

# TIA Programmes and Opportunities BELSPO Information Day 30 September 2022

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



#### Citizens

Always on, everywhere Digital equality

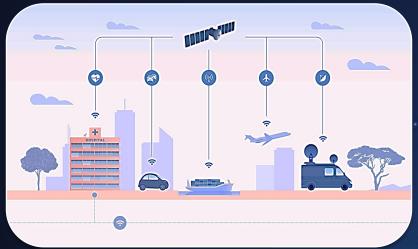
#### **Industry & business**

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

#### **Governments**

Secure, resilient, autonomous







Underpinned by a responsible use of space for a sustainable future

### **Space Part of the Solution**



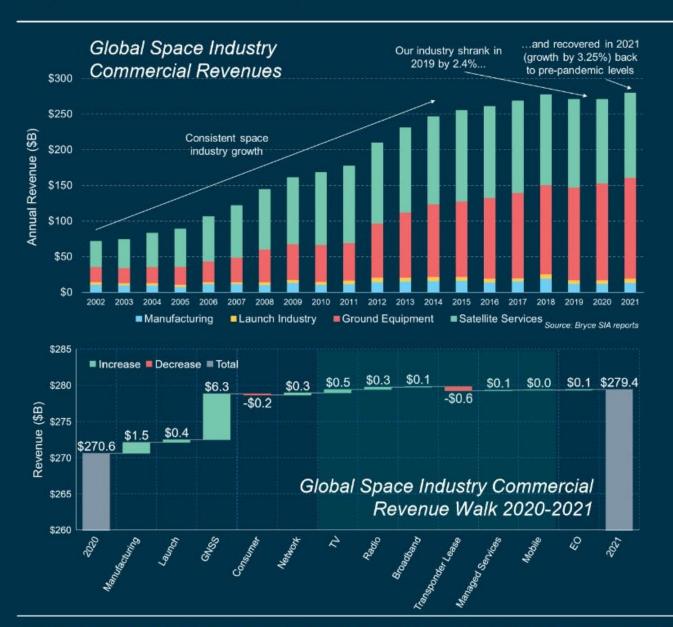


ESA plays a key catalyser role

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



Satcom represents substantial segment of global satellite economy.



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.



\$102Bn



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



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



### ARTES 4.0 - 1.400 M€



Moonlight - 225 M€



### **Secure Connectivity - 750M€**



**Civil Security from Space - 100M€** 



### **ARTES DNA**



Team up with full space value chain & verticals

**Strong commercial** industrial base



**Facilitate** access to capital

Well-established **Partnership Projects** (co-funding scheme)







**Guaranteed return of 1** Intellectual property to industry

Innovation, disruption of technologies and services





Collective **Intelligence network** 

#### A Decade of Successes LEGEND **LEO Nano Satelites** SES 17 Neosat Eutelsat Konnect Neosat ADS EDRS-C + Hylas 3 **LEO Micro Satelites GEO Micro Satelites** Eutelsat Quantum exactEarth ESAIL **GEO Large Satelites** Spire GNSS R1 R2 SGEO Hispasat 36W-1 Spire RF OSL 1/2 & ISL GNSS R3 R4 Spire Marsupial\_1+2 Eutelsat HotBird13F/G Neosat Spire RF-ISL 1/2/3/4/5 GNSS RO1 RO2 Open Cosmos LS2b 2019 2020 2018 InSpace Faraday 2027 OneWeb 2027 ADS EDRS-A JoeySat 2022 Spire RF-OISL 1/2/3 5076 Immarsat GXT/8/9 Novacom I ArQit QKDSAT InSpaceFaraday 2G 1+2 Immarsat Alphasat 2023+ 2013 MicroGEO SITAEL Striving Hisdesat SpainsatNG 1/2 PACIS3 2010 AVANTI Hylas1 xSPANCION • SES ASTRA 1Q/ OpenCosmos Sapion Novacom II



