



## **Zemo Partnership NEWS**

**28 October 2024**

### **Zemo study confirms emissions from vehicles' auxiliary transport refrigeration units**

An interim report from Zemo Partnership confirms that emissions arising from the use of transport refrigeration units incorporated into trucks and vans contribute to local air pollution as well as to road transport's total 'greenhouse gas footprint'.

The refrigeration components of all vehicles fitted with them – mainly trucks and vans – add an average 11% CO<sub>2</sub> emissions compared with standard vehicles without a transport refrigeration unit (TRU) on-board.

Calculations for emissions of ultrafine particles resulting from the use of TRUs has been revised upwards compared with the original analysis. Ultrafine particles pose a particular health concern where vehicles operate close to where people live and work.

The study finds that emissions of fine particulate matter and other local pollutants of concern (NO<sub>x</sub> and larger particulates) are much higher for vehicles fitted with auxiliary TRU engines, with the large majority of pollutants (especially fine particulates) emitted by the TRU engine rather than the drive powertrain of the vehicle.

The report's central estimate is that the refrigerated road vehicle fleet adds over 5,600 kilotonnes (kt) of CO<sub>2</sub> to total road transport emissions, with the majority (over 80%) coming from refrigerated HGVs, with the remainder from refrigerated vans.

Original research for this study calculated that an additional 54 kt of tailpipe CO<sub>2</sub> emissions come from the refrigeration systems on vans compared with those without a fridge. These vehicles also consume around 20 million litres of extra fuel (0.3% of the total fuel burned by vans).

A final stage of the report, due to be completed later this winter, will assess alternative technologies to reduce emissions from TRUs on-board vehicles as fleets transition away from operating on diesel.

Zemo project manager **Emily Stevens** said: “This latest research confirms that there is a significant issue in terms of emissions arising from the presence of refrigeration units on vehicles, particularly in terms of their impact on local air quality.

“The final stage of the study aims to provide further evidence and useful recommendations for operators and policymakers to reduce their negative impacts.”

This work programme – a multi-year project funded by the Department for Transport (DfT) – is a response to the need to understand the UK-wide environmental impact of auxTRUs and other Non-Road Mobile Machinery (NRMM). It builds on previous work undertaken between Zemo Partnership and Transport Scotland in 2021.<sup>1</sup>

## Further information

**Table 15. UK fleet central estimates for all refrigerated vans and HGVs with diesel auxTRUs**

	Refrigerated HGVs		Refrigerated Vans		All refrigerated vehicles		Total impacts	% from refrigeration
	Driving	AuxTRUs	Driving	AuxTRUs	Driving	AuxTRUs		
Fuel (Ml)	1,700	235	186	20	1,885	255	2,140	12%
CO <sub>2</sub> (ktonnes)	4,534	590	466	54	5,000	644	5,644	11%
NOx (tonnes)	777	4,400	56	0	833	4,400	5,233	84%
PM <sub>2.5</sub> (tonnes)	43.5	126	0.4	0	44.0	126	170	74%
PN (#x10 <sup>21</sup> )	1.5	353	0.0003	0	1.5	353	355	99.6%

**Zemo’s report “Diesel-powered fridge testing: Emissions from refrigerated vans and auxTRU” can be [downloaded here](#).**



<sup>1</sup> [https://www.zemo.org.uk/assets/reports/Zemo\\_TRU\\_emissions\\_report2021.pdf](https://www.zemo.org.uk/assets/reports/Zemo_TRU_emissions_report2021.pdf)

## **NOTES TO EDITORS**

Zemo Partnership ([www.zemo.org.uk](http://www.zemo.org.uk)) is a public-private partnership working to accelerate a sustainable shift to low carbon fuels and zero emission vehicles. Around 200 organisations are engaged from diverse backgrounds including automotive and fuel supply chains, vehicle users, academics, environment groups and others.

**For further information**, please contact:

Neil Wallis, Head of Communications. [neil.wallis@zemo.org.uk](mailto:neil.wallis@zemo.org.uk) M: 07974 255720

Follow us on X: [@Zemo\\_org](https://twitter.com/Zemo_org)

and LinkedIn: [www.linkedin.com/company/3728228](https://www.linkedin.com/company/3728228)