

# SPACE SYSTEMS

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LAUNCH VEHICLES & MANNED PLATFORMS

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# FORECAST

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# SAMPLE

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## Analysis 1

# The Market for Orbital Launch Vehicles

## Executive Summary

A few key factors will play a role in the launch industry going forward: the growing popularity of small satellites, the entry of new companies into the market, and the increasing commercialization of space transportation. Although launch vehicle production is dominated by countries including the United States, China, Russia, and France, Russia's share of the market is declining.

The rise of small satellites has created a trend toward a higher number of payloads per launch vehicle, since multiple smaller satellites can be carried by a single launch vehicle. The average number of payloads per launch doubled between 2013 and 2017, rising from 2.5 to 5. As a result of the high number of payloads launched, 454 satellites and spacecraft were carried beyond Earth's atmosphere in 2017, surpassing the record of 315 set in 1983.

The number of commercial launches, as categorized by the U.S. Federal Aviation Administration, Office of Commercial Space Transportation, held steady from 2013 to 2016 at between 20 and 24 per year. However, the number of commercial launches jumped to 33 in 2017, driven largely by an increase in production of the Falcon 9 and the addition of new entrants such as the Minotaur C. These joined older launch vehicles like the Soyuz, Proton, and Ariane 5 in serving commercial customers.

For years, Russian manufacturers dominated the launch industry. Between 2014 and 2015, Russian manufacturers accounted for 39 percent of all launches. The next closest competitor was the U.S. with 24 percent. However, launch failures and increased competition have cut into Russia's market share.

Russia has largely replaced the U.S. and China as the leading launch nations. Russia is still an important player in the launch market, but fell behind the U.S. and China in number of launches in 2016. In 2017, Russia ranked behind the U.S., and in 2018 it is expected to once again fall behind both the U.S. and China.

The production of launch vehicles over the next 10 years will in part be driven by the efforts of some countries to pursue human space exploration. For example, the U.S. is currently developing a new launch vehicle specifically designed for human spaceflight,

while Russia and China continue to rely on proven rockets to carry their crews into orbit. India is also working to develop a human spaceflight capability.

Launch providers are currently facing several challenges. The satellite replacement cycles of many operators' large commercial communications satellites are nearing an end. At the same time, new entrants are forcing prices to decline. On the commercial market, the average cost to carry payload into orbit declined from \$17,185 in 2013 to \$12,000 in 2017.

However, a number of opportunities exist within the industry. Despite an end to capital expenditures by major commercial satellite operators, there will be continued demand for commercial communications satellites. Furthermore, new satellite operators like Planet and OneWeb are developing networks of hundreds of satellites that will require a large number of launch vehicles.

New manufacturing technologies will also benefit the industry. Vertical manufacturing practices and 3-D printing are expected to lower costs and improve production times for launch vehicle manufacturers. These developments will enable launch providers to lower costs yet still make a profit.

During the next 10 years, Forecast International anticipates production of 1,035 expendable launch vehicles (ELVs) worldwide, with this production worth about \$73.7 billion. These systems range in size and price from the small and inexpensive Virgin Orbit LauncherOne and Rocket Lab Electron to the large and expensive Delta IV and Atlas V of the U.S. Air Force EELV program.

Over the next 10 years, the market for launch vehicles in the United States is expected to be valued at \$25.71 billion. This represents about 34.9 percent of all launch vehicle buys during the forecast timeframe. Russia follows the U.S. in rank at \$15.5 billion, representing 21 percent of the market. European launch producers follow Russia in rank with a combined value of \$13.4 billion over the next 10 years, accounting for 18 percent of the market. China is expected to follow with \$11.3 billion, or 15.3 percent of the market. Japan and India, meanwhile, will capture 7 percent and 3.6 percent of the market, respectively.

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