Council of the
European Union

Brussels, 10 January 2023
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ESPACE 2

NOTE

From:	General Secretariat of the Council
To:	Delegations
Subject:	Outcome of ESA Ministerial Council 2022 (Space Working party meeting of 10 January 2023)

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Outcome of ESA Ministerial Council 2022
EU Council Space Working Party
10 January 2023
Simonetta Cheli
Director of Earth Observation Programmes, ESA
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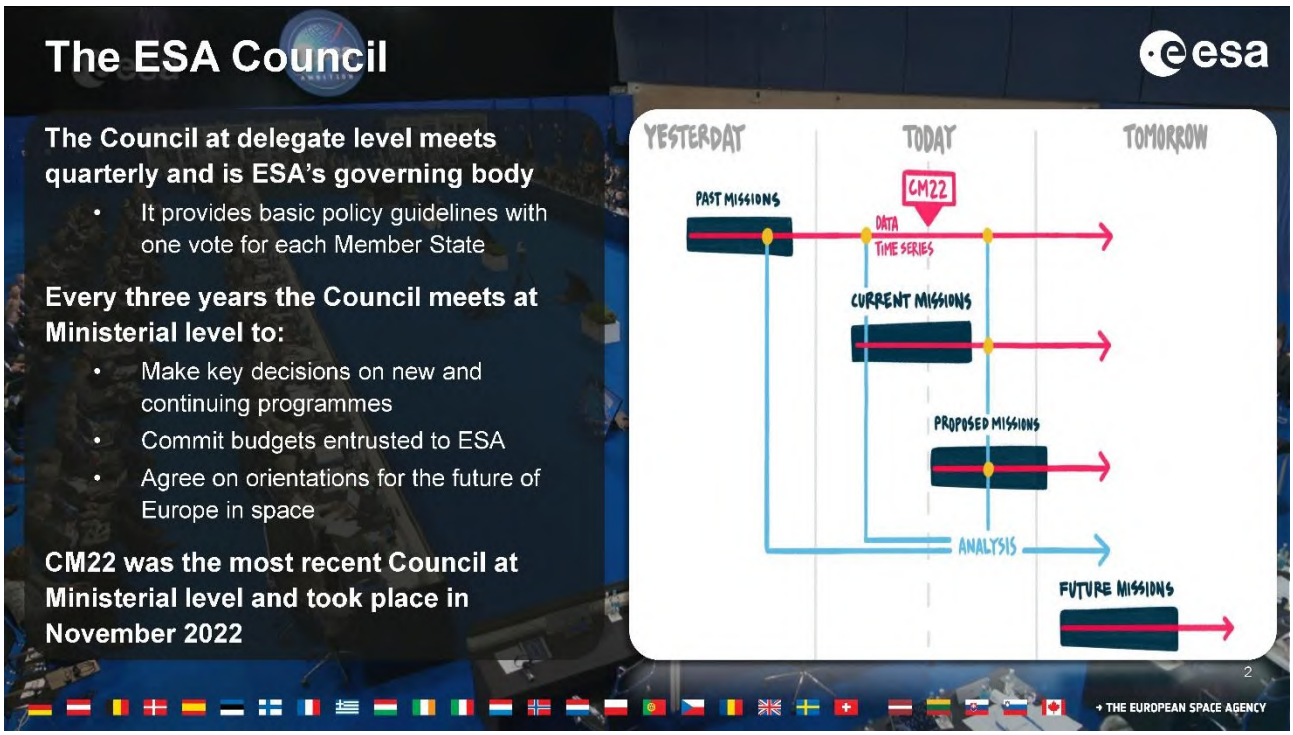
The ESA Council
esa
The Council at delegate level meets quarterly and is ESA's governing body
• It provides basic policy guidelines with one vote for each Member State
Every three years the Council meets at Ministerial level to:
• Make key decisions on new and continuing programmes
• Commit budgets entrusted to ESA
• Agree on orientations for the future of Europe in space
CM22 was the most recent Council at Ministerial level and took place in November 2022
YESTERDAY
TODAY
TOMORROW
PAST MISSIONS
CM22
DATA
TIME SERIES
CURRENT MISSIONS
PROPOSED MISSIONS
ANALYSIS
FUTURE MISSIONS
2
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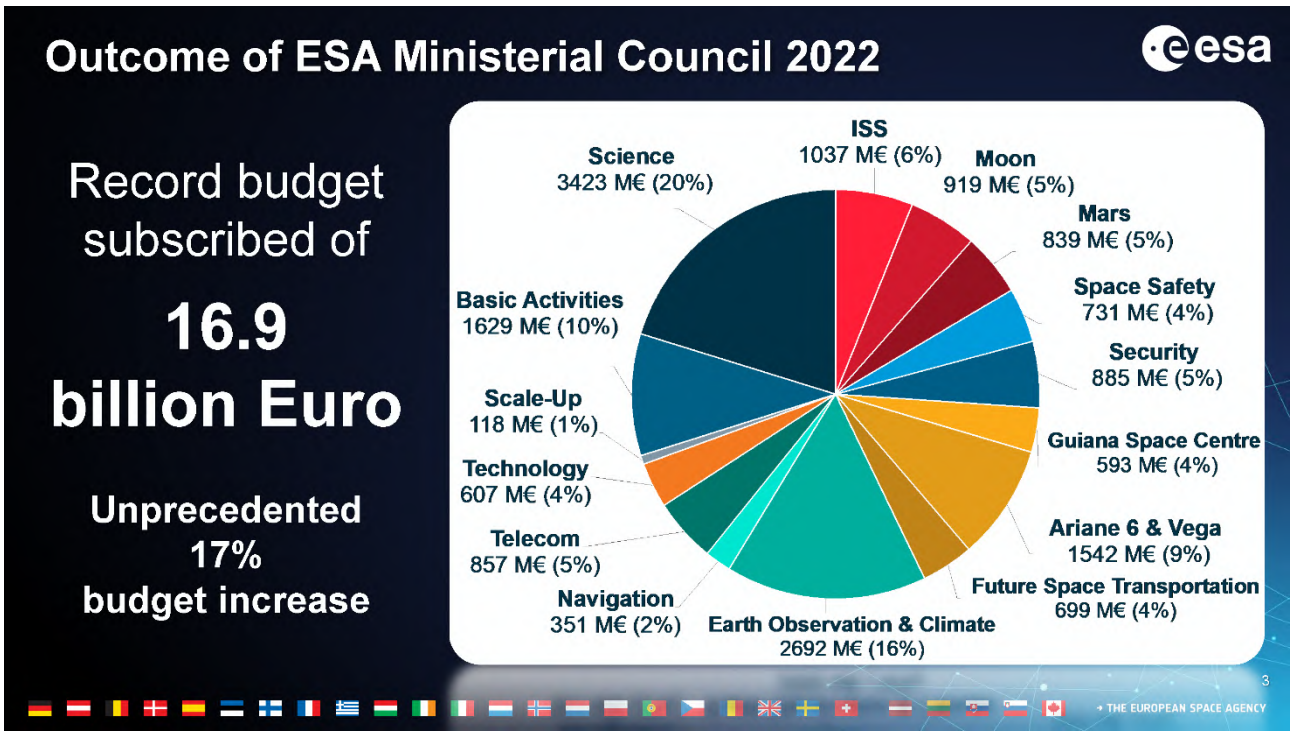
Outcome of ESA Ministerial Council 2022
esa
Record budget subscribed of
16.9 billion Euro
Unprecedented 17% budget increase
ISS 1037 M€ (6%)
Moon 919 M€ (5%)
Mars 839 M€ (5%)
Space Safety 731 M€ (4%)
Security 885 M€ (5%)
Guiana Space Centre 593 M€ (4%)
Ariane 6 & Vega 1542 M€ (9%)
Future Space Transportation 699 M€ (4%)
Earth Observation & Climate 2692 M€ (16%)
Navigation 351 M€ (2%)
Telecom 857 M€ (5%)
Technology 607 M€ (4%)
Scale-Up 118 M€ (1%)
Basic Activities 1629 M€ (10%)
Science 3423 M€ (20%)
