Challenges & Opportunities for space commercialization

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Introduction

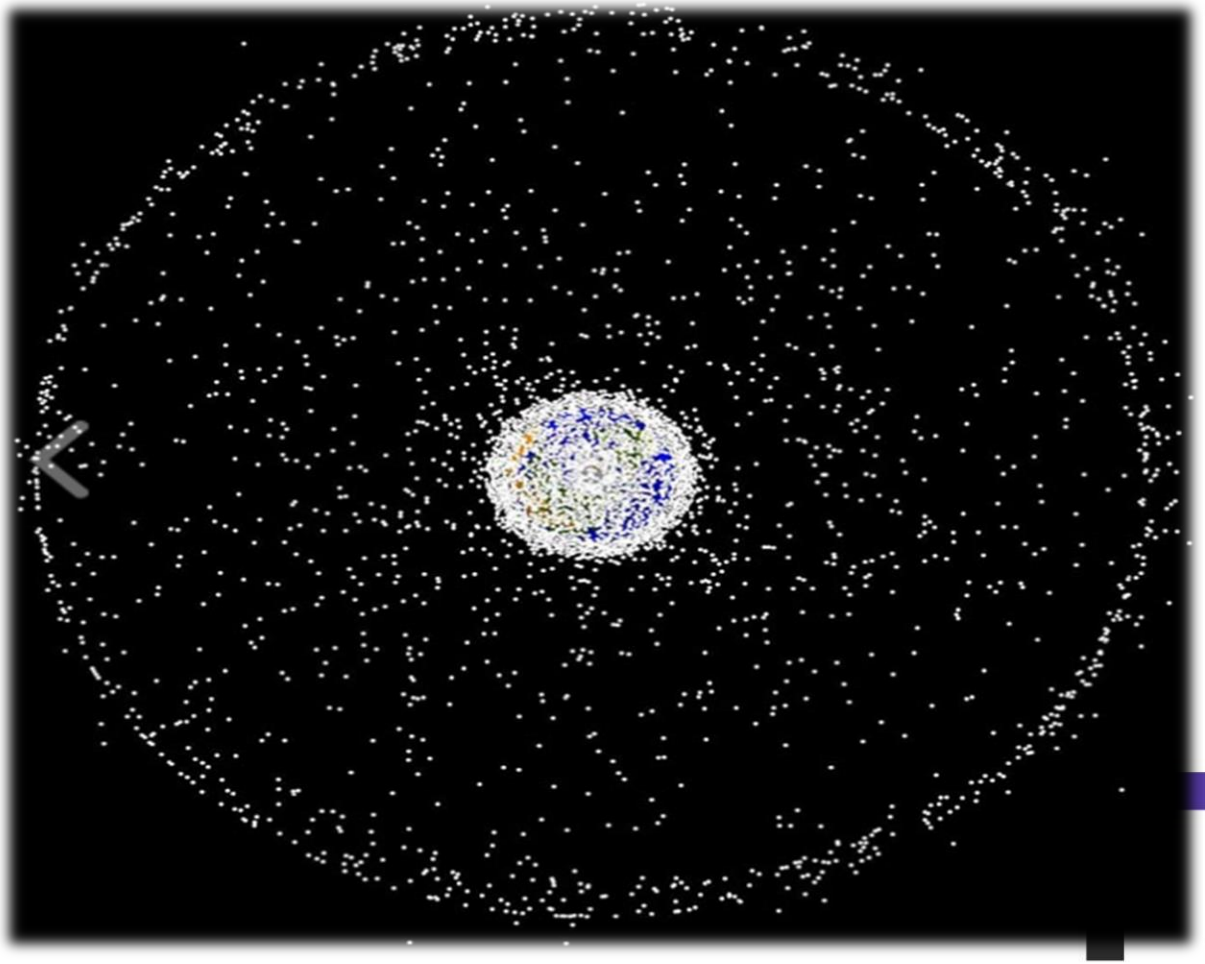
European Innovation Council

Observations

- Commercialisation Lessons learnt

EIC Introduction

