



CLEAN SPACE

Luisa Innocenti, head of ESA Clean Space office

CLEAN SPACE INDUSTRY DAYS 2023

#2023CSID

16/10/2023

ESA UNCLASSIFIED – Releasable to the Public



What is clean space?



Developing solutions for a sustainable space sector on Earth and in space

What was clean space 2012



ecodesign

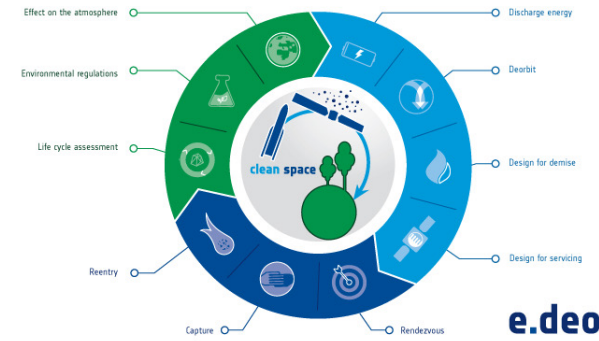


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ecodesign
 • REDUCING IMPACTS

cleansat
 • SPACE DEBRIS REDUCTION



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 • ACTIVE DEBRIS REMOVAL

What is now clean space 2023

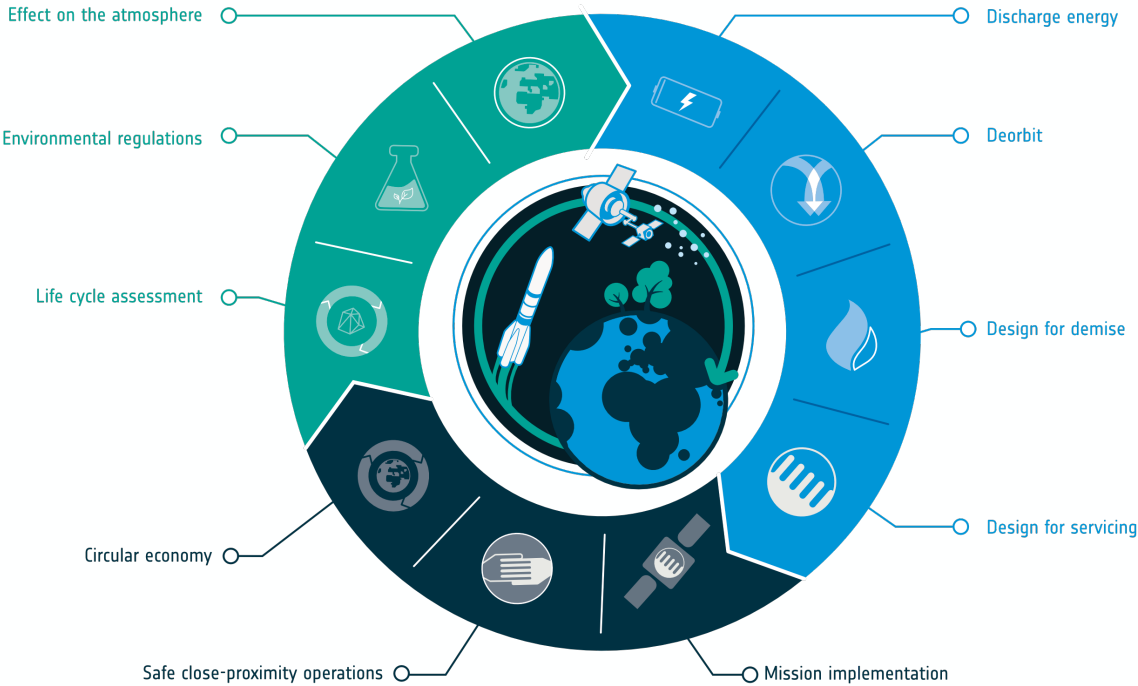


ecodesign

→ ENVIRONMENTAL IMPACTS REDUCTION

management of end of life

→ ZERO DEBRIS



in-orbit servicing

→ ACTIVE DEBRIS REMOVAL



EcoDesign Scope

How much space activities “pollute” on Earth?