3
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CM22 Demonstrated…
esa
46,0°C
45,9°C
Climate change and environmental degradation are not just for scientists to study, they are issues with consequences knocking on the doors of every human on the planet
A strong political support to climate and environmental actions
Climate as top concern for European Citizens (Harris survey)
Strategic relevance of EO sector for climate and environment
4
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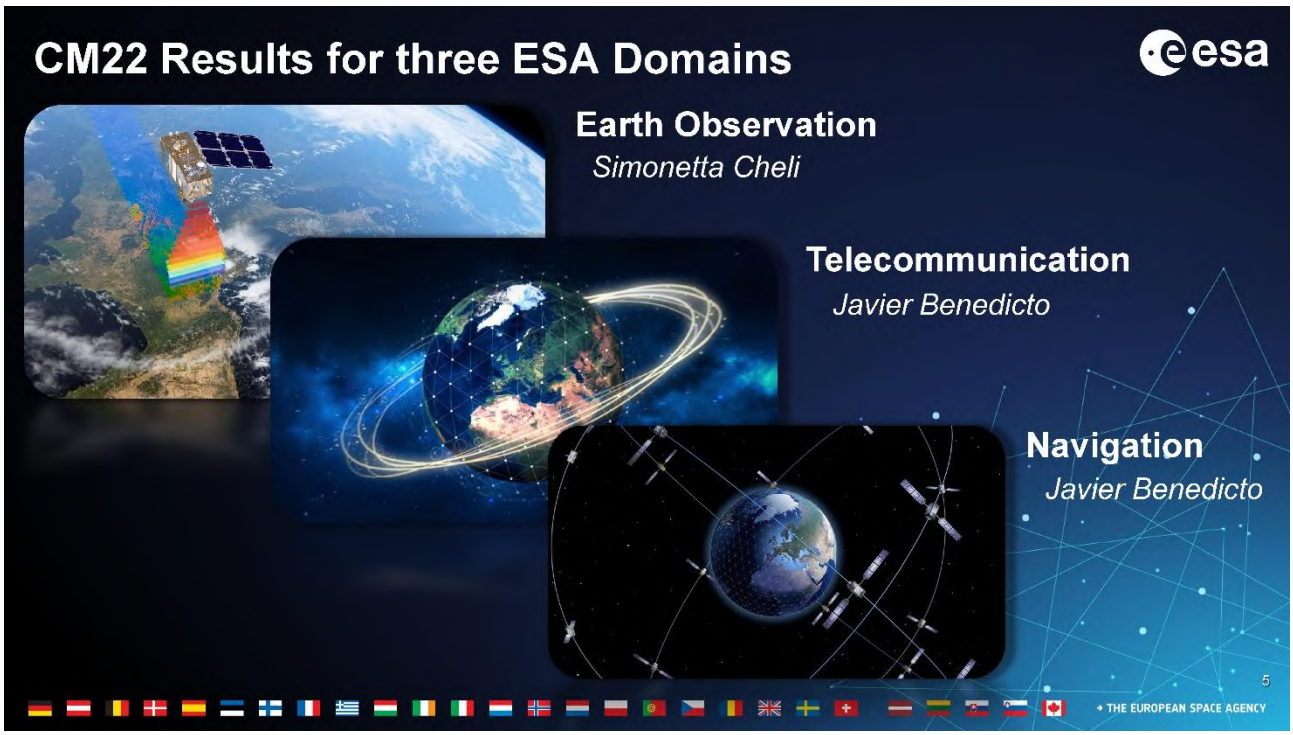
CM22 Results for three ESA Domains
esa
Earth Observation
Simonetta Cheli
Telecommunication
Javier Benedicto
Navigation
Javier Benedicto
5
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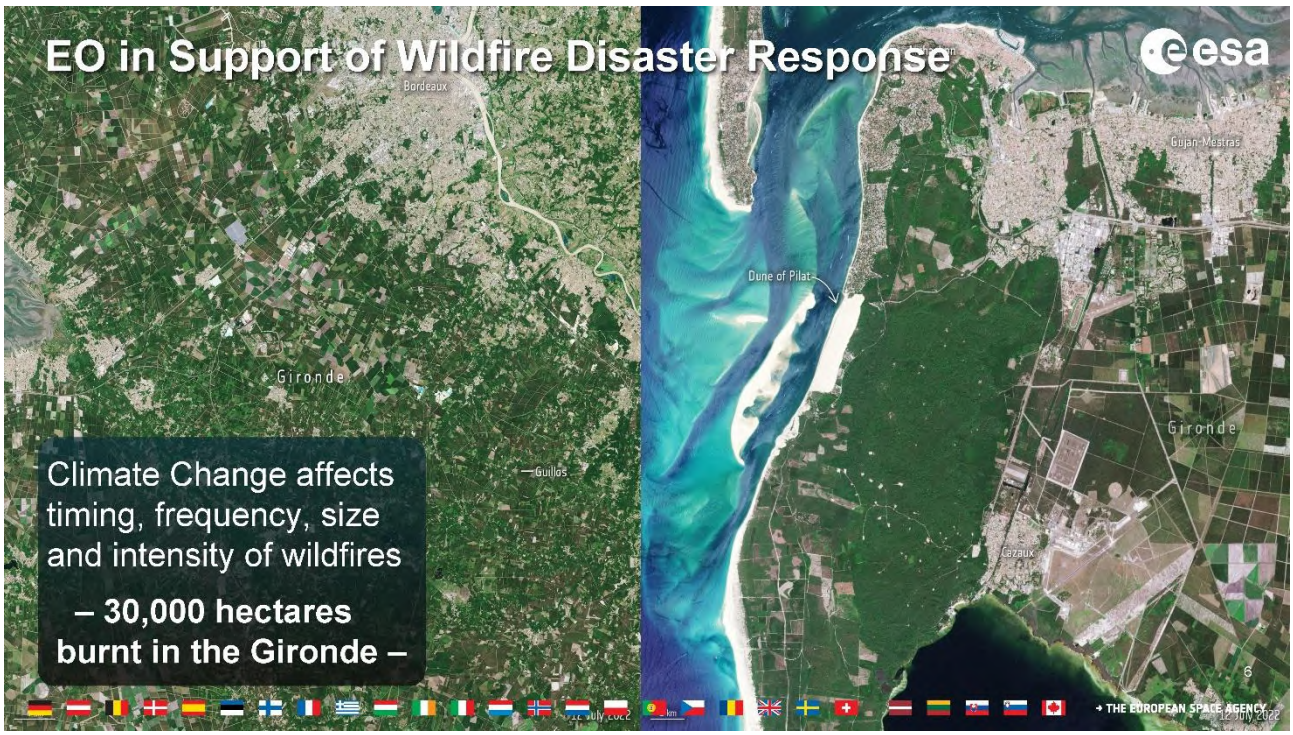
EO in Support of Wildfire Disaster Response
esa
Bordeaux
Gujan-Mestras
Dune of Pilat
Gironde
Guillos
Gironde
Cazaux
Climate Change affects timing, frequency, size and intensity of wildfires
– 30,000 hectares burnt in the Gironde –
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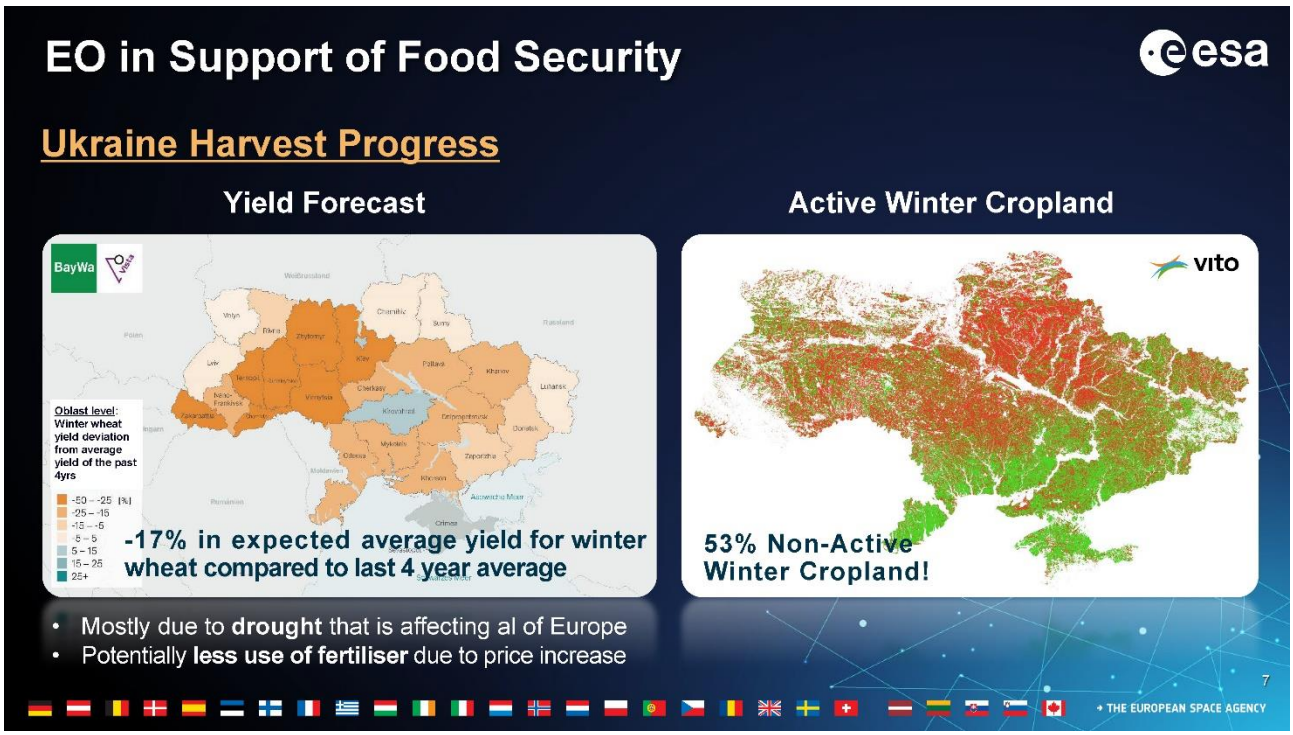
EO in Support of Food Security
esa
Ukraine Harvest Progress
Yield Forecast
Active Winter Cropland
BayWa
Oblast level:
Winter wheat yield deviation from average yield of the past 4yrs
-17% in expected average yield for winter wheat compared to last 4 year average
vito
53% Non-Active Winter Cropland!
Mostly due to drought that is affecting al of Europe
Potentially less use of fertiliser due to price increase
7
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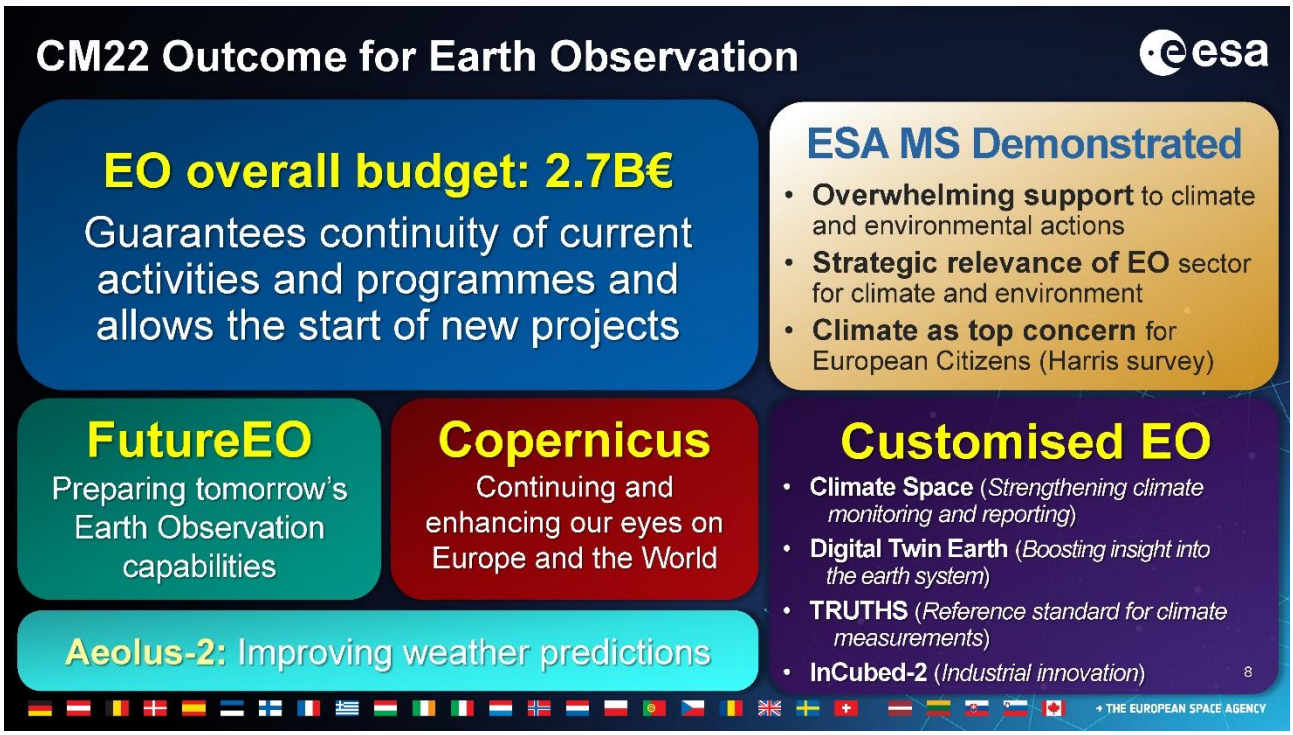
CM22 Outcome for Earth Observation
esa
EO overall budget: 2.7B€
Guarantees continuity of current activities and programmes and allows the start of new projects
