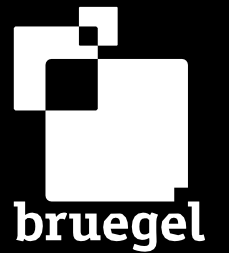


Autonomy in Orbit: Europe's place in the Space Economy



*Launching
Bruegel Blueprint*

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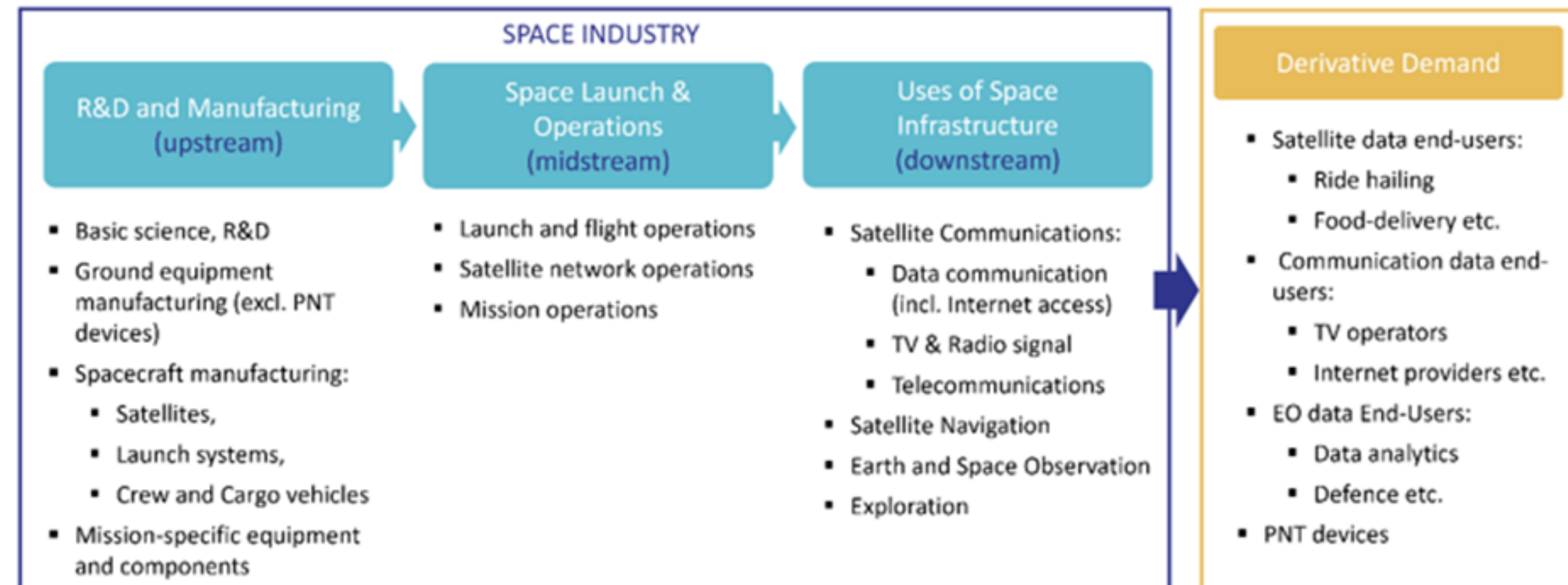
**Joint with Kamil Sekut
and Francesco Nicola**



- Key trends in the global space sector
- The position of Europe
- Assess what (and if) industrial strategy for space for Europe
- **Recommendations**

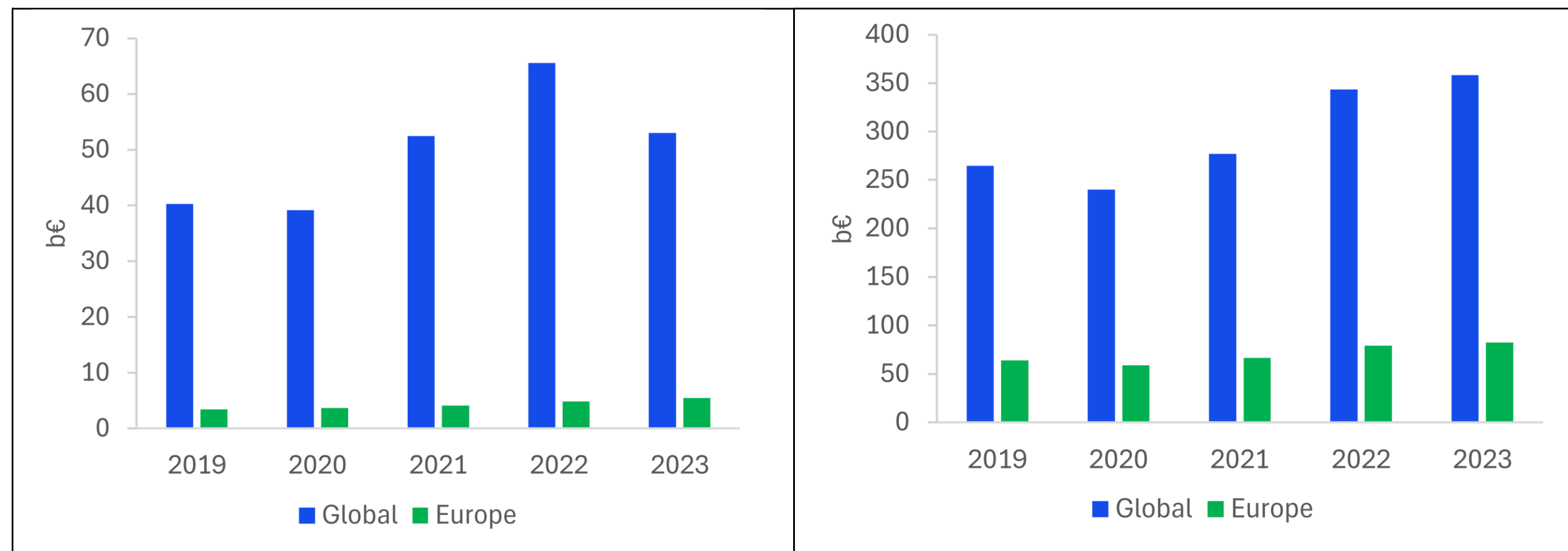
Space economy as an ecosystem

- Space economy is an ecosystem that **creates** and **operates infrastructure** that **utilises space** for various goals
- Satellites are critical dual use infrastructure
- Large majority of space economy is these days satellites related



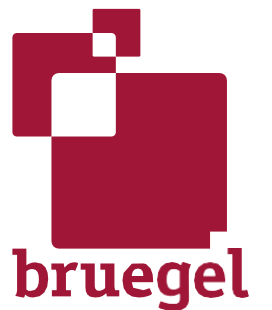
Europe a dwarf in space markets

Europe's position in the global upstream/midstream markets (left) and downstream market (right)



Source: ESA (2025). Note: the left panel is manufacturing and launch value, which we categorize as upstream and midstream, respectively (cf Table 1). The right panel is downstream value as defined by Eurospace.

