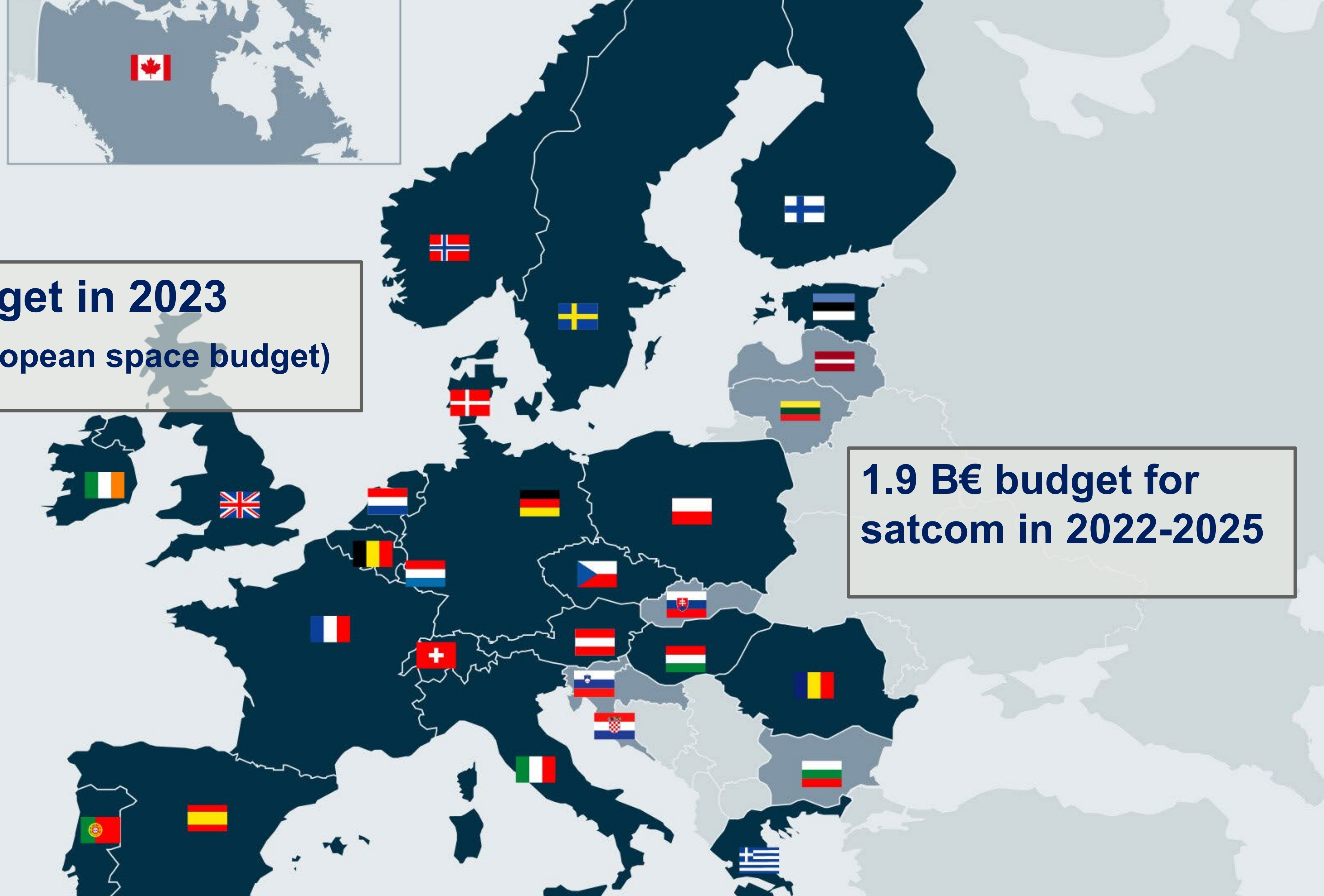
BEREC Workshop 2024

Usage of satellite technologies in mobile communications

22 May 2024

Directorate of Connectivity and Secure Communications (D/CSC)



esa

7.1 B€ budget in 2023

(60% of the European space budget)

