



# INCAS

## National Institute for Aerospace Research

### "Elie Carafoli"



## Institutional Development Plan

### 2017 - 2020



## Foreword

**INCAS** - National Institute for Aerospace Research "Elie Carafoli" is the leading research establishment in aerospace sciences in Romania, with more than 65 years tradition in aerospace engineering, flow physics and applied aerodynamics, using state-of-the-art technologies and unique infrastructure of national strategic importance. INCAS has been involved in all major national aeronautical projects for civil and military areas, and currently is acting as a major player in EU policy for R&D development under FlightPath 2050 vision and future Horizon 2020 program.

Reorganized in December 2008 under HG 1463 as a public body, INCAS has been repositioned as a research establishment, acting under public law as INCD, coordinated by ANCS - National Authority for Scientific Research. This transformation recovers the original position of INCAS as a successor of INCREST - National Institute for Scientific and Technological Creation before 1990 and follows 20 years of activity as a private R&D company in the private property of the Romanian state.

Starting 2007 INCAS has initiated a solid long term strategy towards recognition of the status and capabilities of Romania in aerospace sciences, making usage of the unique research infrastructure (including wind tunnels with state-of-the-art technology) and outstanding competencies in both major and "niche" areas for development at international scale. At the same time, INCAS has been recognized as a policy maker in Europe and at international level, playing a major role in all programmatic documents and visions developed in the aerospace sector.

The crafting of the current Development Plan is based on analysis of the global R&D area and new challenges imposed by the changing economic and social environment. INCAS is one of the contributors for the FlightPath 2050, an active participant to the new ACARE - Advisory Council for Aeronautical Research, has jointly developed the EREA - European Research Establishment in Aeronautics programmatic "Vision for the Future - Towards the Future Generation of Air Transport System", has initiated and signed as an institutional member the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers" and is one of the founder members of the IFAR - International Forum for Aviation Research. This is a solid basis for the foundation and implementation of the proposed Strategy and Development Plan for INCAS in the next decade.

President and CEO

dr. Catalin NAE

A handwritten signature in black ink, appearing to read 'Catalin NAE', written in a cursive style.

## **INCAS Mission**



**The Institute is a comprehensive research establishment, fulfilling a national and international role in providing world class capabilities across the whole spectrum of basic and applied research in aerospace sciences, industrial support and specialized expertise.**

INCAS performs this mission in an integrated environment with industry and academia, and supported by higher education training in areas reflective of the Institute's mission. It aims to achieve this in an innovative, responsive, caring and flexible working environment with state-of-the-art facilities and the most advanced technology available.

It is committed to providing access to state-of-the-art infrastructure and technologies for the world wide aerospace industrial community, universities and academia, and to achieving quality and excellence in all aspects of its work.

This commitment extends to the provision of basic and applied research, development and consultancy services for industry and society, with due regard to the technological, commercial, social and cultural needs of the community it serves.



## INCAS Institutional Vision

Our Institutional Vision in the next decade is linked to the major social and economical changes in the society and major technological challenges in order to meet the society future needs.

The Vision is based on deep understanding of the mechanisms driving R&D activity at national and international levels. The Vision is based on strategic studies performed at European level (e.g. for the benefit of EREA, ACARE and Horizon 2020) and part of the international cooperation (JTI Clean Sky in Europe and IFAR study at global international scale).

**INCAS Institutional Vision is for a global interconnected technological multicultural world, with segregated access to basic resources and institutions tailored to the increasing need for excellence. In this context, INCAS will be recognized as a distinctive, open for access and multidisciplinary, low to medium TRL application orientated, featuring world class infrastructure and competencies.**

INCAS Vision underlines a major role in the four areas of interest with respect to the political position and strategic partnerships and commitments:

- Role in the Aviation Roadmap and Air Traffic System of the Future
- Role in the Frontier Research in Aerospace Sciences
- Role as a Research Establishment at EU level
- Role as a R&D Center of Excellence and Innovation Culture Development Agent

**Role of INCAS in Aviation Roadmap and Air Traffic System of the Future** - As for all leading-edge sectors, the future of ATS depends on decisions made decades earlier in research centers and laboratories. In key technology areas such as energy, materials, design, onboard systems, infrastructure and environmental protection, making correct and timely decisions is crucial.