Key Trends in the Space Economy



- **Technological Shifts:**

- The introduction of reusability, miniaturization, and new materials has drastically reduced the cost of launching and operating in space, opening up unprecedented opportunities for new technology and its commercial applications.

- **Strategic Importance of Space:**

- Governments are increasingly viewing space as essential for both civilian and military applications, which has led to growing public investments in space-related activities.

- **Public and Private Sector Interplay:**

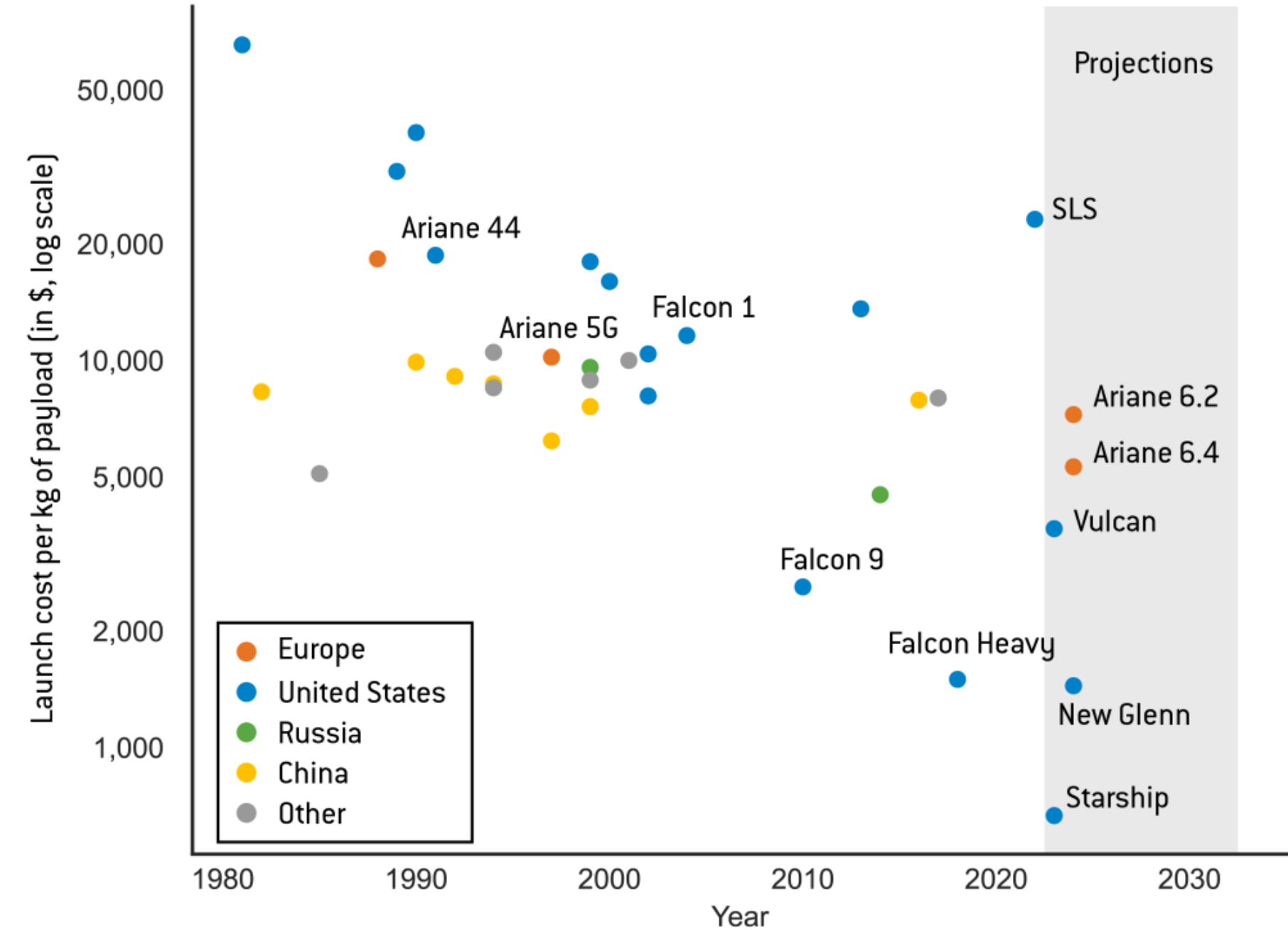
- Governments are major influencers of the space industry as investors, developers, owners, operators, regulators, and customers
- Changes in procurement practices have contributed to increased incentive for innovative solutions
 - US: COTS principles: later followed by others: from cost-plus to fixed costs; more incentives for competition; co-funding from private sources; sharing risks of low TRL projects; milestones; innovative procurement, DARPA

- **Growing Role of Private Sector in the US:**

- The shift towards commercialization has seen the rise of private companies as key players in space. It's mostly United States that benefits from a vibrant innovative private sector: unique entrepreneurial spirit of US companies, the role of the U.S. government as an anchor customer and a recent shift in public procurement practices which created an incentives for private companies to innovate and reduce costs.

Costs of sending things to orbit are falling drastically

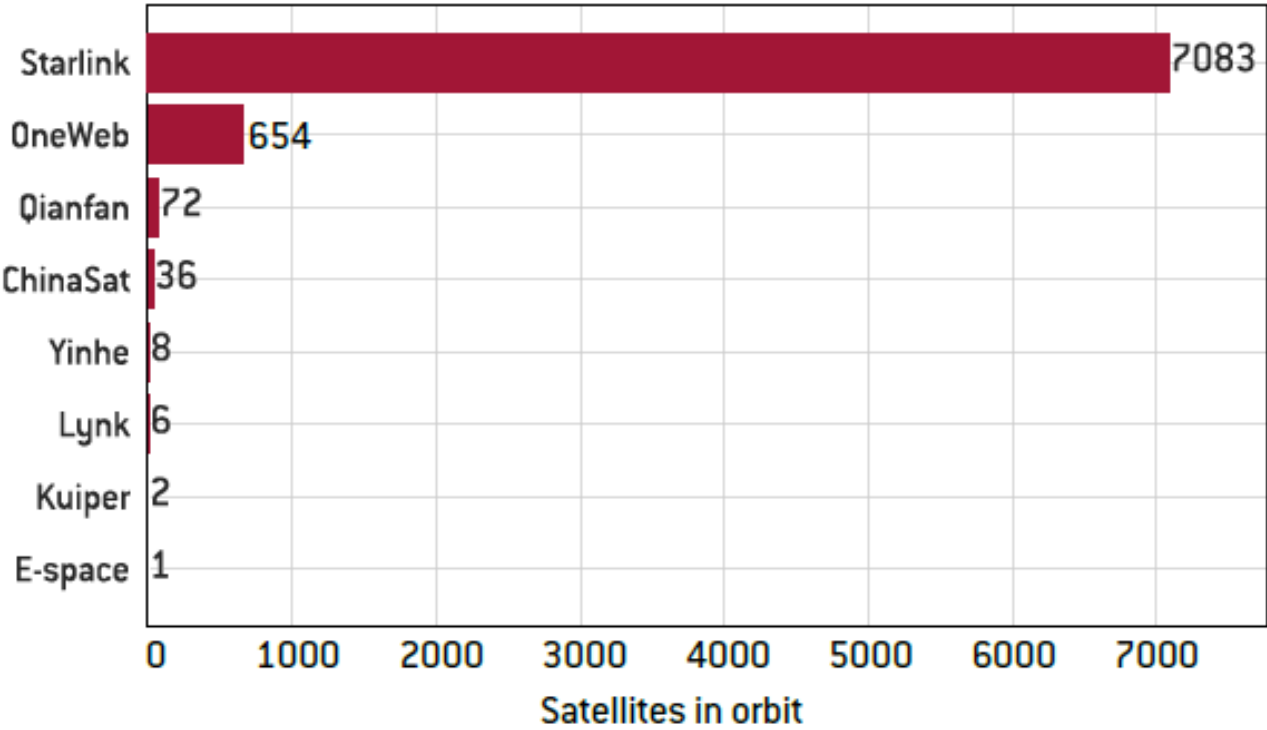
The greatest cost-reduction has been achieved by SpaceX which pioneered partially reusable rockets



