

TAKING ON A NEW DIMENSION







DRONE



DEFENCE



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AERO

SPACE

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CHAIRMAN'S MESSAGE

2023 is the year of the return to the face-to-face Paris Air Show with the participation of around fifty Walloon companies among Skywin members.

The context is extremely dynamic : air transport returns to pre-Covid level activities and the potential for commercial exploitation of Space has never been so promising.

Civilian and military drones continue to be developed. The defence industry is under great pressure from the regrettable conflict in Ukraine.

Our industrial sectors are living in demanding and exciting times, framed by an omnipresent climate challenge and resolutely ambitious decarbonization targets. Technology plays a major role in the midst of these challenges.

Wallonia has always been a land of innovation. And when the political will, the energy of entrepreneurs, the know-how of academies and the pragmatism of research centers join their efforts, the results are there.

In this environment full of opportunities and with the help of the Walloon government, the Skywin cluster continues its actions to federate scientists and industrialists to promote research and innovation at the service of businesses and of the growth of the local economy.

Jacques Smal Chairman



SKYWIN IN A NUTSHELL

For the Skywin cluster, the year 2022 was marked by the deployment of the general strategy of the cluster, redefined end 2021 following a collaborative process, henceforth structured around :

- 4 economic sectors,
- 5 new technology areas (DAS for "Domaines d'Actions Stratégiques") and
- 5 missions defined in the future Objectives and Means contract with the Walloon government.



MISSIONS

- Support for the regional strategy
- Innovation
- Economic growth
- Talent development
- Internationalisation



TECHNOLOGAL AREAS - DAS

- Structures, propulsion and flying subsystems
- Innovative materials and processes
- On-board and communicating systems
- Data economics, artificial intelligence
- Simulation, modelling and test facilities



SECTORS

- Aeronautics
- Space
- Drones
- Defense

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SECTORS

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Aeronautics Space Drones Defence

2022 MAIN ACHIEVEMENTS



For the **Aeronautics sector**, faced with a strong and rapid recovery of activities after the Covid crisis, several actions have been undertaken, such as :

- preparation of a strategic and technological roadmap, involving industries, research centers and airports partners,
- assistance with operational excellence for SMEs,
- in collaboration with the Administration, monitoring of the WINGS structuring program including the validation of phase
 1 and the launch of phase 2,
- focus on a clean aviation (net zero emissions), including of course impacts on future airplanes and engines but also on airports and fueling (SAF) infrastructures and services (in partnership with Tweed Cluster),



For the **Space sector**, Skywin has presented and deployed the technological roadmap for the Walloon space sector, particularly highlighting Earth Observation and Launchers. For instance, Skywin supported a dedicated call of projects for Space in the frame of the "Plan de Relance Wallon".



For the **Drone sector**, the collaboration with the ID2Move incubator continues, as well as the partnership within the European consortium Prestigious, aiming to establish the Inspection and Security drone value-chains, while intensifying the collaboration of drone-related clusters in Europe, strengthening competitiveness and sustainability of the drone SMEs in Europe.



For the **Defence sector**, in cooperation with Mecatech, a strategic and technological roadmap was prepared with the industry and a support was provided for a dedicated call of projects for Defence in the frame of the "Plan de Relance Wallon".

AERONAUTICS

The Walloon sector dedicated to Civil Aviation is a historical sector resulting from the metallurgical and mechanical skills acquired in the 20th century and is still growing in Wallonia. It brings together more than 70% of the Belgian activity and supplies alone **5% of the equipment in the Airbus range**, while also being present at **Boeing**.

The Walloon aeronautical industry employs more than **6,000 people** (direct employment), with a **turnover of over 1,5 million euros.**

The activity is concentrated around the following areas :

- Structures (metal and composite);
- Aircraft engines and propulsion systems ;
- Engine test benches ;
- Embedded systems ;
- Maintenance and repair (MRO);
- Assisted simulation and design ;
- Airport services ;
- R&D;
- Training.

This sector brings together large companies recognized worldwide such as :

- Sonaca, world leader for wing leading edges ;
- Safran Aero Boosters, world leader in low pressure compressors ;
- Sabca (Orizio Group) for structures and maintenance.

It also includes an extremely dynamic network of SMEs that integrate into the global supply chain, sometimes as Tier 1.



SPACE

For more than **50 years**, the Walloon space sector has been an important part of the Belgian sector, which **ranks 5th in Europe** in terms of investment both in research and in the space industry. (305 MEuros/y)

The Walloon space sector includes **40 active players** who generates a turnover in 2022 of **300 million euros** and provides more than **2000 direct jobs**.