The entire air traffic environment will have changed significantly by 2050. But to what degree will it actually change, and what resources will it need to support these changes, this is a matter of continuous research and political decisions. Whether the dominant scenario turns out to be unlimited development, drastic regulation, the virtual disappearance of the sector, or a combination of all three, the enabling technologies will undoubtedly not be the same.



Development scenarios are major drivers for the development of new technologies. Research establishments will be in a leading position for low TRL development. Industry will take the lead for high TRL developments and large scale demonstrations. INCAS, as a research establishment, has committed for a long term investment in new technologies and human resources in order to play a major role in ATS for year 2050.

**Role in Frontier Research in Aerospace Sciences** will be enhanced by latest major developments in the national and scientific community and results from INCAS strategic planning:

- Romania is ESA member starting 2011. This will enable higher exploitation of institutional resources in major areas of technological interest, as for NGLS - New Generation of Launchers Systems, advanced space system dynamics including satellite formation flying, up to advanced navigation systems using EGNOS and Earth Observation activities.



- INCAS has made a major investment in ATMOSLAB, a flying laboratory based on a KingAir aircraft and state-of-the-art technology for airborne sensing, including atmospheric research and lidar technologies. This unique national asset will be part of an international infrastructure to be used for frontier research in atmospheric studies and climate changes.



- INCAS has become full member of two exclusive alliances dedicated to large experimental facilities in aerospace sciences (STAI and EWA). This strategic partnership will enable enlargement of the scope of current R&D activities in new areas of knowledge development, as for combustion and plasma physics, to be extended towards particles dynamics.

As a pole of excellence with respect to these new areas for advanced research, INCAS will become a major attraction for upstream research projects from enlarged international community, with the continuous enhancement of the circle of industrial partners for downstream research at higher TRL.



**Role of INCAS as a Research Establishment at EU level**, taking into account commitments towards joint policy in EREA - the Association of European Research Establishment in Aeronautics, should be to carry out in improving the coherence and co-ordination of aeronautical research and innovation activities conducted at national and international levels through:

- Lead to the European Strategic Forum on Research Infrastructures (ESFRI) contributing to establishing a European 'roadmap' for new and upgraded pan-European research infrastructures;
- Generate/coordinate/participate in Joint Research Initiative (JRI) for the implementation of technical and institutional issues;
- Secure the complementarity of European-national Aeronautics R&D policies;
- Contribute to EU environmental technology action plan (ETAP).

INCAS should coordinate the harmonization and standardization process relative to new business models focusing on intellectual property protection, spin-off creation from research and technology transfer, define new transfer protocols which describes the technological trajectories in terms of research topics, staff responsible, legal aspects, and economic contributions, in coherence with European guidelines.



**Major EU institutional documents with INCAS contribution**

## Role of INCAS as R&D Center of Excellence and Innovation Culture Development

**Agent** is based on the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers, key documents in the EU's innovation and economic policy to make the best of its scientific potential.

INCAS will act in order to prevent potential shortage of researchers as a threat to the Europe's innovative strength, knowledge capacity and productivity growth in the near future, contributing to the development of an attractive, open and sustainable labor market for researchers.

The science and engineering base for human resources development includes the accumulated knowledge and the science and technology spin-off units that underpin business innovation also by providing technological training and scientific knowledge: specialized technical training system, support for university system, advanced infrastructure for basic research, public R&D activities, strategic R&D activities, non-appropriable innovation support.

INCAS has been associated with a long tradition of innovations and successful implementations in industry for the R&D results in aeronautics. In a competitive multicultural world INCAS will fully exploit this experience, with a clear benefit for the national economic environment.



**INCAS signature for The European Charter for Researchers and  
The Code of Conduct for Recruitment of Researchers**



### 3.1 Scientific SWOT analysis

The SWOT analysis performed at INCAS aims to identify the strengths and weaknesses of the Institute and the opportunities and threats in the very challenging economic environment where INCAS is acting as a research establishment. Having identified these factors, the Institute strategy has been developed which builds on the strengths, eliminate the weaknesses, exploit the opportunities or counter the threats.

INCAS has initiated a SWOT analysis starting 2011 (for the institutional evaluation process in 2012) in the context of repositioning the Institute as INCD under the Romanian public law and to integrate as a research establishment in ERA-Net and broader competitive aerospace communities.

#### Methodology

The strengths and weaknesses were identified by an internal appraisal of the organization and the opportunities and threats by an external appraisal.