Source: Bruegel based on CSIS Aerospace Security Project (2022). Historical data is adjusted for inflation.

The rise of megaconstellations: satellites in LEO, > 100kg

Figure 7: Progress towards planned mega-constellations by provider



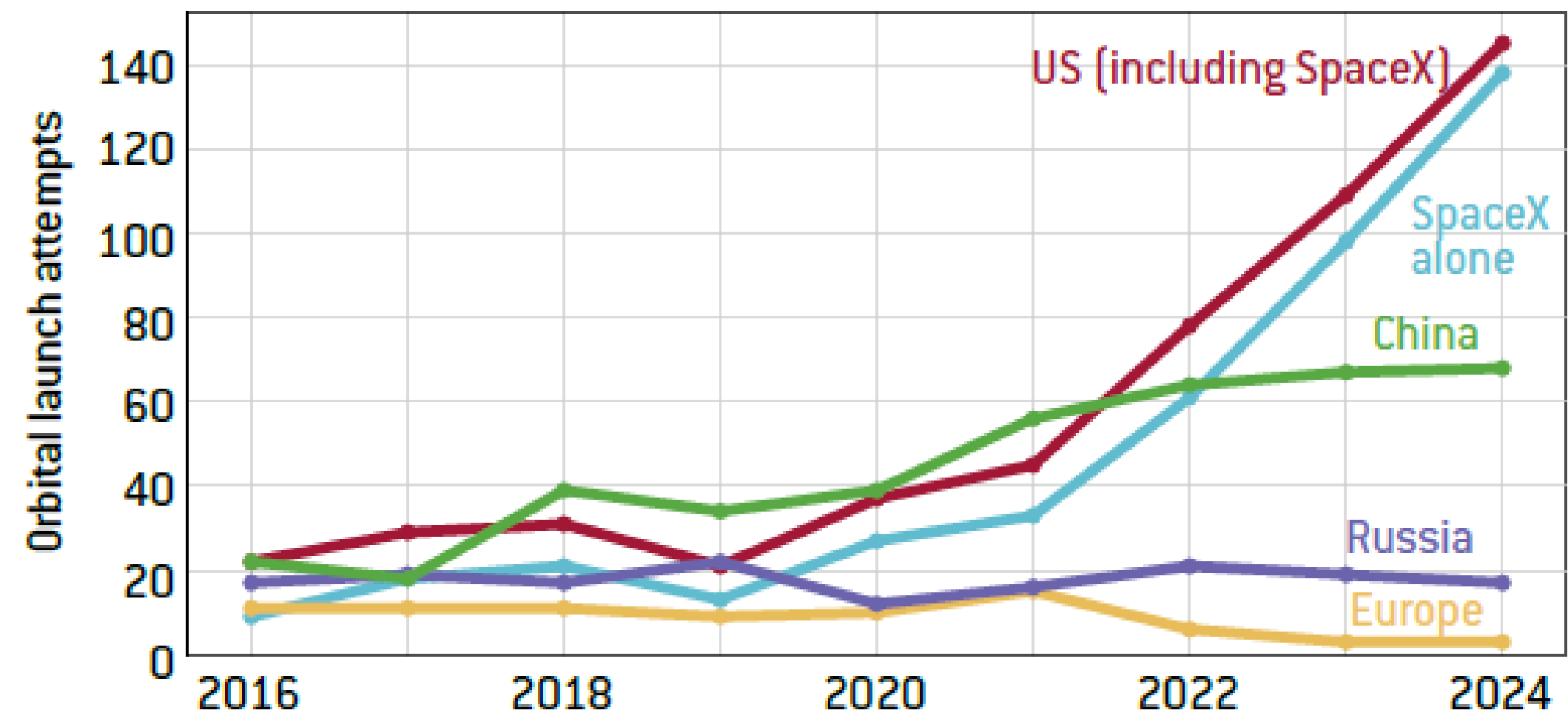
Source: Bruegel based on McDowell (2025). Note: data as of 23 February 2025. All companies plan to have more than 1,000 satellites in orbit.

US dominates in launches

- USA has the cheapest services by far due to SpaceX

Towards a (natural) monopoly for SpaceX?

Figure 4: Orbital launch attempts (2016-2024)