The activities of these actors cover the 7 main and traditional segments of the space sector :

- Preparation for space ;
- Space Transportation ;
- Earth Observation ;
- Satcoms and Navigation ;
- Cybersecurity ;
- Exploration ;
- Space Education.

In 2022, our cluster has developed a **roadmap** to more actively support two major space value chains :

- **The Earth Observation industrial** Chain (Bringing together more than 25 actors) including the Upstream and the Downstream Segment and cybersecurity dimensions.
- **The space Transportation**, in it's "reusable launcher niche who brings together more than 15 actors.

Regional support and public funding will be provided from 2023 to complement important industrial investments in these two sectors.

At the same time, **Research Centres and Universities** will be structured through the **Joint Research Institute for Space** (JRI4Space) to jointly develop these fields by pooling equipment and supporting more than 30 theses.

The results of these industrial and scientific projects are expected by **2025** to place our region among **the most active European Regions in the field of New Space.**



DRONES

The drone sector is strongly growing in Wallonia. It mainly revolves around the following activities:

- Development of on-board applications, which can be closely linked to on-board applications in space ;
- Development of services of all types for industry and the public sector ;
- Machine design for various applications ;
- Design of on-board electronics ;
- Autonomous flight ;
- Pilot training ;
- Diversified testing facilities.

DEFENCE

The Walloon sector devoted to Defence and Security is a historical sector resulting from the metallurgical and mechanical skills acquired in the 20th century. It is still a growing sector in Wallonia.

It brings together several large companies (Belgian and international) as well as an extremely dynamic network of SMEs that are constantly developing new skills.

The Defence and Security activity focuses on the following areas :

- Structures (metal and composite, shielding) for military aviation and land armored vehicles ;
- Military aircraft engines (production and MRO);
- Maintenance for military aviation (planes and helicopters);
- Complex Systems integration ;
- Military drone system (sensors, secure operating system, remote control, etc.);
- Weaponry ;
- Weapon boarding system on-board air carrier (pod) or ground (turret);
- Secure communication system for military mission aircraft (Awacs, maritime patrol, etc.);
- Embedded electronic system according to military and civil qualification.





TECHNOLOGY (DAS)

Structures, propulsion and flying subsystems

- Innovative materials and processes
- Embedded and communicating systems
- Data economics and artificial intelligence
- Simulation, modelling and test facilities





Structures, propulsion and flying subsystems

This theme covers all structural elements and their integration into aircraft, drones, propulsion systems, launchers and satellites, at all stages of their life cycle. It encompasses the adaptation of existing systems and subsystems to take account of the issue of environmental transition.

In the longer term, this theme goes beyond such adaptation by gradually integrating the energies of tomorrow (H2, synthetic fuels, hybridisation, electrification, etc.) which are due to profoundly transform the flying systems and subsystems of the future.

Innovative materials and processes

This covers various aspects of flying systems and subsystems (aircraft, drones, launchers, satellites):

- materials (intelligent materials, composites, metals), manufacturing and associated special processes (additive manufacturing, advanced composite processes, process equipment,...);
- mechanical components and their assembly;
- surface treatments and coatings.

The theme also covers the sectorial specific qualification/certification aspects as well as the environmental transition, integrating the principles of the circular economy. It is supported by the solutions developed in the "data management and AI" theme, in particular to integrate with the establishment of an industry of the future.



Embedded and communicating systems

The third theme covers systems embedded in flying systems and subsystems (transducers, sensors, communication systems, energy management, human/machine interfaces) to meet the main challenges of the following four pillars:

- autonomy supported by on-board artificial intelligence;
- electrification, with the challenge of increasing power and voltage;
- continuous connectivity is a major issue on land, at sea, in the air and in space;
- cyber security to provide safe and secure platforms.

Embedded systems contribute to the challenges of digital continuity, massive data processing, systems of systems, and miniaturisation in all areas such as drones and satellites.



Data economics and artificial intelligence

This theme covers methods and tools for data processing and mining. Firstly, it covers the data economy and the specific integration of artificial intelligence. Second, it includes services related to data from earth observation (space, drones, etc.) and from test and maintenance benches. Finally, it supports the development of the industry of the future (Industry 4.0).

As a matter of fact, this theme is a provider of solutions to the other themes, such as design, simulation, production, operation, maintenance (especially predictive) and it provides the solution for everything related to the themes of materials / processes and structure / propulsion / subsystems.



