Global environmental change and Security/Defence: what can Luxembourg do?

Ministry of Foreign and European Affairs
Luxembourg – Directorate of Defence

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Introduction

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Climate Change and its impacts raise **2 main questions** for national Defence organizations :

1. How should we **prepare ourselves** in order to be able to effectively **anticipate, prevent, prepare and adapt to security risks and threats amplified** & induced by Climate Change?

2. How can the Defence sector better **assess and reduce** its greenhouse gas emissions in order to become more sustainable, while **maintaining or increasing** its operational effectiveness?

Context: Climate change and Security

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How does Climate Change affect our security?

- **Direct threat to Vital Infrastructure**
  - Sea level rise, storm surge, wild fires compromise critical economic hubs. and military installations and operations.
- **A Peace Inhibitor in Fragile States**
  - Need to develop early warning mechanisms for climate change as a root of conflict. Increased demand for conflict prevention and conflict resolution in area's affected by climate change.
- **Changes in the Geostrategic landscape**
  - New geopolitical arena's opening up. Increasing scarcity of natural resources like drinking water (the new oil'?!).
- **Increasing risks to Human Security**
  - The increased intensity and frequency of severe weather Incidents and floodings require large-scale. coordinated civ-mil response mechanisms to provide disaster-and humanitarian relief and prevent local disruption.
- **Need to minimise footprint**
  - New 'green' technologies can help reduce the ecological and logistical footprint and improve climate resilience
- **Existential threat**
  - Small Island States threatened by sea level rise. Parts of countries becoming uninhabitable by heat and droughts.

IMCCS (International Military Council on Climate and Security) Report financed by Luxembourg's Defence






Assess and Mitigate greenhouse gas emissions of Luxembourg's Defence

Luxembourg Defence

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Institutional Perimeter of the LCA assessment:

- **Directorate of Defense** @ Ministry of Foreign & European Affairs **(47 staff)**
  - designing and implementing Luxembourg's Defence Policy
  - overseeing and exercising civilian control over Armed Forces' operations
- **Luxembourg Armed Forces:**
  - about 1'000 personnel (military & civilian; 11,3% female)
- 4 main areas of specialization:
  1. **Reconnaissance:** 4 companies (incl. drone observation development program)
  2. Development of **military aviation**:
     - A400M (bi-national fleet with BE)
     - Air refueling: Multi Role Tanker Transport (MRTT): 1'200 flying hours
  3. Development of **Space program**:
     - Secure SATCOM services to Allies and partners : LuxGovSat
     - Earth Observation satellite for high definition imagery (as of 2023)
  4. Development of **Cyber Defence**
     - Cyber Defence Cloud