ESA MS Demonstrated
• Overwhelming support to climate and environmental actions
• Strategic relevance of EO sector for climate and environment
• Climate as top concern for European Citizens (Harris survey)
FutureEO
Preparing tomorrow's Earth Observation capabilities
Copernicus
Continuing and enhancing our eyes on Europe and the World
Customised EO
• Climate Space (Strengthening climate monitoring and reporting)
• Digital Twin Earth (Boosting insight into the earth system)
• TRUTHS (Reference standard for climate measurements)
• InCubed-2 (Industrial innovation)
Aeolus-2: Improving weather predictions
8
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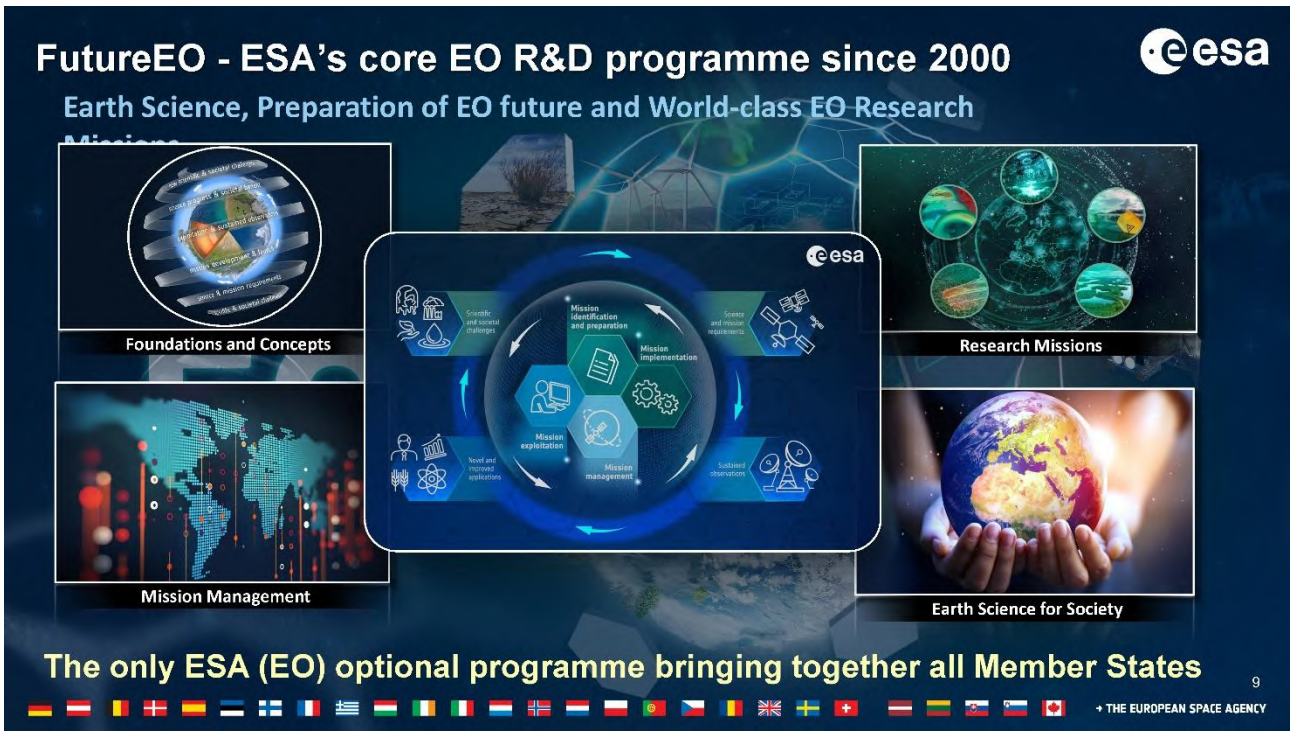
FutureEO - ESA's core EO R&D programme since 2000
esa
Earth Science, Preparation of EO future and World-class EO Research
Foundations and Concepts
Research Missions
Mission Management
Earth Science for Society
Mission identification and preparation
Mission implementation
Mission management
Mission exploitation
The only ESA (EO) optional programme bringing together all Member States
9
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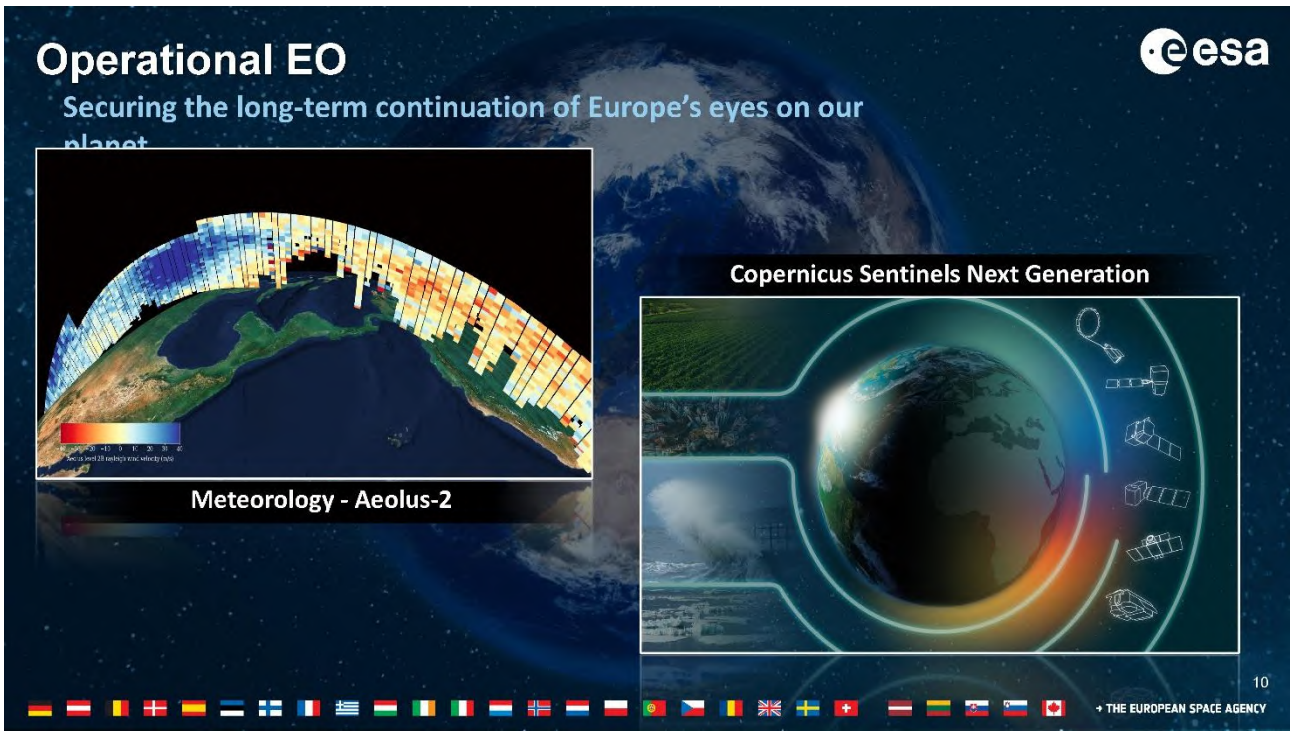
Operational EO
Securing the long-term continuation of Europe's eyes on our planet
esa
Meteorology - Aeolus-2
Copernicus Sentinels Next Generation
10
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Customised EO
esa
Pre-operational activities answering demands from user communities, industry, Member States
CLIMATE FROM SPACE
CLIMATE–SPACE
Enter market
Accelerate
European EO competitiveness
Invest
Foster entrepreneurial initiatives
Develop
Mature "the solution"
Explore
Nurture good ideas "Fail fast" ethos
Discover
Creation of "Blue-sky" transformative ideas
in3
