EUROPEAN DEFENCE AGENCY

Fact sheet

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ENSSURE
ENergy Self-Sufficient REsilient military base

Background Description

The defence sector is an intensive energy consumer, with significative reliance on fossil fuels to meet its increased demand for energy.

Operational capability is a non-negotiable priority, and this fact has long been considered as a barrier to the energy efficiency and renewable energy integration to military infrastructure and operations.

Resilience, autonomy, and environmental issues related to energy have to be addressed by Ministries of Defence (MODs), on the national territory, as well as during overseas operations.

Objectives

The key objective of the proposed project idea is to examine the feasibility of energy self-sufficiency in a small to medium size permanent military base, through the combined use of renewable energy sources (RES), energy management and energy efficiency tools and methods.

The project includes the demonstration through field experimentation (on one small military base) of:

- Total fossil fuel independency for infrastructure needs;
- No greenhouse gas emissions as a result of infrastructure energy needs;
- Power resilience by “islanding” capability.

Project Analysis

The proposed solution is a systemic and holistic approach to achieve zero-emission camps including:

1. **Energy sobriety:** reducing energy needs by putting an end to "useless" energy consumptions (lights on in empty rooms, computers on overnight or during weekends, heated empty buildings), and implementing an energy management system (EMS) to ensure a consistent approach.

2. **Energy efficiency:** reducing energy consumption necessary to cover the already reduced final needs (peak shifting, equipment efficiency, buildings insulation, etc.).

3. **RES & storage** to cover the remaining energy needs.

4. **Microgrid and EMS** for the electrical energy supply, and ensuring an "islanding" capacity.

The project addresses specific defence considerations including **resilience, operational capability, cybersecurity, and reliability.**

Fruitful data will be provided to evaluate the potential for the defence sector to contribute to EU energy policy.

Impact – Expected Outcomes

The expected impact includes replicability in other military establishments in different geographic regions.

The cost and environmental evaluation of the field experimentation will provide data and good practices, taking primarily into account the site-specific requirements.

Opportunities

EU policies regarding energy efficiency, buildings energy performance, and renewable energy require Members States to commit to ambitious targets.

The defence sector, as a significant fossil-fuel based energy consumer, has an opportunity to contribute to those objectives, if it can be proven that cost-effective solutions which meet energy performance requirements and also support operational capability exist.

In addition, as RES, storage and micro-grid technologies start to reach levels of maturity, they will be able to be considered as sufficiently reliable for use in the defence sector.

The project is eligible for potential funding at European level, for instance, through the LIFE Programme and the European Regional Development Fund (ERDF).

Challenges

A test field on a military base usually presents some risks related to the potential quick evolution of the base activity and the personnel posted. This variability constitutes a challenge with respect to the reliability of both the energy baseline and the achieved results. It also affects the choices made in terms of systems' sizing.

Furthermore, security and confidentiality of energy data will have to be addressed. All implemented systems will have to comply with cybersecurity requirements.

The capacity to identify cost-effective actions and good practice at the end of the project, is also a main concern regarding potential replicability. This issue will be studied considering a global cost approach (including energy bill, investment, operation and maintenance costs).

Methodology

A phased approach is proposed, mixing:

- **theoretical studies** (energy modelling and costing) and field testing;
- **various competencies** (academics and industrial/operational).

The project includes the following two phases:

- **Phase 1** – Preliminary studies and case study (6 months);
- **Phase 2** – Implementation: metering system, civil engineering, smart plug devices and RES and storage technologies, a micro-grid, islanding capability, and an energy management system (EnMS) ISO 50001 (24 months);
- **Phase 3** – Analysis and dissemination, and a conclusion regarding best practice and replicability (12 months).

Way Ahead

Identify a suitable contractor to take the project forward.

Identify Member States interested in taking part in the project, by offering military establishments in different geographic regions for similar demonstrations and exchange of results and best practices, in order to enhance replicability of the project outcome.

In parallel, take into account other relevant work including:

- EDA “Smart Camp” projects
- FR national “eco-camp” project
- PESCO initiatives
- NATO initiatives
- …

This project idea was developed during the second phase of the Consultation Forum for Sustainable Energy in the Defence and Security Sector (CF SEDSS II) and does not entail any future commitment for the EU Ministries of Defence (MoDs) or the EU institutions or agencies. However, it provides the framework for enabling the formation of multi-national collaborations at the European level to help the MoDs to address common defence energy-related considerations and to move towards a defence decarbonised future. The potential of those ideas will be further explored in the context of the forthcoming CF SEDSS Phase III (2019-2023).

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