



Space Telecommunications Challenges of a key sector for Europe

The European space telecommunications manufacturing industry is a sector mostly acting on the worldwide commercial scene. Its sustainability is constantly put at risk by non-European competitors, benefiting from a significant Public support. The situation is totally unbalanced for the European industry which future is at stake. The sector has thus identified institutional supportive actions, which will help it to remain in the race.

► A key Space sector addressing EU priorities

Today, the communication satellites manufacturing sector (SatCom) is:

- **Recognised by the EU Space Industrial Policy** as “instrumental in sustaining Europe’s space industry”;
- **Contributing to more than 50% of the revenues of the European Satellite manufacturing industry** which represents today 36000 highly qualified jobs across Europe.

► World-class European industry on a market subject to uncertainties and suffering from an uneven playing field with the non-European competition.

Broadcast is the core SatCom market but the evolution of TV usages and the deployment of 5G impose to innovate at infrastructure level. High throughput satellites are confirmed as the next growth axis but satellite services take-up in Europe remains slow. Also, major Internet players now seriously envisage the usage of satellites to reach any part of the planet, leading to potential new markets yet difficult to assess. **Concurrently, the European SatCom sector is put at risk by non EU-players** who benefit from huge supports on their domestic markets (allowing them to develop leading-edge technologies) as well as on the export fronts.

► The European SatCom sector needs to equally benefit from political, financial and regulatory EU support in order to remain in the race.

Because it acts on a worldwide competitive commercial scene, the European SatCom manufacturing industry needs the support of European institutions to establish a level playing field:

- **Ambitious and sustainable R&D programmes dedicated to the European SatCom industry, duly coordinated across Europe (ESA, EC and national agencies)**
 - Establish European industry fundamental assets and competitiveness to address the post 2020 markets
 - Achieve the European non-dependence on both critical technologies and components
 - Develop novel architectures to answer ICT market trends
- **Appropriate framework and legal instruments to enable the deployment of innovative SatCom infrastructures to serve the EU agenda** (especially the Digital Agenda for Europe and the Common Security and Defence Policy):
 - Foster the European governmental markets (e.g GovSatCom)
 - Set-up innovative Public financial schemes to support both infrastructures and services
 - Manage market demand aggregation, support awareness and demand stimulation
- **Set-up European standards, regulations and international policies**
 - Address regulations: preserve and enlarge the necessary frequencies spectrum
 - Address standards (e.g protocols and interfaces) for the satellite infrastructures and network (space and ground segment) and the inter-working with other networks.
 - Support and incentivise operators and user’s to buy European satellite infrastructures and solutions (be they from the EU or not)
 - Support the European industry on identifying and developing new export markets.

For a thorough analysis please consult the annex of this position paper available at:

www.eurospace.org ► Research & Publications ► Position Papers ► Space Telecoms

Space Telecommunications: a key sector for Europe

► A key Space sector...

Space solutions enable a wide range of services involved in the day-to-day activities of European citizens, companies and governments. The space manufacturing industry relies on a small but highly qualified workforce (36,000 persons, 65% holding a PhD or an engineering degree) across Europe. Within this sector, Telecommunications holds a specific and important position:

- **The core of the space manufacturing sector:** Satcom today contribute to more than 50% of the European Satellite manufacturing industry revenues (space and ground infrastructures)
- **A mostly commercial market:** export and private customers generate currently about 85% of the European SatCom manufacturers' sales, in turn supporting the competitiveness of the industry on the governmental market.
- **The anchor customer of the launch industry:** telecommunications operators are the main customers of European launch services (38 satellites out of the 64 launched from Kourou over the last 3 years – out of which only 1 was a European government owned satellite).
- **A domain in which SMEs develop:** hundreds of SMEs are active and continue to develop on the entire Satcom value chain.

While the Satcom market open to competition is a strong pillar of the space manufacturing industry, it remains small. Any evolution has an immediate, potentially strong and structural impact on the European space manufacturing industry and its jobs. These highly qualified jobs and technological skills took a long time to get but could be lost quickly.

