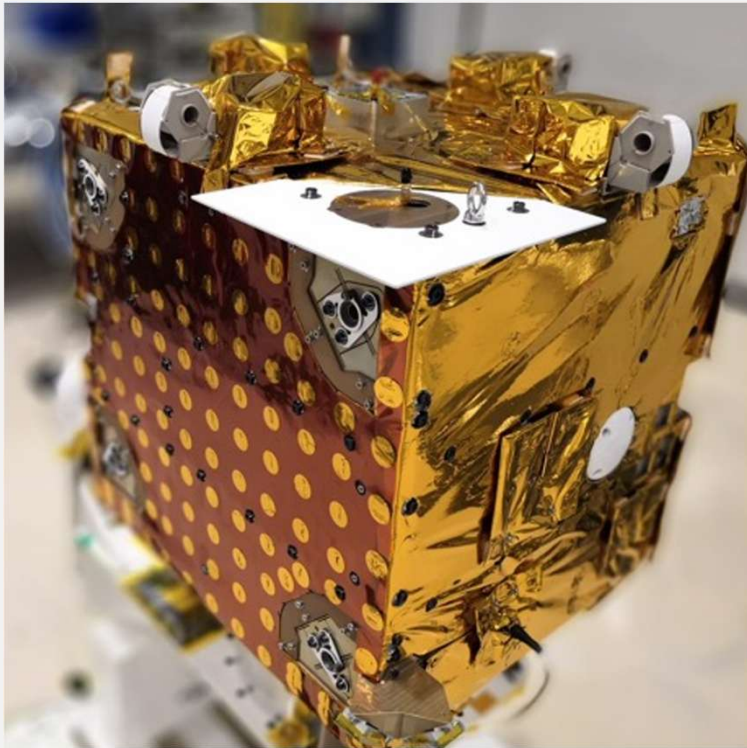


3 KEY ESA INITIATIVES

OF (OUR) INTERESTS, ALSO FOR OUR TRITON-X PRODUCT LINE (UPGRADES)
FLORIO DALLA VEDOVA, ESA/ESTEC – ECODESIGN DAYS 2025



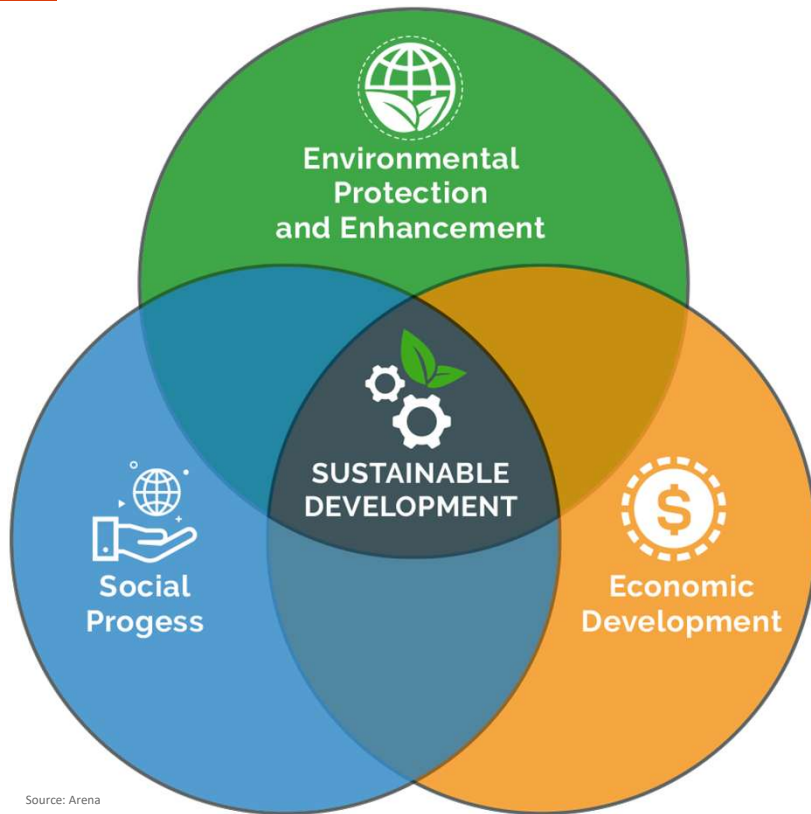
AGENDA



- 1** **Triton-E5** : Eco(re)designing our **Triton-X**
- 2** 3 Key ESA Initiatives : **M-IND**, **SEZD** and ... **EcoSTAR** !
- 3** What we did so far and ... What next ...

