

Space 4 Critical Infrastructure: GOVSATCOM and other space programme components

Online meeting, 23rd June 2022

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Critical Infrastructures

Definition and Scope

Infrastructures

Energy & Raw Materials

Insurance & Finance



Timing & Synchronisation (T&S) of Telecommunication Networks

- Data Centre
- Digital Cellular Network (DCN)
- Professional Mobile Radio (PMR)
- Public Switched Telephone Network (PSTN)
- Satellite Communication (SATCOM)
- Small Cells

Energy Network Fidelity

- Energy Network conditions monitoring
- Phasor Measurement Units (PMU)

Finance

- Commodities trading
- Risk assessment
- Timing and Synchronisation for finance (Banks & Stock Exchange)

Critical Infrastructures

Legend
 EO application
 GNSS application
 Synergetic application (combined use of EO and GNSS)

Critical Infrastructures

Applications

Telecommunication applications

- Digital Cellular Network (DCN)
- Public Switched Telephone Network (PSTN)
- Professional Mobile Radio (PMR)
- Satellite Communication (SATCOM)
- Small cells

Energy operators

- Phasor Measurement Units

Finance applications

- Banks
- Stock Exchanges

EUSpace

Galileo

Copernicus

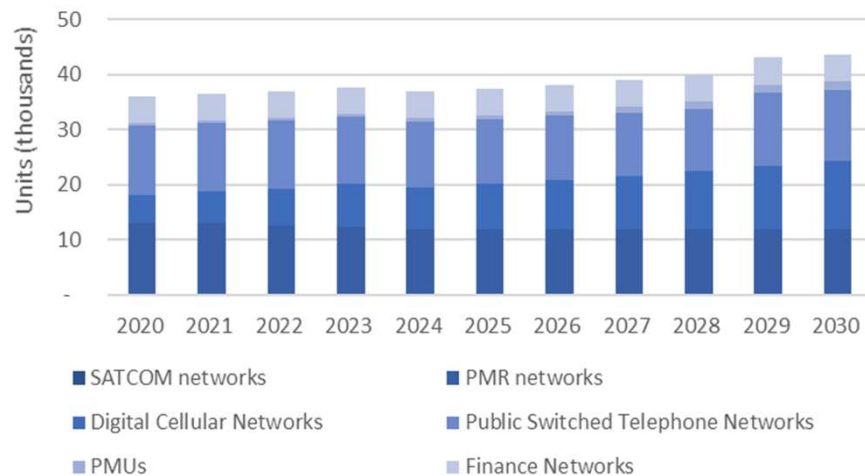
GovSatCom

SST

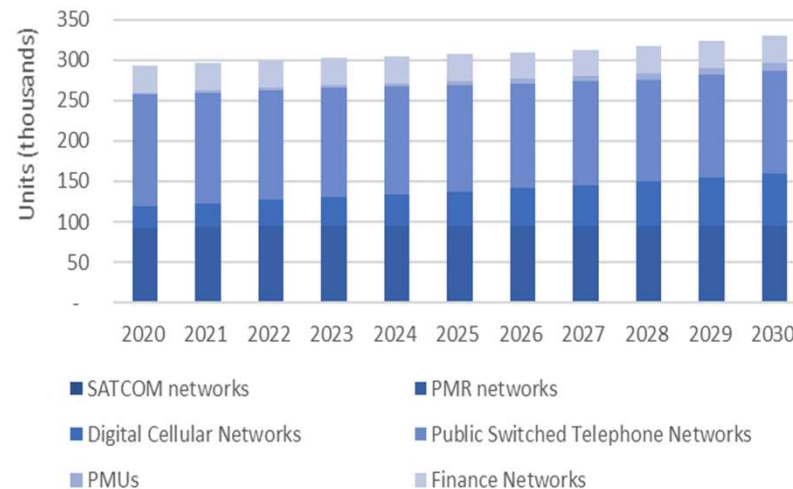
Market potential for EU Space downstream



GNSS receiver shipments by application (CIV)



GNSS receiver installed base by application (CIV)



The GNSS CI market is driven by **telecom applications**, which should stand for **84% of the shipments and 80% of the revenues in 2030**. The GNSS CIV market should benefit from the 5G rollout in the DCN market with a 9% CAGR growth over the forecast period 2020-2030.