Incubed-2
TRUTHS
Digital Twin Earth
11
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EO Activities Following CM22 Programme Proposal
esa
Deliver:
New & Actionable Insight into Earth System, Essential Climate Variables, Digital Twins, …
TRUTHS
Phase B2/C0
Earth Explorer 10
HARMONY
MAGIC/NGGM
Small Missions
SCOUTS 3-4
Aeolus-2
(+ recurrent)
Operate 9 research missions
Prepare future Missions
S-2 NG, S-3OPT NG, M4G, EE-11, EE-12 & EE-13
Support Commercial EO sector
Copernicus
Sentinel-1 NG
Sentinel-3 NG
(+ recurrent)
Copernicus Budget Shortfall
Urgent action is needed to identify budgetary sources to address the 721 M€ funding shortfall
Postponing to next MMF would lead to breaks in development, causing schedule delays and increased costs
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EO in Support of European Strategies & Policies
esa
CLIMATE PACT AND CLIMATE LAW
INVESTING IN SMARTER, MORE SUSTAINABLE TRANSPORT
STRIVING FOR GREENER INDUSTRY
ELIMINATING POLLUTION
ENSURING A JUST TRANSITION FOR ALL
FINANCING GREEN PROJECTS
MAKING HOMES ENERGY EFFICIENT
LEADING THE GREEN CHANGE GLOBALLY
FROM FARM TO FORK
PROTECTING NATURE
PROMOTING CLEAN ENERGY
THE EUROPEAN GREEN DEAL
NEW CAP
#NewCAP
New Common Agricultural Policy
New EU Forest Strategy for 2030
EU Biodiversity Strategy for 2030
Bringing nature back into our lives
THE EU'S ARCTIC POLICY
A SAFE, STABLE, SUSTAINABLE, PEACEFUL AND PROSPEROUS ARCTIC
13
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Green Future Accelerator: Space for a Green Future
esa
"Provide European decision-makers, industry, and society with the support they need to reach the objectives of the energy transition and the green agenda, notably carbon neutrality by 2050 with a resource-efficient society."