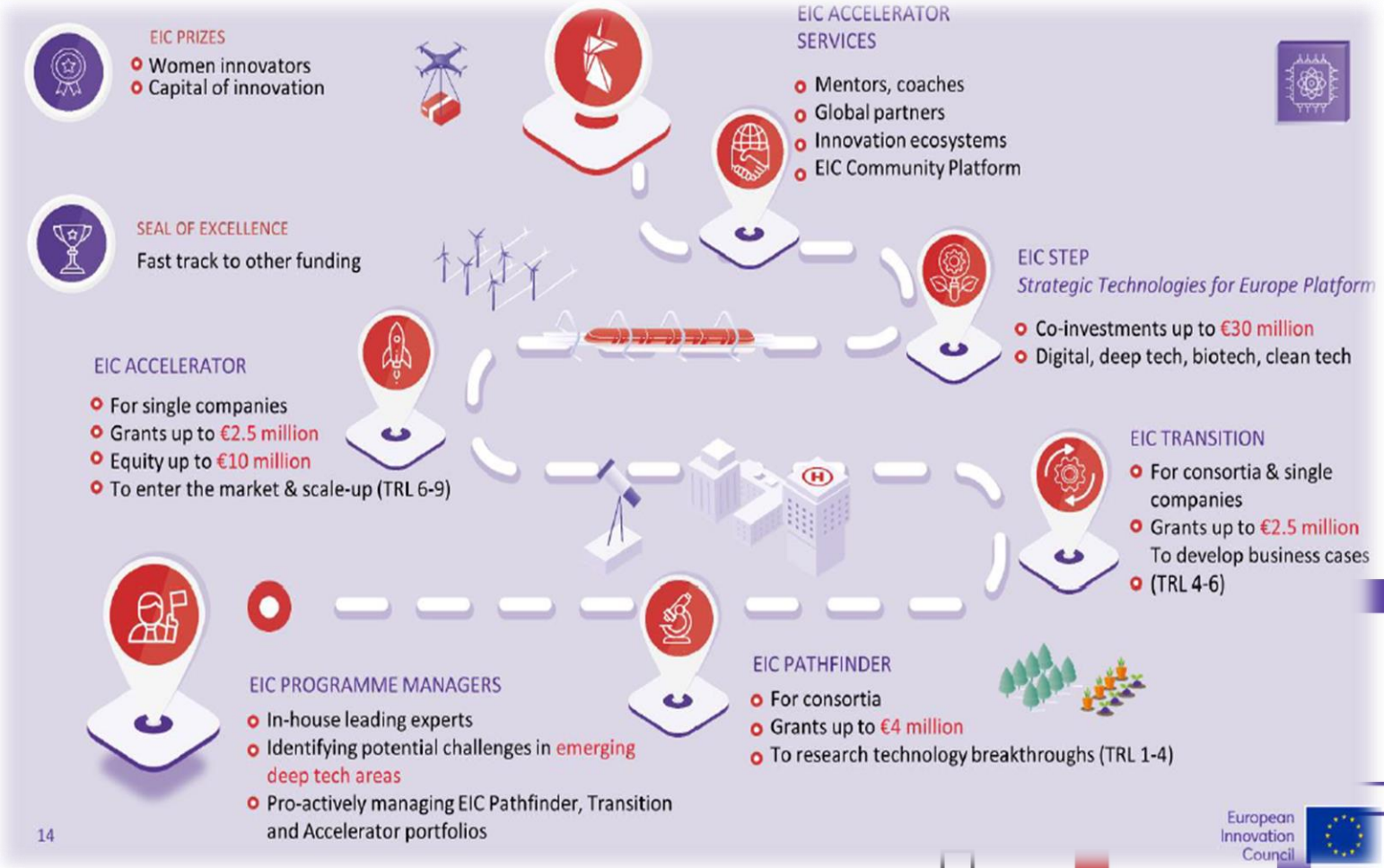
- EIC role & space portfolio
- EIC space challenges
- EIC WP2025 Accelerator - Innovative in-space servicing, operations, robotics and technologies for resilient EU space infrastructure
- Conclusions



