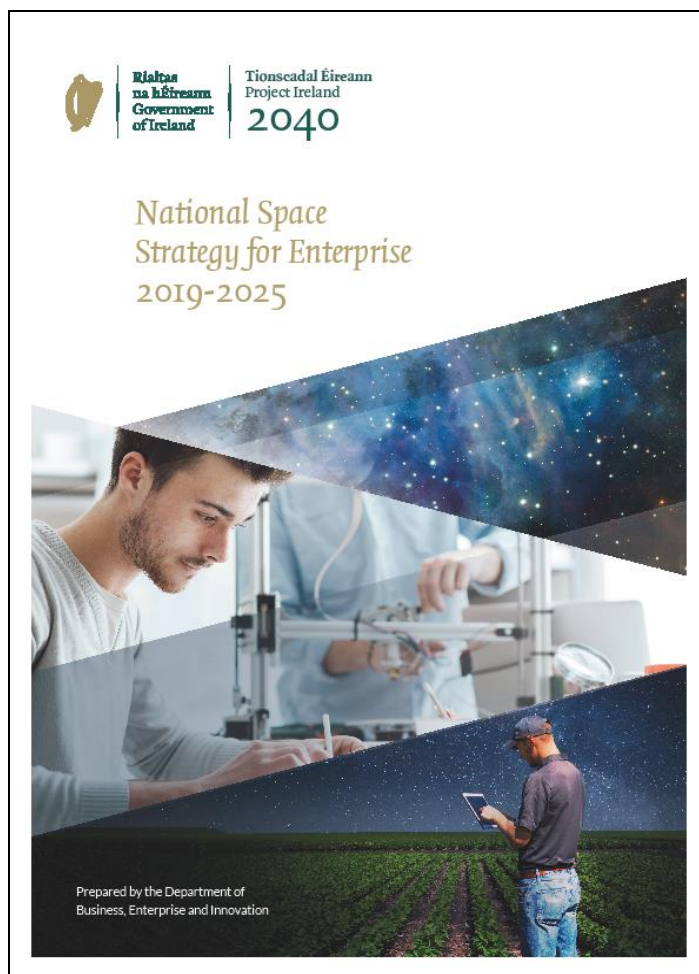


National Space Strategy for Enterprise 2019-2025

Third Progress Report: July 2022-December 2023



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Overview of Progress

The Government's vision for the space-active enterprise sector is for Ireland to develop “*an economically sustainable and expanding space-active industry, delivering quality jobs for the economy of tomorrow*”. The National Space Strategy for Enterprise 2019 – 2025, developed to deliver this vision, sets out a direction for growth and opportunities within the space sector which is growing in importance.

This is the third progress report on the implementation of the National Space Strategy for Enterprise 2019 – 2025 (NSSE), prepared by the Strategy Implementation Group, approved by the Space Enterprise Coordination Group and presented to the Minister of State for Business, Employment and Retail for information. It sets out the progress made in delivering on the 19 key implementing actions in the reporting period July 2022 to December 2023.

The reporting period saw several positive developments in the Irish space sector, and of the 19 actions, 4 have now been completed, and 15 actions on schedule.

EIRSAT-1

History was made in December 2023 when Ireland became a space faring nation with the launch of our first ever satellite, EIRSAT-1. Led by UCD, the project involved a number of Government Departments including the Department of Further and Higher Education, Research, Innovation and Science, the Department of Education, the Department of Communications and the Department of Enterprise, Trade and Employment. The satellite, built through the European Space Agency (ESA) “Fly your satellite!” and Prodex programmes has three scientific payloads on board including the Gamma-Ray Detector (GMOD), a thermal materials experiment ENBIO Module (EMOD), and a Wave-Based Control (WBC) algorithm.

Industry Developments

At the end of 2023 a total of 109 Irish based companies had benefitted from engagement with ESA. This figure is an increase of 56% (70 companies in 2019 compared to 109 in 2023) since the publication of the Strategy, surpassing the target of 100 set out in the National Space Strategy for Enterprise. 13 new companies engaged with ESA during the report period of which 8 companies received funding through the ESA Business Incubation Centres (BIC). 10 Irish companies participated in a trade mission to ESRIN, ESA's Earth Observation Centre in October 2022.

