



Luxembourg Defence in Space

Luxembourg Defence Space capabilities



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère des Affaires étrangères
et européennes

Direction de la défense



1. Luxembourg Defense in Space
2. Context
3. Defence Space Strategy
4. Strategic objectives
5. Political Guidelines
6. Conclusions

1. Luxembourg Defense in Space



- 2012 Luxembourg Defense joins Wideband Global SATCOM system (WGS) a high capacity United States Space Force satellite communications system
- 2015 development of SATCOM expertise within the Armed Forces
- 2016 Luxembourg Defense starts National SATCOM programme in a Private-Public-Partnership with the Luxembourg Satellite Operator SES to establish LUXGOVSAT
- 2018 Launch of 1st National SATCOM Satellite GOVSAT -1
- 2018 Luxembourg Defense starts National Earth Observation programme on its own
 - Launch Satellite foreseen End 2023
- 2022 Luxembourg Defense publishes First National Defence Space Strategy

- Increase of our defence budget spending to 1% as of 2028
- Russian Invasion of Ukraine
- Increasing dependence of our societies on space assets → vulnerabilities
- For Defence, space has become a real national security issue : the multiplication of activities and actors implies an increase in the risk of conflicts



- NATO : Space = operational domain
- European Union : Space = strategic priority
- Luxembourg :
 - Space has played an important role in the diversification of the economy → strengthening the economic sector
 - Defence is also active in Space (LUXGOVSAT, LUXEOSys)



➤ The Strategy is built around one long-term objective:

Willing to act in solidarity, Luxembourg Defence will consolidate its role as a reliable reference partner in the field of space by 2030.

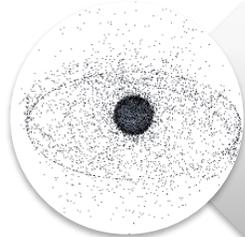
Through development of space capabilities at national level or in cooperation with NATO/EU partners, and by strengthening the resilience of these capabilities, Defence will not only meet its national needs but also contribute these capabilities to international organisations and allied countries.

By doing so, Defence will help to guarantee access and to preserve a peaceful and sustainable use of space, in full compliance with international law, while relying on the expertise of the Luxembourg space sector.

3. Defence Space Strategy



SO 1 : Consolidate current space capabilities, increase their resilience and develop new systems



SO 2 : Support freedom of action in and from space



SO 3 : Foster national and international cooperation



SO 4: Attract and secure a skilled and motivated workforce



- OS 1 : Consolidate current space capabilities, increase their resilience and develop new systems
 1. SATCOM
 2. Earth Observation
 3. Space Situational Awareness

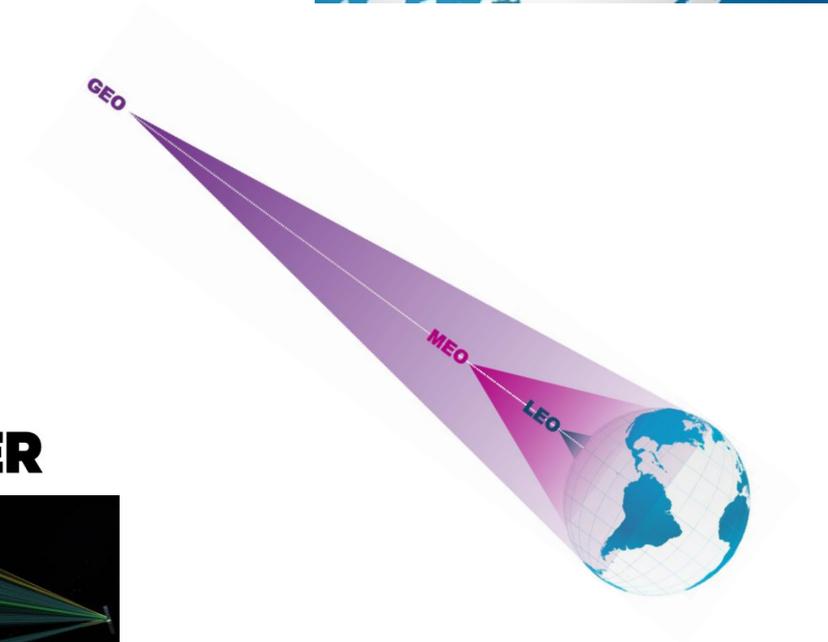
4. Strategic objectives



SO 1 : Consolidate current space capabilities, increase their resilience and develop new systems

1. SATCOM

- ✓ Contribution to collective Defence through GovSat-1 services (Mali, Mozambique, etc)
- ✓ Focus on communication system « multi-orbit » aiming to provide resilience (potential use of O3b mPower in addition to WGS and GOVSAT-1 access)
- ✓ Extension LUX Defence SATCOM hub station
- ✓ Attention to be paid at Poles