Courtesy: NASA ODOPO, ARES | Orbital Debris Program Office | Photo Gallery (nasa.gov)

EIC role in the European Space Industry

- EIC funds **game-changing innovations** and **high-risk ideas** of space SMEs & start-ups
- **EIC funds a diverse space portfolio** from low TRL to high



EIC Space Portfolio

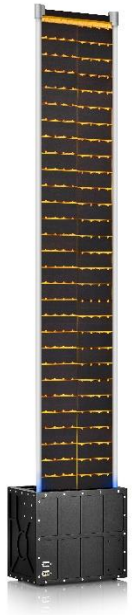
- **Space Debris Sustainability** – tethers for debris removal, space debris monitoring, active debris removal, in- orbit satellite servicing, etc.
- **Enabling Space Technologies** -propulsion technologies, in-space manufactured solar arrays, flat panel antennas etc.
- **Earth Observation & Meteorology -** thermal infrared p/l, precision agriculture, predictive monitoring

Courtesy: RePowerSIC – WP23 ISSEH Pathfinder project

Figure 5. Example of application of the RePowerSiC technology for space applications

Courtesy: Ice2Thrust- WP23 ISSEH Pathfinder project

Courtesy: HYPERION EIC Accelerator, ION-X



Courtesy: DCUBED, ISM4Europe

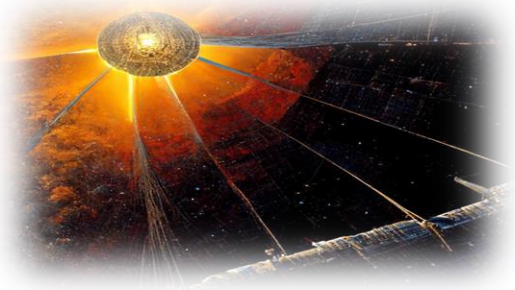
Courtesy: E.T.Pack-F project – EIC Transition

EIC space technology challenges

WP 2023

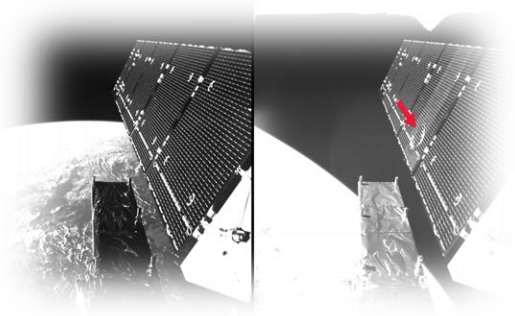
Pathfinder (TRL1-4): In space solar energy

- Collect
- Conversion
- WPT
- In space green propulsion



Accelerator (TRL6-9): "Customer driven" innovative space applications

- S/C inspection
- Collision avoidance
- Collection, recovery & reuse space debris
- IOS,ADR, EoL
- ISAM
- Microgravity platforms



WP 2024

Pathfinder (TRL1-4): Strengthening the sustainability and resilience of EU space infrastructure

- Space debris mitigation
- Space debris remediation
- In-space recycling and re-use of orbital assets (ISRROA)

WP 2025

Accelerator (TRL6-9): Innovative in-space servicing, operations, robotics and technologies for resilient EU space infrastructure

- In-Orbit Servicing & Maintenance
- In-space transportation & in-space refueling and recharging, OTV
- Space-based resilience

WP2025 (788) Innovative in-space servicing, operations, robotics & technologies for resilient EU space infra - YouTube

WP 20203 In-space solar energy harvesting for innovative space applications

- **Collection, conversion and transmission (CCT)**

Collection	Conversion	Wireless Power Transmission
JUMPINTOSPACE - Perovskite solar cells/photonic substrates APACE - Nanoscale photosyntethic antennas ZEUS- Nanowire cells E.T.COMPACT- PVK/CIGs solar cell standalone devices	REMPOWER- Modular, flexible & lightweight rectennas POWERSAT-High Power Transmission rectennas	APACE- Sunlight Pumped Laser (SPL) POWERSAT- Low power transmission for inter-satellite links RePowerSIC – High-power laser transmission