Life Cycle Assessment

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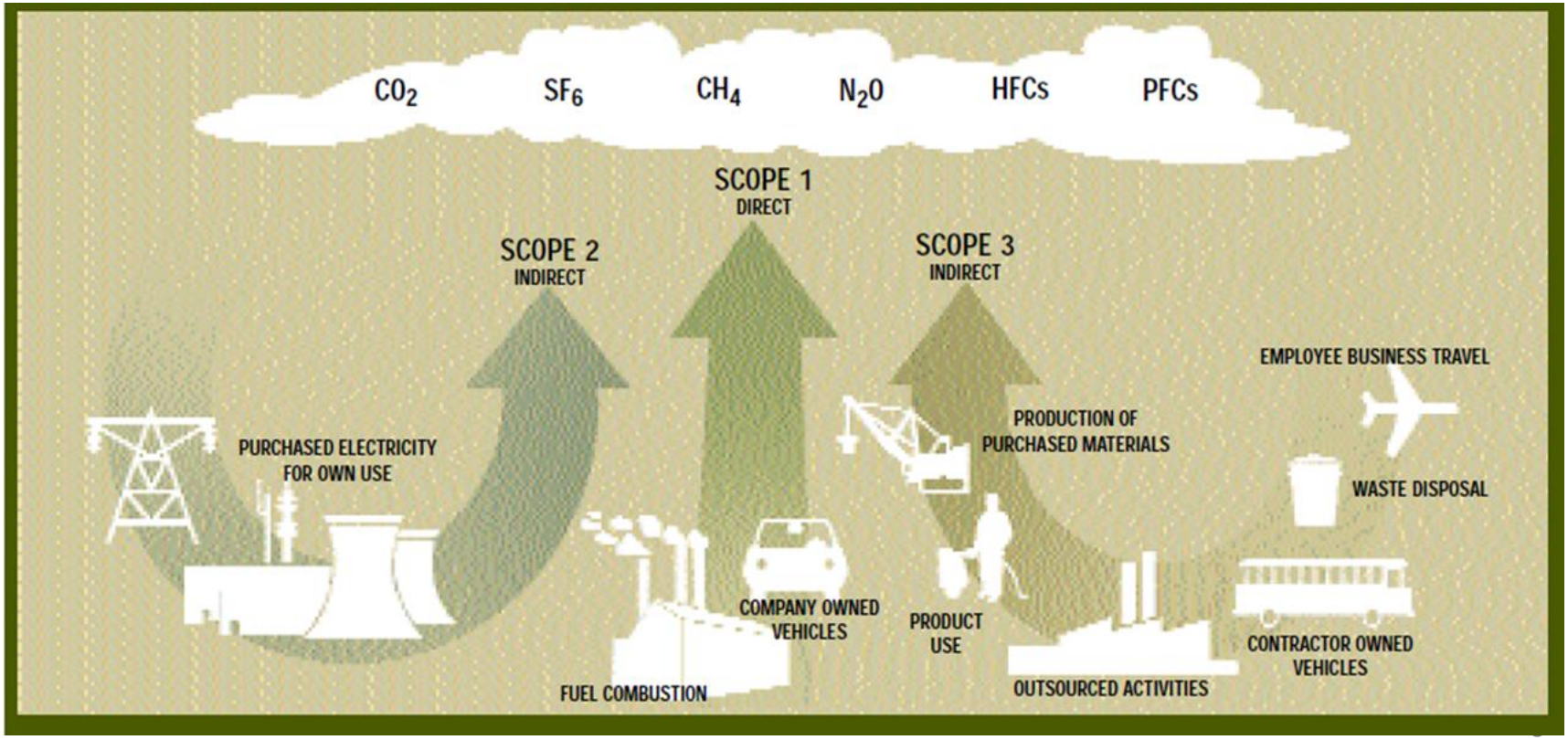
- Life Cycle Assessment (LCA) methodology used:
  - **Scope 1:** Direct emissions due to fuel use in mobile combustion, stationary combustion (heating), fugitive emissions and use of chemicals
  - **Scope 2:** Indirect emissions caused by production of purchased energy
  - **Scope 3:** Indirect emissions caused by production & transport of purchased goods and services



Preliminary results

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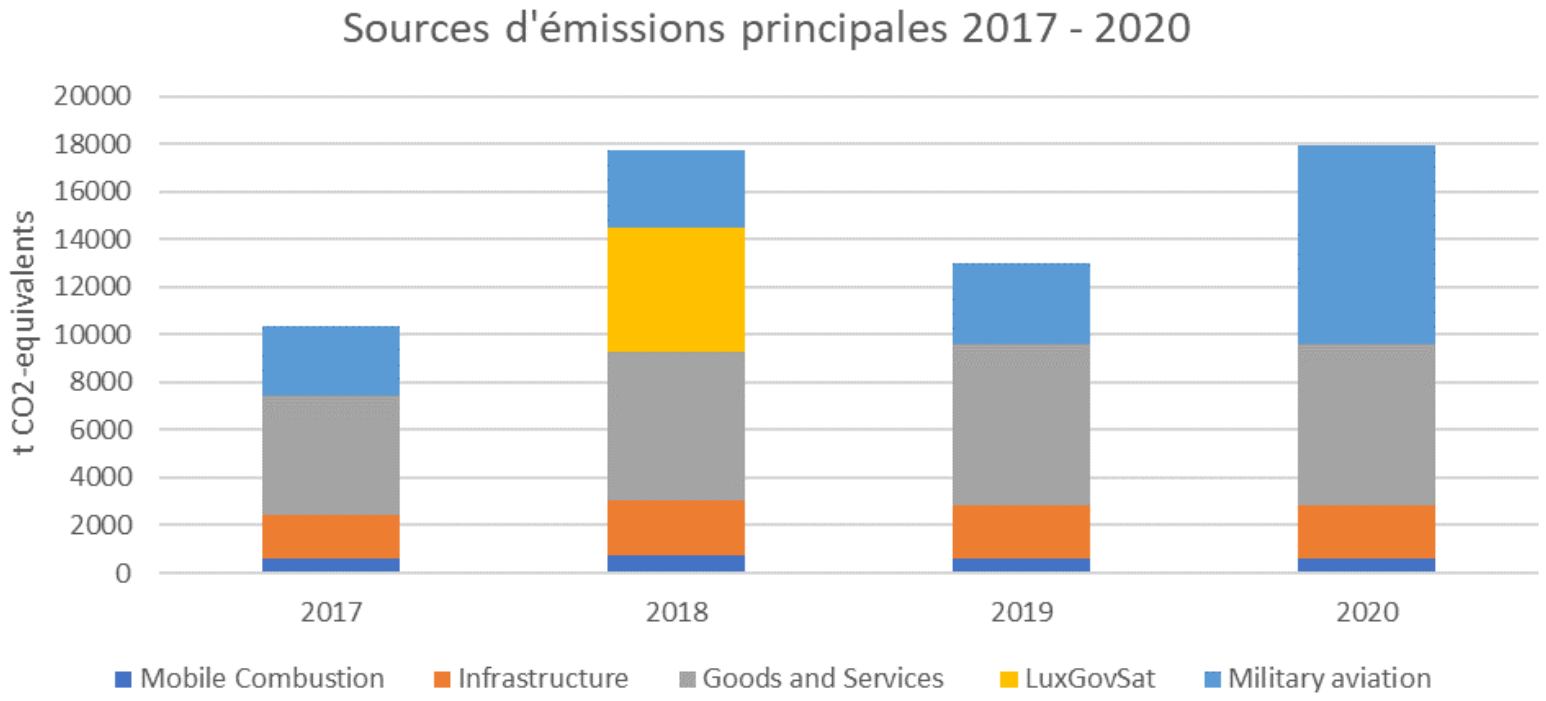
- **5 main sources of emissions:**
  1. Value chains: Production of purchased goods & services
  2. Military aviation (national & third party flights)
  3. LuxGovSat production and launch (only in 2018)
  4. Infrastructure
  5. Mobile combustion (vehicle fleet)



