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**FC LAB**  
Research**TRONICO**  
ALCEN**MALHERBE**  
L'avenir est en route**ARTS  
ET MÉTIERS**  
ParisTech

REFRIGERATED OPTIMIZED ADVANCED DESIGN

<b>Type of project :</b>	Fond unique interministériel: FUI20, FUI21 September 2017 -> September 2020	
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	MALHERBE	TRANSPORT MALHERBE, Rots, France
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	FCLAB	Fuel Cell LAB, Belfort, France

## Abstract

The ROAD project covers the development of a new generation of refrigerated semi-trailers that maintains the cold chain with more affordable, environment-friendly and silent technology. To this end, the consortium is developing technological building blocks related to the aerodynamics, weight reduction and thermal insulation of the refrigerated semi-trailer.

The members of the consortium also work on the semi-trailer's equipment with a particular focus on the cooling unit. The new cooling unit's design is powered by electricity instead of fossile fuels and allows for a considerable reduction of its environmental impact (noise and pollutant). Furthermore, it enables the use of a more efficient management strategy for the electrical and mechanical components.

## The hydrogen genset

The FCLAB's main mission in this project covers the supply of the hydrogen genset. The hydrogen genset provides the energy required by the temperature regulation of the semi-trailer's cargo hold. The genset is composed of PEM fuel cell systems that convert the hydrogen energy into electrical power and includes Lithium-ion batteries that acts as energy buffers. The use of PEM fuel cell systems enables a silent and environment-friendly operation.

The main tasks tackled by the FCLAB in this project include :

- The design of the hydrogen genset
- The system management's strategy.
- The experimental testing of the hydrogen genset.