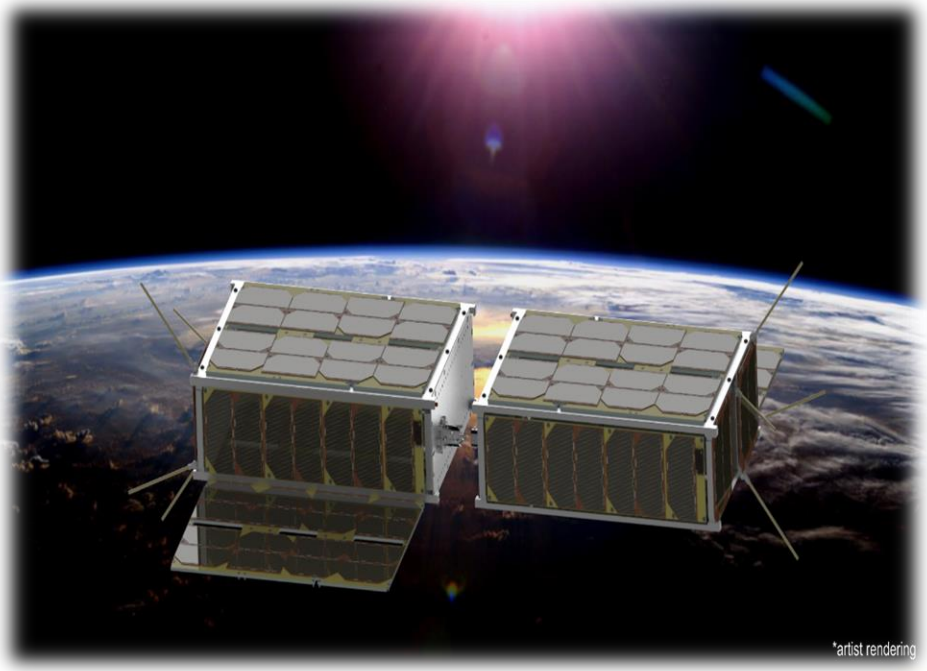
E2E efficiency
Interoperability
Lightweight

WP 20203 In-space solar energy harvesting for innovative space applications

- **In-space green propulsion**

- GREENSWAP In-space fuel production to produce propellants on board space-craft

- S4I2T Solar Electric Propulsion (SEP) using solar energy for in-space mobility



Courtesy: Ice2Thrust- WP23
ISSEH Pathfinder project

WP 2023 In-space solar energy harvesting for innovative space applications

- Projects addressing emerging innovative space applications

Space-Based Solar Power (SBSP)

Active Debris Removal/In Orbit Satellite servicing

In-Space Assembly &Manufacturing (ISAM)

In-Situ Resources Utilization (ISRU)

In-space Refueling & mobility

Cis-lunar exploration & interplanetary missions

WP2025 Innovative in-space servicing, operations, space-based robotics and technologies for resilient EU space infrastructure

