SATELLITE VALUE CHAIN: SNAPSHOT 2017

KEY TRENDS AND INDICATORS ON SUPPLY & DEMAND OF THE WORLD COMMERCIAL SATELLITE INDUSTRY – AN EXTRACT
WHO WE ARE / WHAT WE DO

We are trusted experts in the satellite industry, advising the world’s leading businesses and governments.

AT A GLANCE

- Over 30 years of experience in space markets
- Multi-cultural team of over 30 full-time experts
- 600 clients in over 50 countries
- Completed 500+ consulting missions in over 50 countries
- Missions conducted in all world regions on a yearly basis
- We participate in over 30 international events each year

Following the acquisition of a majority stake, Southern Aerospace & Telecom Consulting (SATConsult) has joined the Euroconsult group. Euroconsult & SatConsult will continue to operate as separate companies and will work in concert on a project-by-project basis.

Together the two companies boast an international roster of nearly 80 experts from a host of countries that can be called upon for projects across the entire spectrum of the satellite value chain and expertise domains.
THE BEST OF EUROCONSULT’S RESEARCH

REPORT CONTENT COMES FROM:

- SATELLITES TO BE BUILT & LAUNCHED BY 2026
- SATELLITE COMMUNICATIONS & BROADCASTING MARKETS SURVEY
- SATELLITE-BASED EARTH OBSERVATION: MARKET PROSPECTS TO 2026
- TRENDS & PROSPECTS FOR EMERGING SPACE PROGRAMS
- HIGH THROUGHPUT SATELLITES: VERTICAL MARKET ANALYSIS & FORECASTS
- PROSPECTS FOR IN-FLIGHT ENTERTAINMENT & CONNECTIVITY
- PROSPECTS FOR MARITIME SATELLITE COMMUNICATIONS
- PROSPECTS FOR THE SMALL SATELLITE MARKET

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STRATEGIC ISSUES
The satellite industry is an infrastructure supplier to government agencies and commercial companies. It operates upstream of a value chain that flows downstream to the end-users of satellite capabilities.

The satellite value chain permits the delivery of space-based services reliant on satellite technology, and includes a wide diversity of stakeholders, active at five levels of the chain:

1. **Government agencies** who fund space technology R&D for their own uses and for dual-uses: public R&D efforts remain highly concentrated in a limited number of countries;
2. **The space industry** (upstream) that includes a limited number of players who design and manufacture space systems and their launch vehicles;
3. **The satellite operators** who own the satellite systems and market their capacities to the service providers (downstream) who deliver communications, navigation and geographic information services to the final users by integrating the satellite signal into packaged solutions;
4. **Ground segment and terminal suppliers**, who design and deliver a large variety of software and equipment for both the management of satellite infrastructure, and for the access to services by the users. Customers stand along the value chain;
5. **The final users**, whether governmental (civil/military) or commercial (business or customer), do not ask for the satellite technology per se but for solutions tailored to their needs, whether for better communications, navigation or geographic information services.
INTRODUCTION TO THE SATELLITE VALUE CHAIN
OVERVIEW OF THE COMMERCIAL SATELLITE VALUE CHAIN IN 2016

**MANUFACTURING:** $4.9B
5Y CAGR: +8.6% EBITDA: <10%

**LAUNCH:** $2.5B
5Y CAGR: +10.4% EBITDA: <10%

**OPERATIONS:** $14B
5Y CAGR: +0.7% EBITDA: 50-80%

**SERVICE:** $228B
5Y CAGR: +7.0% EBITDA: 5-30%

$250 BILLION
Cumulated turnover
7% 5-year CAGR
97% DOWNSTREAM
3% UPSTREAM

Figures include commercially-active companies with at least 1 satellite in operation or under construction; satellites equal to or greater than 50kg.
A total of 963 satellites have been launched worldwide over the decade by government agencies and commercial clients, i.e. an average of 96 units/year. The rise of small satellites and mega constellations in the next 10 years will dramatically increase this number.

Governments remain the primary client of the space industry, launching 80% of the 963 satellites during the decade (i.e., 771 units). However, due to the rise of constellations, commercial satellites are expected to replace government satellites as the largest market next decade.

Telecommunication is the largest application, with 375 satellites launched over 2007-2016, while Earth observation programs launched 259 satellites. Together these two applications accounted for 68% of the total. The remaining six applications together accounted for 329 satellites.

Asia/Oceania and North America launched together 578 satellites (60% of the global total), predominantly for governments. North America led the commercial demand, with 129 of 252 total global satellites.
• The wholesale of satellite capacity is the primary revenue source for both FSS and MSS operators. After the significant drop in revenues recorded in 2015 (more than 5% decrease), total wholesale revenue from satellite operators slightly decreased by -0.7% in 2016 and reached $12.4 billion. The reduction was entirely due to a decline in FSS operators revenue, which nevertheless accounted for ~88% of total wholesale revenues.

• Following a period of limited growth for the FSS industry in recent years, revenues declined by ~7% in 2015 and 0.8% in 2016, to $10.9 billion. While the strengthening of the U.S. dollar explained a significant part of the decrease in 2015, it played a marginal role in 2016. The decline was entirely driven by the fierce price competition throughout the year with the oversupply of regular satellite capacity, exacerbated by the rapid expansion of HTS capacity.

