ACHIEVING SUSTAINABLE SPACE ACTIVITIES

ESA SUSTAINABILITY STRATEGY & TECHNICAL EXPERTISE

Andrea Vena
ESA Chief Climate & Sustainability Officer

Clean Space Days 2024

ESA’s holistic approach to sustainability

THE MOON & DEEP SPACE

Ensuring a responsible use of resources, preventing contamination and managing waste

EARTH’S ORBIT

Developing solutions to manage and reduce space debris, ensuring responsible satellite operations, and avoiding collisions

EARTH

Studying, measuring, and reducing environmental impacts on Earth, including climate change, biodiversity loss, and pollution

ESA & space sustainability: strategy and action plan

- Contribute to the sustainable development of society
- Reduce ESA GHG emissions by 46% by 2030

- Maximise **sustainability benefits** in space programmes
- Minimising our **environmental impacts**, with a measurable target on GHG:
  - - 46% for our direct operational activities
  - - 28% for our space programmes, together with our suppliers

What specific actions are being implemented?

To achieve the Agenda 2025 targets, ESA Green Agenda focuses on five different areas of action.

- Set sustainability objectives for ESA projects

- Reduce environmental impact of ESA assets

- Reduce environmental impacts from space systems along their entire life cycle

- Enable ESA responsible procurement

- Promote awareness and cultural change

Reducing environmental impacts from space systems

Aim: Reduce environmental impacts from space systems along their entire life cycle by progressively integrating lifecycle thinking and ecodesign into space programmes.

- Adopt life cycle thinking and **ecodesign**
- Support the identification of environmental **hotspots** along the ESA guidelines
- Participate in working groups to share and adopt **best practices**
- Participate in training opportunities to gain **knowledge**
- Make sustainability an **innovation driver and differentiator**

How to achieve these objectives?

Life cycle thinking approach

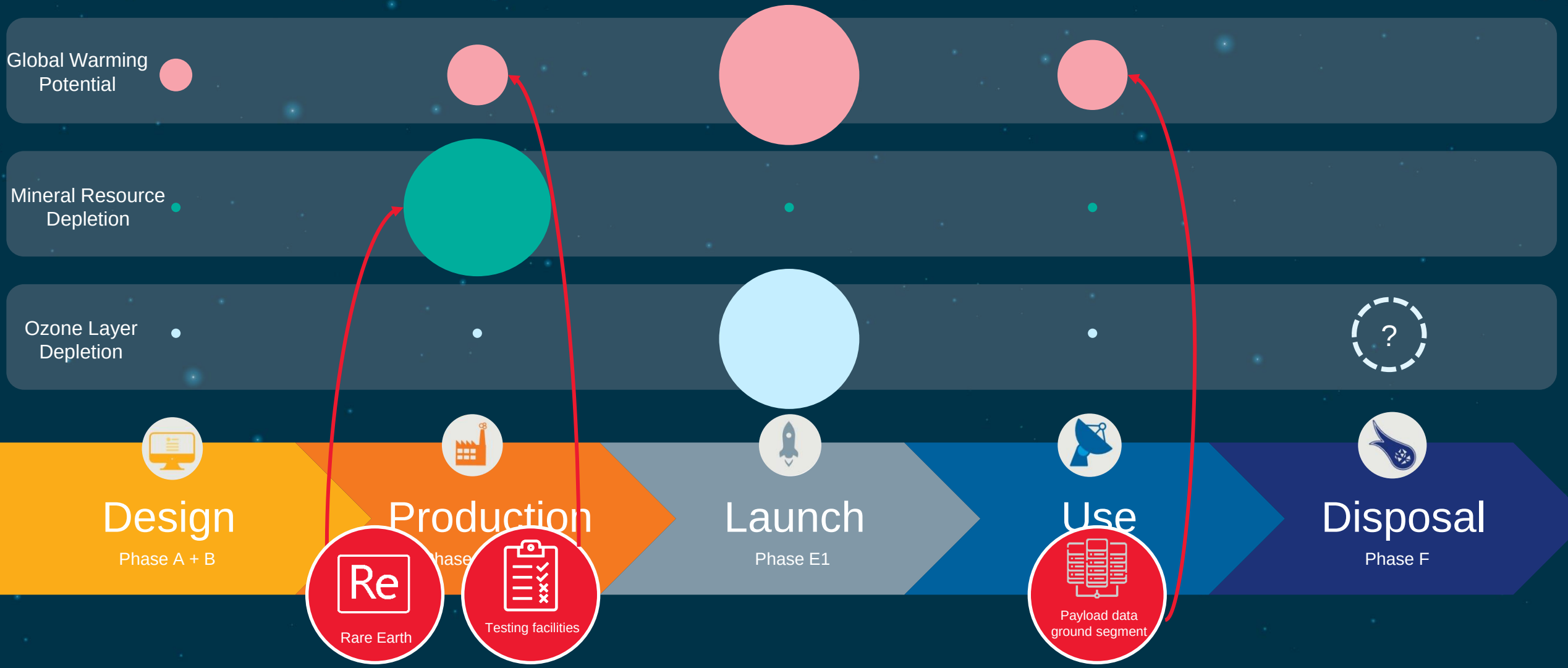
Life Cycle Assessment

- **Quantify** environmental impacts along a product/project life cycle
- Identify **hotspots**

Ecodesign

- **Identify alternative** process or technologies that could help reduce a product/project impact
- **Implement** – early in design – optimised mitigation solutions

Life Cycle Assessment of a space mission (simplified)



Critical topics to be discussed in this conference

- Data availability
- Data quality
- Assessment and comparison tools
- ESA LCA handbook update
- Ecodesign on propulsion systems
- Cost analysis

Thank you

esa.sustainability@esa.int