INTRODUCTION

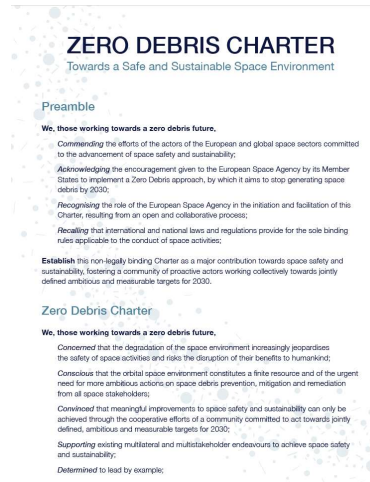
THE OHB GROUP, THE LSA (LU) AND LUXSPACE (LU) WORK FOR SUSTAINABILITY ...



Source: LSA

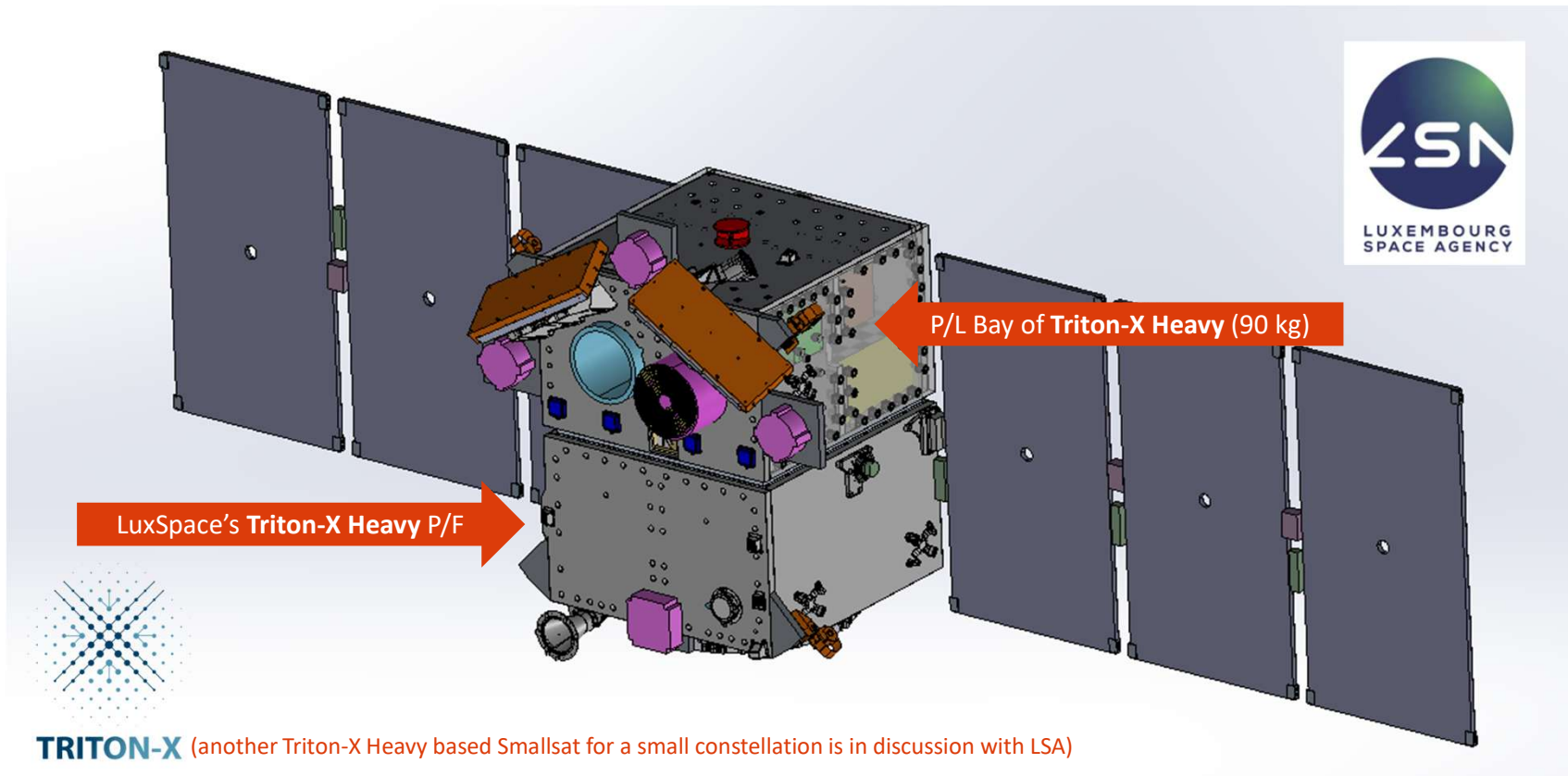
Space Strategy

4 priorities



INTRODUCTION

LU-IOD SMALLSAT, BASED ON **TRITON-X HEAVY** AS PRESENTED TO LSA **FOR MC25** AT THE END OF PHASE 0A (JUL. 25)