Additionally, 46 Irish companies and 189 trainees participated in 14 courses organised by Skillnet during the reporting period – an increase of over 300% on the previous reporting period which had 13 companies and 28 trainees engage in space related courses.

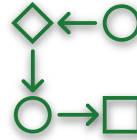
The National Space Subsystems and Payloads Initiative secured over €7.9m funding from the Department of Enterprise, Trade and Employment's *Disruptive Technologies Innovation Fund*, administered through Enterprise Ireland, to support the development of an economically sustainable and expanding space industry in three initial clusters: optical communications for space, autonomous smart satellites and spacecraft and payload modelling.

The establishment of the Irish Space Association (ISA) which represents members in Ireland's space sector, was also a welcome development. Officially launched in April 2023, ISA was formed in response to the rapid growth of the space industry in Ireland and the need for sector-level industry representation.



2022/2023 Progress Report Highlights

19 Actions, 4 completed and 15 on schedule



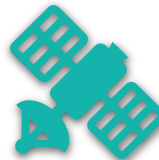
Government Investment of €63.84m towards ESA programmes

109 Irish companies have benefitted from engaging with ESA



46 companies and 189 trainees availed of 14 Skillnet space related courses - an increase of 300% on previous reporting

Ireland launched its first satellite Eirsat-1 December 2023



Eirsat-1 contained 3 scientific payloads developed by UCD and Irish businesses SensL (Cork) and ENBIO(Dublin)

The Irish Space Association was established in 2023 in response to the rapid growth of the space industry in Ireland



Increased Funding of ESA

The Government's commitment to continued investment in the Irish space sector over this period was evidenced by the increase in the level of funding to the ESA programmes with €30.17m invested in 2022 and €33.67m in 2023. This 2023 figure included once off funding of an additional €8m secured under supplementary estimates and €2.8m through Enterprise Ireland's Industrial RD&I fund. Industry co-investment in 2023 amounted to €2.2m or 22% of annual value of ESA contracts with Irish companies which in 2023 was valued at €9.9m.

This additional investment is putting innovative Irish companies and researchers in a position to further seize the opportunities presented by the growing space-related global economy whilst also developing their capabilities to enable the technology transfer and commercialisation of their products and services, in space and other complementary sectors.

The Strategy Implementation Group will continue to engage with appropriate representative bodies and experts to understand the evolving needs of the Irish space industry and continue to focus on progressing the outstanding actions outlined in the NSSE in order to achieve Ireland's goals for space enterprise by 2025.

Strategic Actions

The National Space Strategy for Enterprise continues to deliver on developing a strong and economically sustainable space-active industry in Ireland.

The strategy is built on five pillars, representing key action areas to support the achievement of Ireland’s vision and goals for Space Enterprise. Progress of the 19 key implementing actions identified to enable the delivery of the strategy’s goals in the period July 2022 to December 2023 are reported under the following Pillar headings:



The following sections sets out the progress made to date on the various recommendations contained within the National Space Strategy for Enterprise.

Pillar 1: Investment

Aim: We will strategically invest to support strong and sustainable space enterprise.

Actions: 5.1.1 Investment to drive sustainability

5.1.2 New forms of investment

Key Action	5.1.1 Investment to drive sustainability a. Aim to increase public and private investment in ESA by 50% by 2025. b. Utilise the Space Technologies Programme to develop space focused initiatives, including funding mechanisms, delivered through DETE Agency Programmes.	
Status	a. On schedule	b. On schedule
Implementation Date	2019-2025	
Lead Responsibility	DETE, EI, IDA, Industry, SFI	
Progress Update	<p>a. Annual investment in ESA increased from €29.7m in 2021 to €33.67m in 2023, an increase of 13.3%. The increase included once off funding of an additional €8m secured under supplementary estimates and €2.8m through Enterprise Ireland's Industrial RD&I fund in 2023.</p> <p>b. Irish space active industry and researchers continue to benefit from publicly funded programmes including DETE's Disruptive Technologies Innovation Fund (DTIF) as well as Enterprise Ireland's R&D fund as mentioned above.</p> <p>In November 2023 a UCD-led space project entitled National Space Subsystems and Payloads Initiative (NSSPI) secured over €7.9 million in funding from the DTIF.</p>	