The Accelerator shall:
1. Address the Energy Transition & the complex social-environmental-economic dynamics
2. Leverage and build upon existing and planned activities with the EC and international partners
3. Establish a participative and inclusive engagement of all stakeholders
4. Stimulate sustainable business growth enabled by the Green Economy.
Space for a Green Future
14
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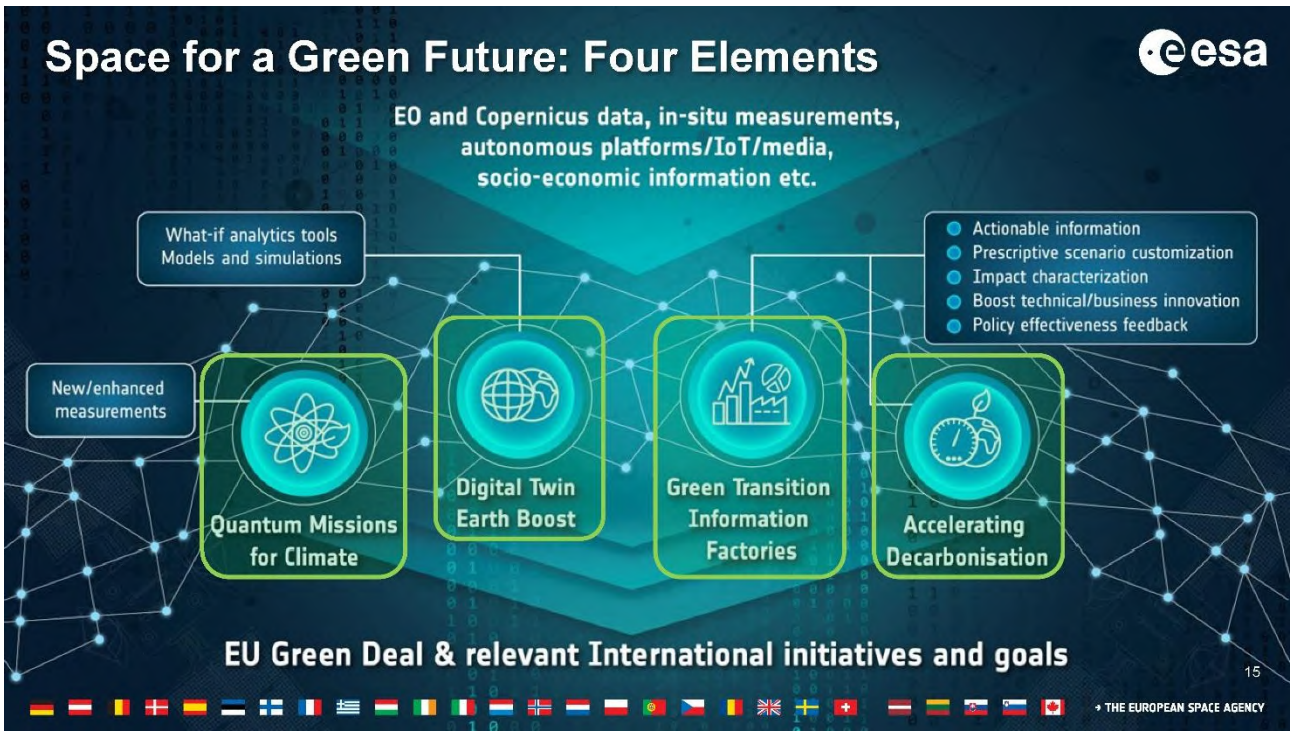
Space for a Green Future: Four Elements
esa
EO and Copernicus data, in-situ measurements, autonomous platforms/IoT/media, socio-economic information etc.