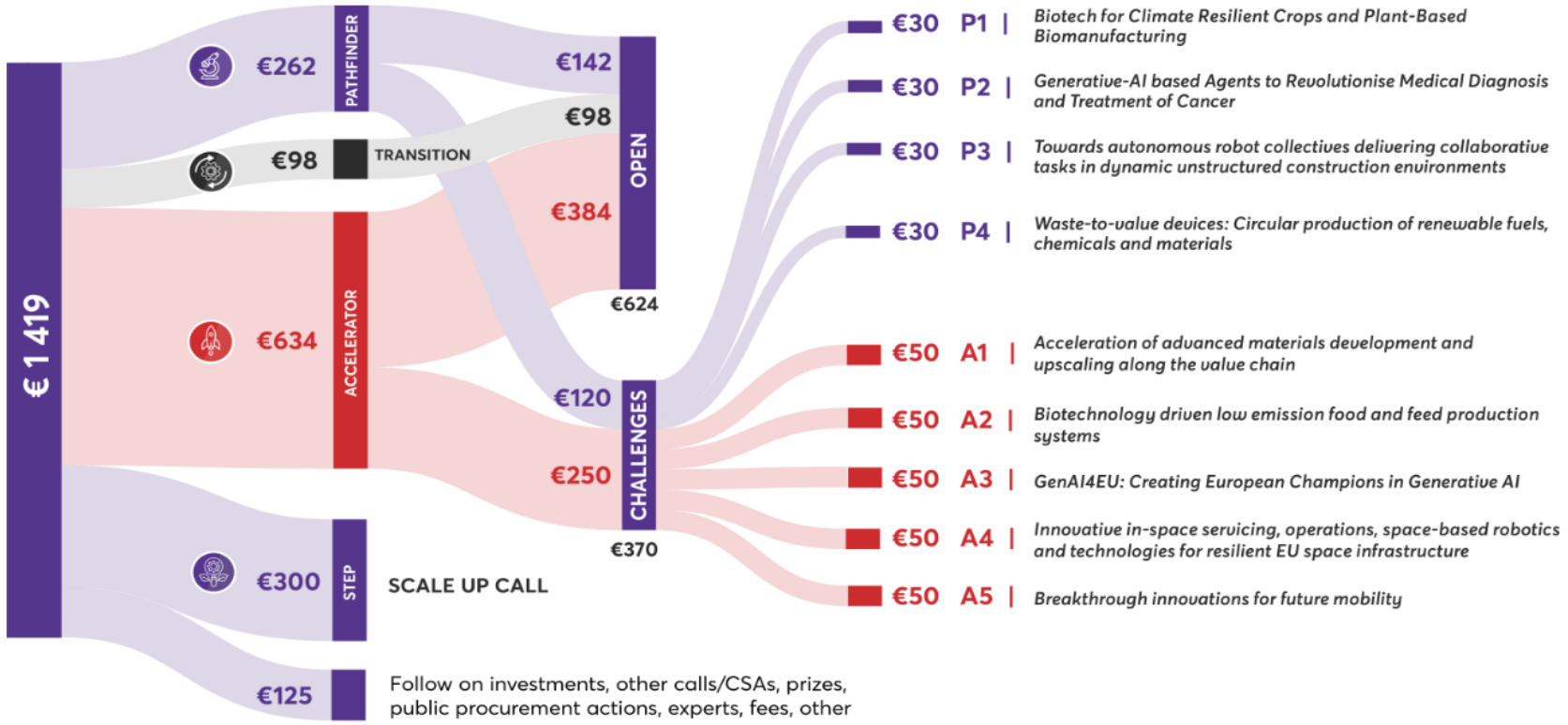
European Innovation Council

Indicative Budget

- EUR 50 Million

Deadlines

- 1st October 2025

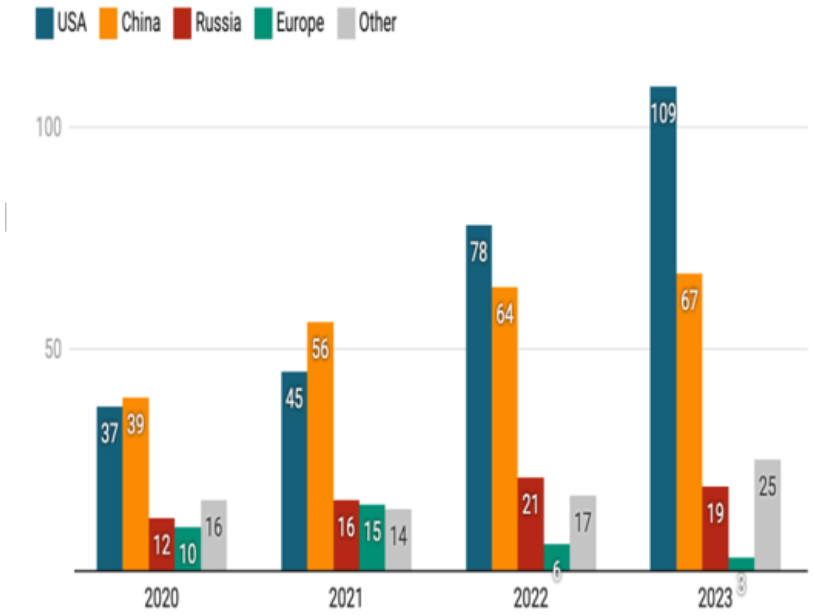


[Innovative in-space servicing, operations, robotics and technologies for resilient EU space infrastructure - European Commission]