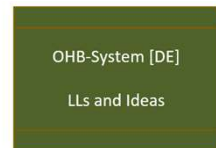


INTRODUCTION

TRITON-E5 : ECO(RE)DESIGNING OUR TRITON-X



Thanks to:

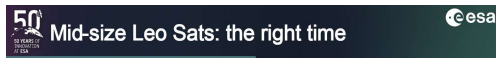


3 KEY ESA INITIATIVES

(FOR LUXSPACE AND ... TRITON-X)



M-IND



- ESA Objective(s) : Support the European industry for the availability of subsystems (or subsystems' elements) needed to provide European sovereign mid-size satellite platforms operating in LEO (Constellations), by 2028
- M-IND stands for **Mid-Size** [LEO Satellites Platforms] **Industrialisation**
 - M-** is for Mid-Size LEO Satellites Platforms (100 to 500+ kg; 200 to 2kW: LEO constellations sweet-spot) ... **thus (also for) our Triton-X Heavy** (Next)
 - IND** : is for **INDustrialisation** which encompasses:
 - Serial production
 - Competitiveness
 - Sovereignty

SEZD

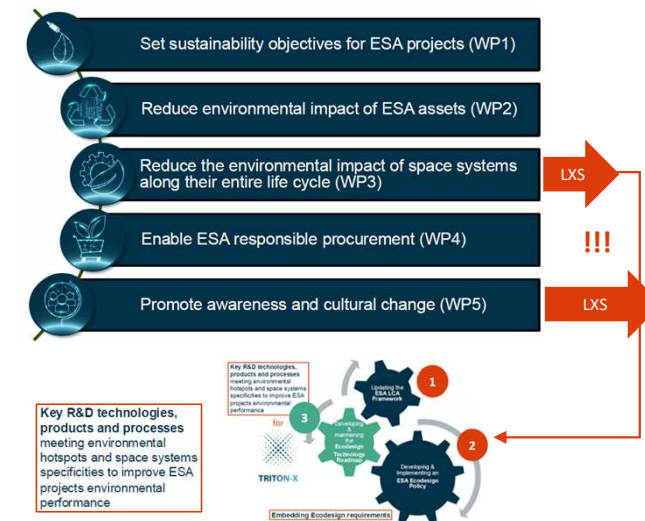


- ESA Objective(s) : introducing a Zero Debris (ZD) strategy, **(here) for Smallsats**, to be implemented by 2030
- SEZD stands for **Smallsat Platforms Evolution for Zero Debris Implementation**
- An essential pillar of this ESA (ZD) approach involves initiating the immediate evolution of the European satellite platforms product lines and this activity is focused on Small Satellite Platform, for *Satellite with drymass in the range of around 50 to 500 kg.* ... **thus (also for) our Triton-X Heavy** (Next)**
- Specifically, the evolution of the European satellite platforms for ZD is an essential step to (1) validate the feasibility of the requirements and their evolution up to 2030, (2) **identify technology gaps**, ease its adoption, and (3) avoid duplication of efforts in different projects.

EcoSTAR

The ESA Green Agenda

- ESA Objective(s) : **Maximise Sustainability Benefits / Minimise Environmental Impacts (by 2030)**
- To achieve its objectives and targets the ESA Green Agenda focuses on five different areas of actions :



Pareto 80%



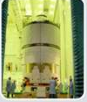
3) LCA at UNIT (muRTU) Level:

[illegible]

LL from ESA Ecodesign Roadmap to MC25

Lessons Learned - Environmental Hotspots








1. Office Work (AIT, Phase B2 and C/D)

- Main Driver
 - Energy consumption
- Key Impacts
 - Climate change
 - Resource depletion, especially energy and most project phases

2. Testing (AIT, Phase B2 and C/D)

- Main Drivers
 - Occupation
 - Vacuum tests
 - TVAC (Thermal Vacuum) tests
- Key Impacts
 - Climate change
 - Energy consumption
 - Water use (marine aquatic)
 - Resource use (energy carriers)

