

Space Transportation Challenges for Germany

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Knowledge for Tomorrow



European Space Transportation 2020

What options do we have?

Today, all institutional missions can be launched from Europe's Guyana Space Center on either Vega, Soyuz, Ariane 5

Technically, these launch systems are in very good shape

The challenges we are facing are mostly of economic nature:

- Revenues under pressure from international competition
- Availability of small satellites for pairing on Ariane 5 at risk
- Launcher procurement is facing monopolist suppliers
- European industrial chain is hard to optimize and streamline

To deal with these challenges in the medium time frame, two competing lines of action have been under discussion in Europe for a while:

Evolution: Increase of margins in the current system with **Ariane 5ME**

Revolution: Start over with **Ariane 6** and new industrial structures



2012 Naples ESA Ministerial Conference

What did we decide?



A Franco-German agreement was reached on government level, to be implemented through an ESA optional programme:

1. Continuation of the development of specific adapted Ariane 5 ME activities with a goal of a maiden launch in 2017 or in maximum 12 months later
2. Maximizing synergetic activities developing as many commonalities as possible for a common upper stage offering an optimized solution (cost and time) for both launchers
3. Specific adapted Ariane 6 activities (clarification of open issues: proof of superior cost-effectiveness of exploitation, detailed definition, development cost, calendar and industrial distribution)

It is worth noting that the decision to only study PPH variants of Ariane 6 was not part of the joint France/Germany strategy on launchers

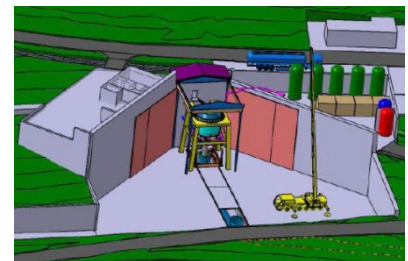
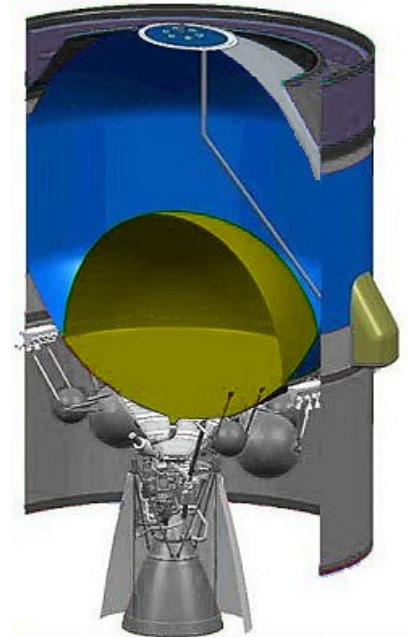


2012 Naples ESA Ministerial Conference

Where are we now? (1 of 2)

Thanks to ESA's programme management and a very quick and efficient **Commonality Assessment** action, work on adapting **Ariane 5 ME** has well progressed since last November. We are looking forward to:

- Contracts up to CDR-level end of 2014 / early 2015
- Construction of the new Upper Stage Tank production facilities in Bremen and Augsburg
- Construction of the new Upper Stage Test facility at DLR LAM
- Confirmation of adapted Ariane 5ME compliance with requirements on performance and development schedule
- Confirmation of stable cost at completion for the adapted Ariane 5ME development until the first flight in 2018
- Confirmation of Astrium's commitment concerning recurring production cost of the adapted Ariane 5ME



2012 Naples ESA Ministerial Conference

Where are we now? (2 of 2)

Work on Ariane 6 preparation has also timely begun. However, **none of the “open issues”** could be closed as of today: We observe:

- No **convincing launcher concept** for Ariane 6 with solid propulsion lower composite (yet)
- Current **Cost estimates** of industry for all concepts on the shortlist around 100% above the required levels
- Neither a credible **industrial setup** for a launch system based on solid propulsion has been identified or discussed, nor has any concept been proposed safeguarding **Europe’s liquid propulsion industry** and test centers
- No viable concept for a **transition** from Ariane 5 to Ariane 6 has been formulated or agreed between ESA’s member states



Challenges for Launcher decisions on the next ESA Ministerial Conference (1)

What is the goal?