Main trends and challenges

Telecommunications



Trends

- Backup time stamping
- Handover between base stations
- Time slot synchronisation and management
- Event logging
- Higher data rates and more stringent needs for synchronisation

Challenges

- Better timing and synchronization accuracy, robustness to interference
- Availability and continuity of service in case of crisis

Energy



Trends

- GNSS (GPS) master clock synchronisation is the predominant timing source
- Power substations currently are switching from terrestrial network synchronisation to GNSS based timing source

Challenges

- Increased resilience to Interference and timing integrity

Finance



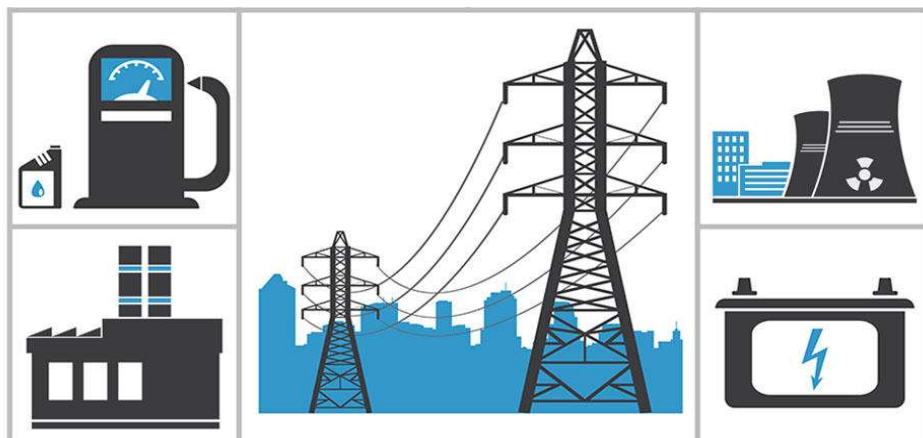
Trends

- T&S solutions required for time stamping financial transactions
- Financial services are currently shifting to GNSS-stamped precise time from atomic clocks

Challenges

- Increased resilience to Interference, and timing integrity
- Increasing robustness to GNSS signal outages and anomalies

Increasing Galileo adoption



- **Ensuring the resilience of European infrastructure is both a major goal and a major challenge**
- **To this end, the EU seeks to utilise Galileo for critical infrastructure that depends on timing and synchronization**
- **EU-funded projects are looking to further protect and improve the resilience leveraging the key differentiator offered by Galileo in this respect**
- **Also, the deployment of 5G networks in Europe will increase the Galileo penetration in the TLC market**

Rolling Out OSNMA for the secure synchronization of Telecom networks

- ROOT is an EU-funded project which will assess the benefits introduced by the Galileo authenticated signals (OSNMA) in the specific context of the synchronisation of 5G telecommunication network.
- ROOT will foster the adoption of Galileo signals featuring authentication mechanisms in terrestrial infrastructure that depend on satellite-derived time.



HORIZON 2020

<https://www.gnss-root.eu>

BroadGNSS: a PCP project

- BroadGNSS is an EU-funded project which will procure Innovative solutions for the Synchronisation and Monitoring of Critical Mobile Broadband Communication Infrastructure and Information Assets for Public Protection and Disaster Recovery (PPDR) Operations
- BroadGNSS will contribute to increase Galileo market penetration in the domain of high precision timing and synchronisation



The Request for tenders is open until 2nd of September

<https://www.broadgnss-info.eu/request-for-tenders/>

Timing and Synchronisation for the Critical Infrastructures

The way forward - Towards a roadmap

Applications

Telecommunication applications

..

Energy operators

..

Finance applications

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Synergetic downstream applications

Infrastructure site selection and planning

Pipeline monitoring

..

EUSpace

Galileo

Copernicus

GovSatCom

SST

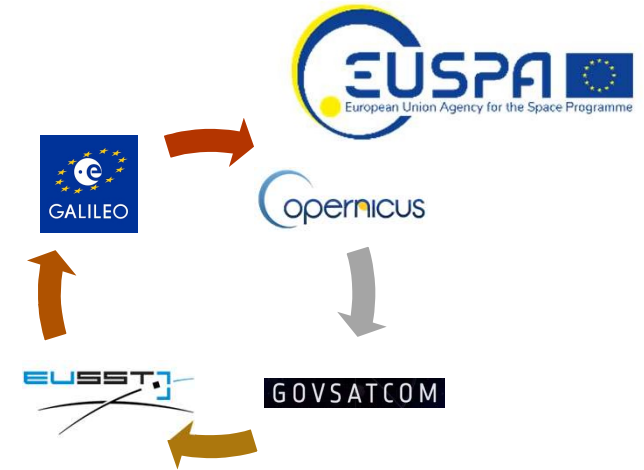
Integrated applications: Critical Infrastructures Monitoring



(Critical) Infrastructure

- Include the management of a wide range of national and EU infrastructures, such as telecom networks, nuclear power plants, space infra, energy systems etc.