Are there alternatives to reduce the environmental impacts?

LCA (Life Cycle Assessment)

Assessing the environmental impacts of the whole life cycle of the space missions

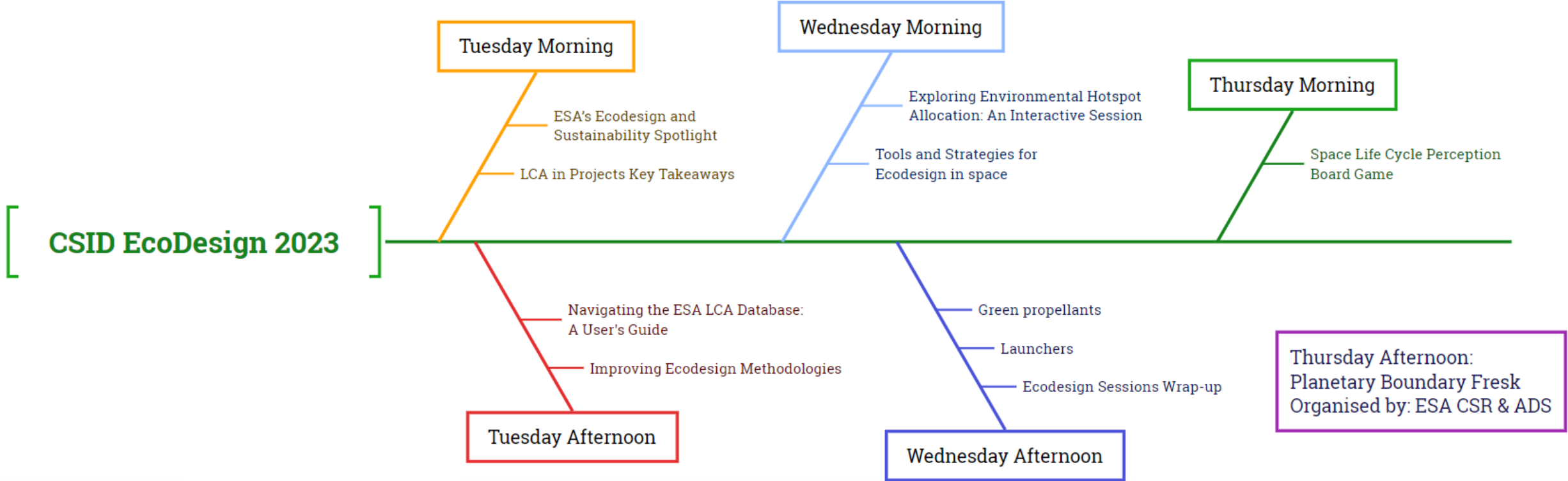
Eco-design

Identifying alternative processes or technologies that can be used to reduce these impacts

Environmental regulation

Finding alternatives to abide by legislations and avoid costly disruptions

Agenda for Ecodesign at CSID 2023





ESA Space Debris Mitigation Standard & Policy

New state-of-the-art technical requirements, applicable to ESA missions, in a step-by-step approach to implement a Zero Debris by 2030.



Facilitate Zero Debris Charter

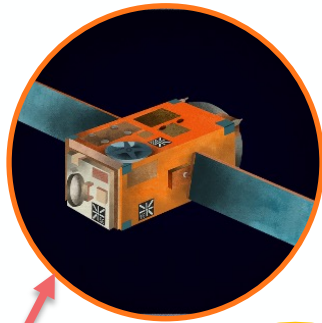
Engaging like-minded actors of the space sector in a collective effort towards space safety and sustainability



Facilitate Zero Debris Technical Booklet

List of needs, technical solutions and contributions gathered through the Zero Debris community to achieve the jointly defined sustainability targets by 2030

Zero Debris implementation for future missions relies on a roadmap of key technical developments:



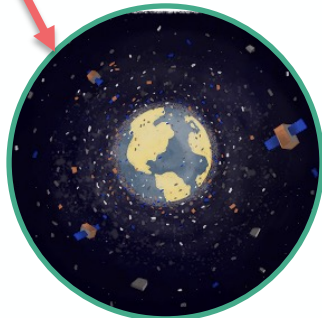
Zero Debris compliant spacecraft platforms

System level development & integration of innovative technology



Development & Demonstration of Removal Services

Demonstrate reliable services, establish standard interfaces



Technology improvement for SST and collision avoidance

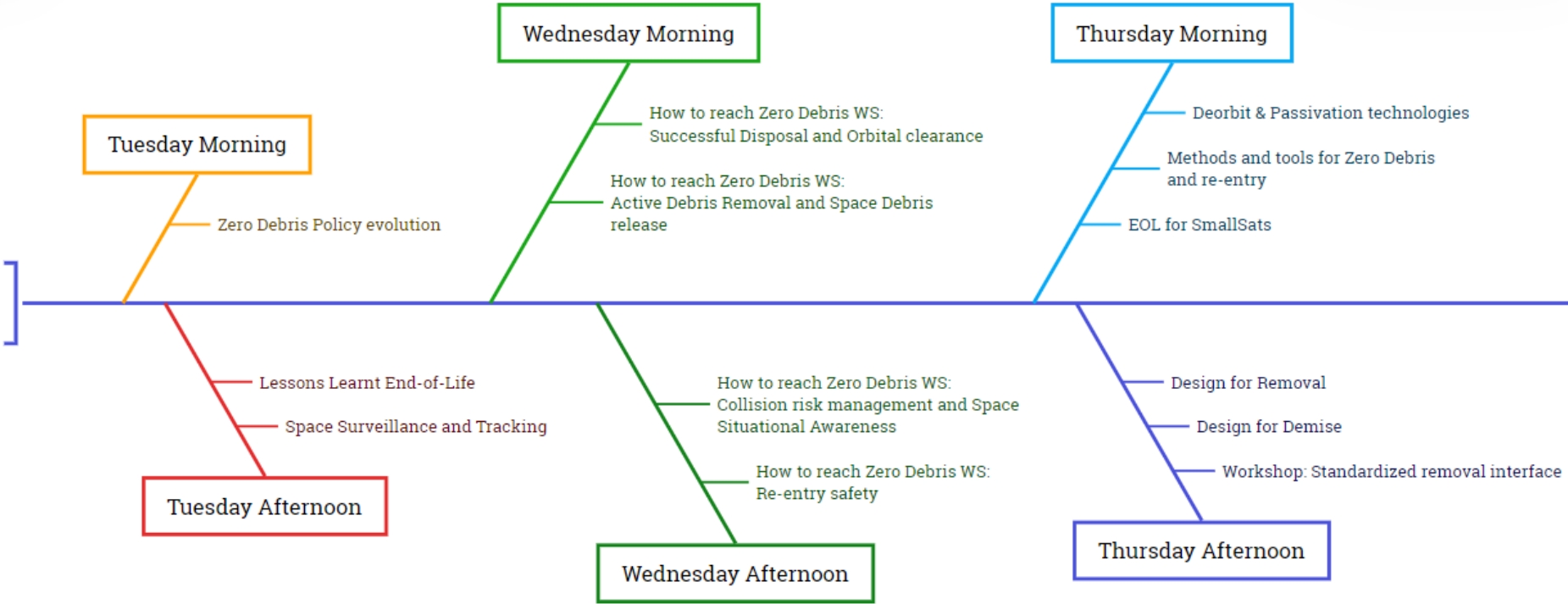
Expand the current processes, coordination and operational capabilities