The internal appraisal took into account all aspects of the Institute covering, for example, personnel, facilities, existing technologies, location, R&D provided services, in order to identify the strengths and weaknesses. The external appraisal scanned the political, economic, social, technological and competitive environment with a view to identifying opportunities and threats in a very competitive market.

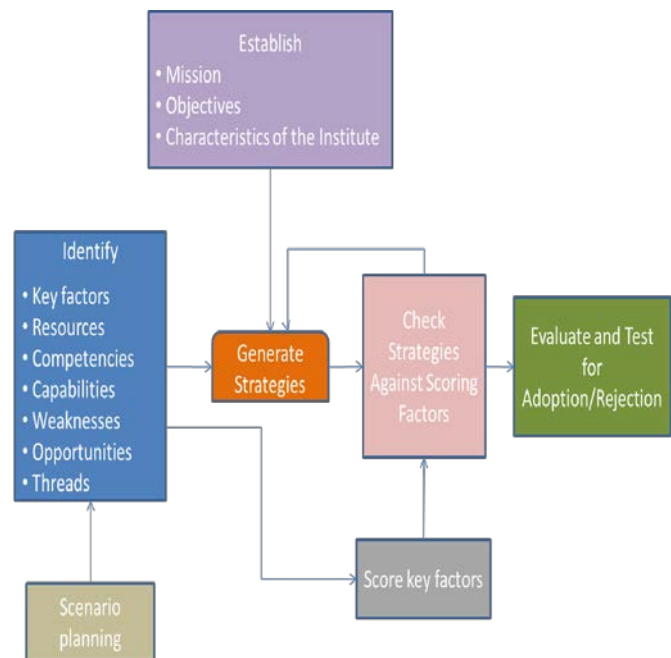
The SWOT analysis was performed by a relevant group of 20 personalities, involving members of the Administrative Council and Scientific Council, Board of Directors and external advisers. A discussion was first held about the mission and characteristics of INCAS to set the context for the SWOT analysis. Basic topics to influence the analysis were considered as follow:

- Internationally competitive, entrepreneurial
- Research establishment, public body, national strategic interest
- High quality research, extensive research infrastructure
- Industrial integration in the civil and military aeronautical sector
- Close collaboration with academia (under aegis of Romanian Academy of Sciences)
- Commitment to widening access

The group then went into idea generating mode first addressing opportunities and then following that with threats, strengths and weaknesses. The approach adopted was for each issue to be discussed in smaller groupings of two or three people seated together. Following the informal discussion each individual was asked in turn to contribute. This led to a rich range of factors being proposed and avoided potentially dominant views of some participants biasing the outcomes.

The group was asked to score each item on the scale of 1–5 (5 represented an opportunity not to be missed). Of the items scoring greater than 3 out of 5, 8 were opportunities, 6 were threats, 7 strengths and 7 weaknesses. The balance of items was thus in favor of opportunities and strengths suggesting an offensive rather than defensive orientation in the SWOT analysis.

The resultant strategy generation process incorporating SWOT analysis, resource-based planning plus the enhancements from scoring factors and checking strategy and factor linkages is generated as presented.



INCAS strategies generated by the analysis were highly commensurate with those in place at INCAS and closely monitored by INCAS Strategy Department.

## **3.2 Strategic Scientific Objectives and Directions**

INCAS Strategic Plan details a set of objectives, and related goals, within the Vision of the future of the Institute under the following themes:

### **SO1. R&D Partner of Choice for Aerospace Community**

INCAS, with its long history of investment and nurturing of national infrastructure, innovative staff and entrepreneurial approaches to working with partners, aims to become "Partner of Choice" to develop innovative, technical solutions to meet the complex requirements of today's aerospace marketplace. Within this strategic objective, the major goals are:

1. To maintain technical excellence and leadership in the national R&D plan, EU Horizon 2020 and ESA.
2. To build world class competencies in four important technology areas:
  - Integrated Conceptual Design, Modeling & Simulation tools in aerospace sciences;
  - Advanced on-ground (wind tunnels) and in-flight experimental facilities (ATMOSLAB);
  - Virtual simulation environments with augmented reality (AERO-VR);
  - New materials & structures for aerospace applications

### **SO2. Building Regional Competitiveness in Aerospace Sciences by Strengthening Lower-Tier Suppliers**

Under this strategic objective, INCAS will leverage its position as a key player in Romanian and regional aerospace community to act as a catalyst to address the many challenges facing lower-tier suppliers. Within this strategic objective, the major goals are:

1. To enhance the lower-tier suppliers' product development capacities, knowledge transfer, and linkages of SMEs.
2. To develop the lower-tier suppliers' process development knowledge, skills, and capacities.
3. To showcase new technologies through increased number of demonstrator projects.
4. To continue to strengthen INCAS commitment to skills development in the industry.
5. To continue to strengthen the aerospace industry clusters, strengthening the regional economic environments supporting SMEs as a whole.