Simulation, modelling and test facilities

This last theme brings together :

- the development of agile and secure design algorithms and software;
- the development and operation of numerical simulation methods and numerical twinning techniques;
- facilities for ground tests and physical simulations (NDT, engine testbeds, autonomous systems, aerodynamics, vibration, radiation, extreme conditions, etc.).

It provides innovative solutions for the four previous themes by reducing the time to market for the introduction of new differentiating, reliable and certified technologies in flying systems and subsystems.

MISSIONS

03

Regional strategy support Innovation projects Networking and Economic dynamics Talent Development International











International

- The cluster offers international visibility to the 4 sectors (Civil aeronautics, Space, Drone and Defence) and their collaborative projects through the organization or participation in various events or exhibitions (in close collaboration with AWEX).
- Skywin collaborates with NCP Wallonia to promote the involvement of companies in European projects.
- The cluster has a network of international partners (France, Canada, Germany, etc.), and is an active participant in the European Aerospace Cluster (EACP), the European Network for Defence-related regions (ENDR) and the Network of European Regions Using Space Technologies (NEREUS).

Regional strategy support

- Skywin develops in 2022 and 2023 strategic and technological roadmaps for 3 sectors (Civil aeronautics, Defence and Drone), the Space roadmaps was achieved in 2021.
- Skywin leads 3 thematic working groups (Civil aeronautics, Defence and Space) aiming to anticipate mid-term technical and business evolutions.
- The cluster collaborates in co-working or incubation initiatives such as A6K or ID2Move.
- Skywin supports and pilots with the administration the Walloon structuring project WINGS dedicated to future carbon-free aviation.
- Skywin participates in the European projects Cosme PRESTIGIOUS (Drone value chain) and Interreg ET2SMEs (Einstein telescope).

Innovation projects

- Skywin provides a technology watch to enable its members to anticipate future technological challenges.
- Skywin advises and accompanies companies in the development of collaborative projects (R&D, training and investment) up to their labelling and financing.
- The projects bring together the skills of industrialists, universities and research centers.
- Skywin supports the management of the labelized collaborative projects and provides assistance in the economic valorization of these projects.
- The ultimate goal is to create economic activity and sustainable employment.

Networking and Economic dynamics

- The members of the cluster have access to a wide network of Walloon and international industrial, scientific and training partners.
- Skywin participates in the scale-up program for Walloon SMEs in partnership with Wallonie Entreprendre (ex-Sowalfin) and WSL.
- Skywin regularly organises thematic events to promote exchanges and partnerships (conferences, seminars, technology roundtables).
- Skywin frequently takes part in its partners' events.
- Skywin advises and accompanies companies in the development of investment projects up to their labelling and financing.

- Talent development
- With its partners, Skywin participates in the circulation and acquisition of the skills necessary for the technological development of companies.
- Skywin participates to working group with FOREM and Social partners to analyse future development of production skills in aeronautic domain.
- Skywin wants to support innovative training projects in order to support a specific advanced field or to ensure the development of skills related to a R&D project but this action is limited due to budget issues at regional level.

FIGURES

Since 2006, **95 labelled** industrial projects promoted

End 2022, Skywin represents **7,500 jobs** and **€2 billion of turnove**r

The number of members increased from 86 in 2006 to 147 entities at the end of 2022

70% of Belgian aeronautical companies are based in Wallonia. These Walloon companies provide an average of 5% of the components for each Airbus product.



95 labelled projects over 36 Calls (2007-2022)

- ----- 65 R&D Projects
- **10** Training Projects

Private budget (from industry) €102 M Public funding (for Research & Education) €80 M Public funding (for industry) €105 M Total budget:



147 ENTITIES

зовя 7500



PROJECTS

05

For 2022 :

- 7 accompanied project ideas
- 5 summitted projects
- 4 labelled projects

SW_RIBLETS

Restructurations de surfaces par Impulsions ultracourtes Basées sur des Lasers fibrés et modules de mise En forme Temporelle et Spatiale

Production of surface structures (called riblet) on aerodynamic system parts, allowing a reduction of drag.

Project Leader : LASEA (SME)

Partners : GDTech (SME), Multitel (Research Center) International Partners : Cailabs (SME) , Photonics Bretagne (Research Center)







SW_SUAVIN

Smart UAV Inspection

Drone inspection of high-voltage power lines.