1.9 B€ budget for satcom in 2022-2025

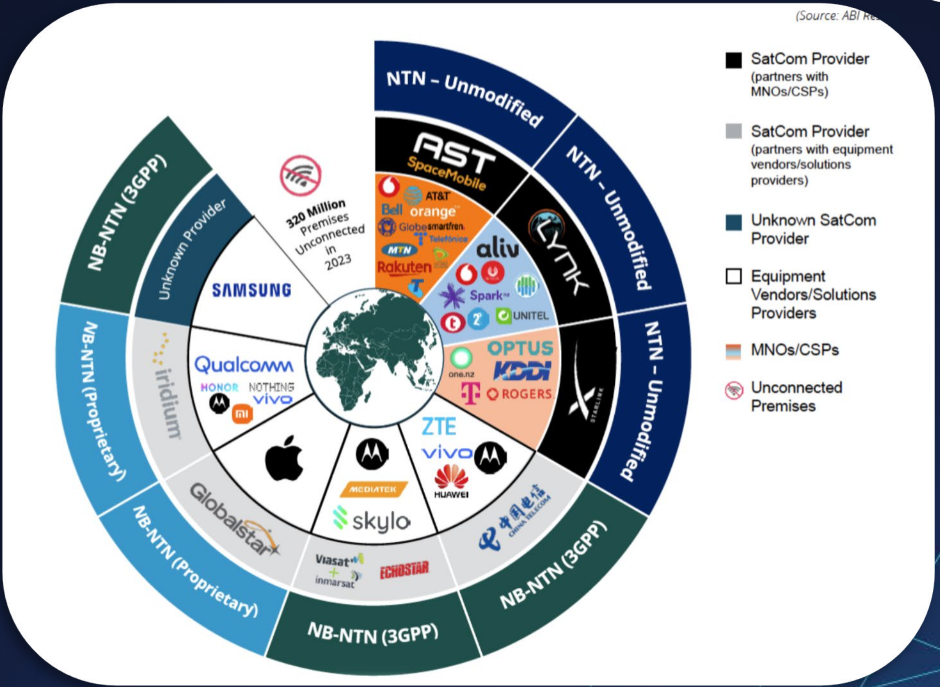
What is D2D?

Direct to Device via satellite (< 6 GHz)

Frequency allocation	MSS (Satellite freq. bands)			MS from Space (terrestrial freq. bands)			
Air interface	Proprietary	Modified LTE	5G NTN (REL 17)	GSM (modified)	LTE (modified)	5G TN (modified)	5G NTN (REL 17)
Space segment	Existing GEO	Existing NGSO	New space segment transparent	New space segment OBP			
Ground segment	Fully proprietary	Modified eNodeB	5G NTN gNodeB				
Smartphone	Unmodified	New with satellite adaptation					
Service	Messaging (bi-directional)	Warnings (broadcast)	Voice	Broadband			

The race is on…

- 70 MNO/SNO partnerships announced
- Across 42 countries
- 8 operators currently evaluating, trialling
- Apple Emergency SOS operational in 16 countries across 3 continents (for free)

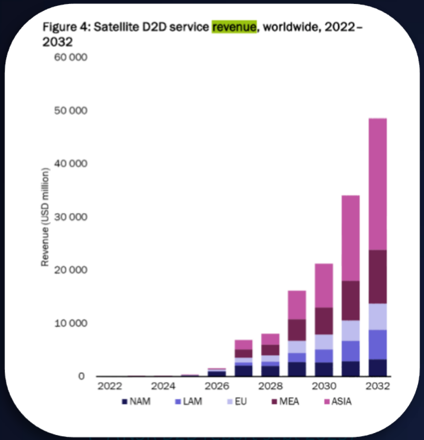


with far-reaching market impact

but no European initiatives

- many uncertainties: technology, market, business model, monetisation strategies, spectrum and regulatory policies
- no single European player can catch up
- European industry is currently vulnerable, unlikely to take risks

Market and key actors



DTHH yearly revenue speculated at ~ 50 B$ by 2032*

A new source of differentiation and growth for MNOs…

- Providing a cost-effective solution for MNOs to achieve truly ubiquitous connectivity coming with the 5G/6G era
- Better customer experience and boosting subscriber engagement
- Unlocking new use cases (6+ billions smartphone subscriptions) and other market vertical (eg Aero, automotive, maritime)
- An attractive solution also for public services to citizens (PPDR)

… but also for prominent vendors (eg Apple)

(NSR D2D report sept 2023)

TOTAL SATCOM:
28 B$ yearly*
(without TV broadcast)