Preliminary results

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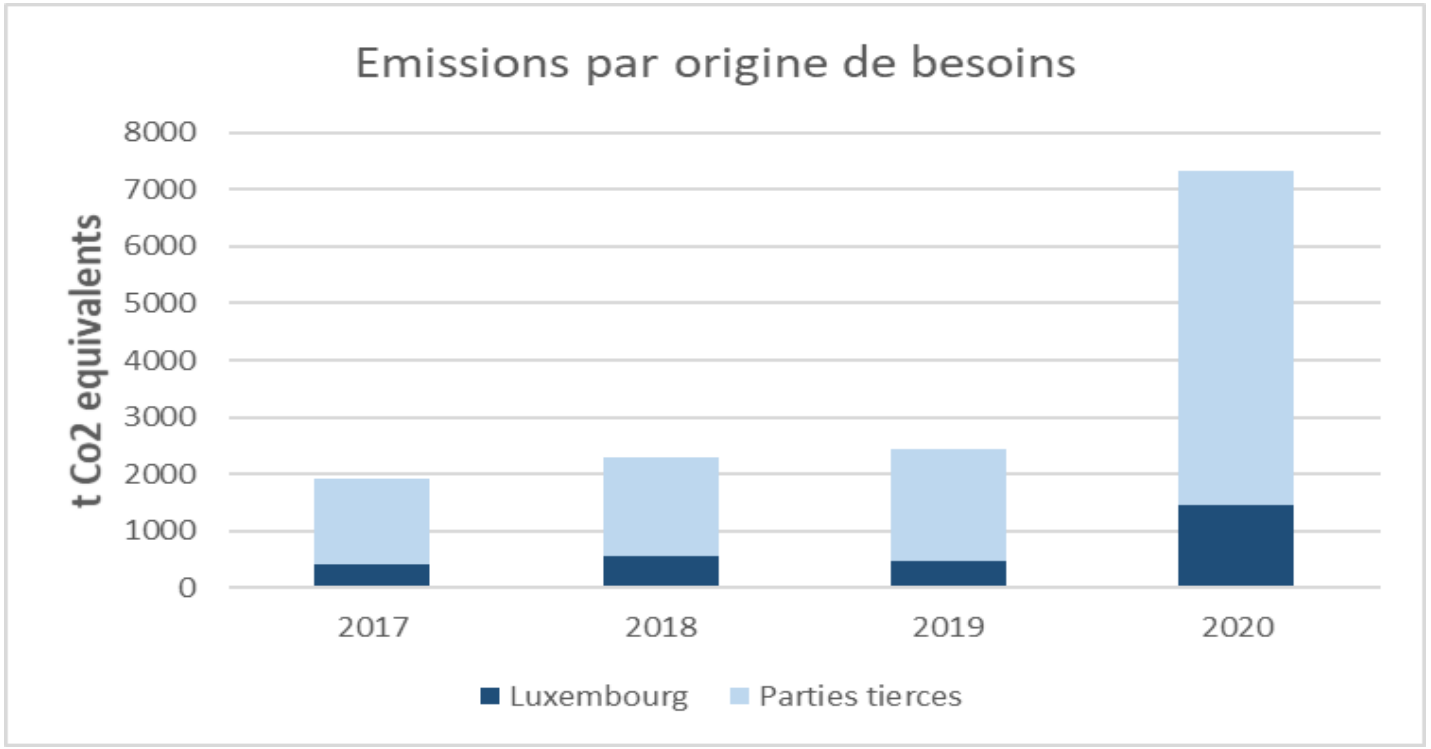
- **Military aviation is the fastest growing source of emissions**
  - almost 80% of emissions due to flights for third parties