O3b **mPOWER**



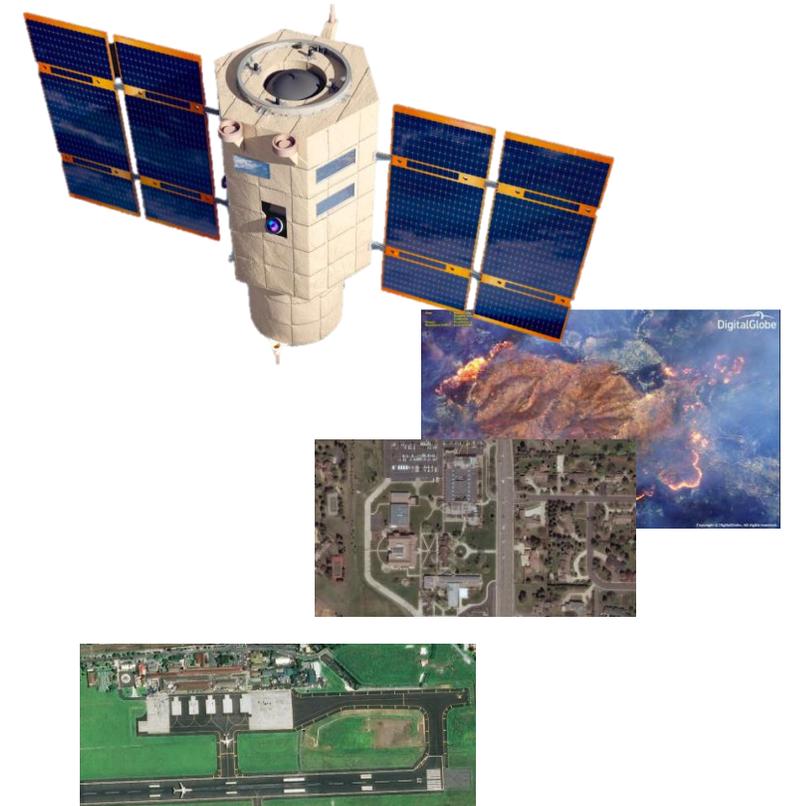
4. Strategic objectives



SO 1 : Consolidate current space capabilities, increase their resilience and develop new systems

2. Earth Observation

- ✓ Main focus on LUXEOSys (right contribution to the common effort)
- ✓ Dual use of the images and a focus in the field of disarmament and climate change monitoring
- ✓ Integration of data from multiple sources, not only governmental but also commercial (Hyperspectral, SAR, AIS, RF) in support of a Persistent surveillance from space
- ✓ Development of analytical capabilities, in particular through artificial intelligence



Remark: LUX is supporting the NATO APSS development (Alliance Persistent Surveillance from Space)



4. Strategic objectives



SO 1 : Consolidate current space capabilities, increase their resilience and develop new systems

3. Spatial situational awareness

- ✓ Detecting, characterising and determining the trajectory of objects - natural (e.g. asteroids) or man-made (debris, hostile actions) - to avoid possible collisions and to prevent potential future threats
- ✓ Use of ground and space-based assets
- ✓ Protection, preservation of freedom of action in the space environment and preservation of the peaceful use of space in accordance with international law



Remark : LUX is supporting the development of the NATO 3SAS (Strategic Space Situational Awareness System)

4. Strategic objectives

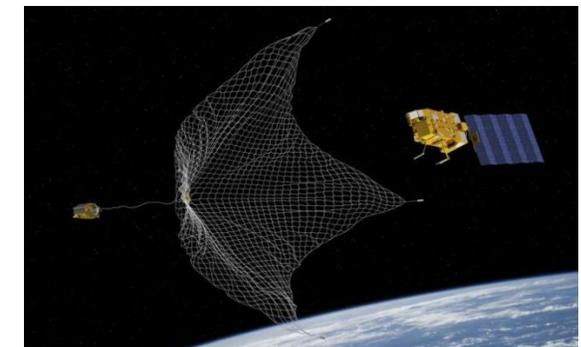


➤ SO 2 : Support freedom of action in and from space

1. Protection of data sent to and from satellites (including waveform protection) + cyber protection of ground terminals
2. Clean Space (Active Debris Removal)
3. Ensuring access to space → flexible and agile satellite launch system
4. Supporting a credible deterrent through international alliances and partnerships
5. Supporting the creation of norms and standards for responsible and sustainable behavior



Committee on the Peaceful Uses of Outer Space



4. Strategic objectives



➤ SO 3 : Fostering national and international cooperation

1. Strengthening cooperation and developing new partnerships
2. Coordination and interoperability
 - Planification process in NATO and EU → right contribution fitting an effective requirement
 - Promotion of dual-use synergies to strengthen the Luxembourg space sector
3. Supporting research and exchange programmes



4. Strategic objectives



➤ SO 4: Attract and secure a skilled and motivated workforce

1. Strengthening the attractiveness of Defence as an employer
2. Study the introduction of the “space” career path within Defence
3. Closer cooperation with the University of Luxembourg



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- Cooperation between countries sharing the same values
- Increased resilience of space capabilities (access to multiple systems or increased protection of capabilities)
- Specific attention paid to the development of dual-use capabilities, civil and military



- High level ambition in Space
- Importance of cooperation with international partner
- Working closely together with Luxembourg Space Industry
- Increase Luxembourg's standing in Space

- In the space sector, Luxembourg can have an impact and make its fair contribution to the overall effort in terms of Security and Defence.

