NETWORK

Aerospace sector in Lazio is made up of world-renowned universities and research centres, large enterprises and production units of international corporations, as well as SMEs providing components, services and technical/industrial support. It covers all areas from research to planning, from design to manufacturing and services:

- 10 major research institutes/bodies headquarters: ASI (Italian Space Agency), ENAV (National Air Traffic Control Service Provider) ENAC (the Authority of technical regulation, certification, supervision and control in the civil aviation sector in Italy), ESRIN (European Space Research Institute) headed by ESA (European Space Agency), CNR (National Research Council), INAF (National Institute of Astrophysics), INFN (National Institute of Nuclear Physics), ENEA (National Agency for New Technologies, Energy and Sustainable Economic Development), ISPRA (Higher Institute for Environmental Protection and Research), INGV (National Institute of Geophysics and Volcanology)
- 5 Universities with 4 Faculties of Engineering, 12 departments and 30 higher education university programmes
- 3,000 University Professors, Researchers and other specialists involved in aerospace R&D

Lazio environment is further enriched by the Competence Centre “Cyber 4.0”, focused on cyber security and led by Sapienza University, with 37 partners from industry and science.

INCENTIVES AND FUNDING

Lazio Authorities support startups and enterprises in research, testing, business development, internationalization and international cooperation, also in the framework of the 2014-2020 ERDF Regional Operational Programme.

Lazio Innova SpA is the “one-stop” Agency of Lazio Regional Government, which supports economic development, innovation and internationalization, operates to the advantage of businesses and local public administration providing:

- Incentives from regional, national and/or European resources;
- Credit support and the issuance of guarantees;
- Interventions in risk capital;
- Services for the internationalization, promotion of business networks and regional excellence; services for the creation and development of business;
- Measures for social inclusion.

More info available at: www.lazioinnova.it

SITES AND BUILDINGS

Business incubators, accelerators and technology parks:

- ESABIC (Business Incubation Centre) Lazio is a partnership among Lazio Region, ASI (Italian Space Agency) and ESA and it is part of Innovation and Ventures Office (TIA-AI) of the European Space Agency. ESABICs aim to inspire and work with entrepreneurs to turn space connected business ideas into commercial startup companies, applying space technologies, solutions and systems in everyday life. ESABIC Lazio offers an incubation program with integrated services for creating and developing business and support to finance and technology transfer.
- Accelerators: there are many public and private companies that offer incubation and business acceleration services in Lazio and host start-ups and SMEs that base their business on the exploitation of space technologies, among these: Ketlab, Luiss EnLabs, Spin Over, INNOVA startup accelerator, Dock3 - The Startup Lab, TIM #WCap, The Business Factory, Vejo Park, Talent Garden, Roma Innovation Lab.
- Lazio Technopole system: Tecnopolo Tiburtino, east of Rome, characterized by production activities mainly in the ICT Electronics Telecommunications, Aerospace, Environment and Green Economy sectors, Research and Technological Transfer, Castel Romano Technopole, south of Rome, focused on R&D in New Materials, Life Sciences, the Environment and Green Economy and Science and Technology Park of Southern Lazio (PALMER).

SUCCESS STORY

Space Engineering is a frontrunner, based in Lazio, Italian space company with 30 years of experience in space technologies. Since April 2012 it is controlled by the leading space company Airbus Defence and Space, Space Systems. Space Engineering stands as a reliable partner for space agencies, satellite operators and leading companies in the space domain, with a significant amount of projects worldwide. Space Engineering has an outstanding expertise in design, engineering, simulation, prototyping, integration, testing, for Space & Ground, owning a significant number of international patents on antennas, radars, scientific software and Digital Signal Processing.

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PIEDMONT

FACTS AND FIGURES

Piemonte has the highest concentration of Italian aerospace companies. The region offers a complete pipeline of skills and qualifications, high-level manufacturing, processes and service companies, cooperation with universities and the R&D network, unique products and engineering know-how, educational & training system and an organized and complete supply chain.

Aerospace industry:

- 280 SMEs;
- 14,800 employees;
- € 3.9 bn turnover;
- 17% of national exports;
- 26% of exports directed to USA;
- 22% of exports directed to Germany.

International key players: Leonardo, Avio Aero, Collins Aerospace, Thales Alenia Space, ALTEC.

Aeronautics: Piemonte played and still plays a key role in many international programmes: 777 and 787 Dreamliner, Airbus A321, 500/600, A380, and A 320 NEO, Falcon 2000 and EX, Eurofighter Typhoon, C27J, ATR42, NH90, EH101 and AM400.

Space field: Piemonte is involved in a prime contractor role in international programmes such as the International Space Station (more than 50% of its pressurized modules are being developed here), ExoMars, Euclid, Bepi-Colombo, IXV and Space Rider, Ariane 5, ArgoMoon and many others.

Technological trends:

- Advanced materials
- Low emission aeroengine design
- High power transmission systems
- Additive technologies
- Advanced space robotics
- Technologies for space habitation
- Advanced satellite design
- New solutions for reusable vehicles

Piemonte aerospace district, stronger together:

Piemonte Aerospace District was established with the aim to support and strengthen the excellence of the regional aerospace sector through the creation of a network of large companies, SMEs, research system and institutional subjects.

So far the Association has gathered 51 members: public authorities, universities and research centers, trade associations and above all enterprises, both local SMEs and large globally operating companies with a significant presence in Piemonte, such as Leonardo, Avio Aero, Thales Alenia Space Italy, Mecaer and US Collins.