3. Travels

- Key Impacts
 - Climate depletion (up to 62%)
 - Photochemical ozone formation
 - Eutrophication (marine and terrestrial)

4. Ground Support Equipment (OSE) Production

- Main Drivers
 - Use of fluorinated gases
- Key Impacts
 - Climate depletion
 - Resource use (minerals and metals)

5. Equipment Manufacturing

- Main Drivers
 - Extraction and processing of raw materials (e.g. gold, aluminium, titanium)
- Key Impacts
 - Metal depletion
 - Human toxicity (cancer and non-cancer)
 - Abiotic resource depletion

6. Cleanroom Occupation

- Main Drivers
 - Large cleanroom usage by prime and suppliers
- Key Impacts
 - Electricity consumption
 - Climate depletion (indirectly via energy use)

7. Propellant (Phase C/D)

- Main Driver
 - Freshwater
- Key Impacts
 - Resource depletion (100%)







































• THE EUROPEAN SPACE AGENCY

WHAT WE DID SO FAR ... AND WHAT NEXT ...

OHb GROUP LL & IDEAS ... AND ... TRITON-X SUPPLIERS & PARTNERS WORKSHOPS

OHb Group

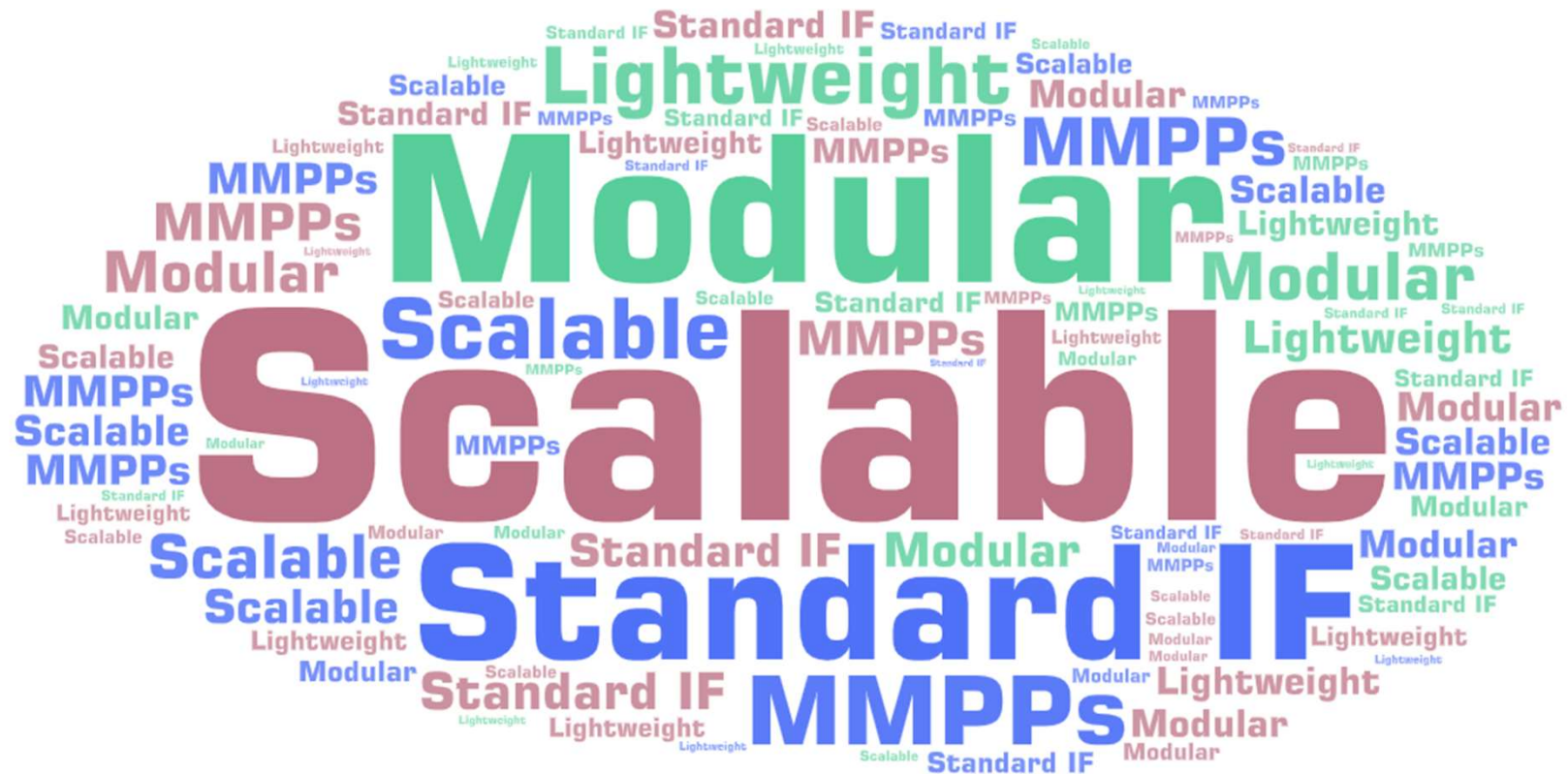
- Informed all OHb Group Sister Companies about EcoSTAR
- Asked them about related Lessons Learned and Ideas
- Invited the OHb Group CTOs to the LuxSpace workshops presenting these 3 Key ESA Initiatives
- Collected the OHb Group Lessons Learned and Ideas for EcoSTAR
- **To note:** (OHb) LuxSpace idea/proposal to *Investigate and qualify the use of Recycled Aluminum in 3D Metal Printing for Space*
 - *It takes 20x less energy to create Al powder from recycled material when compared to native mineral source !*
 - Partner VITO has been asked to (further) investigate on this with a dedicated LCA
 - *A Team of Expert Industrial Entities in Luxembourg is already interested in working on such (future) ESA project*

