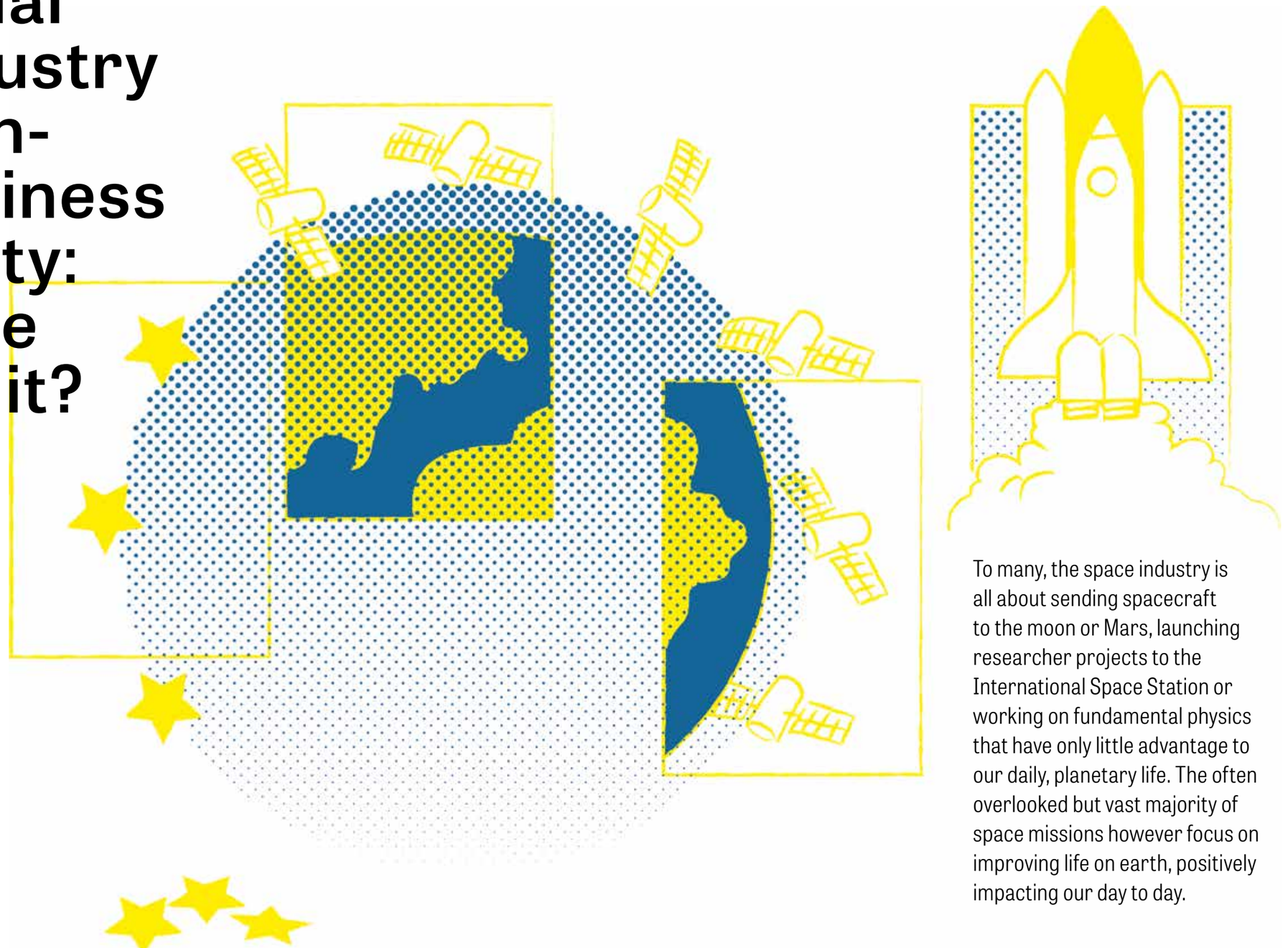
Scaling the Commercial Space Industry to a Trillion-Dollar Business Opportunity: Will Europe Be Part of it?





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To many, the space industry is all about sending spacecraft to the moon or Mars, launching researcher projects to the International Space Station or working on fundamental physics that have only little advantage to our daily, planetary life. The often overlooked but vast majority of space missions however focus on improving life on earth, positively impacting our day to day.



Launching to space to improve life on earth

How do we even know about climate change? How can we quantify its effects and take actions based on actual data points? How can we simulate different scenarios based on different actions? Earth observation satellites generate data to answer these questions, both on a global basis but also providing individual companies and institutions with insights into their footprint. Inevitably, in a few years space data will be on every company's balance sheet in form of its environmental impact.

A satellite in low earth orbit (LEO) completes one revolution around earth every 90 minutes. Thus, being a global business case from day one, space assets also offer solutions to connect the four billion people who currently do not have internet access because of missing ground infrastructure. Instead of burying copper cables into the ground, satellites elegantly beam high bandwidth internet from the skies. Serving potentially every single human being on earth with connectivity might just be the single biggest business case in the world.

Most of these applications are commercially driven where limitations are set only by one's creativity how to best use the ultimate vantage point. The commercial space industry today finds itself in the same position the internet industry was in 20 years ago.

