

TIA Programmes and Opportunities BELSPO Information Day 30 September 2022

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ESA UNCLASSIFIED – For ESA Official Use Only

Applications from space for users on Earth

THULLING

Underpins the Digital Economy



Seamless



Improves our daily life

> Inspires future generations

It's all about Connectivity



Connecting Europe globally Space part of Global Data Economy for a Sustainable Future



Citizens

Always on, everywhere Digital equality

Industry & business

Mobility, Energy, Climate, Health, Finance, Education, Entertainment

Governments Secure, resilient, autonomous







Underpinned by a responsible use of space for a sustainable future

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Space Part of the Solution





ESA plays a key catalyser role

Space Systems Safe & Secured, Innovative and Resilient

- Space System for highly secured services
- Innovation: enhanced authentication and super-secure Quantum Key Distribution
- Resiliency: combine space component to terrestrial infrastructures for increased security

Space Industry Recovered to Pre-Pandemic Levels in 2021 @ esa

40%



Satcom represents substantial segment of global satellite economy.

33% of upstream market

42% of downstream market

Europe represents 24% of satcom market

- \$4B upstream European satcom revenues
- \$29B downstream European satcom revenues

Satcom will continue to play a key role in supporting upstream markets.





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Future satellite communications manufacturing and launch market (2021-2030).

Sources: Bryce State of the Satellite Industry (SIA) reports, ESA internal analysis, Euroconsult "Space Economy Report" 2022 Euroconsult "Satellites to be Built and Launched by 2030" Report 2021 5

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Responding to Europe's connectivity needs 2.4 B€ over 4 Programmes at CM22



ARTES 4.0 - 1.400 M€



Secure Connectivity - 750M€



Moonlight - 225 M€



Civil Security from Space - 100M€



ARTES DNA







ARTES 4.0 CM22 - Partnership Projects



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Software Driven Satellites – Sustainable Platforms

Novacom 1 & Novacom 2

12 satellites sold already- Development Continues

Flexibility – Performance – Competitiveness and manage Obsolescence

Hummingsat

Micro GEO New product line Micro geostationary satellites High throughput satellite, up to 40 Gb/sec



Develop commercially-driven generic LEO satellite European solutions

AIDAN NEXT

Ground & space segment elements for GEO satcom systems and ubiquitous internet connectivity

Project Green

New, open-architecture and sustainable LEO constellation, multi mission capabilities

ARTES 4.0 CM22 - Industry competitiveness



Core Competitiveness





W-Band

Flat Antennas Digital P

Digital Processor

AI, Cloud

Enables disruptive technology & products

CM22 Introduction of Hubs

Accelerating product/applications developments and demonstrations- Upstream & Downstream

Business Applications & Space Solutions



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ARTES 4.0 Strategic Programme Lines



Safety & Security Space System



Quantum & Optical



5G/6G Sustainable Connectivity



R&D & Innovation Incubation & Application Institutions & Industry Partners of Member StatesPartners of IndustryPartners of Europe

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ARTES 4.0 Strategic Programme Lines **CM22** Partnership Projects



Ceesa

HydRON SAGA Sunrise phase 3 **Optical backbone in Space Pre-commercial deployment** 1st Gen Euro QCI Space Segment **Very Low latency for 5G/6G services** LEO **Next Gen Quantum Satellites** OGS **Increased System Capacity** Network GEO Service based on entangled OneWeb photons

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Iris brings greener, more sustainable aviation





ESA Programme related to EU Secure Connectivity



Teaming up with EC and partnering with industry for a more secure and sovereign Europe Strong security, resilience and autonomy requirements

Industry is the design authority

ESA Programme – Development and Validation Functional End to End System

Preliminary Market Consultation

- Strong interest from Industry demonstrated by the large number of early responses received to PMC
- Need for an ambitious Space Based Development & Validation Programme confirmed
- More than 30 full responses expected by 7 October
- EC and ESA defining together a coordinated procurement process
- ITT expected ~ March 2023

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Civil Security from Space <u>R&D and Innovation for Civil Protection</u>



Catalyse innovative ideas – User driven, industry led

Accelerate the use of space: innovative use-cases and open new market opportunities

Partnership projects, product development, IOV/IOD Demonstration of applications

22 RFIs responses Industry Day - 31 Oct 2022

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Every minute reduction in response time results in: 8 - 17% decrease in overall mortality rates in the population

5.5% decrease in health care costs for patients with severe trauma Mortality

Morbidity healthcare costs

\$2,700 - \$6,000 reduction in infrastructure damage costs (from fires)

Property damage costs

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Lives lost in disaster directly correlate with response time.

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Source: Access Partnership - The Role of Satellite Communications in Disaster Management - May 2022 17

A satellite-enabled connectivity revolution in disaster management could reduce losses in Europe by 35%.

A connectivity revolution in disaster management could significantly reduce losses globally by up to USD148 billion in 2025-2029

Estimated average annual global impact in 2025- 2029 by region, USD billions

- BUSINESS-AS-USUAL
- CONNECTIVITY DIVERGENCE
- CONNECTIVITY REVOLUTION
- PERCENTAGE CHANGE IN AVERAGE ANNUAL ECONOMIC IMPACT

1. For this analysis, the Asia Pacific region excludes the Central Asian countries of Kyrgyzstan, Kazakhstan, Tajikistan, Uzbekistan, and Turkmenistan NOTE: Sum of numbers may not match due to rounding.



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Source: Access Partnership - The Role of Satellite Communications in Disaster Management - May 2022 18

PERCENTAGE CHANGE

USD

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Civil Security from Space as a seed for ESA Rapid and Resilient Crisis Response (R3)





- Disaster and crises has an enormous cost to human life, to the economy and to our planet
- Opportunity for satellite services and applications to be part of a solution providing added value in risk management and response

R3 System Study: Belgian industry helping to bring a distributed intelligent Earth to Space Infrastructure to reality!

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Thank you

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in Elodie Viau, ESA Space Solutions

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Space Solutions in everyday life



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ENERGY

EDUCATION

AVIATION

FINANCIAL

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MEDIA

TRANSPORT

ENVIRONMENT

AGRICULTURE

...



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EARTH OBSERVATION





SATELLITE COMMUNICATION

HUMAN SPACEFLIGHT TECHNOLOGIES