• Total MSS wholesale revenue reached $1.47 billion in 2016, with a 0.8% growth y-o-y. The speed for MSS operators to adapt to the new market environments (new product, new pricing, new distribution, etc.) has helped MSS operators to control the churn to VSAT and terrestrial competitors.
The commercial data market totaled $1.8 billion in 2016; this represents 7% growth over 2015 and a five-year CAGR of 5%.

Defense markets dominate, topping $1.1 billion in 2016. Non-U.S. defense spending continues to grow strongly, reaching $712 million in 2016 for a five-year CAGR of 10%.

The VHR optical data market is valued at $1.2 billion, primarily defense-driven. Very High-Resolution and High- to Moderate-Resolution account for 83% of the total market.

The remaining 17% corresponds to SAR data. SAR has not experienced the same ramp-up in sales as optical data; however, in specific application areas, such as maritime domain awareness, it is gaining more traction. Higher SAR data costs also remain an issue.

Data pricing is driven by ground resolution and geolocation accuracy: higher resolution and accuracy = more complex and costly systems.
The GNSS market, estimated at nearly $95 billion in 2016, includes both sales of GNSS devices (i.e. terminals) and revenues generated by GNSS added-value services (services which leverage GNSS technology, such as fleet management, navigation services, etc.).

Sales of devices will grow steadily (forecasted at 6% annually until 2020, and 3% afterwards as the market matures), while revenues from services, which overtook revenues from devices in 2015, will experience very strong growth (20% annually) until 2020, slowing to 10% through 2025. By 2020, revenues from added-value services will double revenues from terminals, driven by trends such as 5G, IoT, Automated Driving, Smart Cities, etc.

The GNSS market has tripled in value over the past decade, driven by the LBS and road segments, and forecast to reach over $300 billion by 2026.

Though LBS accounts for 96% of GNSS shipments in 2016, Road is the largest segment in revenues (49% of GNSS market), mainly driven by in-vehicle systems (IVS), accounting for 40% of total road revenues. IVS represent strong commercial opportunities, especially for navigation and connected cars, meaning that automotive manufacturers are becoming the largest integrators of GNSS solutions.

GNSS industry revenues are heavily concentrated: 75% of revenues are generated roughly equally in the US, Europe and Japan, with China at 11%.
ABOUT EUROCONSULT // CONSULTING & RESEARCH REPORTS

CONSULTING

BUSINESS STRATEGY
Market analysis & forecasts • Competitive analysis & benchmarking • Customer surveys • SWOT assessment

DUE DILIGENCE
Independent business case assessments • Pricing valuations • Revenue forecasts & DCF modeling • Feasibility study

GOVERNMENT POLICY
Policy & program evaluation • Impact assessments • Socio-economic & cost benefit analysis • International benchmarking and best practices

PROGRAM MANAGEMENT
Program specifications & procurement • Management and process optimization • Marketing and sales strategy

2017 RESEARCH REPORTS

✓ Satellite Communications for Defense & Security
✓ Prospects for In-Flight Entertainment & Connectivity
✓ Government Space Programs: Benchmarks, Profiles & Forecasts
✓ High Throughput Satellites: Vertical Market Analysis & Forecasts
✓ Prospects for the Small Satellite Market
✓ Prospects for L-Band, IoT & M2M Markets
✓ Satellite Communications & Broadcasting Markets Survey
✓ Satellites to be Built & Launched by 2026
✓ Satellite-Based Earth Observation
✓ Satellite Value Chain: Snapshot 2017
ABOUT EUROCONSULT // EXECUTIVE SUMMITS & EVENTS

21ST SUMMIT FOR SATELLITE FINANCING
Sept. 11-13, 2017 / The Westin - Paris

The must-attend senior executive event for the satellite communication industry

> 550+ executive participants
> 80+ senior executive speakers
> 45+ countries

SMART Plane 2017
Sept. 11, 2017 / The Westin - Paris

The premier annual executive meeting place for the IFEC community

> 100+ executive participants
> 20 senior executive speakers

9TH SUMMIT ON EARTH OBSERVATION BUSINESS

The unique international event dedicated to commercial satellite imagery

> 250+ executives and senior government officials
> 40+ senior executive speakers
> 45+ countries

4th annual LATSAT
May 23-24, 2017 - Mexico City

The unique executive meeting place for the Latin American telecommunications sector

> 250+ executive participants
> 40+ senior executive speakers
> 25 countries

Perspectives Spatiales 2017

The unrivaled annual event for the French and European space sectors

> 200+ executives and senior government officials
> 40+ executive speakers

BRINGING TOGETHER EXECUTIVES OF THE GLOBAL SATELLITE COMMUNICATIONS AND INFORMATION BUSINESS
ABOUT EUROCONSULT // TRAINING PROGRAMS

• Interdisciplinary training on all aspects of the space industry – markets, financial, policy, technical, program management, etc.
• Build your own program or benefit from packaged programs based on your needs
• Benchmarking, profiling, best practices and lessons learned from key players
• Flexibility in choosing a training location, ranging from on-site training at your office, at our offices or in prestigious third-party locations
• Exposure to training in a variety of mediums and formats, from videoconferences to seminars and hands-on exercises, over a few hours, days or week-long sessions

We organize tours of government/private industry facilities and meetings with high-level international executive & officials:

TRAINING SESSIONS
Visits of public and private organizations in one or several countries to

Connect with executives and facilitate cooperation

Identify best practices for operations and innovation

• Groups of 10-20 executives
• Duration up to 5-10 days to facilitate cooperation
• We can organize sessions in most world regions