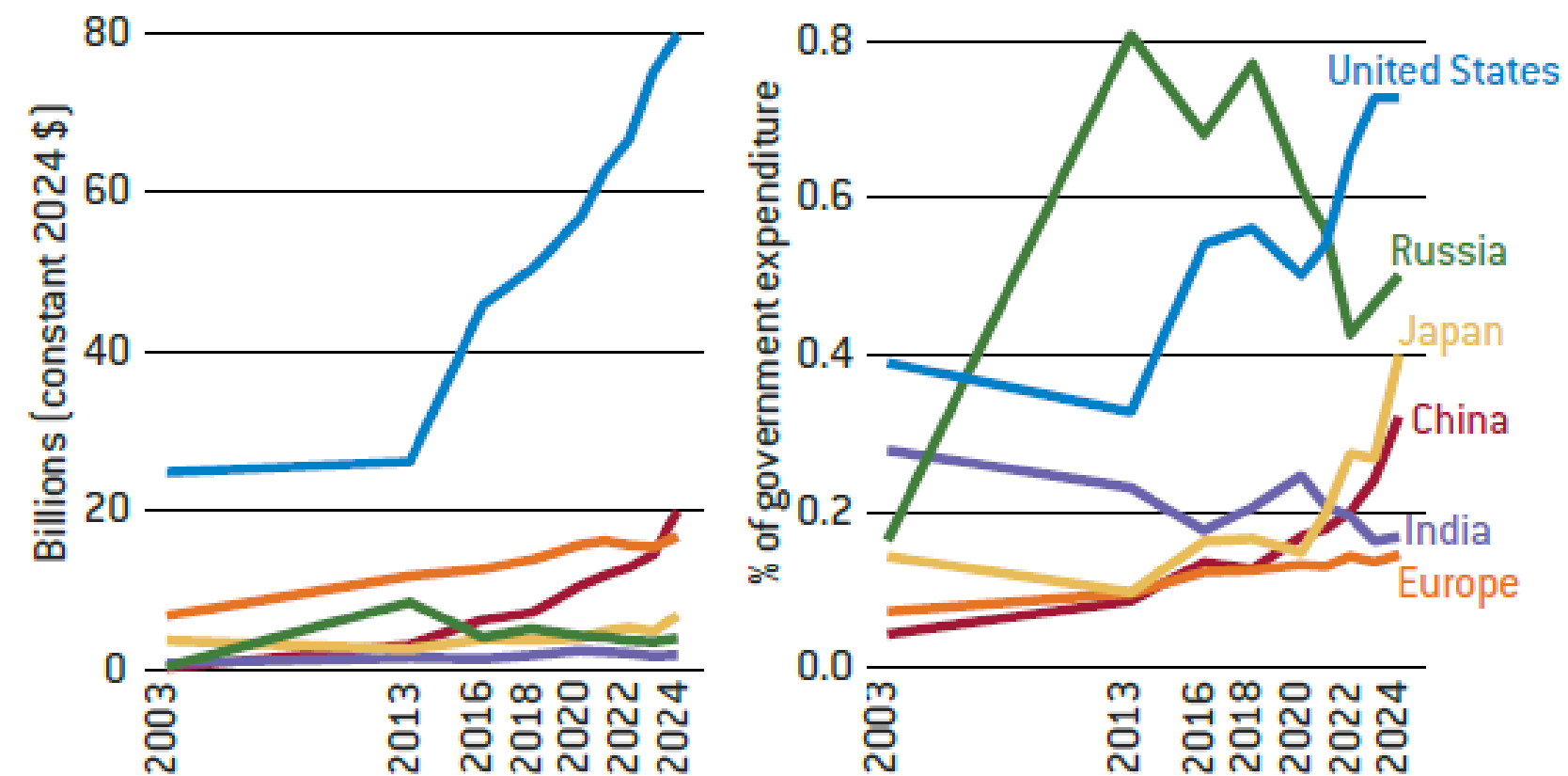


Source: Bruegel.

American public space budget overshadows other budgets

- The sharp increase in US space spending starting in 2013 was largely driven by an increased emphasis on space operations for national defence purposes (DOD; since 2019 **United States Space Force**)
- European public investment in space is roughly 6x smaller than that of the US
- Europe is getting surpassed by China
- Space-related **defence** in Europe is under-funded compared to the RoW

Figure 10: Trends in space-related public budgets

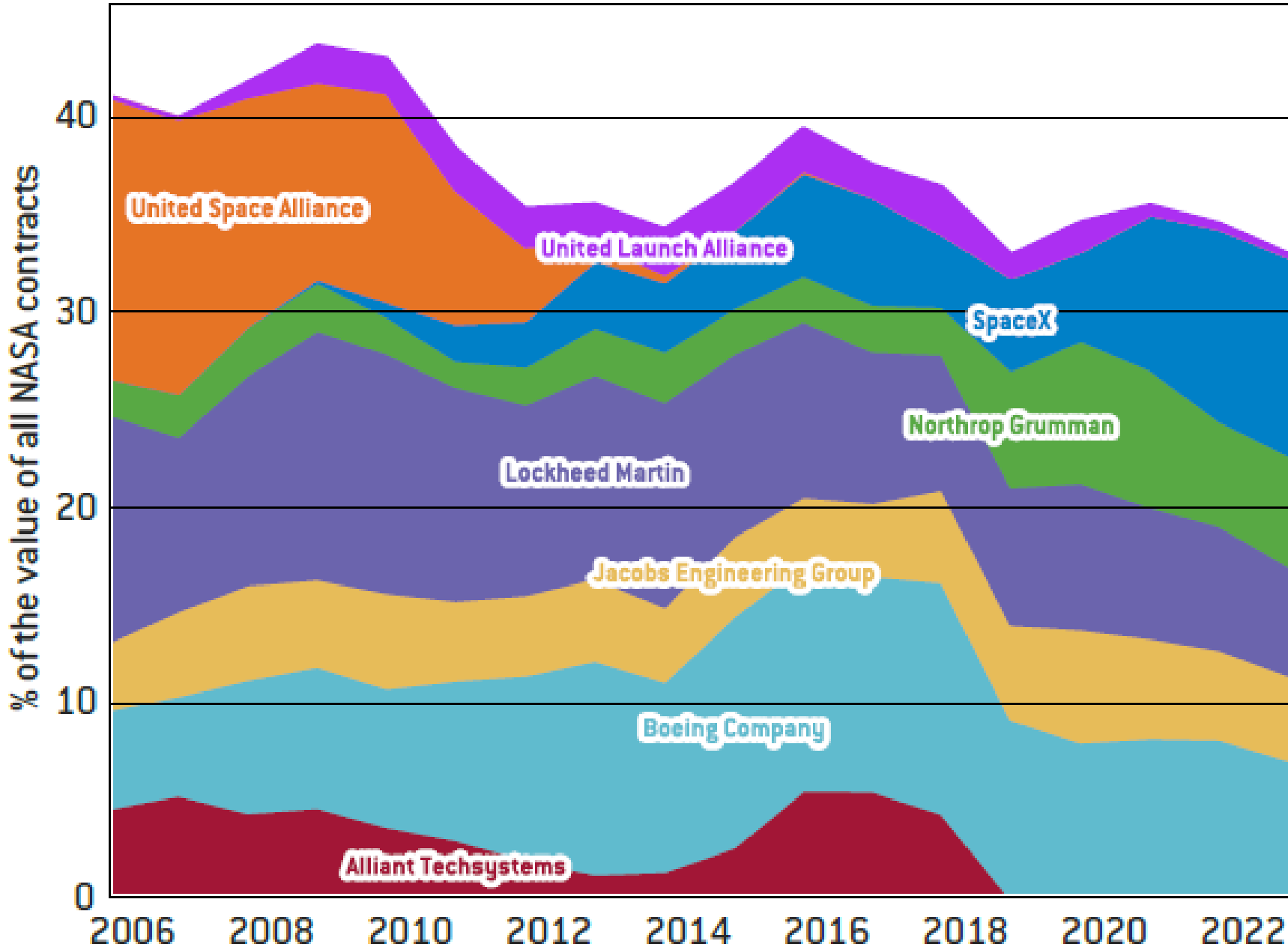


Source: Bruegel based on Novaspace, Müller *et al* (2025). Note: data on space budgets in the first panel is adjusted for inflation.