Triton-X Supplier & Partners Workshops

- Invited all Triton-X Suppliers & (OHb) Partners to the LuxSpace workshops presenting these 3 Key ESA Initiatives
 - 47 Entities related to the Triton-X Product Line (for Item or Service)
 - 39 Companies providing TRX (S/S) C.Items
- Organised 3 instances of such Workshop during Summer Break 2025
 - 20 (out of the 47) attended at least one of these workshop
 - 20+11 (out of the 47) were invited to submit ideas for M-IND, SEZD and/or EcoSTAR
- As per mid-September,
 - 11 Triton-X Suppliers & (OHb) Partners provided *49 R&D ideas that need now to be further analysed for the final proposal to ESA.*
 - *Also, another (more technical) Workshop has been proposed to the Triton-X Suppliers & (OHb) Partners to provide them (technical) guidance wrt these ESA Key Initiatives of (our) interests*

WHAT WE DID SO FAR

TRITON-X SUPPLIERS WORKSHOPS WITH FIRST « INGREDIENTS » FOR THEIR M-IND, ECOSTAR, SEZD SOLUTIONS



WHAT WE DID SO FAR

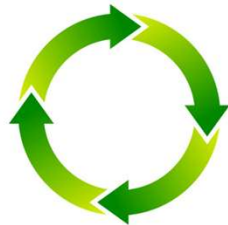
TRITON-X SUPPLIERS WORKSHOPS WITH FIRST « INGREDIENTS » FOR THEIR M-IND, ECOSTAR, SEZD SOLUTIONS

“ R3 ”

Source: Virtus-consult



REDUCE

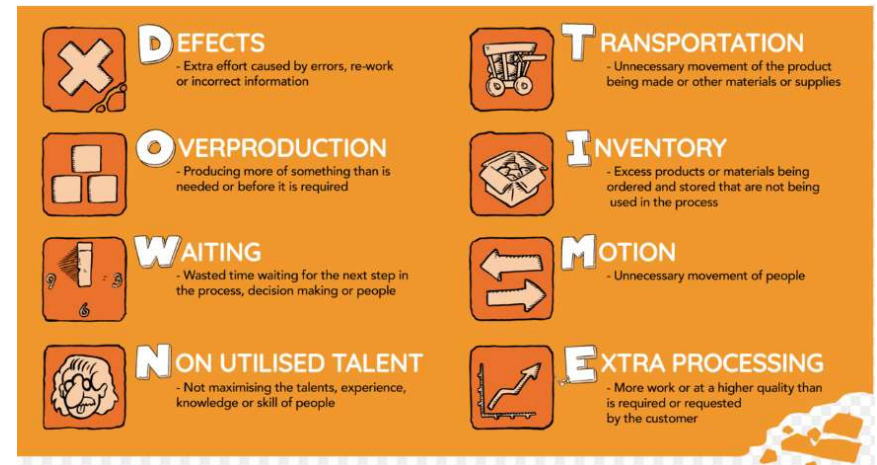


REUSE



RECYCLE

The 8 Industrial, Serial Production WASTE (« Muda »)



Source, in Ref.: LuxSpace Proposal



THANK YOU!

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