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BRINGING SPACE TRANSPORTATION IN EUROPE TO THE NEXT LEVEL

Abstract

In the past decade the boundary conditions of the space transportation sector have significantly changed, with a strong increase in competition linked to the booming new space economy, leading to the urgent need for Europe to increase the resilience of the European space transportation products and services.

In 2022 ESA, with the support of experts from major national agencies and institutions from the member States contributing to the Space Transportation sector, has consolidated a technical vision for the future of space transportation in Europe, so-called Vision 2030+.

Such Vision 2030+ is built on the implementation of common reusable building blocks for a family of mini/medium/heavy launch systems, fostering cooperation across Europe to capitalise on common resources, introduce technological innovations, achieve disruptive changes in economies of scale for the production of European expendable launchers and, with a corresponding increase in the launch cadence, pave the way to the introduction of reusable launchers in Europe.

In line with the Vision 2030+, at the occasion of the ESA Council at Ministers level in November 2022, significant political support and financial subscriptions were dedicated to the common reusable building blocks elements proposed by the Agency, such as reusable first stage and reusable upper stage, serving a family of reusable launch systems, targeting mini/medium/heavy performance markets, with the heavy version encompassing also human space transportation applications.

Industrial activities are being started for the consolidation of the missions requirements for the family of European reusable launch systems, encompassing also human space transportation capability, based on the maximum use of common reusable building blocks, together with the identification of the critical technological gaps and technology maturation/demonstration plan to be addressed to enable such a future family.

The paper will present the main elements of the up-to-date Vision 2030+, the launch systems family mission requirements and end-to-end reference architecture, as well as the corresponding common reusable building blocks definition and development status.