It will be challenging to answer all questions raised on Ariane 5ME and Ariane 6 in time for the next Ministerial Council Meeting

In order to un-block the decision making process in the launcher development, the essential goal of all efforts must be the definition and mutual agreement of a **coherent launcher development scenario** that is:

- Robust** with respect to the European institutional and commercial launch services requirements for the next 15-20 years
- Realistic** in terms of utilizing the European competences and manpower resources in the most efficient and sustainable way
- Reasonable** what concerns affordability to ESA and it's Member States

The political agreement of all participating states to support this launcher development scenario is indispensable. A “European Launcher” without European consensus will fail!



Challenges for Launcher decisions on the next ESA Ministerial Conference (2)

What should we do to prepare it?

How can we get to a European consensus?

As the challenges in the field of launchers are mostly of economic nature, the main focus while elaborating the coherent launcher development scenario must be carefully put on cost issues

•**Exploitation:** How do we get from Ariane 5ECA to Ariane 6? How does the business case evolve? Transition periods? What are the risks?

•**Industrial restructuring:** How do we run-down those companies / competences needed in A5, but not in A6? Who will cover the cost? What are the risks?

•**Development:** How do we harmonize the budget needs of the launchers development scenario with the financial capabilities of the public funds?

The “**open issues**” still need to be clarified and answered – no “rushing” and no “short cuts” are possible, only solid answers count!



Challenges for Launcher decisions on the next ESA Ministerial Conference (3)

What can we afford?

- The investment in launcher programs must safeguard the balance with ESA's overall mission and international commitments to the ISS, Exploration, and other infrastructure programs
 - Current commitments of ESA Member States for actually running programmes require the use of budget lines up to 2017/18, assuming constant budgets of Member States
 - Remaining Ariane 5 ME development will require about 1000M€ and will use up ESA's launcher budget corridor until 2018 (current ESA LTP).
 - Ariane 6 development will require about 4000 M€*.
- ⇒ Financially speaking: Ariane-6 development will be challenging before 2017-18 ⇒ we have about 3-4 years to clarify “open issues”.

* c.f. A5ME/A6 Declaration: “For indicative purposes, the overall cost at completion of Ariane 6 until 2022 is estimated at 4B€ at 2012 e.c.”



Challenges for Launcher decisions on the next ESA Ministerial Conference (4)

A coherent launcher development scenario

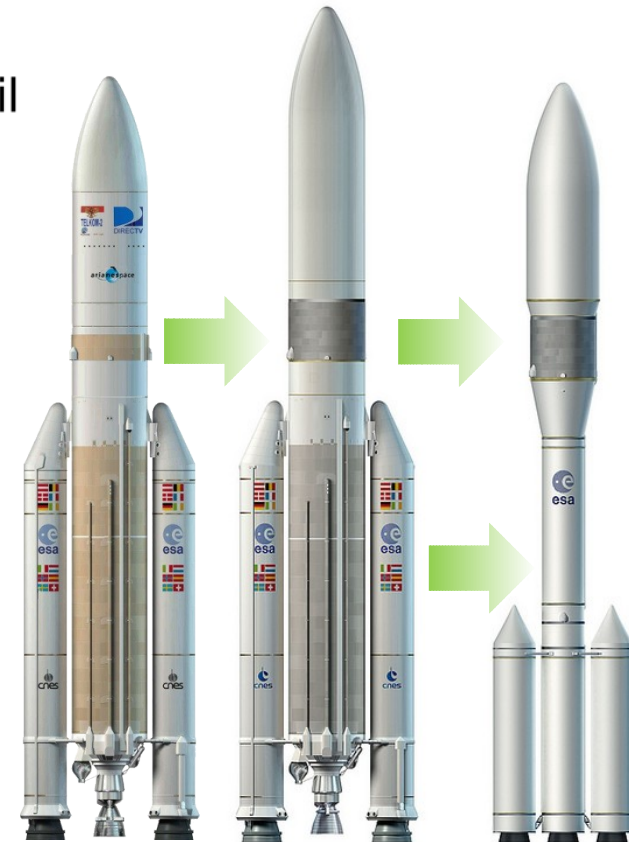
This coherent launcher development scenario must build on the decisions of the Naples Ministerial Council

A German proposal:

- Rapid finalization of the Ariane 5ME development
- Anticipation of commonalities between Ariane 5ME and Ariane 6 to maximise the return of investment
- Engagement into a new Ariane 6 launcher after a good clarification of the open issues, and established consensus between the participating states ⇒ “a well organized revolution”

Launcher programs have a very long lead time – we need to take careful steps – one after the other.

Let's take our time and get it right!



Thank You!

