



KEY TAKEAWAYS

1 A second digital paradigm shift is upon us. Space Based Data Centres (SBDCs) have matured from a speculative idea into an emerging field of industrial development, garnering **attention from digital giant executives** such as Amazon (Jeff Bezos), Google (Sundar Pichai), xAI (Elon Musk), and the Alibaba Group (through Zhejiang Lab).

2 The global data centre market is expected to reach €535 Billion in 2030. Driven by unprecedented demand for data centre processing and computing power on Earth for AI, an increased strain on terrestrial energy and environmental resources, and increased data generation of operational and future satellites in orbit. These developments drove Jeff Bezos to assert “We will be able to beat the cost of terrestrial data centres in space in the next couple of decades.”

3 A dynamic ecosystem of **startups targeting the market** has emerged over the past years across Europe, North America, and Asia. Close to €70 million in private investment was tracked targeting the application itself, or directly relevant enabling components.

- ADA Space and Zhejiang Lab (China) have launched the initial 12 satellites from the planned 2,800 satellite-strong Three-Body Computing Constellation.
- In November 2025, Starcloud (USA) launched its initial demo satellite featuring the first Nvidia H100 GPU in space.
- European startups and scaleups are also active in this segment either directly targeting the market or enabling infrastructure, including D-Orbit, KP Labs, Edge Aerospace, and Loft Orbital.

4 Several **institutional programmes**, including the EU-funded ASCEND study led by Thales Alenia Space, and ESA missions such as Φ -sat, have developed building blocks that can enable a future on-orbit data processing infrastructure.

5 **Formidable challenges remain** to reach gigawatt-scale infrastructure.

- Launch costs, while falling thanks to reusable rockets like SpaceX’s Falcon 9 and soon, Starship, remain a significant barrier.
- Thermal management itself, dissipating gigawatts of waste heat in orbit is a daunting engineering task.
- In-orbit assembly is still underdeveloped to reach integrated gigawatt-scale infrastructure in the short term



OUR RECOMMENDATION

Europe cannot afford to miss a new potential golden age with high multiplier effects across the economy. While developments are in their infancy, Europe should capture the opportunity using ESA’s GSP and the EC’s IOD/IOV programmes as a public-private testbed for enabling technologies, critical components, and operational practices in pursuit of SBDCs. Near-term opportunities already exist in improved in-orbit edge computing and satellite-to-cloud integration, which could act as stepping stones toward larger ambitions.

Building on the findings of the ASCEND study and in view of the proposed Horizon Europe Moonshot Projects under the 2028-2034 MFF, an ambitious European Space Based Data Centre initiative should be proposed. Going beyond R&D and demonstration, it should include a phased roadmap towards potential commercial deployment, supported by ESA’s ARTES programme.

While the technical and economic challenges remain a barrier, it is exactly disruptive concepts such as SBDCs that can, if successful, massively boost Europe’s competitiveness and, in turn, autonomy, repositioning Europe as a global leader.