Project leader: QUALITICS (SME)

Partners: Flying Cam (SME), ULB (University), Sirris (Resarch Center) Associated cluster : MecaTech





Data economics and artificial intelligence







SW HYPSTER

Project leader: SAFRAN AERO BOOSTERS

Funded Partners: BeBlue (SME), Dardenne (SME), GDTech (SME), V2i (SME), VKI (Research Center), ULiège (University), Sirris (Resarch Center)





SW_ICOM2C3D

Intelligence de pièces en COMposite renforcées par des fibres de Carbone Continues de structures 3D

Composite Structure Health Monitoring

Project leader: MPP (SME)

Partners: AnyShape (SME), Flying Cam (SME), Alkar Technology (SME), HEPH Condorcet (University college), UMons (University)





ME/MBERS

Membership of the Skywin Cluster is open to private or public legal entities with a registered office or operation headquarter in Wallonia and who are active in the research, development and/or application of technological products and processes in the aeronautic or spatial sector.

Members of the professional associations EWA (Walloon Aeronautics companies) and Wallonia Espace are de facto members of the Skywin cluster. Any other company or association may become an adherent member of the Skywin cluster, upon written request to the board of directors and following the agreement of the latter based on the following criteria :

- Active in the research, development and/ or application of technological products and processes within one of the 4 sectors covered by Skywin.
- Have a link with at least one of the strategic focuses defined by the cluster.
- Pay an annual fee.

A company may also become a temporary member if it is part of a consortium for a certified project.

Since 2007, the total number of members has increased from 86 to 147 including a remarkable rise in the number of SME's.

In 2022, 2 large companies and 1 SME joined the cluster.

New members in 2022



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SABCA SABCA TECHNOLOGIES



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INTERNATIONAL

To increase the visibility of the Walloon aerospace sector To accompany members in their international development



Skywin develops and implements its internationalization strategy to increase the visibility of the wallon sectors (Aero, Space, Drone and Defence) in close collaboration with AWEX and regularly consults its members.

Globally, it is based on the following actions:

- Participation in the essential events of the aeronautics, space, drone or defence sectors.
- Actions in more difficult to access or newer markets (e.g. participation and prospection to trade fairs in Dubaï, Brazil or Chili).
- Targeted actions in geographically close markets (France, Germany, Luxembourg, Poland, Denmark, Norway), or more traditional ones (Quebec, USA).
- Participation to economic missions abroad, in collaboration with AWEX.
- Welcoming foreign delegations in Wallonia.
- Active participation in European networks, in particular the EACP network (European Aerospace Cluster Partnership), the NEREUS network (Network of European Regions Using Space technologies) and the ENDR network (European Network for Defence-related Regions).

The year 2022 can be considered as the resumption of international activities after the 2 years during which many international (and national) events were either purely canceled, postponed, or transformed into a digital event following the Covid pandemic.

Curent participation in the international projects:

- COSME project "PRESTIGIOUS" euroPean stRatEgic cluSter parTnershlp to Go InternatiOnal for Uav Smes
- Interreg Project "ET2SMEs EINSTEIN"
- Clean Aviation (Horizon Europe) project "ECARE" European Clean Aviation Regional Ecosystem





Participation in major events in 2022:

- Paris Space Week 2022
- AI4Copernicus : "Earth Observation and Artificial Intelligence for a Safer World"
- Nereus Symposium
- Meeting AWEX EEN
- ILA Berlin
- EUCASS Lille
- Farnborough International Airshow 2022
- International Aerospace Innovation Forum 2022
 Montreal
- IAC Paris
- ESA Industry Days
- 2nd conference « European Defence and Security »
- Space Tech Expo Bremen
- Aeromart Toulouse

Otheractivities related to international and communication to promote the technological and industrial skills of the Walloon aerospace sector have also been set up via a digital marketing. A series of webinars have therefore been organised :

- Webinar Security actions in Wallonia
- Webinar European Pole of Ceramics

COMMUNICATION & EVENTS

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Entrance North

Main local events organized in 2022 :

Matchmaking - Hydrogen sector

TWEED and Skywin clusters organised a matchmaking event with the actors of the hydrogen sector. After a presentation of the developments, we discovered the latest H2 production projects in Wallonia (winners of the 2021 call for projects) and in Belgium as well as major initiatives in terms of partnership and innovation. Finally, we discussed the role of H2 & synthetic fuels in the decarbonisation of the aeronautical sector.