What-if analytics tools Models and simulations
Actionable information
Prescriptive scenario customization
Impact characterization
Boost technical/business innovation
Policy effectiveness feedback
New/enhanced measurements
Quantum Missions for Climate
Digital Twin Earth Boost
Green Transition Information Factories
Accelerating Decarbonisation
EU Green Deal & relevant International initiatives and goals
15
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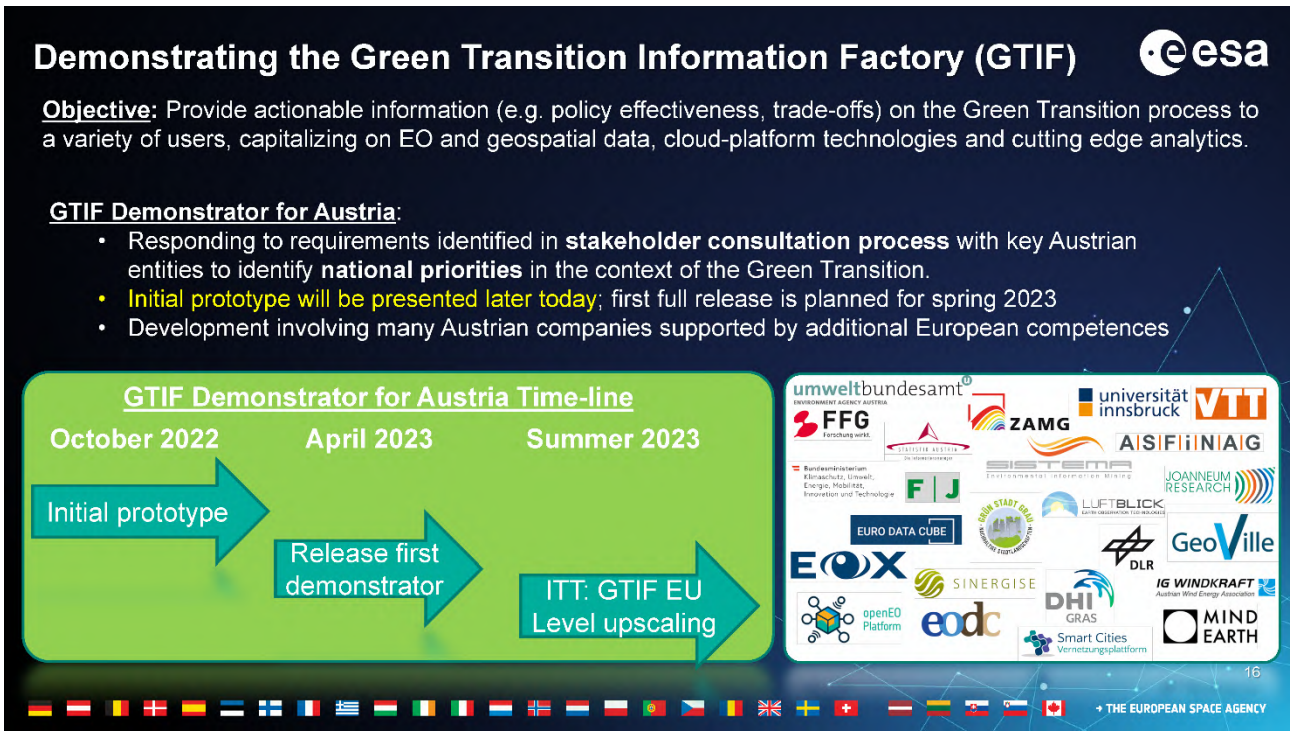
Demonstrating the Green Transition Information Factory (GTIF)
esa
Objective: Provide actionable information (e.g. policy effectiveness, trade-offs) on the Green Transition process to a variety of users, capitalizing on EO and geospatial data, cloud-platform technologies and cutting edge analytics.
GTIF Demonstrator for Austria:
• Responding to requirements identified in stakeholder consultation process with key Austrian entities to identify national priorities in the context of the Green Transition.
• Initial prototype will be presented later today; first full release is planned for spring 2023
• Development involving many Austrian companies supported by additional European competences
GTIF Demonstrator for Austria Time-line
October 2022
April 2023
Summer 2023
Initial prototype
Release first demonstrator
ITT: GTIF EU Level upscaling
umweltbundesamt
FFG
ZAMG
universität innsbruck
VTT
AIT
ASFINAG
SISTEMA
JOANNEUM RESEARCH
F J
LUFTBLICK
EURO DATA CUBE
GeoVille
DLR
EOX
SINERGISE
DHI GRAS
IG WINDKRAFT
openEO Platform
eodc
MIND EARTH
Smart Cities Vernetzungsplattform
16
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Outcome of ESA Ministerial Council 2022
Telecommunications
EU Council Space Working Party
10 January 2023
Javier BENEDICTO
Acting Director of Telecommunications and Integrated Applications, ESA
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TIA CM22: 1.9 B€ - Strong ARTES 4.0 & Three New Programmes
esa
ARTES 4.0 1.1 B€
Secure Connectivity 0.65 B€
Moonlight 150 M€
Civil Security from Space 30M€
18
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ARTES 4.0 CM22
esa
Kick Start New & Disruptive Technologies
ESA de-risks highly innovative satellite solutions. It encourages investments of Space companies in the expansion of their product portfolio.
Meeting Public and Commercial Needs
We increase European self-reliance and simultaneously boost technical expertise and market share for European industry.
Investing in the Future of Space
Bringing strategic value to the ESA member states by making telecommunication collaborations happen, stimulating the economy and creating new jobs.
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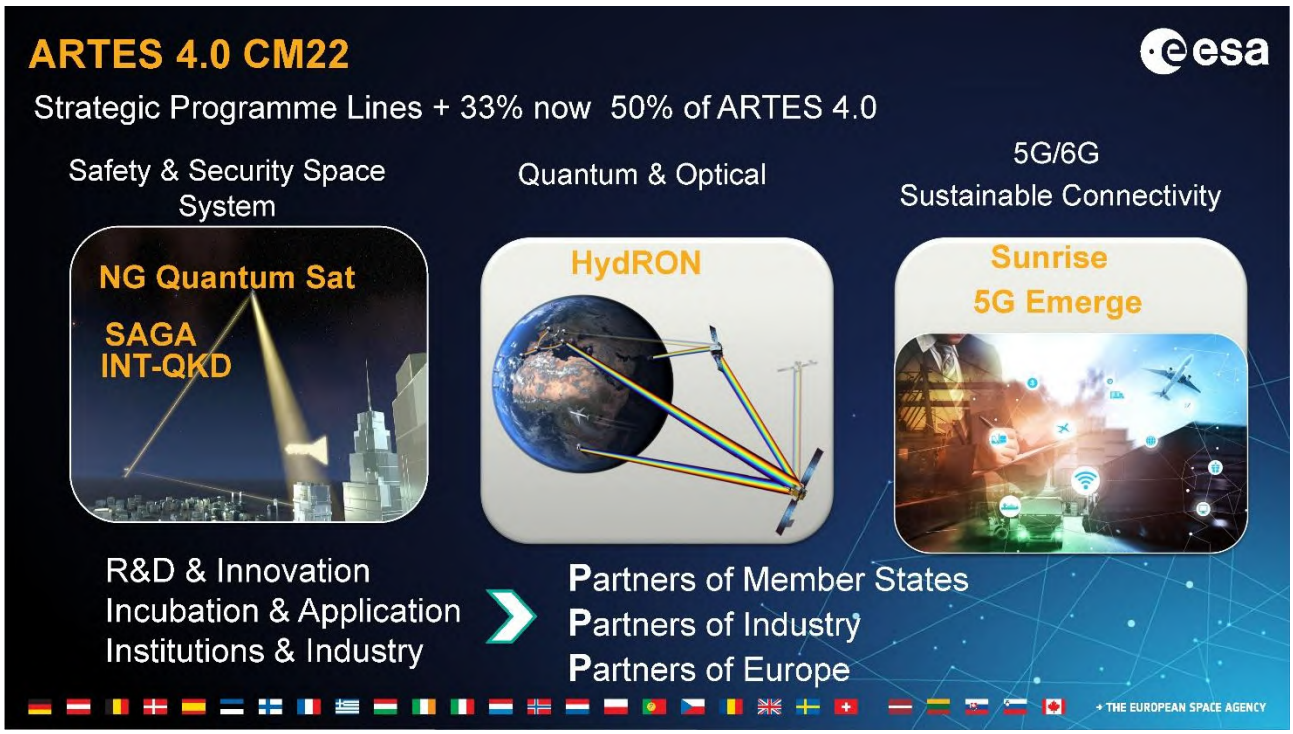
ARTES 4.0 CM22
esa
Strategic Programme Lines + 33% now 50% of ARTES 4.0
Safety & Security Space System
Quantum & Optical
5G/6G Sustainable Connectivity
NG Quantum Sat
SAGA
INT-QKD
HydRON
Sunrise
5G Emerge
R&D & Innovation
Incubation & Application
Institutions & Industry
Partners of Member States
Partners of Industry
Partners of Europe
