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Social Contribution Report SENER Poland 2021

Introduction

Ladies and Gentlemen,

The year 2021 was exceptional for us for many reasons. One of them was the completion of a highly advanced project and the delivery of five key components for the HCS system for IBDM. We can already assume that the technology developed for it by the SENER Poland team will become a standard in manned space missions of the future. Another of our successes is a groundbreaking contract from Airbus for the series production of mechanisms for the OneSat mission. This is an important step towards building the space industry in Poland. In 2021, we also continued our activities within the ATHENA mission – we proudly present our contribution to its development in the report below.

We welcome new opportunities opening up for Polish companies, such as the dedicated ESA Industrial Policy Task Force (IPTF) program. Thanks to the experience gained in the implementation of increasingly advanced projects, we can now effectively compete with European companies also on the commercial market. In this way, we are building the image of Poland as a valuable and reliable member of the global space sector. However, our ambitions are not limited to our current activities – we are ready to become an integrator of space missions.

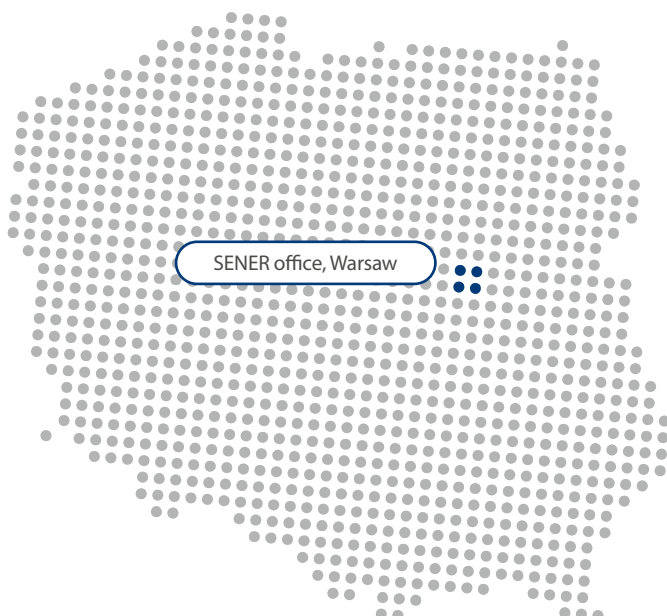
We are presenting the SENER Poland Social Contribution Report to you for the fifth time. It is all the more special for us because it sums up the fifteenth year of our activity on the Polish market. Since its inception, we have been working to develop the domestic sector, build strong human resources and educate stakeholders on the benefits of involvement in the space sector, drawing on the 60-year experience of the SENER Group. The mission of SENER's founders was to serve society through engineering and technology. After more than half a century of the Group's activity, it is still relevant, and its implementation on the Polish market is broadly described in the following report.

Ibon Arregui

General Director
SENER Poland



SENER Poland – key facts



35 | people
on board

18 | successfully
completed projects

15 | years
on Polish market

8 | years of specialisation
in the space sector

5th | edition of the Social
Contribution Report

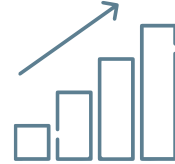
SENER Poland's social contribution objectives



To contribute to the growth of the national economy



To raise the competence of the Polish space sector



To increase the number of companies operating in the Polish space sector



To identify the most promising technological areas in the Polish space sector



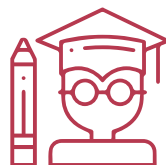
To strengthen the cooperation between industry and science



To develop internship and apprenticeship programs



To build human resources for the space sector



To support student competitions and projects



To conduct informational and promotional activities

Our people, our strength

2021 in numbers



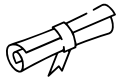
35 people on board
(December 2021)



35% of our team
are women



4 people are in the course of
company-sponsored studies



1 person is in the course of
doctoral studies



5 people accepted for
an internship



60 training and business
trips abroad

The space sector in Poland is still young and we are convinced that trained staff is one of the key aspects necessary for our country to achieve market maturity.

Our team regularly benefits from the knowledge transfer offered

by the SENER Group, for example through training trips to the offices in Spain (Madrid, Bilbao and Arganda), among others. Our employees also receive financial support for their studies: they study and begin doctoral studies at prestigious universities such as the Warsaw University of Technology.