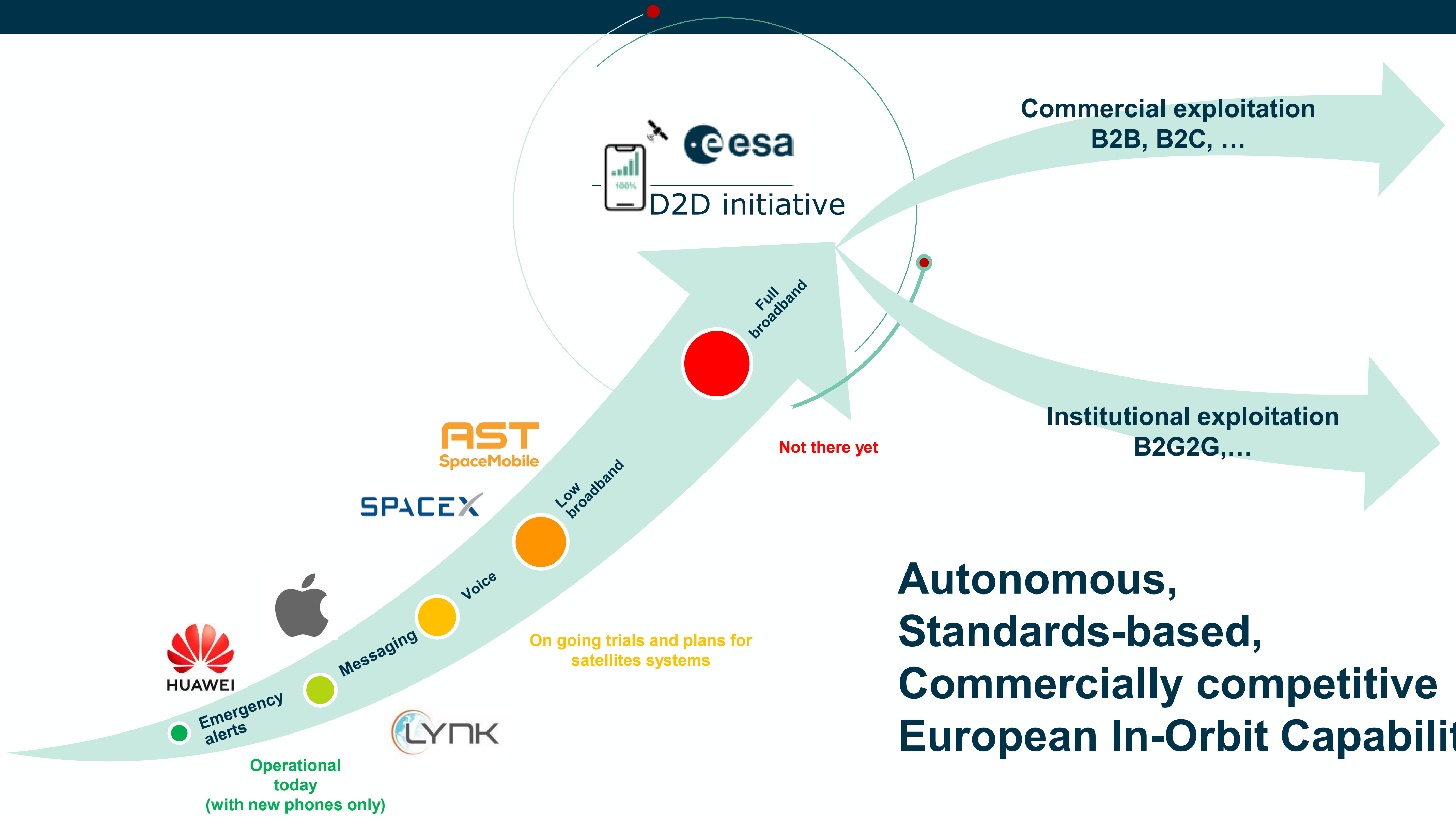
MNOs
1135 B$
yearly*

THE concrete vehicle for Satcom to enter the Terrestrial world with substantial growth opportunity

- Integration into MNOs services extension comes with broader business case with access to large capital
- Potentially disruptive effect on the traditional satcom value chain and markets across many verticals.
- Both a challenge and an opportunity