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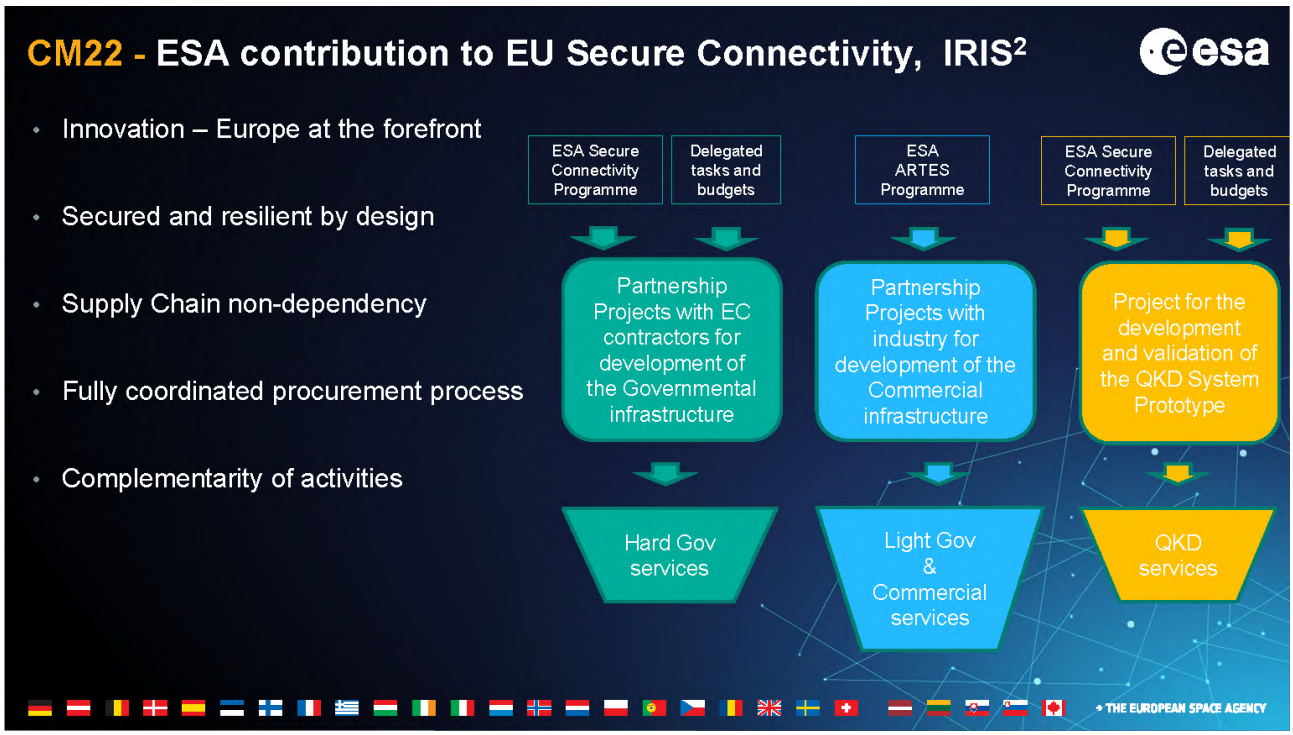
CM22 - ESA contribution to EU Secure Connectivity, IRIS²
esa
Innovation – Europe at the forefront
Secured and resilient by design
Supply Chain non-dependency
Fully coordinated procurement process
Complementarity of activities
ESA Secure Connectivity Programme
Delegated tasks and budgets
ESA ARTES Programme
ESA Secure Connectivity Programme
Delegated tasks and budgets
Partnership Projects with EC contractors for development of the Governmental infrastructure
Partnership Projects with industry for development of the Commercial infrastructure
Project for the development and validation of the QKD System Prototype
Hard Gov services
Light Gov & Commercial services
QKD services
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CM22 – ESA Programme related Secure Connectivity
Next steps
esa
• Phase 1 of ESA Programme started covering preparatory activities & procurement process coordinated with EC:
• Critical preparation of development and validation partnership projects
• Contribution Agreement for all entrusted tasks and delegated budgets
• Current ESA objective is to move to phase 2 in Q3 2023 -> aligned with EC timeline
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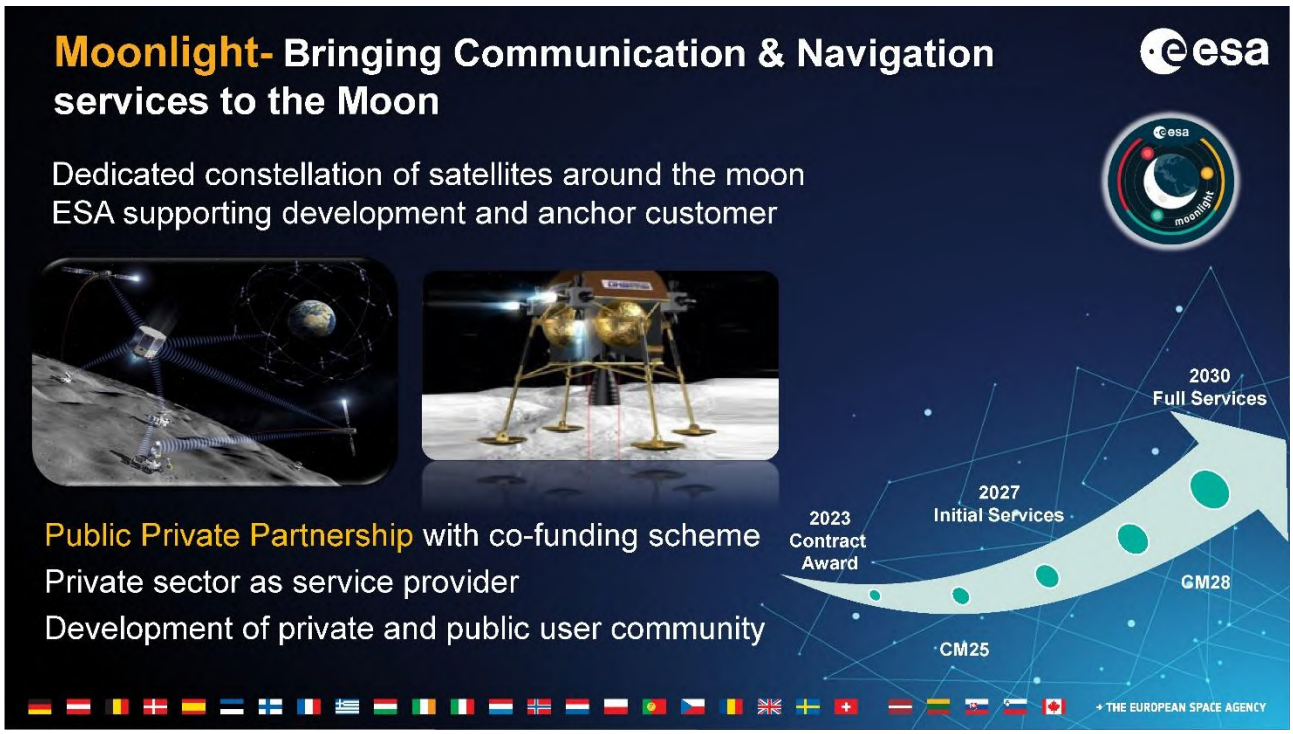
Moonlight- Bringing Communication & Navigation services to the Moon
esa
Dedicated constellation of satellites around the moon
ESA supporting development and anchor customer
Public Private Partnership with co-funding scheme
Private sector as service provider
Development of private and public user community
2023 Contract Award
2027 Initial Services
2030 Full Services
GM28
CM25
+ THE EUROPEAN SPACE AGENCY


Civil Security from Space
esa
ESA Stimulating Rapid Response to Civil Security Events/Crises
Humanitarian crises
Geopolitical Instability
Climate Impact
Vulnerable Critical Infrastructure
Cyber crime
Cyber crime
Europe is facing a set of expanding, evolving security challenges
There is a need to enhance the means to act for European citizens security
Earth Observation
SatCom
Call For Proposals Q1 2023
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Outcome of ESA Ministerial Council 2022
Navigation
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Director of Navigation, ESA
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Global Mobility: future PNT market trends

GNSS huge success inspires more demanding needs for the next decade:

- Fast convergence, high accuracy, secure, resilient PNT
- Outdoor, autonomous vehicles, UAVs
- Indoor, Personal LBS and Industrial IOT (logistics, machine control)
- Low-energy IOT asset tracking
- Integration with Terrestrial 5G/6G for ubiquitous PNT
- Connected PNT (2-way data channels)

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CMIN 22 – Navigation package
esa
NAVISP Phase 3
new system technologies, pre-operational activities, innovative services, and offer support to ESA Member States
Future NAV
LEO-PNT
esa
GENESIS
Colocation of Geodetic Techniques in Space
esa
moonlight
27