Maciej: new key person on board

The aerospace sector, due to its specificity, has always been a space for enormous challenges. We are able and willing to take an active part in the process of its development in Poland. We can use our experience (including the difficulties we have encountered) to take the next step towards maturity in the space market together with other Polish companies. I am convinced that the strength of the local ecosystem will be crucial in our common, exciting, but sometimes bumpy road to the stars.

Maciej Stanecki

Business Development
Manager, SENER Poland



In 2021, Maciej Stanecki, new Business Development Manager, joined the SENER team to take responsibility for building an effective ecosystem that supports the development of the Polish space industry, from suppliers, through the small and medium-sized enterprises sector, to the governmental level.

- Stanecki previously worked at Accenture, where he managed research projects that benefited companies and government institutions in the Aerospace & Defense sector. His professional career of over 10 years has been entirely related to the A&D market in its industrial, scientific and expert dimension.

- He acquired his teaching experience at the University of Notre Dame, Lithuanian Military Academy, Academy of Military Art and University of Warsaw.
- In addition to his PhD, Maciej Stanecki holds Master's degrees from two universities: University of Warsaw and the War Studies University. He also completed postgraduate studies in National Security and in Diplomacy at the European Academy of Diplomacy. His research interests include the study of decision-making processes and strategic planning.

Starting a career in the space sector: internship at SENER Poland

My internship allowed me to get to know the process of creating space projects and significantly broadened my knowledge in mechanical design. I also had the opportunity to learn a lot of good engineering practices. The opportunity to start my adventure with the space sector by working on first level projects for international clients such as Airbus and ESA is an exciting experience, and a rather unexpected lesson from working in an international environment is learning how to communicate effectively and how to properly convey information in a project.

Ryszard Zawila

Intern,
SENER Poland



Ryszard Zawila, a graduate of Aviation and Aerospace Technology at the Faculty of Power and Aeronautical Engineering at the Warsaw University of Technology, currently a student of Mechanics

and Machine Design. He started his adventure with SENER as a student trainee. He is mainly involved in OneSat and ATHENA HDRM projects.

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Learn about the ISM
mechanism for ESA's
AHTENA mission



Cooperation with local business

We seek local suppliers through traditional research, as well as at trade fairs (for example the International Defense Industry Exhibition – MSPO), European Space Agency conferences such as the Euroseed Congress, or during meetings with other representatives of the space industry, especially from the Polish Space Agency. The requirements of space missions (for example of the European Space Agency) are extremely stringent, therefore no company can be included in our suppliers' list without a quality and technological audit: we check, among other things, the production process or documentation management. Most of our suppliers and subcontractors are small companies, employing between a few or just over a dozen people. Our most desired contractors are specialists in high-precision machining and large-size welding. In addition to the approximately 80 Polish companies we work with, we also have business contacts in other Central

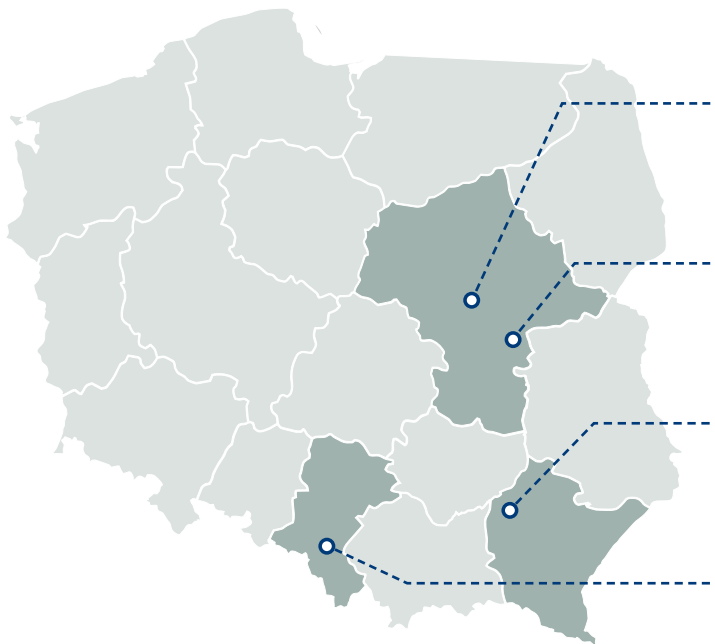
and Eastern European markets, such as Hungary and Romania. All of our suppliers must accept the SENER Code of Conduct, which confirms our compliance with ethical and regulatory requirements to ensure that we all act in an exemplary manner, in line with the SENER Group's ethical principles and values.