Background

European Innovation Council

- Current satellites are designed, build and launched in space, not to be serviced, repaired, upgraded or refuelled in space
- 85% of satellites are discarded due to fuel depletion, there are deployment failures, fuel leaks, etc.
- Increased collision avoidance maneuvers shorter satellite lifetimes
- 650 GEO satellites with 120 GEO satellites beyond their lifetime
- Flight proven life extension missions (MEV-1, MEV-2, etc.) in non-EU countries for GEO satellites
- EU lacks cost-effective, scalable, and resilient mature space technology capabilities and services to extend the lifetimes and protect of its space-based infrastructure



Data extracted: Payload, Jonathan McDowell, 15/01/2024

In 2023 were launched more than 2,664 objects

WP2025 Innovative in-space servicing, operations, space-based robotics and technologies for resilient EU space infrastructure

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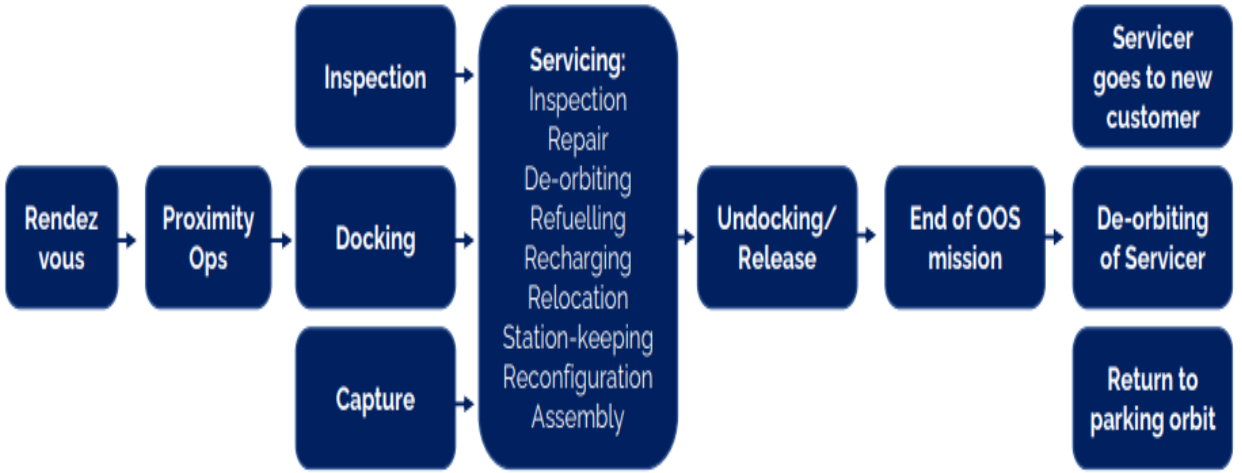
- **In-Orbit Servicing & Maintenance** - Proximity Ops, Rendezvous, capturing, in-space robotic manipulations, maintenance, in-space assembly and operations

- **In-space transportation** & in-space refueling/recharging, Orbital Transfer Vehicles (OTV), etc.

- **Space-based resilience** – space-based cybersecurity for satcom, navigation, Earth Observation and In Orbit servicing missions.