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NAVISP Phase 3: the right tool to support expanding European PNT capabilities
esa
Element 1
Analyse and develop new PNT systems technologies
Element 2
Ad hoc technological developments and pre-operational activities
Support the emergence of innovative PNT services
Element 3
Support to MS National Programmes along the whole value chain
NAVIMOON
GNSS Receiver for Moon Exploration
AIS
Radar
79%
100%
NAVISP Phase 3 100 M€
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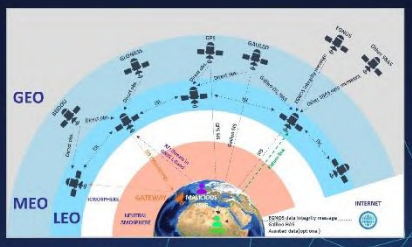
Future NAV: preparing the future of European GNSS
esa
Program Objectives: secure strategic capabilities for independent European satellite navigation infrastructure and services, through support to the early development of advanced satellite navigation technology which has the potential to support operational and scientific missions, both private commercial as well as institutional programmes defined by the European Union
Future NAV comprises 2 components:
a) LEO PNT Component, which includes the definition, development, launch operations and experimentation of a LEO PNT In-Orbit Demonstration system
b) GENESIS Component, which includes the definition, development, launch and operations of the GENESIS Mission
+ THE EUROPEAN SPACE AGENCY

LEO Positioning, Navigation & Timing

Program Objectives: Prepare the future of GNSS :

- Fast convergence, high accuracy, secure, resilient PNT
- Outdoor, autonomous vehicles, UAVs
- Indoor, Personal LBS and Industrial IOT (logistics, machine control)
- Low-energy IOT asset tracking
- Integration with Terrestrial 5G/6G for ubiquitous PNT
- Connected PNT (2-way data channels)



Demonstration of LEO PNT: Fast convergence PPP, additional data channel, two way communication for IOT, in-door positioning, robustness increase, frequency diversity (UHF, L, S, Ku, Ka band), optical ISL connectivity and on-board autonomy

LEO PNT 185 M€

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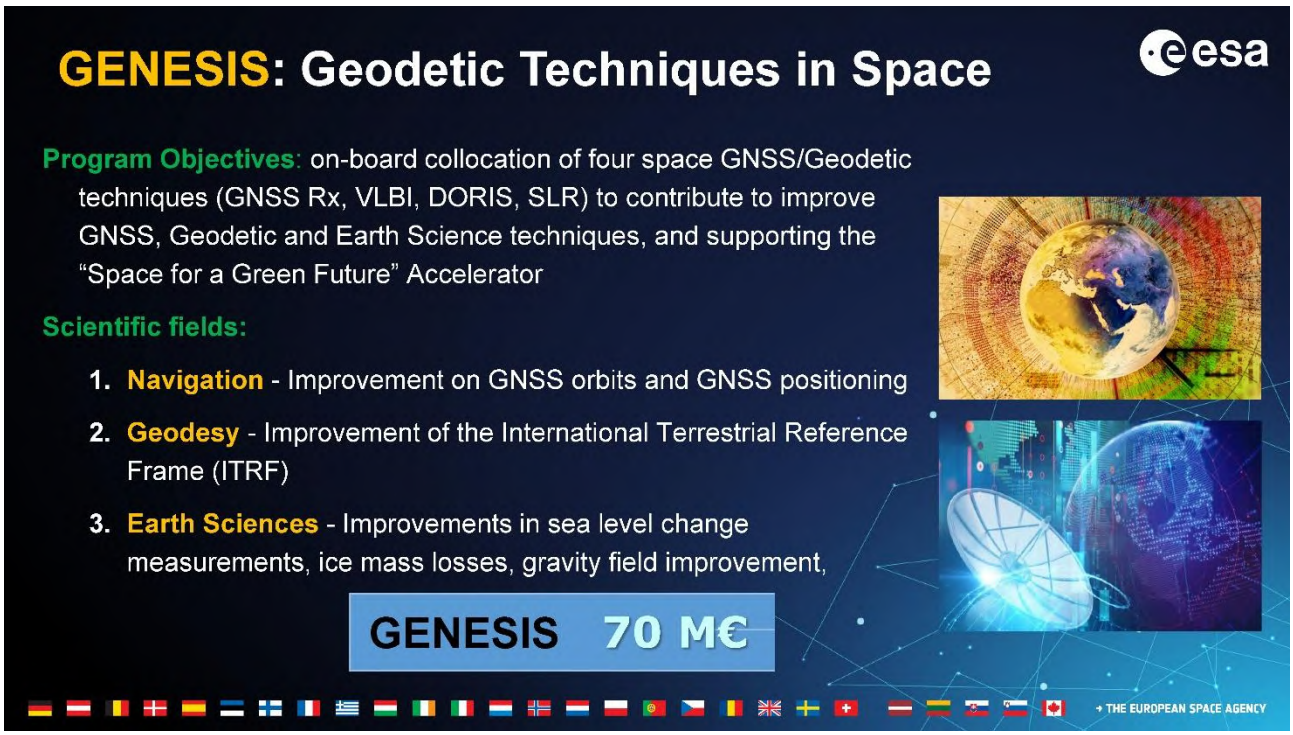
GENESIS: Geodetic Techniques in Space
esa
Program Objectives: on-board collocation of four space GNSS/Geodetic techniques (GNSS Rx, VLBI, DORIS, SLR) to contribute to improve GNSS, Geodetic and Earth Science techniques, and supporting the "Space for a Green Future" Accelerator
Scientific fields:
1. Navigation - Improvement on GNSS orbits and GNSS positioning
2. Geodesy - Improvement of the International Terrestrial Reference Frame (ITRF)
3. Earth Sciences - Improvements in sea level change measurements, ice mass losses, gravity field improvement,
GENESIS 70 M€
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esa
European Satellite Navigation programmes offer a unique opportunity for industry to develop state-of-the-art operational space and ground infrastructure and down-stream PNT user equipment, applications and services
✓ ESA CMIN22: NAVISP, Future NAV, Moonlight
✓ EU-ESA FFPA: Galileo, EGNOS, Horizon Europe
Europe's ambition to maintain SATNAV World-wide competitiveness and leadership on the Earth … and Beyond
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