Jakub Pierzchała

Procurement Manager
SENER Poland



Examples of companies we cooperate with



Industrial Research Institute for Automation and Measurement PIAP, Łukasiewicz Research Network, Warsaw (ATHENA mission, HCS project)

ESEM
Garwolin (ATHENA mission): 25 years of experience

WALDREX
Mielec (PLATO mission): 24 years of experience

Aerospace Dynamic Group
Czechowice-Dziedzice, 4 years of cooperation with SENER Poland

After more than 4 years of cooperation with SENER Poland, the company Endeavour (from Czechowice-Dziedzice) has doubled its team and transformed into the Aerospace Dynamic Group, focusing mainly on the aerospace sector. Most of our suppliers

come from the subcarpathian (podkarpackie), silesian (śląskie) and masovian (mazowieckie) voivodships.

TRUST

EXPERIENCE

LEADERSHIP

INDUSTRIAL PARTICIPATION

Cooperation with the public sector

Space technologies are changing our daily lives, although we often do not realize it. Before our eyes, the space sector is becoming an important branch of economy. Space no longer just sparks imagination, but improves our lives, creates new jobs, and enables us to pursue lifelong careers. The Social Contribution Report is a very valuable attempt to show these effects. Therefore, the Polish Space Agency welcomes it with great interest. We hope that the SENER report will encourage other companies to conduct similar analyses.

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Professor Grzegorz Wrochna
President of the Polish Space Agency



Krzysztof Drynda

President of the Polish Investment & Trade Agency



The Social Contribution Report you have sent is a very interesting reading. The business strategy that you implement shows the technological advancement that is undoubtedly the area of space engineering. Thank you very much for your declaration of cooperation and from our side we declare to support your activities within our statutory mission, which is to support Polish entrepreneurs.

”

Project of the year: IBDM

Why is this project unique?

Working on the IBDM project has given us invaluable experience, strengthened SENER's position as a trusted partner in the global space sector, and allowed us to contribute to the creation of a completely new standard of devices to be used in manned missions.

Our team's responsibilities included the design, manufacturing, integration and testing of five types of mechanisms, ranging from separators to MMOD shields against micrometeoroids and space debris. Designing such diverse mechanisms was a huge challenge for us. The challenge was even bigger because the safety requirements for the manned missions in which the mechanisms

will be used are even more stringent than, for example, in the design of satellites.

Łukasz Powęska

Project Manager
SENER Poland



HCS (Hard Capture System):

Developed for IBDM by SENER Aerospace and SENER Poland, the HCS will guarantee the safety of astronauts passing between spacecraft and the safe transport of supplies and materials (for example, from a ship to a station).

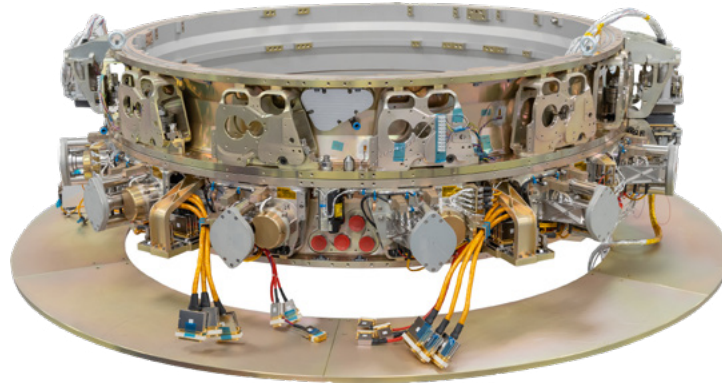
IBDM (International Berthing and Docking Mechanism):

A docking mechanism to berth and connect both large and small spacecraft. It may become the standard used in future manned missions.

Source: nasa.gov/gateway



Main HCS components designed and manufactured in Poland



HCS



Undocking Complete Sensors

Two Undocking Complete Sensors, indicating that the spacecraft has been successfully undocked.



Ready to Hook Sensors

Three Ready to Hook Sensors, indicating that the two docking spacecraft are within hook range.



Micrometeoroid and Orbital Debris Cover

A cover against micrometeoroids and space debris that could pose a threat to crew and mission safety.



