



Decarbonising the Defence Sector – Challenges and Opportunities

Background

The EU aims at reducing its greenhouse gas (GHG) emissions by 55% by 2030 and be climate neutral by 2050. To reach this objective, in the framework of the 'Fit for 55' package, **European regulation** is progressively increasing the target for the share of renewable energy in the energy used by member states. Transitioning defence towards more sustainable energy is an important contribution towards achieving the EU's climate goals. Defence energy security and autonomy is especially relevant since the Russian invasion of Ukraine in 2022 and the resulting pressures on natural gas and oil supplies throughout Europe.

Scope and Objectives

This study identifies ways to decarbonise the EU MoDs' energy mix by increasing the renewable energy sources (RES) share in it. To achieve this, the study addresses the following objective: identify the main challenges in the decarbonisation process for the armed forces and analyse solutions implementation through:

- Measuring progress in RES penetration tracking and monitoring, as currently undertaken by EDA through collecting defence energy data of the participating Member States;
- Looking at options to decarbonise military infrastructure;
- Identifying challenges and opportunities concerning low-carbon technologies for military mobility.

Methodology

This study is based on the analysis of two documents provided by the EDA:

- The European Defence Sustainable Energy Profiles (EDESEP);
- The Analysis of 2016 to 2020 defence energy data.

In addition to these sources, a survey has been conducted amongst participating states of the Consultation Forum for Sustainable Energy in the Defence and Security Sector (CF SEDSS), whereas industry representatives have been interviewed and existing literature on the decarbonisation of armed forces has been analysed.

Main Challenges to Energy Transition

1. **Technologies that are not yet mature enough:** Some decarbonation technologies are still very new, which raises two issues. First, they are still not fully tested and proven. Second, they could become obsolete.
2. **Increasing energy needs:** The energy requirements of armed forces will increase in the future for two reasons. First, the size of the armed forces is likely to increase as a result of the deteriorating international security environment. Second, the evolution of certain technological equipment will increase energy demands.

- 3. Preserve operational capacities:** If the energy transition does come with more autonomy from oil and gas producing countries, it poses nonetheless some risks for the preservation of operational capacities, especially related to an increase of cyberthreat, the shielding integrity threatened by some propulsion methods and potential limits to interoperability.
- 4. Lack of human and financial means for the transition:** The technologies needed to achieve carbon neutrality in the building sector are mature. The main obstacles are the lack of financial resources and the lack of qualified personnel. These shortcomings are also present in other aspects of military activity, such as research and development (R&D).
- 5. Resilience of supply chains:** The energy transition, and in particular electrification, generates new dependencies on specific components or critical metals and minerals.

Recommendations and Way Ahead

1. Facilitate the renewable energy production from MoDs

- Auditing all MoDs sites to figure out how they could contribute to renewable energy generation.
- Concluding off-site green power purchase agreements (PPAs) to decarbonise external electricity supply.
- Increasing self-production of renewable energy notably by concluding on-site green PPAs.
- Implementing mechanisms allowing MoDs to sell the energy overproduction.

2. Set quantified targets

- MoDs have to implement a standardised energy consumption tracking methodology.
- Aligning energy objectives of the MoDs with the objectives of their public state administration.
- Adopting specific energy targets adapted to the defence sector.

3. Finance the energy transition

- Member states should increase defence budget for spending on green energy technologies.
- Sustainability principles should be integrated in all European countries' defence procurement processes and across supply chains.

- More use must be made of dual-use funding opportunities for R&D investments.
- The European Defence Fund (EDF) should increase the share of its budget dedicated to energy and environmental issues.
- A category dedicated to decarbonisation could be created in the Collaborative Database (CODABA) – an EDA web platform designed to support Member States in sharing information of their defence plans and programmes in capability development.
- The Member States should dedicate a fixed percentage of their national R&D programmes to climate-related activities.
- The European Commission could produce a legally binding clarification saying that EU's environment, social and governance (ESG) criteria are not in contradiction with investments in the defence industry.
- Allowing the European Investment Fund (EIF) to directly finance the defence sector.
- EDA could create a dedicated working body in order to support the MoDs in the preparation of applications for European funding for their projects related to the energy transition of infrastructures.

4. Strengthen training and awareness courses

- Member States are encouraged to send their personnel representing the different armed forces domains to the EDA Defence Energy Managers Course (DEMC) and to ensure the widest possible dissemination and implementation of the knowledge acquired there.
- Ensuring the future funding of EDA DEMC.
- Developing and maintaining an energy management structure for the defence sector at national level in each Member States.

5. Extend international cooperation

- EDA should cooperate with NATO and other relevant international partners to develop green minimum capability requirements.
- Investments in energy transition should be included into the reformed 2 percent defence spending target after 2024.
- EDA should ensure that to the extent feasible funding instruments of NATO and EU are aligned.

- EU member states can organise to propose their own interoperability standards for green technologies aligned with NATO requirements, so that they can potentially become NATO standards. Increasing collaborative equipment procurement under the Permanent Structured Cooperation (PESCO).

Conclusion

Activities to be decarbonised in the next decade:

- **Electricity supply** of infrastructure can be decarbonised by signing off-site green PPAs with external suppliers and increasing renewable energy production on-site.
- **Heating** can be decarbonised by connecting military infrastructure to district heating based on RES and increasing renewable energy production on-site.
- **Mobility** can be decarbonised by renewing the non-tactical vehicle fleet, replacing some platforms by drones for a certain range of use and the electric hybridisation of some platforms.
- **The industrial supply chain** can be decarbonised by integrating sustainability principles in all European countries' defence procurement processes.