Key Action	5.1.2 New forms of investment a. Collaborate with international partners including ESA, European Investment Bank (EIB) and the European Commission, to mobilise new forms of investment. b. Support and encourage the space active enterprise sector through the new Project Ireland 2040 Funds	
Status	a. On schedule	b. On schedule
Implementation Date	2019-2025	
Lead Responsibility	DETE, EI, IDA	
Progress Update	<p>a-b. SMEs and start-ups have continued to interact with investment funds with a number of Irish based companies engaging with the EIB and European Innovation Council (EIC). Five Horizon Europe Calls relating to Space announced funding results during the reporting period. A total of €2.7M was awarded to Irish entities, spread across 9 successfully funded proposals. In total, 25 projects with Irish participants were received by the Commission during the reporting period. Under EIC, a Space Pathfinder Challenges Call was issued in 2023 with results expected to be announced in the second quarter of 2024.</p>	

Pillar 2: Strengths and opportunities

Aim: We will build on our strengths and actively pursue new opportunities to develop agile and sustainable space enterprise in Ireland.

Actions: 5.2 Building on our strengths and pursuing new opportunities

Key Actions	5.2 Building on our strengths and pursuing new opportunities <ol style="list-style-type: none"> a. Establish a Space Data Hub to provide access to data from European and other 3rd party space missions. b. Support industry in Ireland to develop advanced data analytic skills and deliver commercial services using the national Space Data Hub. c. Help the space-active enterprise sector in Ireland to identify and access the most relevant research performing organisations to assist with their development needs. 		
Status	a. On schedule	b. On schedule	c. On schedule
Implementation Date	2019-2025		
Lead Responsibility	EI		
Progress Update	<p>a-b. The DTIF supported CAMEO consortium system architecture has now been designed and core components (data warehouse, advanced analytics engine, user interface and test-case demonstrators) have been developed. Based on discussions with members of the Space Enterprise Coordination Group (SECG) and other stakeholders, three user cases were identified and are now undergoing system testing:</p> <ul style="list-style-type: none"> • Flood mapping (in collaboration with OPW) • Hedgerow change detection (in collaboration with EPA) • Forest change mapping (suggested by DAFM). <p>Additional advanced use cases are also being developed using machine learning and addressing issues such as: flood prediction, seagrass monitoring and ship detection.</p> <p>c. The reporting period saw additional growth in the number of Irish companies engaging with ESA support programmes, with 13 additional Irish companies engaging with ESA during the reporting period. In addition to recruiting 7 new companies, ESA BIC Ireland continued to develop new supports for current clients and alumni through the hosting of the inaugural ESA BIC Ireland Showcase, National Networking Days, Lunch and Learn webinars and involvement in the new Irish Space Association (ISA), which was launched in April 2023. ISA's mission is to support the Irish space sector's growth and competitiveness, foster collaboration, and ensure sectoral representation on both the national and international stages.</p>		

Pillar 3: Governance

Aim: We will create an appropriate environment for business

Actions: 5.3.1 The Space Enterprise Coordination Group and Strategy Implementation Group

5.3.2 The Space Enterprise Website

Description	5.3.1 The Space Enterprise Coordination Group and Strategy Implementation Group a. Establish a Space Enterprise Coordination Group (SECG). b. Establish a Strategy Implementation Group.	
Status	a. Completed	b. Completed
Implementation Date	2019	
Lead Responsibility	DETE	
Progress Update	<p>a. The Space Enterprise Coordination Group (SECG) met for the 5th occasion on 10 May 2023. Members were provided with an overview of Ireland's membership of the European Union Agency for the Space Programme (EUSPA), the EU Space Strategy for Security and Defence published in April 2023 and the ESA Ministerial meeting held in November 2022 where Ireland made a commitment of over €125m to ESA for the period 2023 – 2027.</p> <p>b. The Strategy Implementation Group (SIG) has continued to engage with Members of the SECG as required</p>	

Description	5.3.2 The Space Enterprise Website Establish a dedicated space enterprise website	
Status	Completed	
Implementation Date	2019	
Lead Responsibility	EI, SFI, IDA, BCO, ISIG	
Progress Update	Enterprise Ireland's website has been updated to include additional information on Ireland's membership of ESA, our National Space Strategy for Enterprise, and will continue to host the Irish Space Industry Directory for the foreseeable future. As a result of this revamped website, the establishment of the Irish Space Association during the reporting period, and for the avoidance of duplication of effort and resources, the SECG considers that the objectives of this action is met.	