The Association has a governing body composed of 15 representatives and it covers various areas of action through the activation of specific working groups: R&D long-term strategic vision and technological development trajectories, supply chain, marketing & internationalization, education & training.

INFRASTRUCTURES AND CONNECTIONS

- ✓ Piemonte is located at the intersection of the two main axes Lisbon-Kiev European Corridor and Genoa-Rotterdam Corridor 24;
- ✓ The region is a strategic point for goods distribution in Europe with 3 logistics platforms – S.I.T.O. (Torino), C.I.M. (Novara), Interporto Rivalta Scrivia (Tortona) – and a network of about 1,000 km of motorways and 2,000 km of railways. Its position bordering Liguria makes it the idea rear logistics service location for the port of Genoa (150 km from Torino).
- ✓ Torino International airport: 30 minutes from the city center.
- ✓ Milan-Malpensa intercontinental airport: 1h from Torino.

INDUSTRIAL BASE

In Piemonte, the aerospace sector is one of the productive and scientific excellences, confirming the regional vocation for technological innovation. Moreover, the technical-productive specialization of the companies, both in manufacturing and technical services, makes the local aerospace sector highly competitive on international markets. Alongside, the region boasts a distinctive learning and academic environment that contributes to the training and growth of technical and managerial capabilities of qualified human resources appreciated all over the world.

The Piemonte aerospace scenario is further enriched by the presence of Torino Piemonte Aerospace District, the Italian Institute of Technology's (IIT), the Centre for Space Human Robotics (CSHR), a spin-off from the Politecnico di Torino, and and by the core of Italy's Space industry together with some international key players.

R&D NETWORK

Recent data confirm that Piemonte is a leading Italian region in R&D. Companies expenditure in R&D: 1.42% of GDP (national average of 0.65%), with a number of workers in R&D of 6.2 per 1,000 inhabitants (national average of 4.0) and an increasing IP impact, with a number of 137.6 patents registered per million inhabitants (national average of 83.6) (*Source: Istat 2017*).

- 200 private and public R&D centres, 4 Science &Technology Parks;
- 1st Italian region in terms of private investment in R&D;
- 3rd Italian region for hi-tech patents.

INCENTIVES AND FUNDING

Regione Piemonte has allocated € 1 bn to promote the growth and competitiveness of the whole territory.

The subsidy system in Piemonte focuses on both the start-up of new initiatives and on the development of existing companies. Subsidies to companies can take the form of soft loans, non-repayable grants or free-of-charge guarantee support (in compliance with the European regulation on state aid) and can vary according to the type of beneficiary, the kind of investment and the nature of expenses.

A special focus should be dedicated to grants provided for R&D activities:

- Regional investment contract, for R&D initiatives related to new investments in R&D centers, plants or service centers;
- Sector Technological Platforms, for cooperative R&D projects focused on four key topics, among which there is Space Economy (with a dedicated budget of 15 million euros) as Piemonte Region has signed the Multiregional Cooperation Program in the framework of National Space Economy plan.

Piemonte Agency:
Piemonte Agency is the one-stop-shop to get in touch with the regional economic community.
The agency provides a complete range of free services to foreign companies:

- wishing to locate in Piemonte
- searching for suppliers and partners

Piemonte Agency guarantees complete assistance to foreign companies willing to invest in Piemonte. The agency can advise on every aspect of starting and running a business in Piemonte, providing assistance at every stage of the project.
Piemonte Agency manages Piemonte Aerospace, a special project promoted by Regione Piemonte, financed by ERDF – European Regional Development Fund. It provides international players with a preferential channel to meet and start business with top class aerospace selected enterprises based in Piemonte. For more information: aerospace@centroestero.org, www.centroestero.org/en/key-sectors/aerospazio.html

SUCCESS STORIES

Success stories in the framework of new space economy:
New space economy involves a new vision of space opportunities, including the progressive transition from upstream to downstream business models and the increase of private investments: space is becoming more and more a commercial business.
Piemonte has a leading role in the pathway to open a commercial space ecosystem, following the modern vision of “democratization of space”, meaning giving open access to space for everyone.
The first ever commercial airlock that will operate on the International Space Station - ISS will leave from Torino: It is called Bishop and it represents the first step towards a new economy for scientific research, technological development as well as human and goods transport. It will enable additional capability to the International Space Station, giving the opportunity to connect more payloads.
The new module is the result of the collaboration between the Texan company NanoRacks, Thales Alenia Space - which developed 50% of the housing modules of the ISS in the region - ALTEC and by a pool of Piemonte companies: this partnership was created to take full advantage of the commercial opportunities of space exploration and in-orbit-services.
Piemonte production chain is a fundamental advantage as confirmed by the decision of NanoRacks to settle its European headquarters in Torino in October 2018, where the company will concentrate on the use of microgravity of space for advances in the fields of life sciences, biopharma and agriculture.
Also thanks to Piemonte dynamic ecosystem in the fields of new space economy, Tyvak International estabilished in 2015, as the first international subsidiary of the American Group Terran Orbital Corporation, a company that specializes in nanosatellite design and manufacturing, as well as mission operation, which also includes Tyvak Nano-satellites System. Politecnico di Torino and its incubator I3P have provided great support to the activities of the company, which is unceasingly growing.

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