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Public-Private Partnerships: Traditional and New Space Applications (2)

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EMERGING LAUNCH DEMAND OF SMALLSATS IN KOREA AND THE PRIVATE-LED DEVELOPMENT OF DEDICATED LAUNCH VEHICLES

Abstract

At the dawn of the new space industry, South Korea sees some changes in demand and supply dynamics. A survey on domestic demand for small satellites(smallsats) has been conducted for two years from 2020 to 2021, we made an inquiry on smallsats weighing less than 500kg and collected a set of desired information on an expected number of launches per year, iftoff weight, mission and orbit types, and an acceptable price range of the launch service. The estimated next-ten-years number of smallsats via the two consecutive surveys jumped from 318 to 494 in one year, and new developments are additionally emerging. In particular, we cannot help but notice that satellites in the range of 51-200 kg have seen a significant growth. Also, we identified a strong need for a dedicated smallsat launch service in Korea. From 2027 onwards, a cadence of about ten launches is expected to be needed to meet the rising demand.

KSLV-II(Nuri)'s successful flight in 2022 made Korea a spacefaring nation. The Nuri was not only indigenously developed but also operated by the national research institute of KARI. This development program has been continued under the government policy to guarantee an independent access to space in Korea. As a derivative of the Nuri technology, a small-lift vehicle capable of economically delivering 500 kg payloads to 500 km SSO was announced in the Master Plan for Space Development released in 2018. A new version of the Master Plan updated in 2023 clearly states that the Nuri will be operated by a commercial partner and the government will support the private sector that is pursuing development of small launch vehicles.

There are, indeed, some privately-funded startups in Korea that initiated development of small launch vehicles such as Blue Whale and Hanbit series. In parallel, a few national programs to support privately-led development of high-performance upper stage technology have been established. This is a Korean version of Private-Public Partnership where a rocket engine, a common-bulkhead tank, integrated avionics and inter-stage umbilical are being developed in a close cooperation between private and public sectors. The government supports a part of the development cost, while KARI provides support to private partners in enhancing their overall competencies in launch vehicle development based on our own experience. in

KSLV-II. And involvement of private sectors is expected to increase the effectiveness of both time and cost.