Pillar 4: Attract and develop Talent

Aim: We will foster a pipeline of capable graduates and postgraduates and enable upskilling within space enterprises

Actions: 5.4.1 Education

5.4.2 Industry Upskilling

Description	<p>5.4.1 Education</p> <ul style="list-style-type: none"> a. Build awareness of national space education resources such as the European Space Education Resource Office (ESERO) Ireland and Ireland’s recent memberships of the Low Frequency Array (LOFAR) and the European Southern Observatory (ESO). b. Drive awareness and engagement with space through promotion of National Space Week activities. c. Grow the enterprise capabilities of the space research community with appropriate funding for ESA’s science and technology PRODEX programme, and national research programmes. 		
Status	a. On schedule	b. On schedule	c. On schedule
Implementation Date	2019-2025		
Lead Responsibility	SFI, DETE, EI, BCO, IRC		
Progress Update	<p>a-b. National Space Week, coordinated by MTU Blackrock Castle Observatory with support from Science Foundation Ireland and ESERO Ireland (an education project of ESA, co-funded by ESA and Science Foundation Ireland in active fields of education and space), returned to in-person events for 2022 and 2023. The 2023 programme included 432 Events reaching 28,178 people.</p> <p>ESERO continued to provide space themed educational resources through a wide range of engagement activities including: teacher professional development (with 2638 teachers attending in 2023), sponsorship of the Irish Science Teachers association conference, collaboration with the education teams at Birr Castle (home of iLOFAR), Dunsink and Armagh observatories, and promotion of ESA Classroom Projects including the CanSat competition and Climate Detectives programme.</p> <p>ESERO Ireland collaborated with representatives of Irish space industry and academia to host an ESA stand at Dublin ESB Science Blast (27 February – 2 March 2023), a major event which attracted over 800 primary school teachers and 12,000 students.</p> <p>ESERO Ireland trailed reaching new audiences though the use of different social media platforms throughout Science week 2023 (13- 20 November), achieving a reach of 52,860 views and 1564 comments via a 6 part TikTok campaign.</p>		

	<p>Science Foundation Ireland also supported a range of activities via the Discover Funding Call including the RTÉ 6-part series "Space Camp Academy".</p> <p>c. EIRSAT-1, Ireland's first satellite was successfully launched into orbit on 1 December 2023. The live launch of the rocket was broadcast on ESA Web TV Channel 2 and ESA YouTube. Antennas deployed at first attempt and (at time of reporting) all units are working nominally. The satellite has three scientific payloads on board including the Gamma-Ray Detector (GMOD), a thermal materials experiment ENBIO Module (EMOD), and a Wave-Based Control (WBC) algorithm.</p> <p>The ESERO Ireland team, alongside partners Oide (Department of Education) and Blackrock Castle Observatory have built educational resources to promote awareness of EIRSAT-1, including primary and post-primary classroom resources and careers awareness activities.</p> <p>On 19 December 2023, DFHERIS announced that Ireland has been successful in the next step to join the European Organization for Nuclear Research (CERN). CERN considered Ireland's application and agreed to send a taskforce to Ireland in 2024 to assess its application. The taskforce will produce a report on Ireland's fulfilment of the criteria for Associate Membership.</p> <p>On 7 December 2023, Tom Ray, Senior Professor and Director of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) was elected President of the European Southern Observatory (ESO) Council, ESO's main governing body. Professor Ray is currently funded via the ESA PRODEX programme for the development & testing of a dichroic lens for the Ariel mission and represents Ireland on the ESO Council.</p>
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Description	5.4.2 Industry Upskilling <ul style="list-style-type: none"> a. The Strategy Implementation Group to consult with industry to agree skills shortages and develop a Detailed Description of Needs (DDN) to support the development of space focused programmes/courses by relevant training and education providers. b. Space Industry Skillnet to develop and coordinate the delivery of suitable courses supported by HEIs and other relevant training providers. c. Promote awareness of international programmes available to space-active industry to support knowledge development. 		
Status	a. On schedule	b. On schedule	c. On schedule
Implementation Date	2019-2025		
Lead Responsibility	DETE, Space Industry Skillnet, HEIs, EI, SFI, IRC		
Progress Update	<p>a-b. A total of 46 companies and 189 trainees participated in 14 courses organised by Skillnet during the reporting period. New course topics included “EASA- Part 21 Approved Airworthiness certification”, “ESA ECSS Solder training certification”, “Electronic Ruggedisation for Space Projects”, “Communications for Technical Professionals and Customers”, and “Environmental Vibration & Shock Testing for Space Hardware”.</p> <p>New courses on EO Copernicus Sentinel 1 & 2 satellite training and Programme Management for Space Projects are currently being developed by Skillnet and are scheduled to take place in 2024.</p> <p>c. Building on work completed in 2023, Enterprise Ireland will host a visit by the ESA Director of Science in February 2024 where she will meet with members of the Irish delegation to ESA, academia, SFI and DFHERIS colleagues to discuss how Ireland can maximise the benefit of its membership in the ESA Prodex programme. Enterprise Ireland is continuing to engage with Irish based companies and support their engagement with ESA and the EU’s programme for research and innovation - Horizon Europe, the EU Space Programme, and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).</p>		

