

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Future Space Transportation Systems (4)

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## ARIANE NEXT, A VISION FOR THE NEXT GENERATION OF ARIANE LAUNCHERS

**Abstract**

The development of Ariane 6 and Vega-C is well on track, both launchers should start their operational life by 2020. Combining enhanced capabilities, increased flexibility and reduced launch costs, the modernised fleet will be the backbone of the "European Space Access Strategy" for the next decade. Beyond these developments, a step forward must be prepared to further improve competitiveness and flexibility of European launchers.

In this context, CNES Launcher directorate is currently assessing launch system definitions for the next generation of Ariane Launcher, so-called Ariane NEXT. The main goal is to further improve competitiveness in particular by halving the launch cost with respect to Ariane 6.

In order to limit technical risks, Ariane NEXT Launch system studies follow a design approach considering a highly standardized architecture as it will allow for a significant rationalization of the production. The launch system studies also evaluate LOx-LCH4 interest, simpler to handle than LOx-LH2 and allowing for further tank communalisation and simplification.

With the aim of enhancing flexibility and cost efficiency, new technologies in the fields of design, manufacturing and ground operations are involved. Moreover, the reusability is taken into account on the first stage as an option in launch system exploitation. Indeed, it is of prime interest to confirm the potential benefit of reusability from an economic and flexibility point of view in the face of unstable and different markets, including in our low-volume institutional market.

Some Ariane-Next breakthroughs are not yet mature in Europe and four key technological bricks have been identified :

- Callisto: a low scale recovery and reusability demonstrator;
- Prometheus: a low cost reusable engine precursor;
- Themis: a full scale low cost and reusable stage demonstrator;
- Icarus: a demonstrator of a light-weight upper stage.

This paper provides an overview of the current status of the Ariane NEXT launch system definition and economic analysis, as well as the main associated demonstrators development status.