Greening Luxembourg's Defence (I)

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How to reduce emissions of Luxembourg's Defence and reach climate neutrality by 2050?

1. **Military infrastructure/stationary emissions**:
   - **Technology already available** to make significant improvements
   - **Implement energy savings & efficiencies:** through renovation & upgrading of LU military HQ (+25% extension of building surface) : projected emission reductions for heating of buildings: –78%
   - **Increase the share of renewables in energy supply:** LU military HQ onsite electric power production through PV (47% – 62% of total consumption); projected emission reductions: –50%
   - Mainstreaming of **Circular Economy** principles: i.e **reuse of building materials**

Greening Luxembourg's Defence (II)

LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

How to reduce emissions of Luxembourg's Defence and reach climate neutrality by 2050?

2. Emissions due to **mobile combustion** (aircraft & vehicles):
   - **Joint procuring with other MS and pooling & sharing of capabilities:**
     - Pooling & sharing leads to huge efficiencies, savings & improved interoperability (e.g. BE-LU binational fleet of A400M, EATC, MRTT)
     - Joint procuring also leads to efficiencies in procurement & maintenance processes and improves interoperability
   - **Incorporate carbon emissions as criteria in procurement processes:**
     - Electrification of **civilian** car fleet **[LU Army: 21% plugin hybrid, 21% full electric]**
     - Energy efficiency criteria in procurement of future tactical vehicles
   - **Carbon neutral fuels and propulsion systems needed in the long-term:**
     - Massively increase investments in technology innovation and R&D for carbon neutral fuels and propulsion systems
     - Dedicate a certain % of overall defence spending to adaption & mitigation of climate security risks and threats
     - **Public-private partnerships:** e.g. Venture Capital fund for carbon neutral technologies
     - Defence sector as a **testbed** for carbon neutral propulsion systems

Greening Luxembourg's Defence (III)

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How to reduce emissions of Luxembourg's Defence and reach climate neutrality by 2050?

3. Emissions from the **production of purchased goods & services**:
   - **"Green procurement"**: source products & services with the least environmental footprint
     - **impactful, but green procurement criteria & benchmarks lacking**
   - Source **food & other consumer items** from certified sustainable & local production
   - Mainstreaming of **Circular Economy principles** into defence value chains
     - **Need to close material cycles**
     - **LU supports EDA's IF CEED (Incubation Forum of Circular Economy in European Defence)**

Greening Luxembourg's Defence (IV)

LE GOUVERNEMENT
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How to reduce emissions of Luxembourg's Defence and reach climate neutrality by 2050?

4. **Carbon sinks** (only for emissions that cannot be mitigated)

- **Enhance carbon sink functions at military lands**
  - sustainable land management practices are potentially impactful (also for biodiversity protection) - but LU Defence is not a big landowner
- **Carbon offsetting:**
  - Purchase of CER generated in greenhouse gas mitigation projects with positive impact on other SDGs
  - Pilot project in 2022: Offsetting of 12'500 tCO2eq direct ("Scope 1") GHG emissions of LU Defence through certified carbon sequestration in sustainable forestry projects with demonstrated long term social, socio economic and biodiversity co benefits.
  - Solution for bridging the gap until we have climate neutral technologies?

Conclusions & Recommendations

Conclusions on Emissions reduction:

- Reducing stationary emissions of buildings is a “low hanging fruit”
- Reducing emissions of military aviation & vehicles as well as indirect emissions of purchased goods & services is more challenging

➢ Need for a **stronger cooperation in key areas:**

a. **Carbon neutral fuels & propulsion technology** (in order to lower the emissions due to mobile combustion)

b. **Carbon neutral & green value chains** (in order to make green procurement of goods & services possible): e.g. Circular economy

c. Universal benchmarks & standardised labels for **“green procurement”**

d. **Increased R&D funding**

Thank you!

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