

Defence Energy Data 2016 & 2017

In 2016, at the request of its Member States (MS), the European Defence Agency (EDA) started to collect national defence-related energy data with the support of the EDA Energy & Environment Working Group. The aim is to gain a better overview and understanding of the types and volumes of energy resources used by the armed forces on an annual basis. The analysis allows to identify energy consumptions and potential dependencies of Member States' armed forces. At the same time, it supports decision-making and enhances European cooperation on research and development in the fields of energy efficiency and procurement.

1. METHODOLOGY

22 Member States (AT, BE, CY, CZ, DE, EE, EL, ES, FI, FR, HR, IE, IT, LT, LU, LV, NL, PL, PT, SE, SI and UK) provided their national defence energy data sets for the years 2016 and 2017. Those 22 countries stand for 96,9% of EDA Member States' overall defence expenditure, and 90,4% of their total defence staff, according to EDA's 2017 Defence Data. The following analysis of the 2016 and 2017 energy data is presented in aggregated format. Annual comparisons are presented in absolute figures only¹.

2. ELECTRICITY CONSUMPTION

Figure 1: Electricity consumptions and mixtures for 2016 and 2017 (Source of electricity)

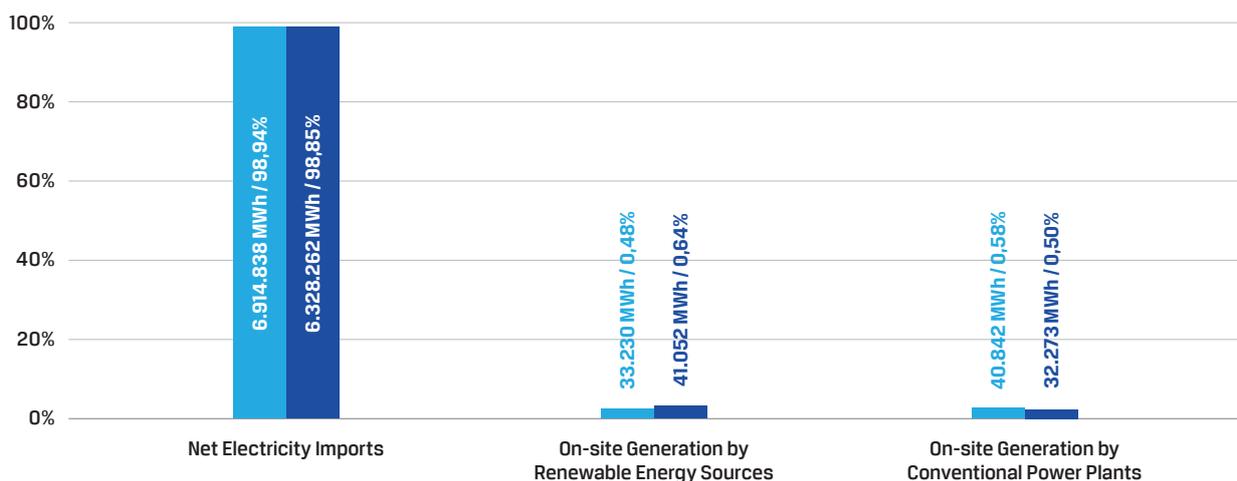


Table 1: Electricity consumptions for 2016 and 2017

	2016 (MWh)	2017 (MWh)	Δ (2017-2016) (MWh)	(%)
Total electricity consumption by armed forces of 22 MS mentioned	6.988.910	6.401.587	-589.350	-8,43

Total electricity consumption in 2017 was 8,43% lower than in 2016.

1. Conditions apply for the energy data provided by AT (no data on transport fuels for 2016), EL (no data on transport fuels for 2016 and 2017), ES (data for heating does not include natural gas), IT (no data on transport fuels for 2016 and 2017, data on heating is under confirmation, therefore not included in the calculations) and NL (energy produced by solar thermal systems for heating not estimated, data on aviation and maritime fuels is under confirmation, therefore not included in the calculations).

3. ENERGY CONSUMPTION FOR HEATING

Figure 2: Types and total volumes of energy resources used for HEATING in 2016 and in 2017 by the armed forces of the afore-mentioned 22 Member States