Resource Transfer Umbilicals

Two Data Transmission System devices allow the electrical connections between the shuttle and space station to be connected and disconnected.



Separators

Separators provide the energy needed to separate the vehicles during docking, as well as bumping function during docking.



Scan the QR code
and watch the video

Athena

Participation in one of the biggest ESA missions

The experience gained with the mechanisms for the ATHENA mission is transformative and fundamental for us: it has allowed us to be ready to play an even more complex and ambitious role in future aerospace projects.

ATHENA (Advanced Telescope for High-Energy Astrophysics) is the second so-called big mission of the European Space Agency within the scope of the scientific program "Cosmic Vision". Projects developed by the SENER Poland team will be vitally important for the successful conduct of the mission, and that is why we used unique technologies in their implementation. As in ISM, which has the shape of a hexapod, i.e. a structure that uses six actuators to precisely move the mirror in many planes. The mission will study phenomena in outer space with the help of an X-ray telescope. The

telescope with dimensions exceeding 12 metres in length will be much stronger than its predecessors, thanks to which we will be able to "look" at much more distant space objects.

Katarzyna Okulska-Gawlik

Project Manager
SENER Poland



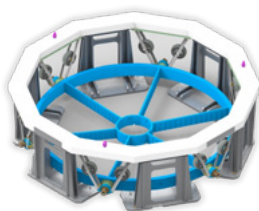
Instrument Selection Mechanism (ISM)

SENER Poland engineers have developed a high-precision system for positioning and controlling the mirror at the heart of the ATHENA telescope. The mechanism, consisting of six actuators, is designed to both secure the mirror during flight and allow its precise positioning relative to the two research instruments.



Hold-Down and Release Mechanism Actuator (HDRMA)

The mirror of the ATHENA telescope is secured by a system consisting of six hold-down and release mechanism actuators. Each of them is mounted on the pre-tensioned structures – bipods, equipped with specially designed dampers, which reduce the level of loads during the launch into orbit (altogether creating the HDRM mechanism). When the desired orbit is reached, the actuators are released, allowing all the support structures to bounce away from the mirror, so the ISM can operate without collisions.



ATHENA MAMD

As a part of the ATHENA MAMD project, SENER Poland is the subcontractor responsible for supplying six hold down and release mechanisms (or their equivalent) and a vibration test adapter, also designed and tested by SENER for the telescope's mirror demonstration model. Thanks to its participation in this project, SENER Poland will test the dynamic behaviour of HDRM system consisting of 6 HDRMs or its dummies equipped with fully functional dampers, in conditions very close to real ones.

Informing public opinion about the space sector

An integral part of building the space sector ecosystem is knowledge transfer in the form of public and media appearances, university lectures and supporting other initiatives such as:

ESMATS (European Space Mechanisms and Tribology Symposium) – a leading European event for mechanical engineers, organized by the European Space Agency. Łukasz Powęska was a speaker at the 19th edition and shared with the audience the knowledge he gained while working on the Resource Transfer Umbilical (Data Transmission System).



New Space Leaders program, which supports competence development among scientific and teaching staff and students of the Podkarpackie region universities in the field of, i.a., space technologies. The New Space Leaders is part of the PCI SPACE EXPLORATION project, which is organised by the Podkarpackie Innovation Centre. Paweł Paško, Project Manager at SENER Poland, was a special guest at one of the project meetings. Paweł conducted a webinar: "Influence of the space environment on the structure of satellite mechanisms", during which he discussed, among others, the issue of satellite systems testing.



European Rover Challenge – Europe's largest international robotics and space competition, where university teams from around the world construct their own Martian robots, and then compete in competitions similar to the tasks performed by rovers on the surfaces of Mars and the Moon. Marcin Wygachiewicz, Project Manager at SENER Poland, was head of the jury during last year's competition.



Media



Excerpt from an article in the industry portal “Urania”, December 2021

SENER Poland announced on 2 December 2021 that it has signed a landmark contract with Airbus for the serial production of space mechanisms for OneSat (...) Mass production is the future of the global space market. (...) New satellite constellations will include thousands of satellites, which opens the way for mass production of standardised components for the space industry. In addition, the projects in question are being carried out by private companies which are the most innovative today and can carry out the most ambitious projects.