Critical Infrastructures Monitoring



Monitoring of a wide range of national infrastructures, such as nuclear power plants, energy systems,, as well as EU Space infrastructures, such as Galileo and Copernicus. Located both in EU and outside.

Users: infrastructure operators and service providers, responsible for the critical infrastructure operations and monitoring.

- **Galileo** services providing essential **synchronization** data, as well as **positioning and guidance** for monitoring personnel and assets (e.g. drones, ..)
- **Satellite imagery to monitor the operational status of the facilities.** Multiple images to monitor the status over time in and around the infrastructure, hence facilitating the monitoring both the operational status and the security of the surrounding area if relevant (e.g. in case of intentional threats or accidents).
- **Secure and reliable transmission capabilities**, supporting the interconnection of remote sites (e.g. Galileo GSS) and the exchange of sensitive information.
- Information on expected **space objects re-entries** threatening key infrastructures provided by SSA for preparedness and reallocation of key operations to other available assets (if existing).

GOVSATCOM – Governmental Satellite Communication



Today

- fragmentation of users –
military | governmental | civilian:
- suboptimal use of satellite resources
- interoperability issues

GOVSATCOM

- Pooling** of existing satellite communication capacities and **aggregation** of user demand
- optimise match between GOVSATCOM **demand** and **supply**
- support **security** features
- foster **interoperability**