## **ARTES 4.0 CM22 - Partnership Projects**



#### 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

#### **LEO Next Generation**

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

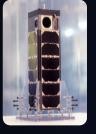


## **ARTES 4.0 CM22 - Industry competitiveness**



## **Core Competitiveness**





W-Band





Flat Antennas

Digital Processor



AI, Cloud

Enables disruptive technology & products

#### **CM22 Introduction of Hubs**

Accelerating product/applications developments and demonstrations- Upstream & Downstream

## **Business Applications**& Space Solutions



Environment & Wildlife

>600 Activities 2016-21



Transport & Logistics



Agriculture, Forestry & Fishing







Safety & Security



Health & Social Care

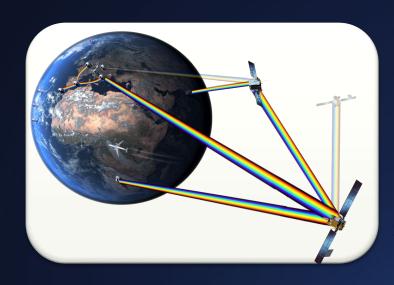
### **ARTES 4.0 Strategic Programme Lines**



Safety & Security Space System



**Quantum & Optical** 



5G/6G **Sustainable Connectivity** 



R&D & Innovation Incubation & Application **Institutions & Industry** 



**Partners of Member States** Partners of Industry Partners of Europe

## ARTES 4.0 Strategic Programme Lines CM22 Partnership Projects

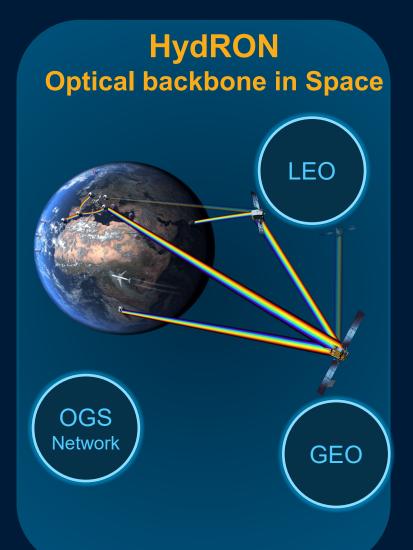




Next Gen Quantum Satellites

**Increased System Capacity** 

Service based on entangled photons



Sunrise phase 3
Pre-commercial deployment
Very Low latency for
5G/6G services



### Iris brings greener, more sustainable aviation





The deployment of Iris as complementary datalink is a key enabler of a greener, more efficient and more sustainable European aviation





This will bring significant benefits to both passengers, airlines and all the main aviation stakeholders



With optimistic equipage rate assumptions and with i4D in 2024, Iris CO2 emissions savings could range from 3 to 6 Million Tonnes CO2 per year



With a realistic equipage rate ramp-up, Iris could bring 1.5-3 Million Tonnes CO2 emissions savings per year, resulting in a cumulative saving of 55 Million Tonnes CO2 over the 2024-2040 timeframe



Cumulative economical benefits linked to CO2 emissions reduction range from 3.5 up to 7 Billion euros over the 2024-2040 time-frame, with a realistic Iris equipage rate

### **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

## **Civil Security from Space**R&D and Innovation for Civil Protection





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

### Faster responses to crises save lives and reduce costs





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

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

Mortality

Morbidity

healthcare costs

Property damage costs

Lives lost in disaster directly correlate with response time.

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%.

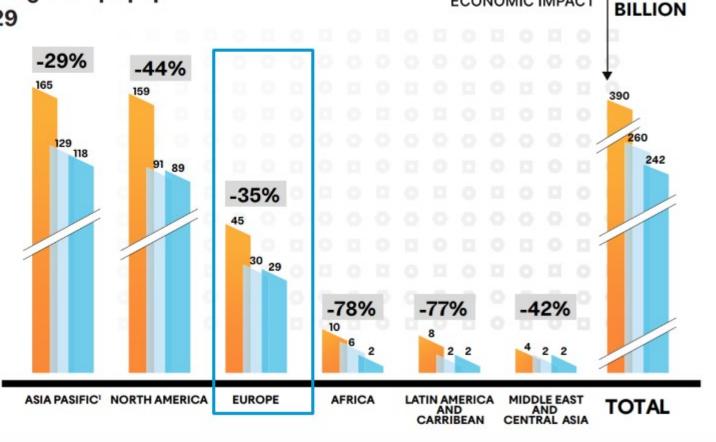


A connectivity revolution in disaster management could significantly reduce losses globally by up to USD148 billion in 2025-2029

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

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

 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.