This also applies to the OneSat project, which according to Airbus is set to revolutionise the telecommunications satellite market because, unlike previous satellites that were designed for specific missions, OneSat can be fully reconfigured while in orbit and is able to adapt its coverage area, capacity and frequency “on the fly” to meet changing mission scenarios.



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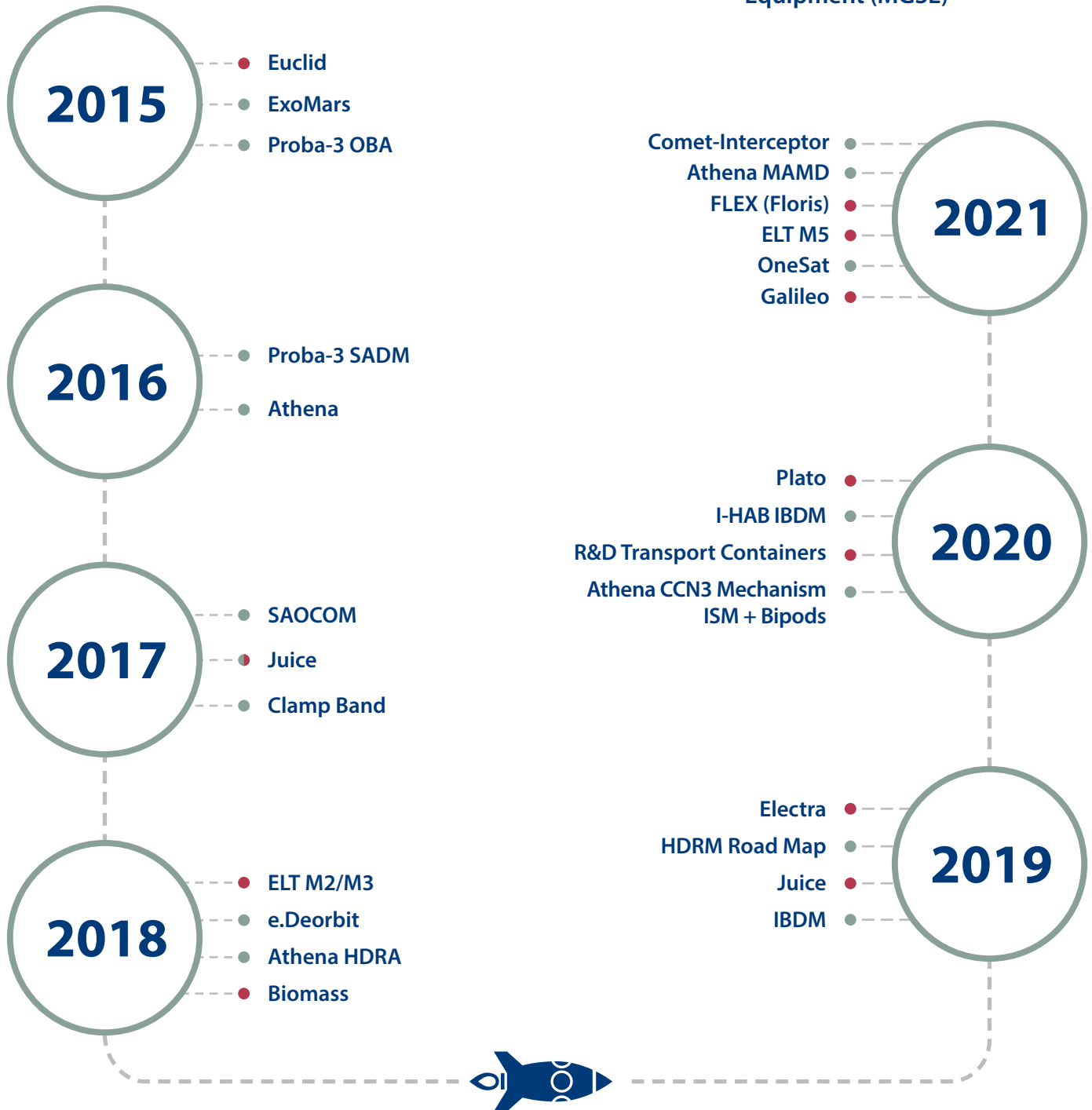
news, articles and interviews about SENER Poland were published in the media in 2021

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recipients according to Press Service

Our experience

Product portfolio:





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