US Public Procurement as market shaper

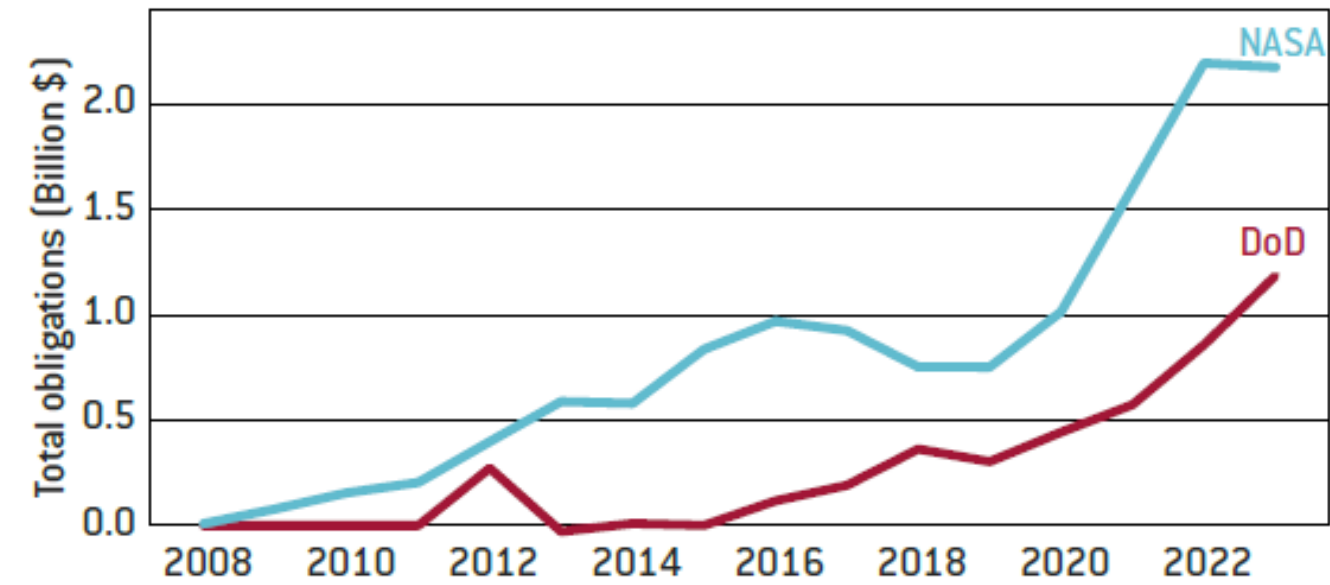


Figure 16: Main private-sector NASA contractors



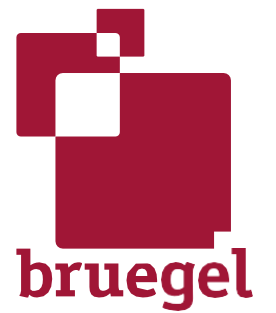
Source: [SAM.gov](https://sam.gov).

Figure 18: Total US government obligations to SpaceX by contracting agency

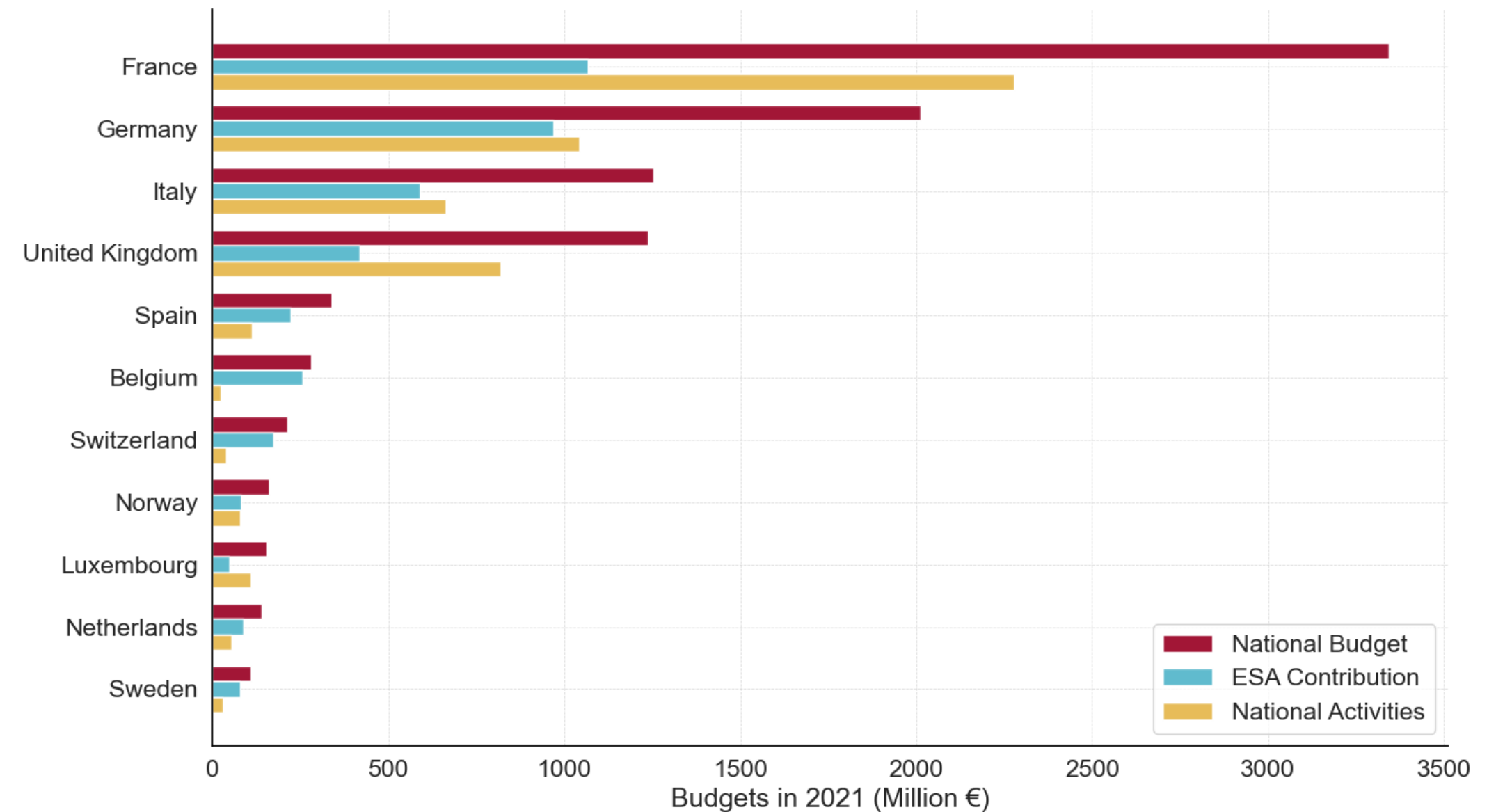


Source: Bruegel based on Federal Procurement Data Systems.