### **SO3. Providing Technical Expertise and Industrial Knowledge to Support National Priorities and EU Policy**

With the relative importance of the aerospace industry to national and EU overall economic activity and global standing, INCAS has formulated a number of policy and program objectives to strengthen the industry's macro environment. INCAS will provide the necessary technological competencies and knowledge to support its decision-making and responsibilities. Within this strategic objective, the major goals are:

- 1.To continue to provide leadership in national industry to develop an integrated framework and set of national policies and programs for the aerospace industry.
- 2.To continue to influence national aerospace policy and program recommendations developed at EU level.
- 3.To continue to support the Department of National Defence in aerospace technologies.
- 4.To continue to support the public's need for safety through regulatory oversight of the aerospace industry (e.g. design verification, product certification, accident investigation support).
- 5.To take a lead role and integrate national aerospace capabilities into horizontal programs (PNCD2), whose focus is broader than just aerospace.

### **SO4. Center of Excellence and Innovation Culture Development Agent**

Taking into account major challenges of the society in the FlightPath 2050 Vision, INCAS has to ensure the Institute is able to meet its basic obligation to support the priorities of the national R&D plan and regional aerospace industry, using advanced training infrastructure for human resources and focusing on the innovation policy. Within this strategic objective, the major goals are:

- 1.To support and participate in the human mobility programs at EU level;
- 2.To enhance INCAS visibility as an excellence centre in Europe, to increase collaborations, and to increase the industry's awareness of new capacities.
- 3.To continue to develop and support spin-off and start-up entities for the aerospace sector;
- 4.To preserve the value of national investments in INCAS advanced facilities.

### **3.3 The Human Resource Strategy (HRS)**

It is through the skill and effort of INCAS staff that we will, as a research establishment integrated at EU level, achieve our institutional goals. Our Human Resources Strategy (HRS) will enable us to attract and recruit staff with the qualities we need. It also sets out the ways in which we will retain staff through motivation, effective rewards, good management, leadership and by establishing a culture and environment that encourages well-being. Finally, our Human Resources Strategy will enable us to manage our staff group effectively in terms of size and composition.

The aims of our HRS are consistent with our Institutional Vision and are captured in similar terms: we will seek to be an employer of first choice and the leading research establishment in Romania in aerospace sciences for professionals.

#### **INCAS HRS Aims**

In essence, the aims of Human Resources Strategy is to deliver a culture and working environment which values:

- High scientific performance
- Innovation, creativity and adaptability in changing circumstances
- Professional responsiveness to the diverse needs of our customers
- Team working
- Excellence in leadership, management and supervision
- Fairness of treatment
- Respect for difference and diversity
- Effective and meaningful employee engagement and involvement

#### **INCAS HRS Key Strategic Priorities**

The key strategic priorities of our Human Resources Strategy over the next period (5 years) are:

- To lead a Institute wide approach to the support, reward, development and management of staff so that consistent levels of high performance are the norm.
- To develop an environment that fosters employee well-being, respect for diversity and difference and in which there is no tolerance of incompetence or unfair discrimination.
- To develop a workforce plan, in terms of size, scientific expertise and competence, integrated with financial and service planning, that underpins INCAS strategic aims.
- To establish and maintain effective relations with staff, individually and collectively and with their recognized trade unions to achieve high levels of employee engagement.



- To build institutional capacity to achieve successful change in the short and long term providing support for and building the leadership capabilities of project managers.

