

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Sustainable Approaches and Impact of Space Transportation Solutions on Earth + Space Environment
and on General Safety (9-D6.2)

Author: Ms. Nathalie Bergmann
The Exploration Company GmbH, Germany

Mr. Artur Koop
The Exploration Company GmbH, Germany

Ms. Lisa Wong
The Exploration Company GmbH, France

Mrs. Lucrezia Veggi
The Exploration Company GmbH, Germany

Mr. Théotime Lemoine
France

SUSTAINABILITY IN SPACE LOGISTICS AT THE EXPLORATION COMPANY

Abstract

The Exploration Company's (TEC) mission is to make space exploration affordable, sustainable and cooperative. The company is positioned as a new Space Transportation actor as it develops, manufactures and operates Nyx, a reusable orbital vehicle, that can eventually be refueled in orbit, which serve the logistic needs of the space stations and of the lunar ecosystem. While the demo-capsule Mission Possible is being integrated and assembled, the Nyx capsule is in the design phase, a 4-meter diameter vehicle with a 4 tons payload capacity. At this critical stage of its development, trade-offs and final choices are being discussed.

Aligned with its core values, TEC is addressing the sustainability challenges present in today's space transportation sector. The environmental impact of space transport cannot be overlooked, given the complexity of these systems, which are characterized by significant mass, numerous subsystems, and which rely on propulsion systems potentially using toxic chemicals. Additionally, the comprehensive supply and operational support required across various mission phases present further environmental concerns. Moreover, enhancing space logistics capabilities, while crucial, risks amplifying the space sector's overall environmental footprint. TEC is dedicated to addressing these challenges through innovative solutions that prioritize sustainability without compromising mission success.

Moreover, the increasing attention on sustainability from public, political and institutional entities and also private stakeholders is pushing the space actors to become more responsible and to genuinely include sustainability as a part of their vision.

As a company, this responsibility towards sustainability could become limiting. TEC is aiming to reduce the impact of its Nyx vehicle, with a specific focus on the Earth environment, without compromising its main mission, and thus committed to contributing to the sustainable evolution of the space industry.

Adopting the regulated methodologies advised by ESA, TEC is implementing the Life Cycle Assessment (LCA) and Eco-Design followed by dedicated actions on the Supply Chain and Procurement processes followed to cover the mission's phases.