Zero Debris approach

Agenda for End of Life & Zero Debris at CSID 2023

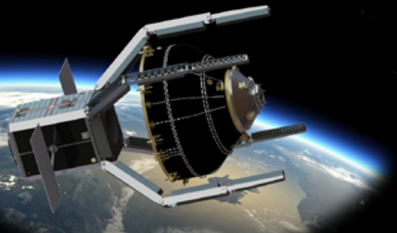


CSID Zerodebris & EOL 2023



ESA Vision for In-Orbit Servicing

DEBRIS REMOVAL



CS-1 Mission

TRANSPORTATION



PoC In-Space Transportation

INSPECTION



e.inspector

AOCS TAKEOVER/
LIFETIME EXTENSION



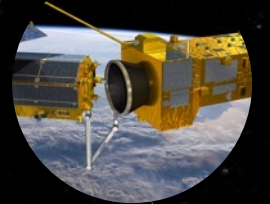
RISE Missions

ENCORE Mission

REFUELLING



REFURBISHMENT



ASSEMBLING /
MANUFACTURING



RECYCLING



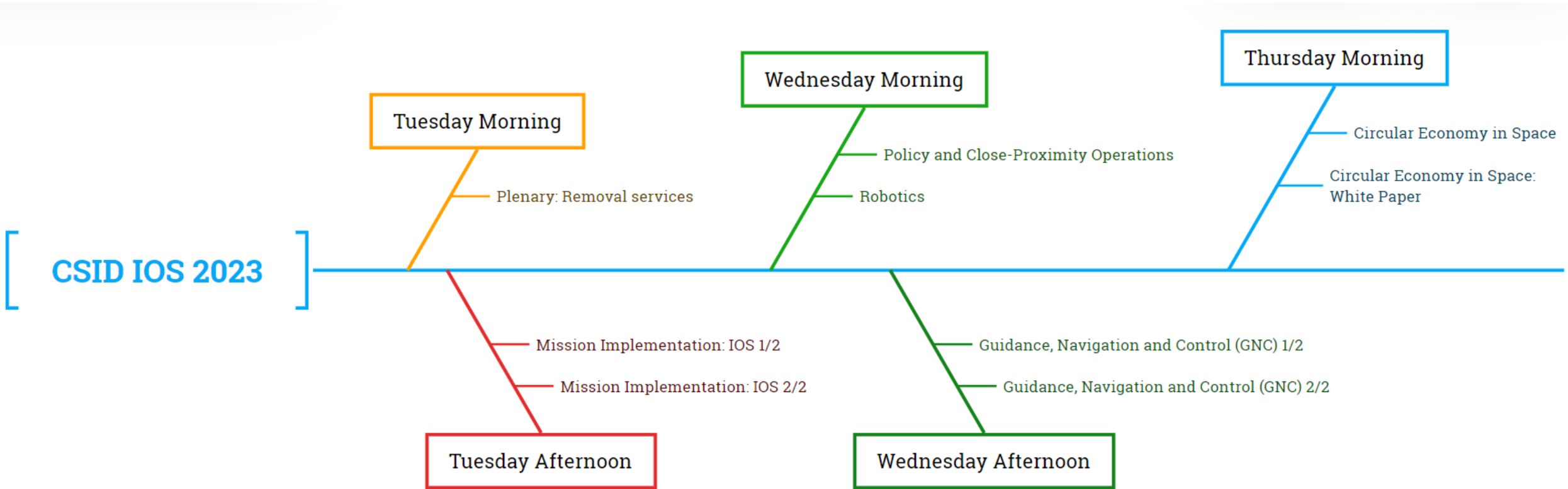
LEO

ADRIOS

GEO

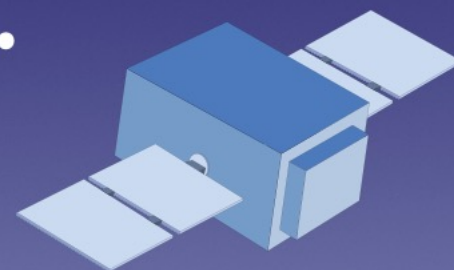
Circular Economy

Agenda for IOS at CSID 2023





Cleaning space needs all of us!



Clean Space Industry Days



1st CSID (e.deorbit
symposium): 90
participants – 2014
Today: 400+



Thank you for listening



Let's stay in touch



<https://blogs.esa.int/cleanspace/>



<https://fr.linkedin.com/showcase/esa-clean-space>



cleanspace@esa.int