Pillar 5: International Engagement

Aim: We will promote international awareness of Ireland’s space enterprise capabilities.

Actions: 5.5 International Awareness

Description	<p>5.5 International Awareness</p> <ul style="list-style-type: none"> a. Support 80 Irish companies to participate at international trade events focusing on integration in global space supply chains. b. Develop the online directory to promote Ireland’s space industry capabilities to the global space market. c. Develop Ireland-global collaborations through bilateral agreements, with space industry development organisations including NASA. 		
Status	a. Completed	b. Completed	c. On schedule
Implementation Date	2019-2025		
Lead Responsibility	EI, SFI		
Progress Update	<p>a. Since the launch of the Strategy 95 companies have been supported by EI to participate at international trade events surpassing the target of 80 as outlined in the NSSE including an additional 15 companies during the reporting period:</p> <ul style="list-style-type: none"> ▪ 10 Enterprise Ireland supported companies visited ESRIN the European Space Agency’s (ESA) Centre for Earth Observation in September 2022, and also met Italian companies and representatives from the Italian Space Agency (ASI). The visit focused on maximising business opportunities for Irish companies in Earth Observation and potential collaboration between Irish and Italian companies. ▪ 5 companies attended the inaugural Earth Observation Commercialisation Forum in Paris in October and 1 company attended the ESA Navigation Innovation and Support Programme (NAVISP) Industry Days - both events were well attended by industry and investors. <p>b. The space industry online directory at www.space-ireland.com was completed in 2020.</p> <p>c. In addition to ongoing discussions with ASI on formalising a Memorandum of Understanding, the Delegation also engaged with space agencies from the United Kingdom, Slovenia, France and Thailand during the reporting period. The discussions with UKSA will initially focus on agreeing a framework for all island collaboration in space. Following engagement with the French Space Agency CNES plans are being put in place for 6 space active EI client companies to meet with CNES in March 2024 in Paris to discuss collaborations opportunities with French companies and the Agency. Work is ongoing with Slovenia to finalise an outward mission to Ljubljana for the second half of 2024. Engagement with Thailand is at an early stage with a number of potential areas of collaboration, initially with the DTIFs in UCD. These will be further elaborated on during a UCD delegation visit to Thailand in May 2024.</p>		

Annex 1: Glossary

BCO	Blackrock Castle Observatory
CAMEO	Creating an Architecture for Manipulating Earth Observation data
DETE	Department of Enterprise, Trade and Employment
DFHERIS	Department of Further and Higher Education, Research, Innovation and Science
DOT	Department of Transport
DTIF	Disruptive Technologies Innovation Fund
EI	Enterprise Ireland
EIB	European Investment Bank
ESA	European Space Agency
ESERO	European Space Education Resource Office
ESO	European Southern Observatory
EU	European Union
EUSPA	European Union Space Programmes Agency
HEI	Higher Education Institution
ISA	Irish Space Association
NSSPI	National Space Subsystems and Payloads Initiative
IRC	Irish Research Council
MOU	Memorandum of Understanding
SME	Small to Medium-Sized Enterprise
SFI	Science Foundation Ireland
UNGA	United Nations General Assembly
EIF	European Investment Fund

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