SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Small Launchers: Concepts and Operations (7)

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FUTURE APPLICATIONS OF SMALL LAUNCHERS – A SECTOR WITH CONSIDERABLE OPPORTUNITIES

Abstract

In September 2012, students and young professionals from around the world met in Herculaneum, Italy, for the annual Space Generation Congress (SGC). During the Congress, amongst others, the Industry Working Group was formed, with a focus on Space Transportation. The group was composed of 27 people from 16 different countries and, during the 3 days of the Congress, the members of the group discussed at length the role of new actors with launch capabilities, the economic considerations of European launchers, and policy and regulatory considerations of space transportation. Several recommendations were made in order to foster development of the launch sector with regards to the different parties.

This paper focusses specifically on the analyses and recommendations made during the SGC 2012 on small launchers. Beyond the content of the SGC report, the paper will add new developments in this sector and critically discuss future applications.

The importance of small launchers for the current space transportation market is well established. The development of the satellite market clearly indicates their potential as a cost-effective response to the current trend towards small satellites and miniaturisation, combined with a demand for launch flexibility and responsiveness.

As a reaction to this trend, the launcher market is opening new opportunities, from Virgin Galactic's LauncherOne to the European VEGA launcher. Additionally, technological developments are undertaken to fit small launchers to evolving requirements in spaceflight, such as deorbiting modules for preventing space debris, and to optimize them for the satellite market, such as multi-launch capabilities for competiveness or hybrid propulsion modules. The most important and promising of these developments in

the worldwide launcher segment are presented and analysed.

Moreover, special attention is given to potentially game-changing applications of small launchers: their application in segments that cannot be served by current launchers; or the possibility to reach the geostationary orbit by using electrical propulsion systems with small launchers, option under study for VEGA, underlining the potential of imminently changing the global space transportation market and promoting the idea of a more affordable access to space.

Furthermore, the paper will also consider the importance of small launchers, like the European VEGA, as a less risky and costly option for developing new technologies. In particular attention will be paid to a possible application in the development of the Ariane 5ME and the Ariane 6.