

# Aerospace Europe Conference 2023

## Joint 10<sup>th</sup> EUCASS – 9<sup>th</sup> CEAS Conference

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Abstract #XXX (to be filled by the organizers)

Preferred Topics: PROPHY / NEWSPA / SPEXPLO (3 maximum from the list of topics)

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Status of corresponding author: Regular / Student

For student corresponding author: student member of one of the following:

N/A

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### Title

## LUNA NOVA – Advanced Green Propulsion Systems

### Authors

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### Abstract

The enhancement of Ariane 6 Launcher System capabilities to serve missions in the field of earth orbit space logistics, Earth-Moon transfer logistics and lunar exploration or beyond is intended to manifest Europe's flexible and independent access to space.

The ESA Future Launchers Preparatory Programme (FLPP) fostered and spotted the interest for a storable green bi-propellant extra stage placed on top of the Ariane 6 cryogenic upper stage. The carried out preparatory system, architecture & technology study is an opportunity to implement innovative technologies that could serve the low production cost, the low empty mass objectives and increase the flexibility or service capabilities regarding mission, vehicle and propulsion system [1].

This paper described in general the Green Propulsion System Options for an additional Ariane 6 Stage as well as in particular the Propulsion System for the FLPP Kick Stage called LUNA NOVA. The LUNA NOVA Kick Stage is envisaged as the additional, optional stage for the Ariane 6 Evolution launcher system to improve its performance and flexibility. It shall perform to-orbit missions in Earth and Lunar orbits, as well as in-orbit services such as Active Debris Removal, Tugging and Communications Relay. At an early stage, the range of possible propellants for LUNA NOVA was focused on green propellants along with 5 KN BERTA green storable engine demonstrator of FLPP [2] as the starting reference for defining the propulsion system.

### References

[1] ESA HQ, «STorable Extension for Versatility and Exploration (STEVE)», ESA-STF-FLP-SOW-2019-0010, 2019.

[2] ESA HQ, «Versatile, green rocket engine gets go-ahead from ESA» [En ligne], Available:

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