### HUMAN RESOURCES STRATEGIC PRIORITIES - Action Plan

In this Development Plan, HRS plays a key role in the next 5 years. Due to the important historical drawbacks with respect to personnel structure, competencies and mainly their age, INCAS has to put in place an operational plan with the following three priorities:

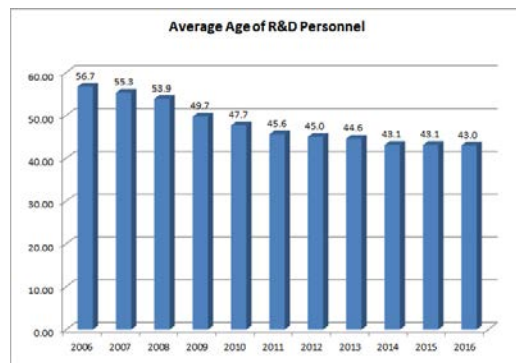
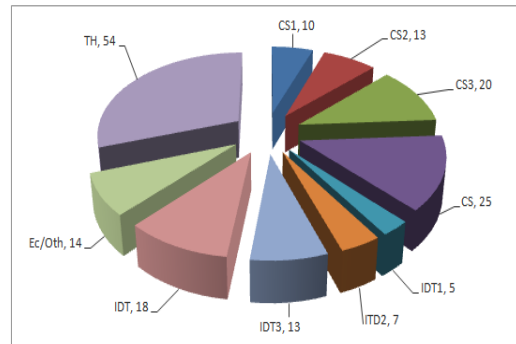
(short term – priority 1)

- Increase the number of young researchers with a PhD degree by new long term contracts, from a multidisciplinary selection pool, using the selection procedures already implemented;
- increase the number of project managers with specific competencies in the line of business of INCAS;
- boost the process of scientific recognition for existing staff.

It is the Scientific Council main responsibility for the moment to monitor this process and to inform the Administrative Board on the evolving situation with respect to these objectives.

**Global Actions Plan** for HRS of INCAS includes:

- Develop strategies to encourage international mobility, for both researchers and staff. The increased mobility would be beneficial for both the Institute and the scientists.
- Develop mechanism for stimulating the post-doctoral fellowships for young researchers in recognized foreign universities and facilitate both the application and return in INCAS.
- Stimulate the publication activity of young and established researchers; this activity should be one of the major points in the attestation of the permanent staff.
- Develop a mechanism for internal dissemination (e.g. seminars) of the research ideas and results within the Institute with a special emphasis on PhD students and young researchers. This action will be combined with the activities of the new research clusters and could result in synergistic effects on the research collaboration.
- Provision of state-of-the-art research infrastructure to the scientists, especially in areas in which the Institute has unambiguous achievements, to gain first hand experience with modern techniques needed in any world class institution.



### 3.4 Mechanisms for stimulating the appearance of new research directions

INCAS has already experience in pioneering new mechanisms for innovative companies and new direction for research. This is emphasized by the new development in INCAS starting 2009, where a first start-up initiative has been put in place. Then, starting 2011, INCAS has encouraged 3 successful spin-off applications with staff from INCAS, where complementary and alternative areas for expertise are involved. This process has been continued in 2016.

INCAS has identified a number of opportunities in the near future, and an action plan is now in place for new business development. This is also supported by the New Business Development Department of INCAS.

#### **Actions:**

- Use the existing (limited) financial resources of INCAS as a tool for support the activities in the priority research areas. INCAS internal funds to be granted to a lower number of proposals but with higher amounts in order to integrate the manpower of the Institute on these areas;
- Provide transparent and objective reviewing of the on-going support actions based on well recognized criteria (number of publications, impact factors of the journals, novelty of the research, etc.). Advantage to be given to spin-off activities of young scientists and/or in new for the Institute research fields;
- Use strategic partnerships in order to use the international business environment and associated financial mechanism for innovative activities;
- Support reintegration of former staff in new associative companies, under INCAS program for new business development.

At the same time INCAS monitors closely and informs the staff on the process where complementary models of academia – industry collaboration are now emerging in several regions of Europe. Examples include:

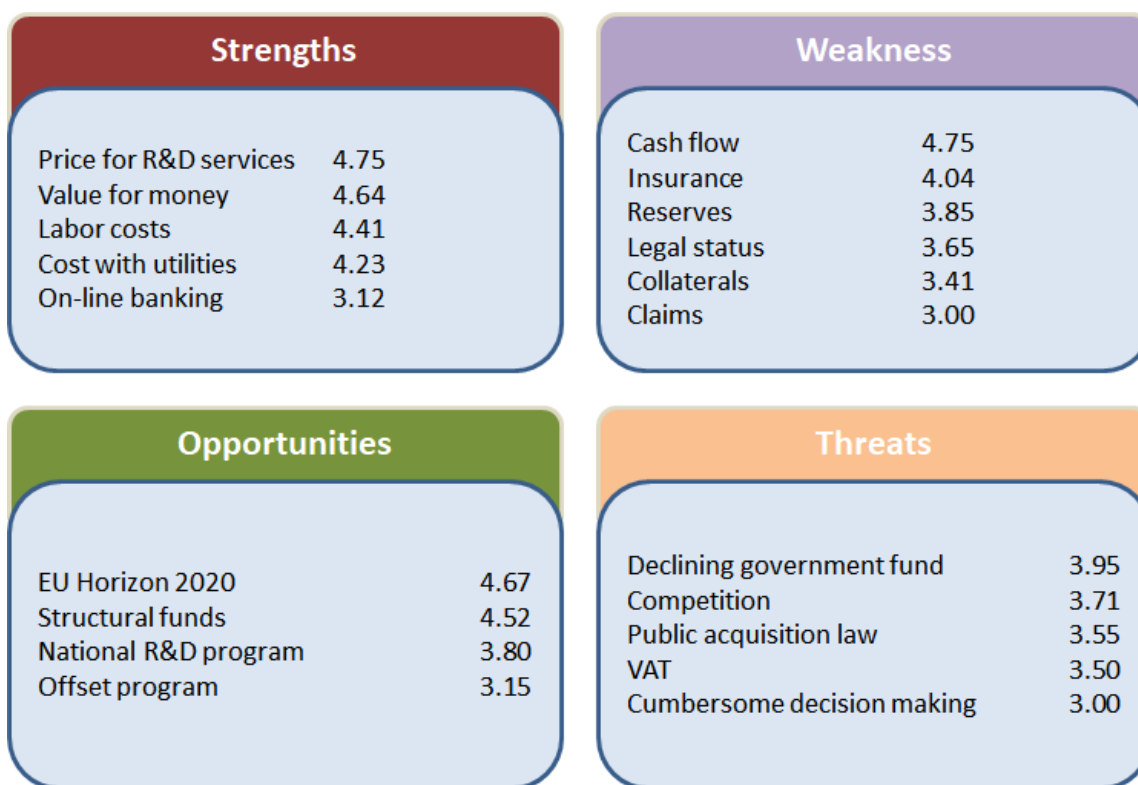
- New real or virtual networked platforms, e.g., the Minatec campus in Grenoble – FR.
- New academic virtual centers of excellence, whose creation are a prime inducement for companies to join activities (e.g., the IMEC/NMRC/Leti/ CSEM virtual centre).
- Formation of national alliances of excellence / industry platforms facilitating the involvement of a broad industrial community (e.g., the ones piloted by the French ministry of research for the definition of new technology initiatives<sup>3</sup>).
- Formation of regional networks of competence in ICTs, (e.g., REGINA4, the regional industry club informatics Aachen, which consists of about 60 high-tech companies and 20 research institutes, its Dutch pendant REGITEL5, etc.).

### 3.5 Financial SWOT Analysis

INCAS has considered most advanced instruments for assessing the Institute capabilities and procedures for successful R&D activity. Targeted areas for in-deep analysis included the overall financial activity, planning and strategic allocation of financial resources.

It was finally decided, after several iterations, that SWOT type of analysis was not the best instrument to support a realistic financial policy under the Institutional Vision and various scenarios for the R&D market development. This is mainly linked to the capability of SWOT analysis to enable a solid and uncontested instrument for a major decision with respect to critical financial areas.

However, in INCAS exercises, several components of the SWOT analysis were identified. They are in line with the global overall business SWOT analysis.



As a more realistic approach to the financial planning and strategic policy in this area, major outcome from audits performed by PWC and E&Y were considered as a basis for internal financial policy and strategic planning for R&D activities.

**For 2017 - 2020 period INCAS will be in a position to achieve a financial global figure for R&D incomes of 18 - 20 million Euros per year. For this volume, 45% of the funding is from EU projects, 40% from national projects (including basic funding) and 15% from direct contracts with industry.**

This is considered to be the limit for sustainable financial growth based on current institutional structure and development scenarios.