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

PERCENTAGE CHANGE

IN AVERAGE ANNUAL

ECONOMIC IMPACT

USD

## 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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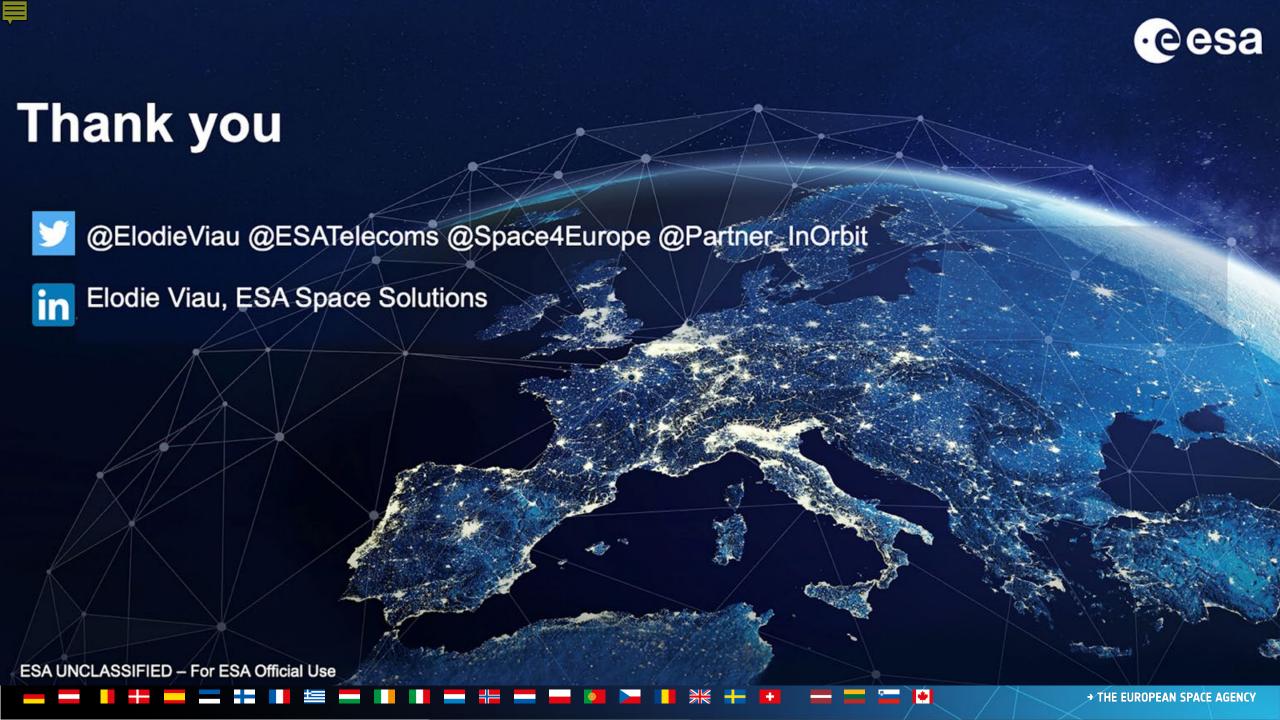


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## Space Solutions in everyday life



MARITIME



**SPACE WEATHER** 



HEALTHCARE



TRANSPORT



**EARTH OBSERVATION** 



**ENVIRONMENT** 



AGRICULTURE



**SATELLITE NAVIGATION** 



MEDIA



ENERGY



**EDUCATION** 



SATELLITE COMMUNICATION



AVIATION



FINANCIAL



**HUMAN SPACEFLIGHT TECHNOLOGIES**