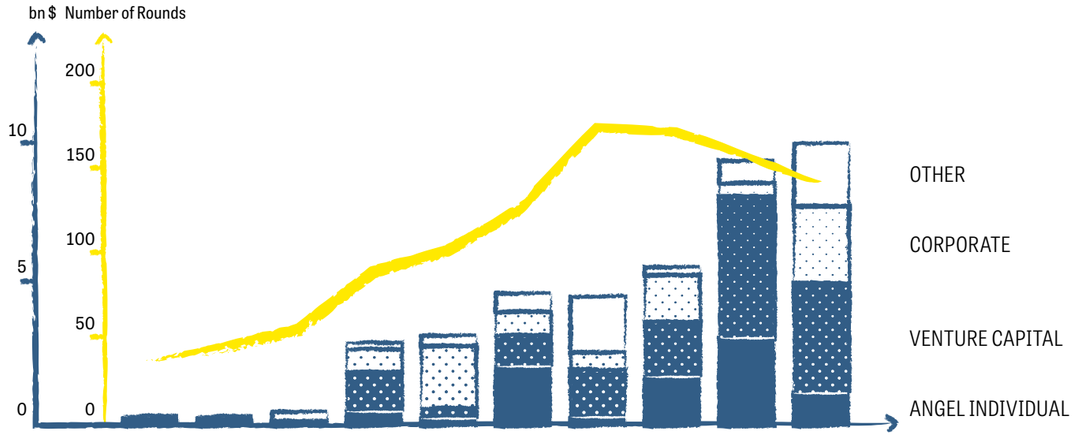
Private Capital boosting the space industry

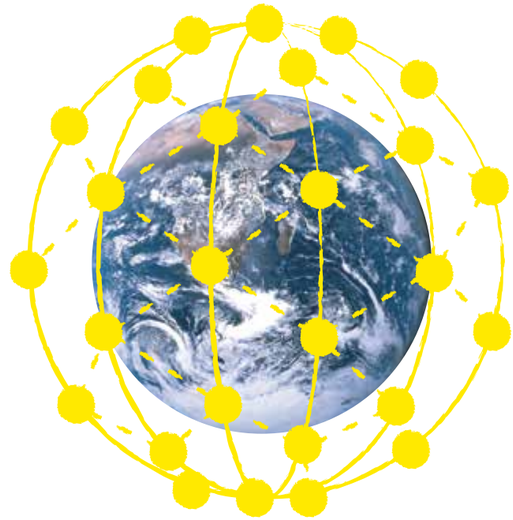
The space industry has outgrown the government market and entrepreneurial endeavors are taking over the industry. They design commercial business cases where they are challenged to offer low cost and compete in the open market – often also against non-space-based solutions. Governments need to adapt to this New Space approach and re-think how to best use government resources as national institutions or ministries are genuine customers to these services.

Placing government contracts to the industry has been proven to be a very efficient way in developing and exploiting access to space and in-space capabilities, as opposed to funding everything with taxpayer's money where there is no incentive for low-cost programs or flexibility with respect to time and technological capabilities. NASA reportedly saved $20–30 billions giving competing contracts to the private industry developing technologies and buying services from them as opposed to developing and supervising as project leaders themselves.

The last years have seen record investments into private companies which support this shift:

Equity investment into space infrastructure until Q3/2021 (hardware and software to build, launch and operate space-based assets; excluding distribution and applications built on top of space data). Source: SpaceCapital.com





Yellow:
satellite constellation at usually low altitudes (500–1,200km)

Blue:
single satellites at usually geostationary altitudes (35,800km)

Scaling the space industry

Satellite constellations are on the rise. These space-based systems do not consist of only one single satellite as was the standard case just a few years ago but of hundreds or thousands of similar satellites creating a connected mesh around our planet, offering (near) real time insights and services on a global scale. The low distance to earth's surface offer low latency while the allocated risk per satellite is significantly reduced. In case a one-off satellite fails, the mission is written off, losing potentially hundreds of millions of Euros. In a constellation however, if a single satellite fails, the financial burden is just a few hundred thousand Euros and the other satellites are taking over while a replenishment is launched into orbit, ensuring continuous service delivery.

Satellites flying in LEO are getting smaller and higher performing, many of which are ranging between 5kg shoebox-sized CubeSats to 500kg compact car-sized SmallSats. They need to be deployed in separate orbital planes in flocks of multiple units to fill the needed mesh. The onboard technology got available in the last years via university and corporate spinoffs such that satellite components, assembly and test kits therefor can be procured in web shops, easing the entry into the space industry.

The high number of satellites to be launched in the next few years also require a massive supply chain to support the build and deployment of satellite constellations. Low-cost satellite systems thus need to be manufactured in thousands instead of single units. Hundreds of low-cost rocket launches are needed to fill different orbital planes, and finally mass manufacturing is required for millions of end devices such as antennas to enable high adoption of the technology, e.g. in cars to provide entertainment or enable software update distribution.

Gaining supremacy in space

Whatever tasks a satellite fulfills in space, first it needs to get to space. While China and United States were responsible for 67 percent of all orbital rocket launches in 2020, entire Europe only accounted for 4 percent of all orbital flights on a global scale. European companies thus see a higher entry barrier to space as low-cost launch and the required satellite industry supply chain is not as mature as in the US or China.

Space is about to be yet another technological sector where Europe is losing ground. In 2030, you will possibly drive an autonomous US car that will allow your kids to watch US videostreaming services while you're connecting your US phone to a US satellite network. In Europe. We will become mere users and dependents of non-EU technology. Most of European politicians, decision makers and government staff seem to not yet have understood the importance of space, let alone the big technological jumps the rest of the world is working on today while Europe is watching.

Neither country within Europe is strong enough to compete on a global scale, however we're fighting ourselves about dominance within Europe instead of gaining traction on international level. It is time for Europe to wake up and work together in a commercially-driven approach to catch up.

Orbital rocket launches
by country in 2020
Source: space.skyrocket.de