GOVSATCOM

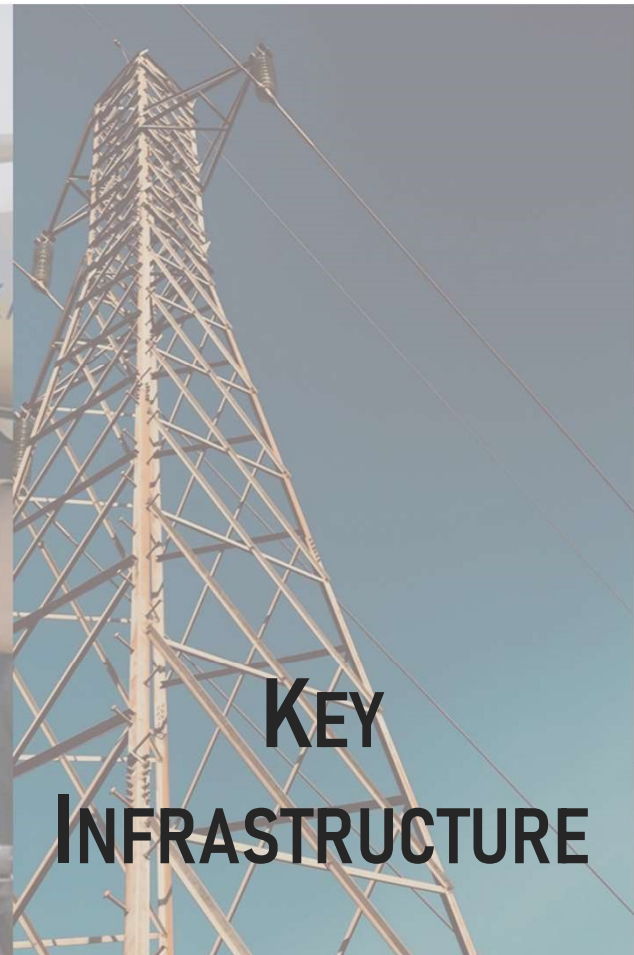
use case families



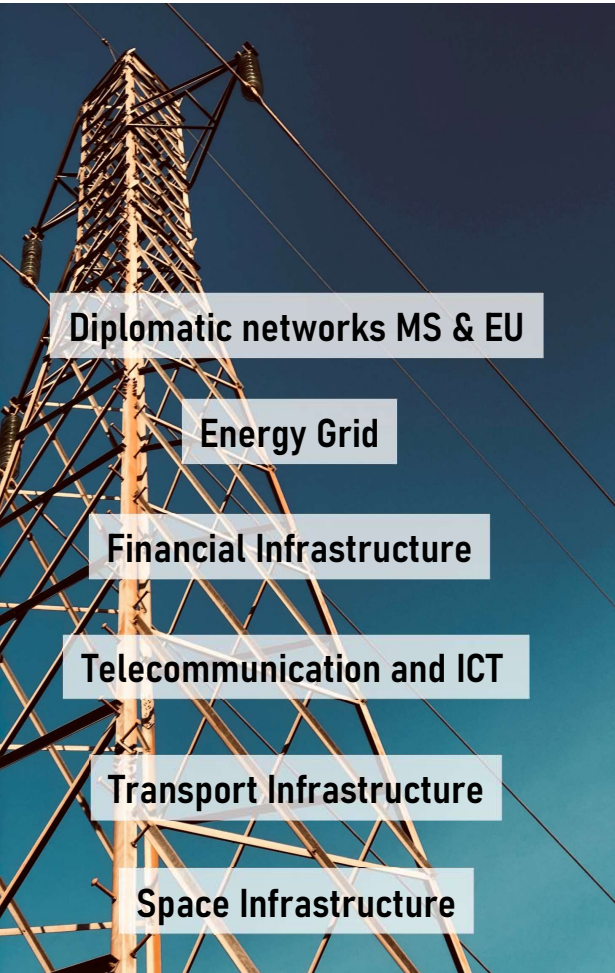
**CRISIS
MANAGEMENT**



SURVEILLANCE



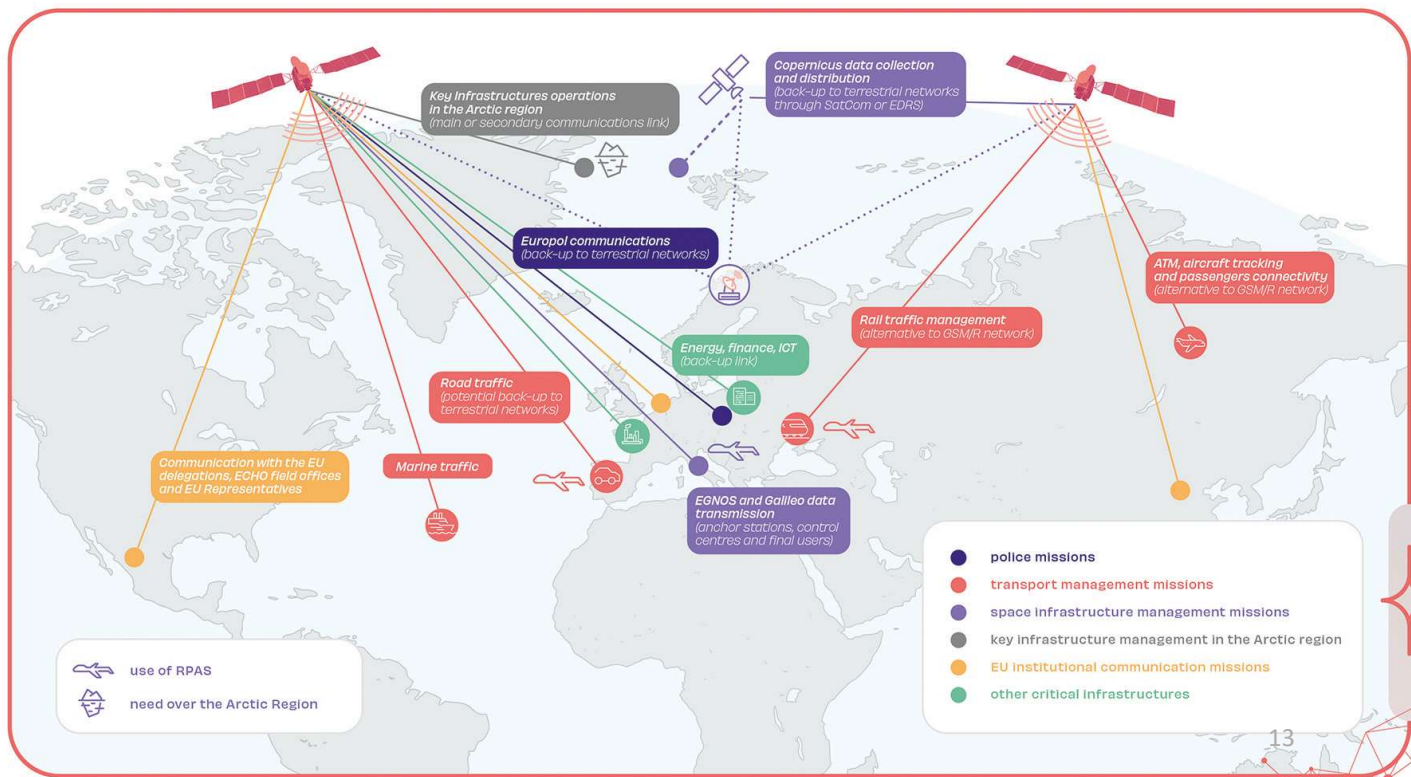
**KEY
INFRASTRUCTURE**



Key Infrastructure



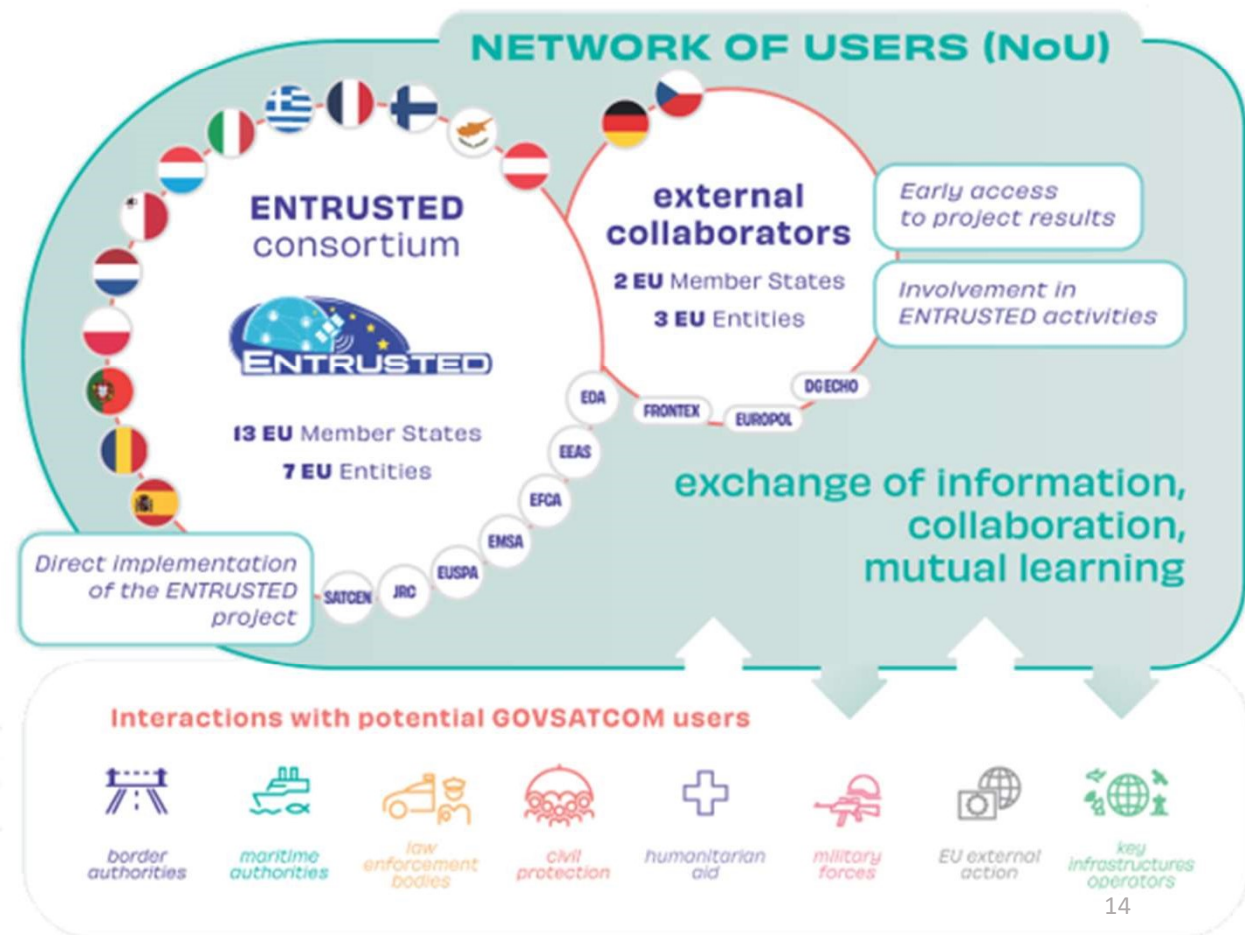
GOVSATCOM to support major infrastructures
 where disruption of communication links impacts the safety and security of EU,
 Member States and its citizens



ENTRUSTED: SATCOM User intelligence

Establish **collaboration** and **coordination** among secure SatCom governmental users

- **User requirements**
- **Use Cases** definition
- **User technology** needed to access the SatCom resources

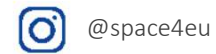




Linking space to user needs

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www.euspa.europa.eu



The European Union Agency for the Space Programme is hiring!

Apply today and help shape the future of #EUSpace!