BR2104 - EN

Aeroflex and the future of sustainable road transport - an ESTA briefing

"The right truck with the right cargo at the right time on the right road"

Published: October 2021

ESTA has been a strong supporter of the European Commission-funded Aeroflex project which was launched in 2017 with the aim of developing new technologies and concepts to improve the efficiency and environmental performance of long-distance heavy freight vehicles by up to 33 percent.

The project had the backing of 23 partners from eight different European countries, including truck and trailer manufacturers, technology companies, universities and engineering firms.

ESTA was represented as part of the Aeroflex Sounding Board - representatives of authorities, associations, policy makers, logistics companies, and industrial firms who advised and helped to guide the process.

The goal of the Aeroflex organisers was to maximise energy efficiency and cost effectiveness while improving safety and also ensuring that the varying needs of customers are satisfied by being flexible and adaptable to changing operational conditions.

Aeroflex – its full name is Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport - held its final event in Germany at the end of September, but the organisers are now planning ways to build on the progress made to date.

Talks are already underway about setting up real use-case demonstration projects that will show how new technologies and systems can help improve performance of the whole logistics sector.

The focus of the Aeroflex project was to demonstrate complete, high-capacity vehicles with optimised aerodynamics, powertrains and safety systems as well as flexible and adaptable loading units.

A further core element was the need to match new vehicle concepts and infrastructures, an approach that will require the development of smart Infrastructure Access Policies (IAP) for use by road authorities and the next generation of trucks and load carriers.

This approach also complements ESTA's long-standing call for the development of pan-European heavy transport corridors for abnormal loads and heavy transport.

Aeroflex had a total budget of 11.8 million euros - of which 9.5 million was provided by the European Commission through the Horizon 2020, the funding programme for research and innovation.

Specifically, Aeroflex aimed to improve the efficiency of long-range freight vehicles by 18-33% while drawing up recommendations for the regulatory and transport industry reforms essential to allow such efficiencies to take root.

The targets included increasing energy efficiency by between 5 and 12 percent from the integration of more flexible, advanced powertrains, and a 5 to 10 per cent reduction in energy consumption through improved truck aerodynamics.

After three years in development and testing, the first fully integrated distributed power-train system in heavy commercial vehicles was ready to undergo fuel consumption tests, thanks to the combined efforts of Fraunhofer IVI (dolly and trailer functions and drivetrain), ZF Friedrichshafen (brake system and communication), Van Eck Trailers (dolly chassis) and MAN (global energy and torque management).

In April this year, the commissioning of the Advanced Energy Management Power Train (AEMPT) demonstrator was finalized. One part of the vehicle combination was the smart power dolly, an electrically driven and steerable double-axle dolly, designed and constructed under the direction of Fraunhofer IVI with support from Van Eck Trailers and ZF Friedrichshafen.

It both supports the reduction of fuel consumption and CO2 emissions, but also makes it possible to split vehicles into single units. Remotely controlled, the dolly is able to drive without a pulling unit and manoeuvre a semi-trailer to its loading dock.

While huge technical progress has been made, a critical future issue will be ensuring the creation, maintenance and management of appropriate infrastructure.

Currently, the size and type of efficient vehicles envisaged by the Aeroflex project are not allowed on most EU roads. What is more, the different EU members have widely different and inconsistent policies which hinder the development of more environmentally friendly and efficient policies.

The vision is to use Intelligent Access Policies (IAP) to create Europe-wide rules and applications that match vehicle concepts with the required infrastructure, while at the same time allowing local flexibility to ensure vehicle access only where appropriate.

For example, in Gothenburg in Sweden, one of the first IAP systems was developed, helping to allow access of new types of vehicles, with capabilities matched with the infrastructure (e.g. maximum possible load, possible turning circles and real-time traffic).

What is more, these vehicles are part of a multimodal system, where the optimal transport mode could be chosen based on cargo and infrastructure requirements and characteristics.

Using IAP planners and road authorities should be better able to maintain the infrastructure within available budgets and better able to match vehicles with the infrastructure characteristics, using GPS to ensure that each vehicle does not go outside areas where it is allowed.

As a result, road authorities could have a tool which enables them to control traffic in a better way and protect, plan and maintain infrastructure, enabling better maintenance planning, reducing costs, and improving safety.

ESTA was represented on the Aeroflex Sounding Board by Section Transport Vice-President Iffet Türken, who is also an Executive Board Member of semi-trailer manufacturer Kässbohrer.

She said: "This is a hugely important project for everyone involved in the European transport and logistics sectors and has involved close and effective cooperation between a wide range of companies and organisations.

"As Aeroflex has already shown, making our industry more sustainable will involve a great deal of new thinking and innovation - backed up by the necessary political and regulatory support.

"What is more, its work has great potential benefits for ESTA members and the abnormal transport sector - for example through the drive for effective pan-European regulations for out of gauge transport and increased and focussed investment in infrastructure."

She added: "Everyone involved is looking forward to the next steps and building on the progress made so far."

For further information about Aeroflex, go to the organisation's website at https://aeroflex-project.eu. ESTA will publish details of the demonstration events and the project's next steps when they are available,