► ...addressing EU priorities

The SatCom industry addresses key societal challenges and policy objectives of the EU agenda:

- **It is at the heart of the European Space policy:** The SatCom manufacturing industry is recognized by the EU Space Industrial Policy as “instrumental in sustaining Europe’s entire space industry”. The SATCOM market is characterised by its extreme dynamism; developing solution always more flexible and more capacitive remain a primary concern to maintain European space industry competitiveness.
- **It is an enabler to reach EU Digital Agenda objectives:**
 - **Broadband for All:** Satellite broadband has proved the ideal tool to overcome the digital divide in Europe and has allowed fulfilling the 2013 DAE objective: broadband for all. The challenge now lies with both i) the adoption of the available services, especially in isolated and rural areas where the demand has to be stimulated and ii) and the delivery of very high speed satellite services to address the DAE 2020 objectives.
 - **Upcoming 5G networks** architectures will include multiple layers, diversified and integrated technologies (wireless, wireline and satellites). They will in addition provide an overall improved spectrum, energy and cost efficiency as well as higher resiliency of current and future network infrastructures. The future 5G networks open a lot of challenges not only in mastering the necessary innovations to integrate all technologies together but also in identifying the various business models to deliver 5G services.
 - **A building block for the Common Security and Defence Policy:** Secured satellites-enabled communications constitute a critical factor in the EU’s and individual Member States ability to respond autonomously (when required) and in a timely manner to global defence, security, humanitarian, emergency response or other challenges. As the period 2017-2025 will see the renewal of all existing military and governmental assets, it is a unique window of opportunity to develop a GOVERNMENTAL SATellite COMMunication capacity that could serve the EU and its Member states needs. European industry is fully dedicated to support the current EU GOVSATCOM initiative and stands ready to contribute to the discussions aiming at preparing the post-2025 generation possibly through a new paradigm.

An industry constantly challenged

► Market uncertainties...

The European SatCom manufacturing industry is highly performing on the world-wide scene but its positioning is constantly challenged: thanks to a tremendous R&D effort, supported by public agencies, its sales share increased from 26% in 2012 to 46% in 2014, almost even with the US manufacturers. The reaction of the non-European competition is immediate: prices are aggressively low, and financial packaging and schedule become key differentiators. Besides, Boeing announced its intention to double the capacity of its satellites every 3 years while Loral enters a new era and claims to adopt a “Silicon Valley Attitude”. Thus, this January 2015 snapshot does not guarantee the sustainability of the European SatCom industry.

- **A limited market size:** The market open to competition has slightly increased to 22 new satellite opportunities in 2014 shared amongst an increasing number of world-class manufacturers (today 8 to 10 of them with China preparing to put in the market 3 new SatCom platforms) from which 2 are European. If one can anticipate a stabilisation around 25 satellites per year in the decade, it still remains a limited market with more competitors meaning fewer opportunities for Europe, whereas the smallest market size variation (be it caused by technological, regulatory, political or financial evolutions) has a significant impact on the sector (jobs and competitiveness).
 - Foster competitiveness through innovation, cutting edge technologies and innovative financial schemes.
- **Dynamic market evolutions:** Broadcast remains the core market for SatCom, driven by video traffic.
 - However, because of major evolutions on the TV usages and the deployment of the 5G ecosystem from 2020 onwards, SatCom Broadcast infrastructures will have to evolve. High throughput satellites are confirmed as the next growth axis: those high-speed broadband satellites will represent one third of the launches of the next 3 years. While the European industry competes with the most advanced American ones, the low institutional European demand and support does not encourage market take-up in Europe and thus does not create the conditions for a significant increase internet-by-satellite services over Europe.
 - A new kind of customers, stemming from the Internet world, has appeared. Their disruptive and creative approaches combined to tremendous financial capabilities are opening potential new markets yet to assess.
 - Secure the broadcast spectrum, support the emergence of innovative and disruptive satellite solutions and act to increase the take-up to new broadband services in Europe.
- **New launch services:** Europe has rapidly reacted to the market distortion (enormous US Government supports) which enabled the aggressive Boeing/Space X offer for an “all-electric / launcher” package. Thanks to its high technology skills and industrial competences, and backed by its institutions, the European industry has been able to implement in 2014 similar contracts: all-electric European satellites for an European operator launched on Ariane. However the situation remains fragile because of the continuing strong American public support combined to a large domestic and military market.
 - Develop public programmes calling for attractive European solutions (satellite + launch) to fulfil European Public objectives (e.g. the Digital Agenda and the CSDP).