Al4Copernicus 2022 - EO & Al for a safer world

The Belgian Copernicus relays (Skywin, ISSeP, Spacebel and VITO) and the Royal Military Academy of Belgium have organised the second edition of the AI4Copernicus conference "Earth Observation and Artificial Intelligence for a Safer World". We met international experts in the use of AI and EO technologies to address security and defence challenges.

EUCASS-3AF

SKYWIN and ONERA have organised EUCASS-3AF 2022, the 9th European Conference for Aerospace Science. The EUCASS conferences are considered the second largest Aeronautics and Space conference in the world - and the first in Europe - and have now been extended to include UAV-related research.

AI Aero and Drone

DigitalWallonia4.ai and the Skywin cluster organised an AI meeting webinar launched to support the Start AI call for projects dedicated to companies active in the space, aerospace and drone sector.



Drone Changers - Belgian Drone Congress

Anthony Biévelez, Project Manager in charge of the Skywin Wallonia drone division, presented "Collaborative projects financed by the Walloon Region, Collaboration with ID2Move, and the COSME European project Prestigious".



Good Vibes Workshop

In collaboration with the LiEU network, we organised a workshop on the theme of vibrations, which brought together around thirty participants. 3 topics were discussed "Sensors & Measurements" "Signal Processing" and "Damping".





2022 figures

80 news published by electronic means via 9 newsletters & 34 mailings

1.050 newsletter subscribers

+400 participants at seminars organised by the cluster

2.000 LinkedIn followers

1.150 Twitter followers

PARTNERS



GOVERNANCE & OPERATIONAL TEAM

Executive Board	(2022-12-31)		
J. SMAL	Chairman	Safran Aero Boosters	Industrial
J-PH. PONTHOT	Vice President	ULiège	University
B. DIVRY	Board member	Thales Alenia Space Belgium	Industrial
T. JONGEN	Board member	Sabca	Industrial
N. VANHILLE	Board member	SONACA	Industrial
P. VAN HELLEPUTTE	Board member	Thales Belgium	Industrial
M. TILMANT	Board member	GD Tech	Industrial (SME)
T. DU PRÉ-WERSON	Board member	Spacebel	Industrial (SME)
V. TIGNY	Board member	AMOS	Industrial (SME)
A. BERTIN	Board member	Coexpair	Industrial (SME)
D. SIMON	Board member	EWA	Association
L. BARREMAECKER	Board member	Wallonie Espace	Association
O. VERLINDEN	Board member	UMons	University
A-S. LIBERT	Board member	UNamur	University
G. WINCKELMANS	Board member	UCLouvain	University
P. HENDRICK	Board member	ULB	University
M. MILECAN	Board member	Wal-Tech/CenAero	Research Center
J-J. WESTHOF	General secretary	Skywin	Cluster
V. JEUKENS	Observer	Governement Representative	Walloon Region
B. VAN CALSTER	Observer	SPW-EER	Walloon Region
J-P. CHISOGNE	Observer	AWEX	Walloon Region
A. CECCONELLO	Observer	WAN	Training center

Steering committee (2	2022-12-31)		
J. SMAL	Chairman	Skywin	Cluster
J-PH. PONTHOT	Vice President	Walloon Universities	University
N. VANHILLE	Member	SONACA	GE
M. DUBOIS	Member	SABCA	GE
O. DEVRIENDT	Member	Safran Aero Boosters	GE
T. DU PRÉ-WERSON	Member	Spacebel	PME
P. GEUZAINE	Member	Wal-Tech/CenAero	Research Center
J-J. WESTHOF	Member	Skywin	Cluster
E. POURBAIX	Member	Skywin	Cluster
T. CHANTRAINE	Participant	Skywin	Cluster
A. BIÉVELEZ	Participant	Skywin	Cluster
S. GUALANDRIS	Participant	Skywin	Cluster
M. STASSART	Participant	Skywin	Cluster
A. GRANDJEAN	Participant	Skywin	Cluster

Operational unit (2022)	
E. POURBAIX	General Manager
J-J. WESTHOF	General Secretary
T. CHANTRAINE	Deputy Director Innovation & Projects
M. STASSART	Deputy Director Space
A. GRANDJEAN	Deputy Director International
A. BIÉVELEZ	Project Manager
S. GUALANDRIS	Project Manager
E. HILT	Communication & Office Manager
P-J. FONDU	Expert
L. MORTIER	Assistant



Skywin is the Walloon Aerospace cluster (Belgium) consisting of an association of companies, research organisations and training centres engaged in public-private partnerships and in the implementation of innovative collaborative projects.