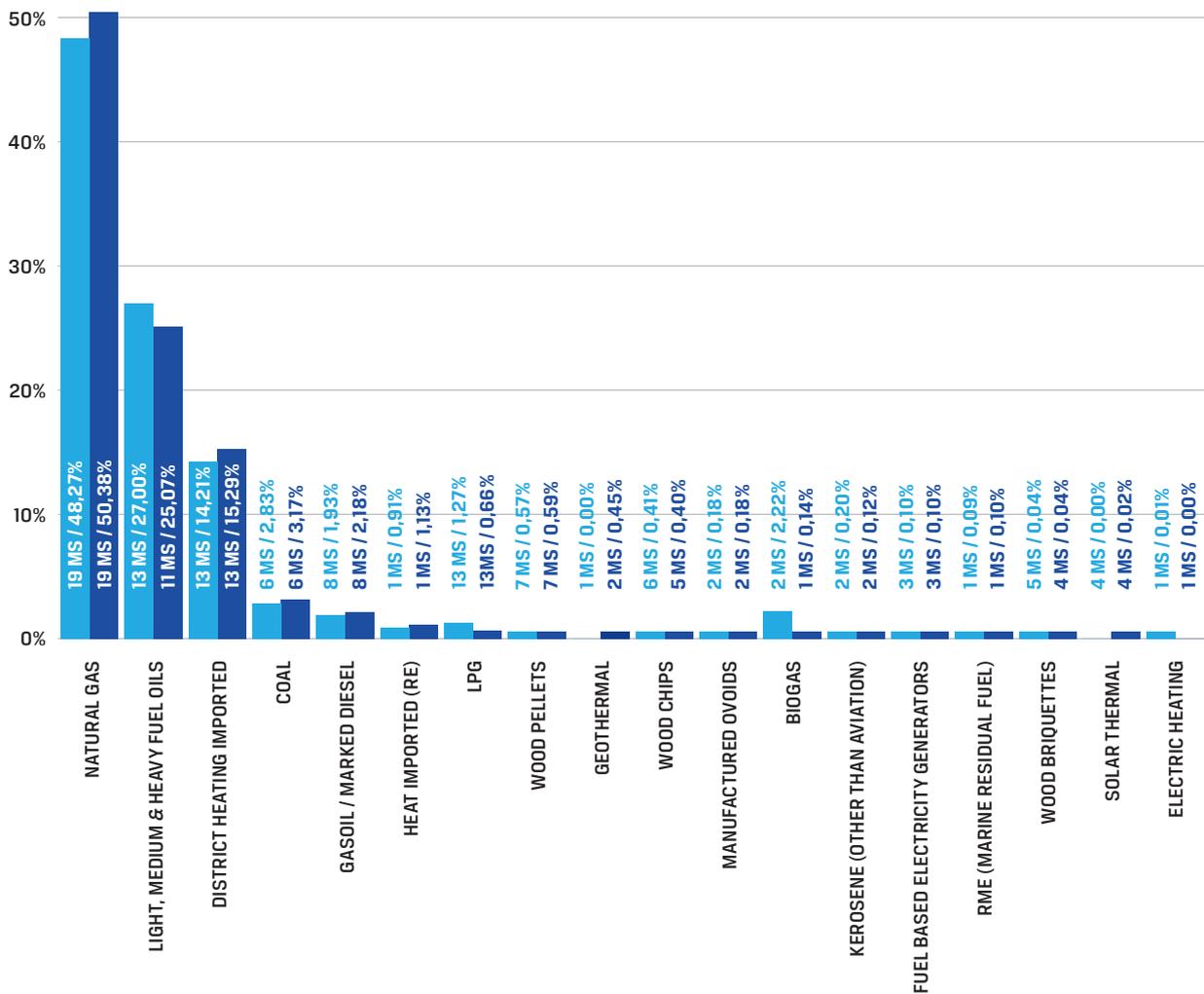


Table 3: Energy consumptions for heating for 2016 and 2017 (except IT)

	2016 (MWh)	2017 (MWh)	Δ (2017-2016) (MWh)	(%)
Total consumption for heating by armed forces of 22 MS mentioned	13.451.496	12.911.633	-540.321	-4,02

The energy consumed for heating in 2017 was 4,02% lower than in 2016.

4. ENERGY CONSUMPTION FOR TRANSPORT

Figure 4: Types and total volumes of energy resources used for TRANSPORT in 2016 & 2017 by the armed forces of the afore-mentioned 22 Member States