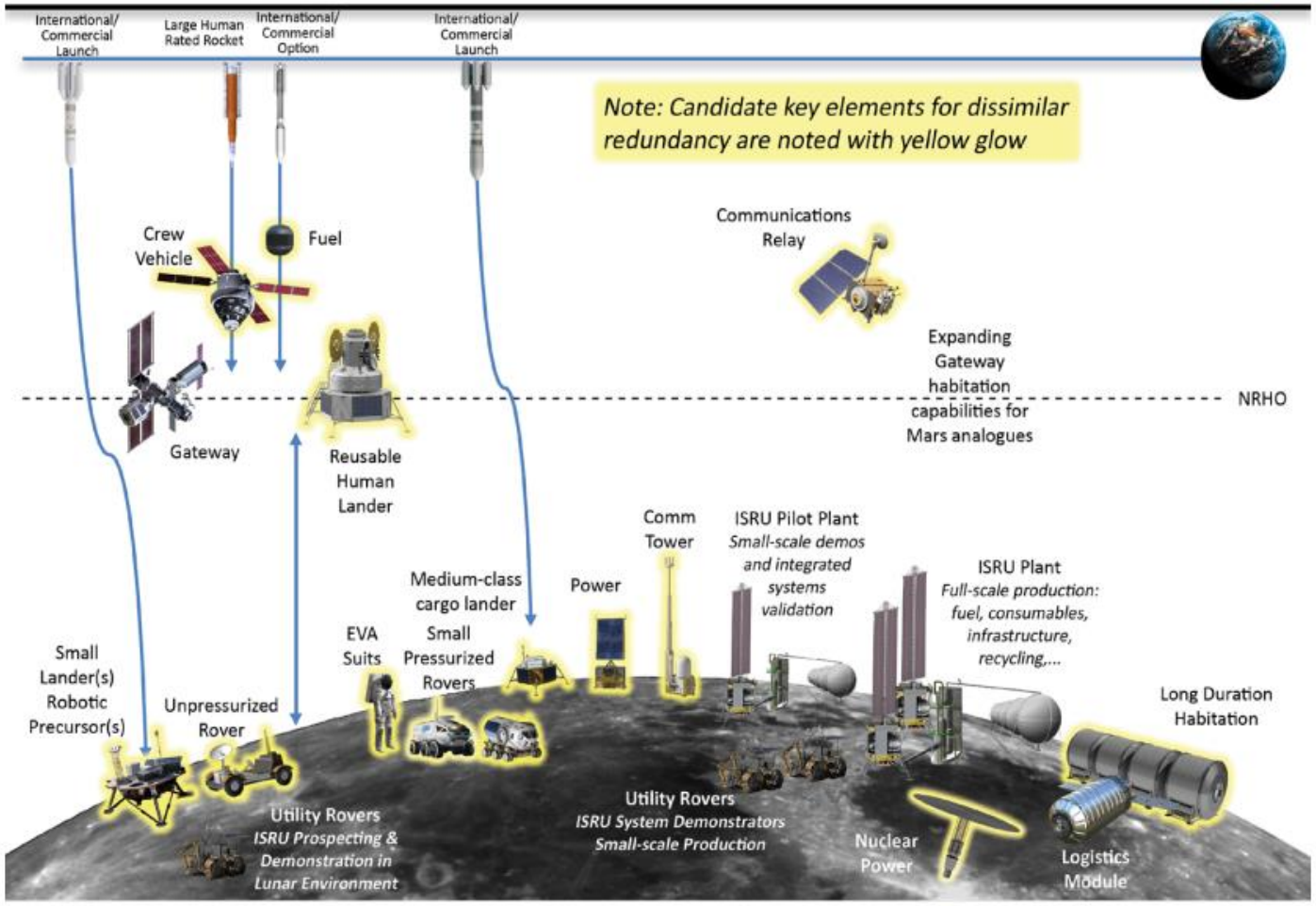


Courtesy: ESPI, OSAM State of Play and Perspectives on Future Evolutions,2023

WP 2025 - EIC 2025 work programme - European Commission

Conclusions

- Space SMEs and start-ups to offer affordable and cost-effective solutions
- Space SMEs need to be aware of historic commercialisation lessons
- Prepare to be risk averse and resilient in a complex macro-economic environment



Courtesy: International Space Exploration Coordination Group, Global Exploration Roadmap

Thank you!