European public funding is fragmented



- Nearly a half of the European public space budget is governed by national space agencies,
- Projects developed using public money are duplicated, frequently rely on national suppliers and offer relatively small contracts



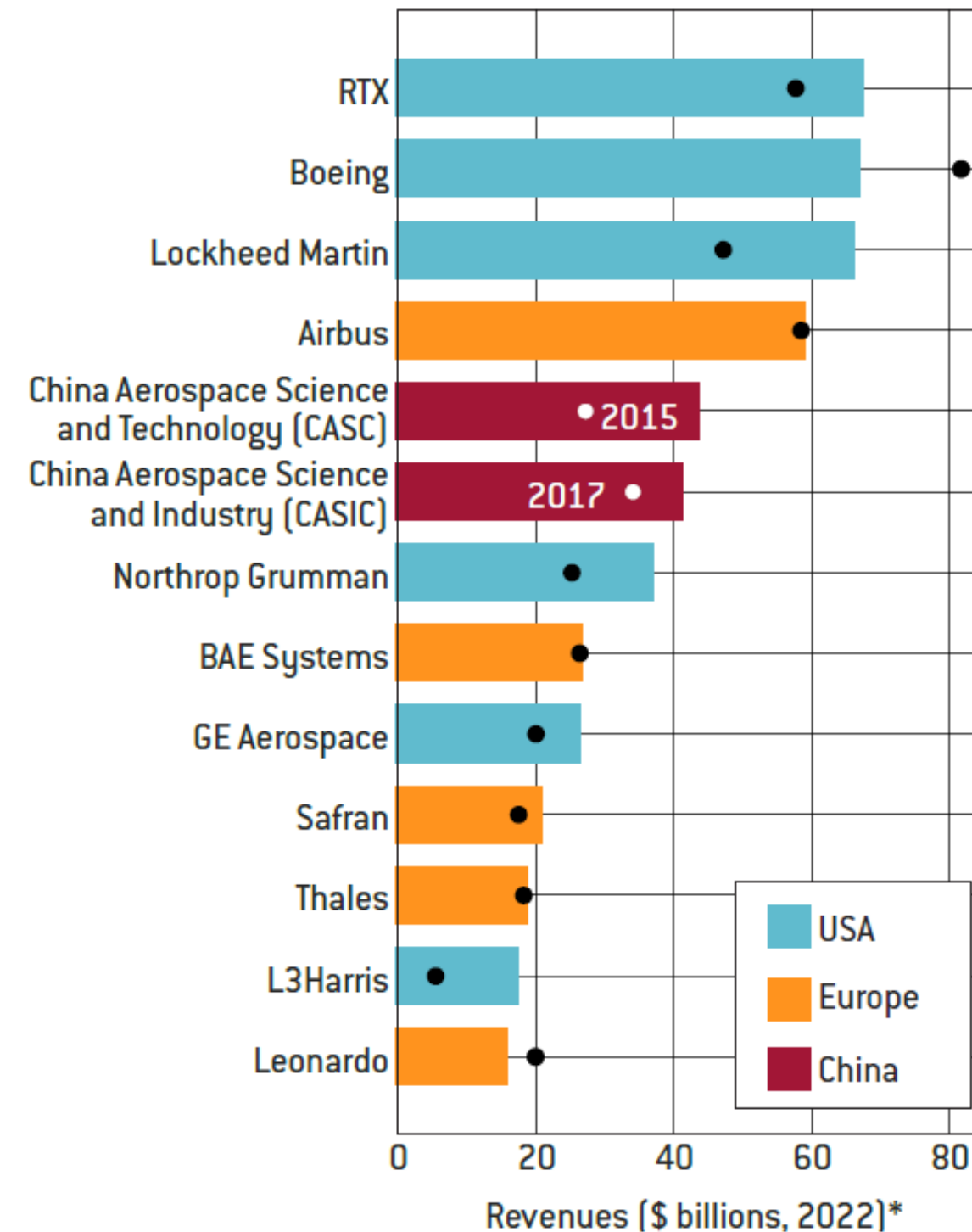
A new landscape of space companies

Persistent position of the large incumbent players, most of which are US companies.

These firms are typically large conglomerates with operations extending beyond the aerospace industry, notably into commercial aviation and defence sectors.

Most of these companies operate in all segments of the space industry

Figure 14: Leading publicly listed companies in the space industry, 2012 and 2022



Source: Bruegel based on PwC, 2023, and Fortune 500. Note: only publicly listed companies and state-owned companies are included (SpaceX is non-listed). Revenues are at conglomerate level and therefore not only space revenues. See Table 3 for a detailed breakdown. *Dots signify revenues in 2012.

The new kid on the block: SpaceX

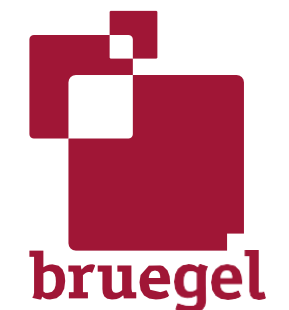
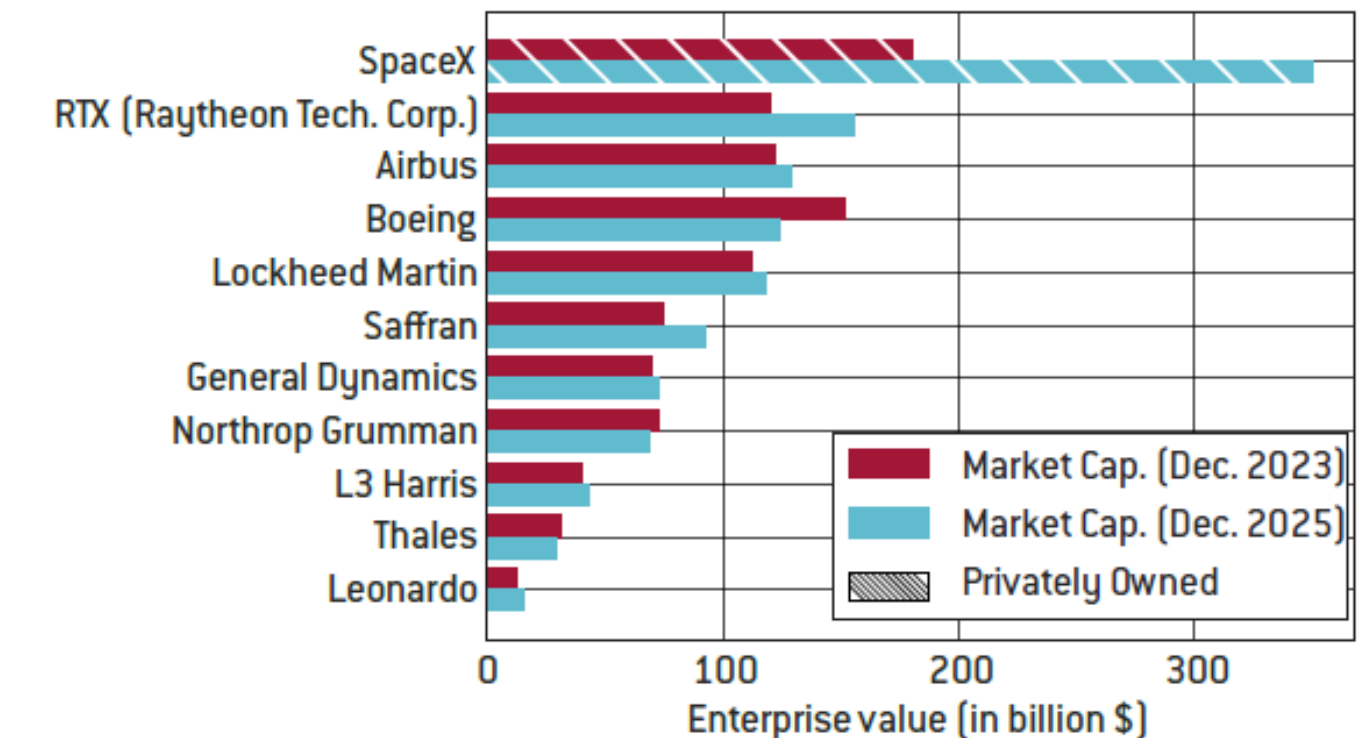


Figure 17: Valuations of space companies



Source: Bruegel based on YCharts, Bloomberg. Note: values for SpaceX are estimated based on a tender offer as reported by Bloomberg. Valuations are reported as of 13 December 2023 and 11 December 2024 when tender reports were published.