### 3.6 Infrastructure Investment Plan and Strategy

INCAS is a unique research establishment in Romania with outstanding technological capabilities, world class infrastructure for applied research and highly appreciated human potential. A strong policy with respect to the investments in these capability was in place in the last years, with long term plans and major objectives.

A strategy for investment at INCAS is structured on three major pylons:

- investment in new technologies;
- investment in experimental platform;
- investment in human resources

Investment in new technologies is our main instrument for implementing the Institutional Vision. INCAS investments in technologies is supported by the institutional policy with respect to R&D contracts, where more than 25% of the total expenditure is orientated in acquisition of new technologies.

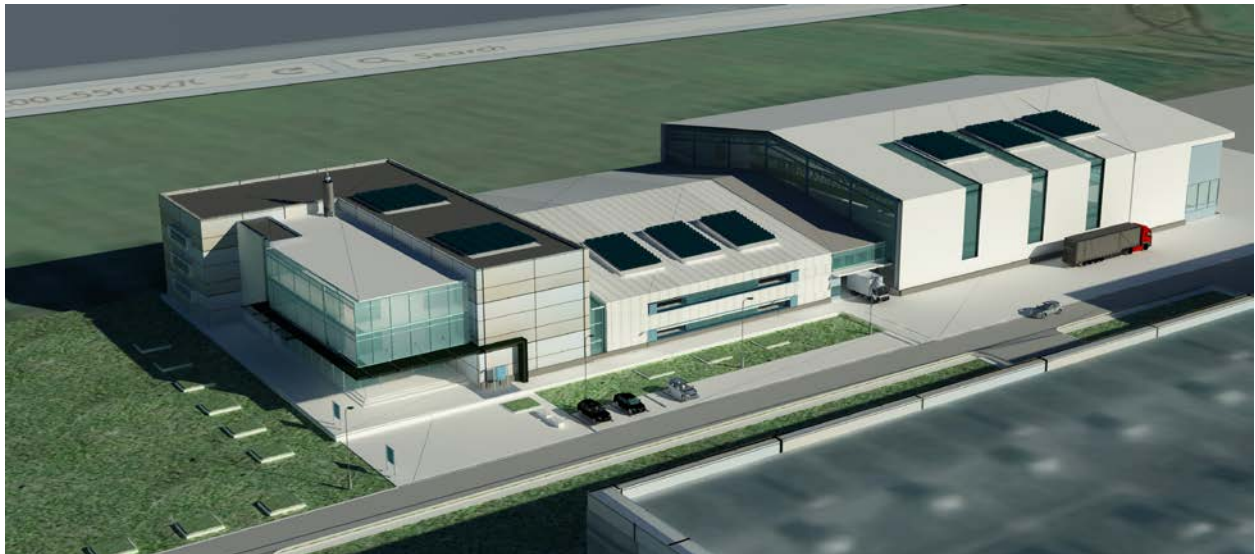
Infrastructure investment is based on development plans in three locations:

- Militari platform, where INCAS invest aprox. 1.500.000 Euro every year in order to maintain the state-of-the-art capabilities and quality of services mainly for the wind tunnels ;
- Strejnic platform, where INCAs will develop an experimental base for atmospheric research. This will enable INCAS to address new areas for research and to develop new capabilities. The infrastructure at Strejnic will include both a ground based station and flying labs.
- Maneciu platform, where INCAS has started an invitational plan for development of a modern base for unconventional technologies and aerospace testing capabilities, with a 6.000.000 Euro investment plan in the next 5 years, using institutional funding.





These investments plans in infrastructure are complemented by the new line of investments opened by ATMOSLAB, INCAS flying lab for advanced atmospheric studies, where INCAS will invest another 1.200.000 Euro every year in the next 4 years (total 5 million Euros in 2017 - 2020).



At the same time, in addition to the investments in research platforms in locations owned by INCAS, the institute will initiate a dedicated investment program aimed towards new technologies for “Green Aviation”, in partnership with SC Avioane Craiova. At Craiova location INCAS will invest in an Excellence Centre for manufacturing technologies dedicated to composites and new metal powder, to be used mainly for aerospace applications. This is mainly dedicated for ESIF funding schemes (POS/PC in Romania).

This huge investment effort in research infrastructure is justified by INCAS position in R&D community, the specific national interest in critical infrastructures and long term commitments assumed by INCAS management.