► ... and an unbalanced playing field

Non-EU competitors (American, Chinese, Russian, Japanese and Indian industries) benefit from large public supports leading to outstanding competitive advantages when they address the commercial markets:

- **Large non-European governmental markets:** most non-EU players benefit from large governmental programmes (institutional and military) which embed a high level of R&D&I funds
 - Over the last years, more than 20 major contracts have been awarded to the US industry. Government contracts represent more than 50% of the US manufacturers business while they represent only 15% of the European ones. Furthermore, US governmental contracts values are often twice as expensive than in Europe for similar deliverables (infrastructures or services)
 - Russia is restructuring its entire space industry within a holding whose capital is 100% owned by the government, with the goal to render its industry competitive on the commercial market. No doubt the 9 military communications satellites to be launched by 2020 will help.
 - In comparison to the above, the European governmental market remains too small to generate a level of activities sufficient to develop novel technologies re-usable on the commercial scene.
- **Bi-lateral governmental barter agreements:** non-EU competitors also benefit from bi-lateral governmental agreements, for example in Australia, Africa and South America where US and China industries managed new captive markets. On one side the US administration delivered WGS network services to Australia against a space infrastructure contract to Boeing and on the other side China delivered satellites to Nigeria and Congo against raw material and crude oil. China recent announcement of the introduction 3 new telecommunications platforms bearing advanced technologies will further support this strategy.

EU support to the SatCom industry

In this context, the European SatCom manufacturing industry calls for timely, strong and sustainable initiatives from the European Union. At stake is no less than the competitiveness and sustainability of an essential sector for Europe.

- **R&D&I: specific, sustainable and focused supports duly coordinated across Europe (ESA, EC and national agencies)** to enhance the satellites performances and attractiveness while providing a sound answer to the overall ICT market. H2020 should therefore contribute in the following areas:
 - H2020 ICT should address users and network-centric activities fostering disruptive combinations of terrestrial and satellite network technologies to build future network infrastructures (including 5G but not only). Both R&D developments and transition to market initiatives (Innovation) should be supported by EU. A few percent of the networks architectures research budget should be dedicated to address the contribution of satellite to the 5G KPIs, in particular in the areas of backhauling (bringing data from the internet backbone to a distribution network) and traffic off-loading (to avoid congestion on terrestrial networks).
 - H2020 Space should include a sustainable line of activities, organised around a vision answering the long term societal challenges of Europe and aiming at preparing the competitiveness of the European industry for the markets beyond 2020. Today, public R&D effort is successful in supporting the SatCom sector for the current race within an harsh competition environment but this landscape is not static. Through research on low TRL space and ground technologies (including an IOV/IOD component), H2020 Space could play a major role in the establishment of the fundamental assets for the competitiveness of the European industry for future markets. Indeed, what appears today as niche services could become the core of the communication market beyond 2020. Such approach would complete the current set-up where i) ESA and national Space agencies are rather addressing mid-to-high TRL technologies and ii) DG CONNECT is addressing with H2020 ICT the integration of the various type of networks. To ensure an impactful research, a significant percentage of the H2020 Space Low TRL technologies topic should be reserved each year for SatCom specific activities.
 - H2020 Security, H2020 Societal Challenges and possibly the CSDP Preparatory Action should support specific SatCom R&D and contribute to the deployment of SatCom solutions in support to EU policies (e.g through large scale pilot projects and services).
- **Technologies and components non-dependence:** set up an industrial policy addressing EU non-dependence so that the European industry no longer depends on its competitors.
- **Enhanced the use of SatCom services in Europe:** foster the deployment of innovative SatCom infrastructures to serve the EU agenda (in particular Digital Agenda for Europe, Common Defence and Security Policy and data collection and distribution for Environmental monitoring):
 - New financial schemes involving Public support to facilitate for example IOV/IOD,
 - Market demand aggregation schemes and enhancement/generalisation of support actions such as the Voucher Scheme subsidising the Customer Premises Equipment (antenna) and its installation (already deployed in some regions on the basis of national or European funds),
 - Deployment of public policies ensuring e-services for all across Europe (for education, health, agriculture...), thus naturally leveraging on the commercial satellite broadband market growth uncertainty in isolated/rural areas,
 - Pan-European harmonisation of standards and regulation frameworks (e.g ensure interoperability with terrestrial networks),
 - Enlarged governmental markets.
- **Spectrum policy:** the spectrum primarily allocated to satellite communication services (BSS, FSS and MSS) should be protected in consideration of the requests of terrestrial services community for new frequency allocations;
- **Institutional support on the export scene to bring the European industry on a level-playing field with its non-EU competitors:** bring the European satellite industry on a level playing field with its non-EU competitors in particular in the field of:
 - Competition rules: manage fair evaluation rules with criteria encompassing in particular costs/benefits, assessment of the strategic character of the procured item and the identification of potential governmental support to non-EU competitors.
 - Competitiveness: fairly consult industry for R&D&I roadmaps, and devote a budget level allowing fair level playing on the international front.
 - Bi/Multi-lateral agreements to support the export market: access to finance, to European services, to R&D, to transfers of technologies, to sharing risks (technologies, markets, etc.).