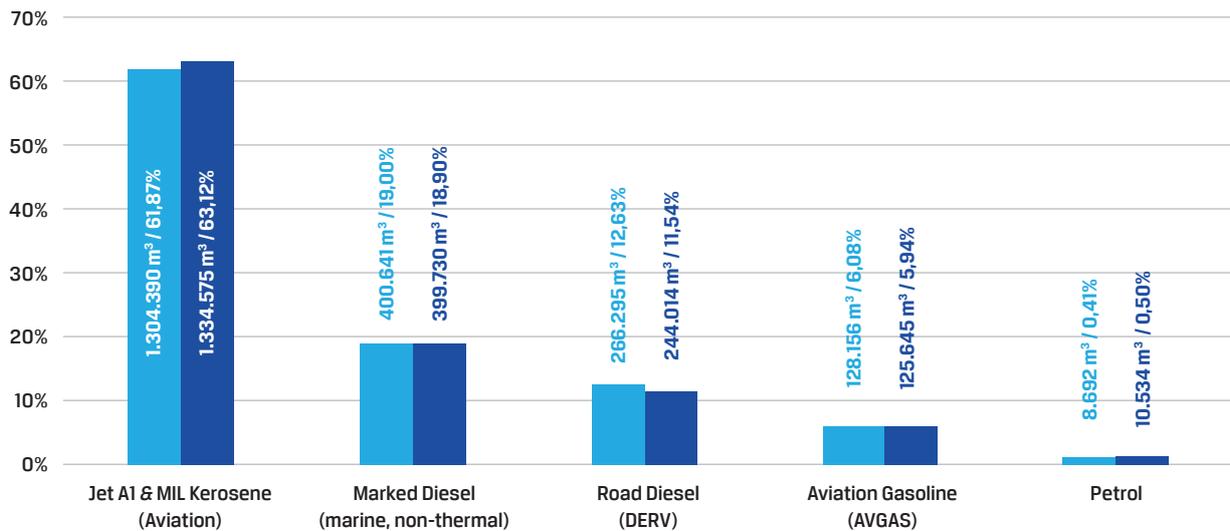


Table 4: Energy consumptions of transport fuels for 2016 and 2017

		2016	2017	Δ (2017-2016)	(%)
Total energy used for transports by armed forces of 22 MS mentioned	(MWh)	20.898.738	20.952.656	+53.918	+0,26
	(m³)	2.108.174	2.144.498	+36.324	+1,72

The total energy used for transports was slightly higher in 2017 than in 2016.

5. ENERGY CONSUMPTION

Figure 5: Energy consumption of the afore-mentioned 22 Member States for 2016 and 2017



Table 5: Energy consumptions of the afore-mentioned 22 Member States for 2016 and 2017

	2016 (GWh)	2017 (GWh)	Δ (2017-2016) (GWh)	(%)
Energy Consumption	41.339	40.266	-1.083	-2,76

In 2017, the total energy consumption of the armed forces of the afore-mentioned 22 Member States was 2.8% lower than in 2016.

This reduction is not linked to a change in weather conditions, which were almost identical in 2016 and 2017². Moreover, the total building surface to be heated/cooled in the various Member States remained almost the same.

6. CONCLUSIONS

Taken together, the total energy consumption of **Member States' armed forces equals that of a smaller EU Member State.**

EU armed forces are shifting towards more sustainable energy defence models. However, given the scarcity of defence energy data (collected only for two years), a trend cannot be validated yet. **Transport fuels** account for more than half of the armed forces' energy consumption. Thus, it is recommended that Member States **consider introducing energy efficiency parameters when developing requirements for future military platforms**, which should lead to less energivorous systems.

On average, in 2017, **heating** accounted for 32% of armed forces' energy consumption, with national figures varying from 9,21% (Southern Europe) to 51,86% (Northern Europe). 18 different energy sources are used for heating purposes but 75% of total consumption is covered by fuel oils and natural gas, which potentially means a risk of **dependencies from non-EU countries**. The part of sustainable energy resources used by armed forces for heating purposes remains very small. The introduction of new technologies could help lower the carbon footprint and, at the same time, increase the energy autonomy of the armed forces.

EU armed forces heavily rely on national grids to cover their electricity needs as they generate only a very small fraction of the electricity they use. In seven Member States, armed forces produce at least some electricity with renewables, two of which also provide electricity to the national grids.

As noted during the Consultation Forum on Sustainable Energy in the Defence and Security Sector³, 17 Member States have issued renovation plans for the building stocks they operate (and in most cases own). Nonetheless, due to the considerable size of the building stocks, the renovation pace will be slow if their funding is covered only by Defence Ministries' regular budgets. **Central governments will thus have to assist the armed forces to fulfil the exemplary role of the public sector**, as foreseen in the Energy Efficiency Directive⁴.

7. WAY AHEAD

As more data sets will become available over the coming years, a robust energy consumption model based on regression analysis may be developed, serving as a tool to forecast and evaluate energy consumption trends in the military based on normalised energy performance indicators.

2. According to Eurostat, with respect to Heating Degree Days and Cooling Degree Days. Definitions and data provided through

https://ec.europa.eu/eurostat/cache/metadata/en/nrg_chdd_esms.htm and http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_chdd_a&lang=en respectfully.

3. Questionnaire circulated among national delegates (energy experts from MS MoDs) under the Consultation Forum on Energy Efficiency in the Defence and Security Sector (<https://www.eda.europa.eu/european-defence-energy-network>)

4. Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, as amended by Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018.