The financial support for the investment plan is based on internal resources 30% and 70% from specific external financing, using specific instruments as EU funding and national programs.



### **3.7 Technology transfer and the attraction of non-public funds**

INCAS has initiated in 2011 a dedicated plan for boosting technological transfer and higher exploitation of the innovative potential, patents and IPRs. As a result, there are already a number of 3 spin-off innovative small companies initiated with the patents from INCAS. Another 2 were set forward for financing in 2012.

Also, Aerospace Consulting is a start-up company providing technical expertise for the aeronautical community, together with Aerospace Services, the 100% owned entity from INCAS in charge with business generated from R&D outcome and mainly IPRs.

This line of action will continue, under a mature approach, based on the consolidation (financial and administrative) of the already existing entities migrating around INCAS. The major target is the aerospace industry, with a new line of business opened by the opportunity of Romania becoming ESA member from end-2011.

Diversification of financing sources is part of a strategy where the INCAS - New Business Development Department plays a major role. We consider a potential market with customers outside the traditional national partners from civil and military entities. There are niches to be exploited, with major interest for:

- regional innovative clusters, financing joint projects in aeronautics;
- direct business partnership with strategic investors, as it is the case with the development of a new trainer aircraft a police mission aircraft and a surveillance unmanned system;
- regional virtual maintenance center for aeronautics;
- regional training facility for CS-23 aircraft category.

These priorities for new developments will be considered on commercial basis, where INCAS will integrate know how, IPR and access to critical infrastructure. It is expected that

It is a constant responsibility for the management team to seek new business opportunities and to identify sources for financing. Specialized Marketing unit of INCAS and New Business Development Department, with the help of the advisers group of the General Director makes a ad-hoc structure using all opportunities at national and international level in order to meet a target of 15% new financing resources every year.

This line of action and objective is consistent with the financial planning for 15% revenues from industrial partners (outside of R&D area) and the expected 75% update for the industrial partners every 10 years in aerospace industry.

### 3.8 Strategic partnerships and visibility

Role of INCAS as a Research Establishment at EU level, taking into account commitments towards joint policy in existing partnerships, should be to carry out in improving the coherence and co-ordination of aeronautical research and innovation activities conducted at national and international levels through:

- Lead to the European Strategic Forum on Research Infrastructures (ESFRI) contributing to establishing a European 'roadmap' for new and upgraded pan-European research infrastructures;
- Generate/coordinate/participate in Joint Research Initiative (JRI) for the implementation of technical and institutional issues;
- Secure the complementarity of European-national Aeronautics R&D policies;
- Contribute to EU environmental technology action plan (ETAP).

INCAS coordinates the harmonization and standardization process relative to new business models focusing on intellectual property protection, spin-off creation from R&D, define new transfer protocols and research topics, legal aspects, and economic contributions, in coherence with European guidelines.

In particular, INCAS strategy builds on existing EU strategic partnerships:

- EREA - European Research Establishment in Aeronautics;
- ACARE - Advisory Council for Aeronautical Research;
- EWA - European Wind Tunnel Association;

International partnership is based on existing recognition of INCAS in the following bodies:

- IFAR - International Forum for Aviation Research;
- STAI - Supersonic Tunnel Association International;
- ICAS - International Council for Aerospace Sciences

A major success for INCAS was the conclusion of several bilateral partnerships with major EU research establishments. This is the case for MoU with DLR from Germany, ONERA in France and VTI in Poland. This line of actions will continue with a major interest in a partnership with TsAGI in Russia and a similar one with NASA, expected to be concluded in 2017 - 2020.

At academic level, INCAS will continue to enlarge cooperation with major universities in Europe. Existing partnerships with French universities (Toulouse and Poitiers) will be further developed with major aerospace engineering departments in UK and Germany.

INCAS Bulletin is a publication in line for ISI quotation and major channel for scientific dissemination. This is complemented by a set of occasional publications dedicated to personalities (as for Henry Coanda and Elie Carafoli) but also for special events (celebrating IAR-93 aircraft).

Participation in various network of excellence in EU, organization of international events (AEROSPATIAL and Caius Iacob international conferences @ INCAS location in Bucharest) or complex partnerships in IMG4 and ASD is a normal line of business for INCAS, under direct responsibility of the International Cooperation Unit and the General Director. This will enable full development of INCAS as an active player in R&D community and true international visibility.