(**) Center for Space Policy and Strategy – Game changer Sept 2023

Level of Ambition



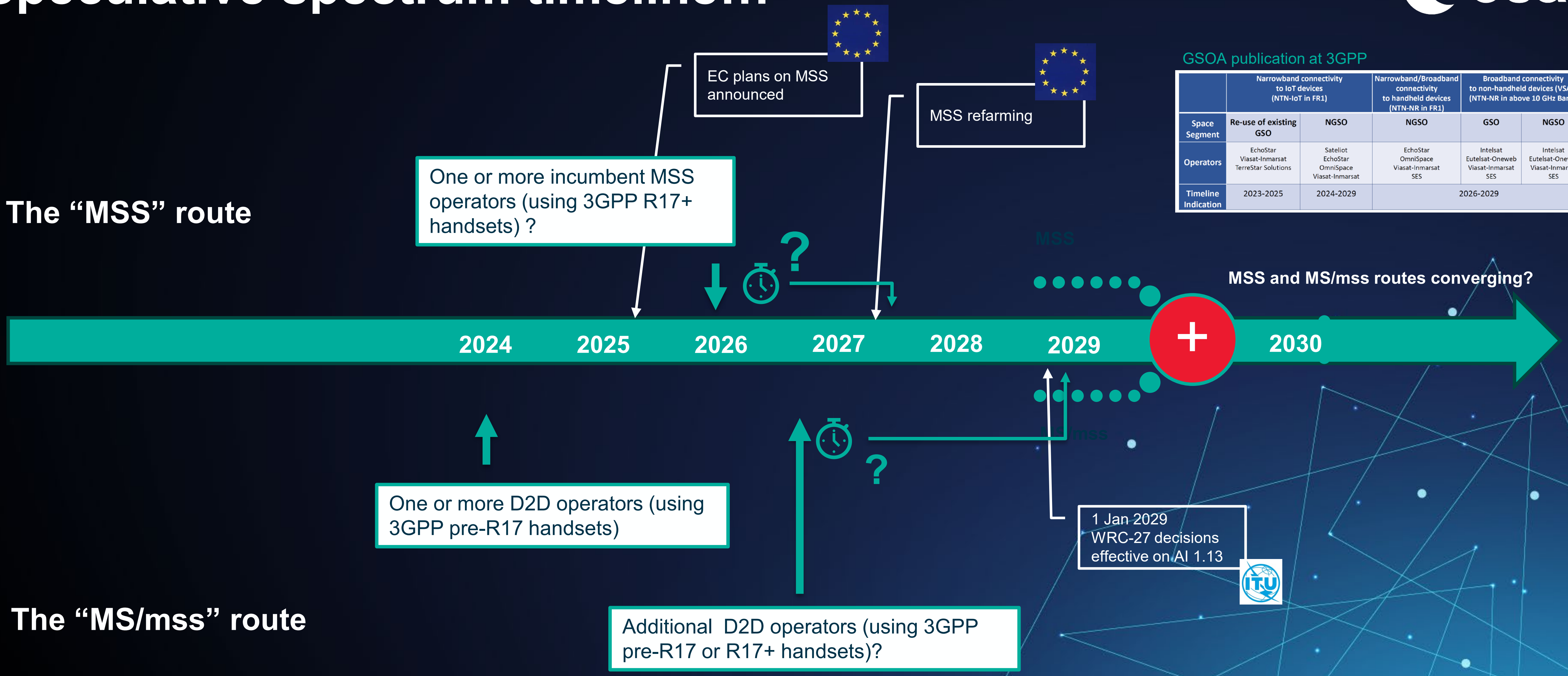
Autonomous,
Standards-based,
Commercially competitive
European In-Orbit Capability

Playing catch-up is not enough. A bold initiative is needed to:

- Mitigate technological and commercial risks
- Federate full value-chain: SNOs, MNOs, vendors, etc.
- Trigger service procurement across B2B and B2C market verticals: mobility, PPDR…
- Address regulatory framework with the best interest of European industry in mind

*Center for Space Policy and Strategy
Game changer Sept 2023

Speculative spectrum timeline…



GSOA publication at 3GPP

	Narrowband connectivity to IoT devices (NTN-IoT in FR1)		Narrowband/Broadband connectivity to handheld devices (NTN-NR in FR1)	Broadband connectivity to non-handheld devices (VSAT) (NTN-NR in above 10 GHz Band)	
Space Segment	Re-use of existing GSO	NGSO	NGSO	GSO	NGSO
Operators	EchoStar Viasat-Inmarsat TerreStar Solutions	Sateliot EchoStar OmniSpace Viasat-Inmarsat	EchoStar OmniSpace Viasat-Inmarsat SES	Intelsat Eutelsat-Oneweb Viasat-Inmarsat SES	Intelsat Eutelsat-Oneweb Viasat-Inmarsat SES
Timeline Indication	2023-2025	2024-2029	2026-2029		

Critical Enablers

- Validated, highly-competitive technology, products, and systems, for the next Gen D2D systems
  - multiple design alternatives will be explored concurrently to enhance innovation, minimize risks, and optimize final solutions.
- Radically innovative system concepts:
  - in-orbit x10m large in space antennas
  - cellular mobile based stations
  - mobile chipsets and vertical devices
- 3GPP 5G/6G standards compliant
- Integration with MNO networks: (potentially) up to frequency spectrum sharing with terrestrial Mobile Networks
- Enablers equally applicable to <u>both</u> MS and MSS “routes”
- Accommodate <u>industry-initiated</u> D2D initiatives