SpaceX shows the viability of integrating innovation, manufacturing, launch infrastructure, and operations segments under the umbrella of a single young firm

Funding of SpaceX: a Public Private story

- SpaceX was created in 2002 with Elon Musk's own money (\$100 million)
- Between 2006-2012, it was granted nearly \$1bn by NASA for the development of its launch capabilities
- Contracts from NASA and DoD followed
- Following the great success of this public contracts, it continued to amass private funding
- Hence, the story of America's most valuable startup, is a public private story

Beyond SpaceX: Space start-ups scale and financing

- Private investment in space start-ups is 6x larger in the US than in Europe
- While the US space startup investors are purely private investors, in Europe, this is only < two third.
- In Europe, UK receives the majority of space VC
 - Between 2019 and 2021, a significant portion of European investment in the space sector was directed towards a single entity: the UK-based satellite manufacturer, OneWeb

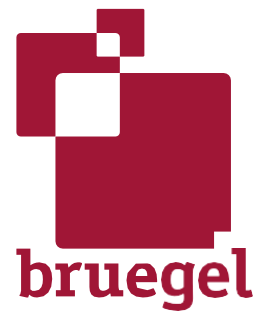
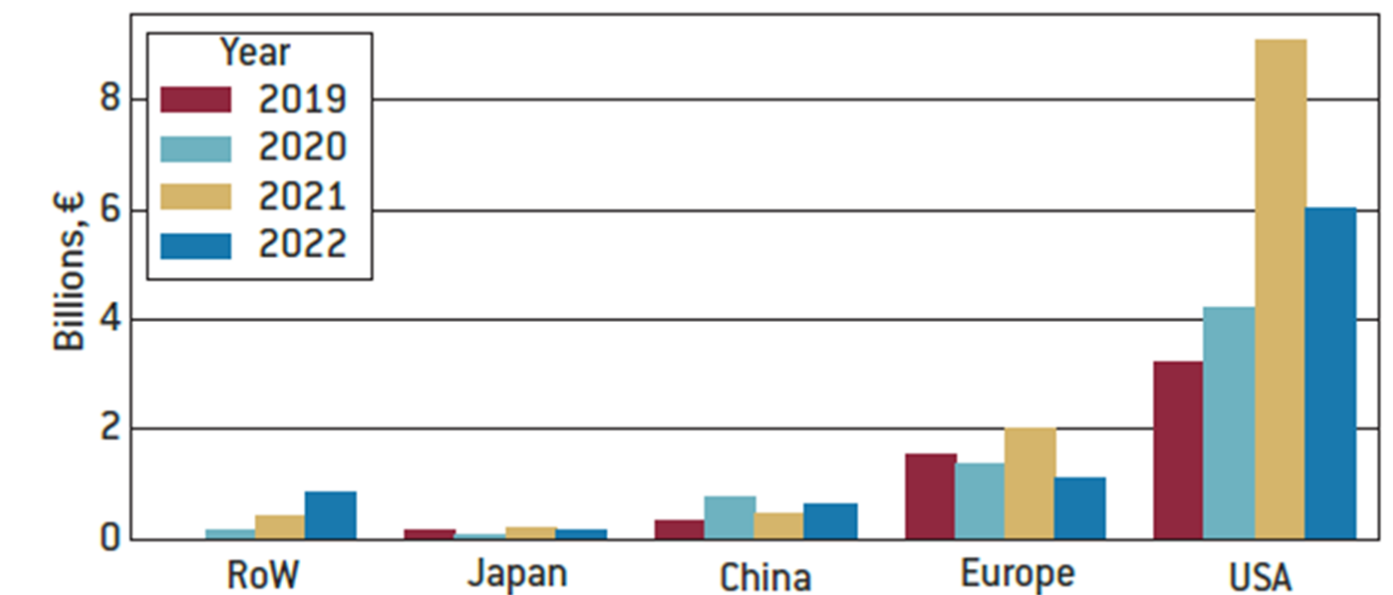


Figure 19: Total investment in startups in the space sector (2019-2022)



Source: Bruegel based on European Space Policy Institute database.

Wrapping up:

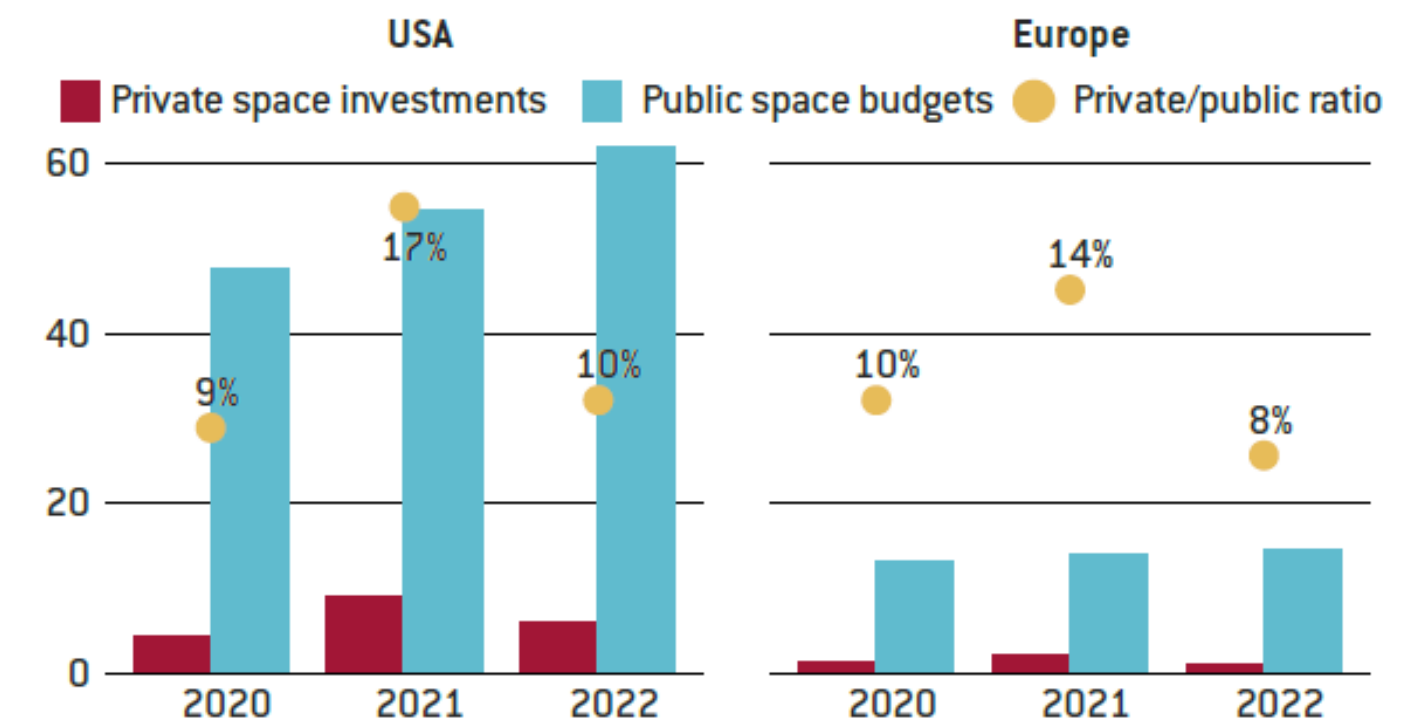
EU's position in space sector:

- US dominance; China and others emerging
- EU's lagging behind is a structural problem
 - both supply and demand characteristics;
 - both public and private bottlenecks;

On the public demand side:

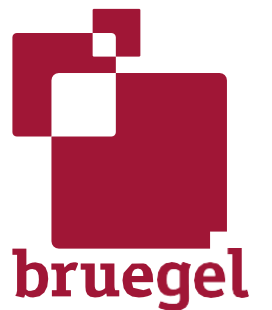
- Public space budget in Europe is 6x smaller than in the US,
- Esp defense part is not a driver;
- ...and there is no consolidated European space budget,
- No clarification of roles between ESA, EUSPA and MS
- And procurement is less innovation/competition enhancing
 - The relationship between procurers and incumbents is unhealthy
 - Only recently public contracts started to be extended to newcomers

Figure 27: Space budgets in the US and Europe (€ billions)



Source: Bruegel based on Euroconsult and ESPI.

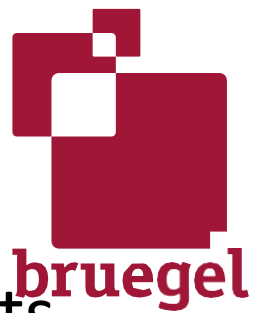
On the corporate side: European space industry is not as contestable as that of the US



- Missing in Europe is the US competitive, innovation-driven private eco-system. The EU suffers from a lack of venture capital and scale-up financing also for space start-ups, which constrains the growth of new players in the industry with the capacity to successfully provide new technology solutions.
- Europe misses the market shaping role of its public sector. Europe's public procurement is characterized by a continued focus on traditional technological models and incumbent space active firms, like the Ariane launch program, which, while once a leader, now lags behind successful American competitors such as SpaceX in terms of cost and innovation in launch.
- There is also a notable absence of public support through grants for high-risk, high-reward ventures à la DARPA.
- The dominant role of US companies and in particular SpaceX in launching and operating satellites creates for Europe the potential of critical dependency and lack of access to critical space infrastructure.

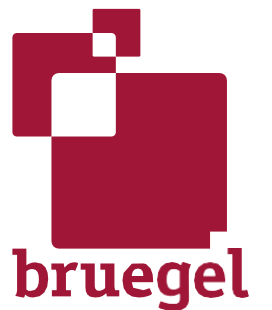
Challenges for designing an industrial policy for Space in Europe...

RECOMMENDATIONS



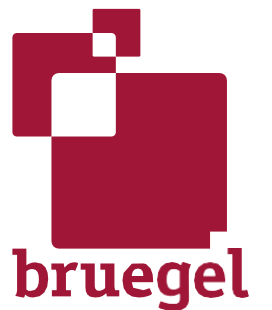
- **Clearly identify and distinguish institutional roles:** Europe as a whole should rationalise and reorganise its institutional footprint, assigning to ESA a strong scientific mandate, and to the EU (DG DEFIS and its operational agency EUSPA) economic, industrial policy, functions associated with the space economy and for the defense component.
- **Increased Public Investment and Coordination:** The EU must scale up its public investment in space, particularly in R&D and defense-related space activities. Streamlining the public space procurement landscape by coordinating the fragmented national space agencies roles and the European (EU, ESA) ones, is essential. EU
- **Leverage Defense Spending for Dual Use:** Europe lacks a dedicated defense space agency, leading to fragmented military space budgets. Increasing and coordinating defense spending is crucial to leverage synergies between defense and non-defense space activities, as seen in the US and China.
- **Commercialization as a Core Principle:** The EU should adopt a more competitive and market-driven approach to its space industry, similar to the U.S. This would not only increase the benefits for the EU from a higher economic growth dividend, but it would also make the build up of the space component for public purposes more cost efficient. Especially downstream space activities, most notably space data applications are ripe for more EU private activities, but also up- and midstream activities although more challenging to reach required scale and scope for competitiveness.

SOME MORE RECOMMENDATIONS



- **Next generation technology innovations and dynamic competition as a Core Principle:** The focus should be on procuring entrants, engaging incumbents to take risky, innovative technological decisions across the space ecosystem. This requires revisiting public procurement practices to prioritize competition, innovation, and commercialization and willingness to share the risks of new breakthrough approaches.
- **Create ARPA for High-Risk, High-Reward Projects:** Establishing a Advanced Research Projects Agency for Space (SP-ARPA) is crucial to fund disruptive, high-risk space technologies. This would mirror the US DARPA model, fostering next-generation space capabilities and supporting Europe's strategic autonomy.
- **Support for Innovation and Start-ups:** Europe needs to cultivate a vibrant space start-up ecosystem by providing better access to private capital and creating an environment where new space players can challenge, compete and cooperate with incumbents.
- **Strategic Autonomy:** Europe should seek strategic autonomy in critical areas like satellite navigation and launch capabilities, building on next generation world-leading innovative solutions developed and supported in scaled EU public and private space markets.
- **International openness and collaboration** with strong partners remain essential to ensure access to markets and cutting-edge technology.

Recommendations for EU level



- Take a EU perspective on public procurement (EU; national; ESA)
 - Coordinated public procurement calls; Jointly financed, EU topped up...
 - AT least the INNOVATIVE public procurement
 - Link with Defense for national and EU
- ESA's geo-return principle needs to be reconsidered;
- The EU and ESA procurement should be more open to new European companies (some new programs are moving in this direction, but have very small budgets)
- IPCEIs & Alliances for EU wide space eco-system building
- An EU-Space- ARPA
- Ensure a strong supply of new projects
 - Bottom up support for scientific and technology capacity development (ERC; EIT)
 - Skills formation at EU integrated level (EU level dedicated master programs, Erasmus mobility between PRO-HEI and start up and incumbent scene)

BLUEPRINT SERIES 36

RELAUNCHING EUROPE'S SPACE ECONOMY

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and Francesco Nicoli



Thank you!

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