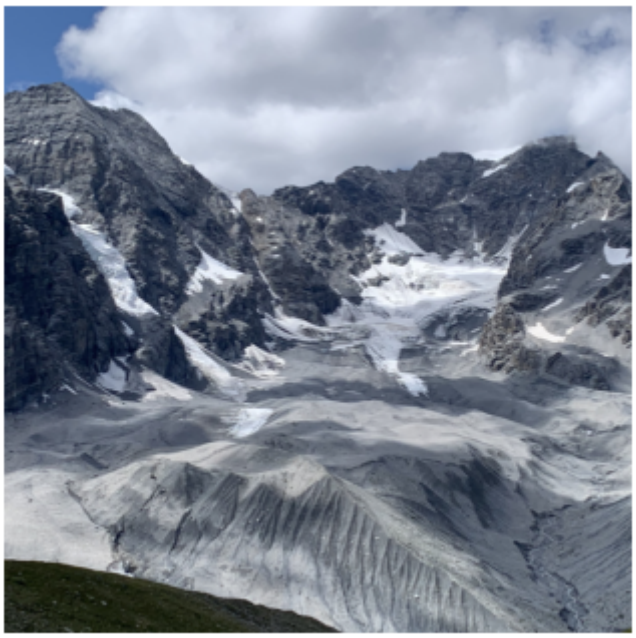
MHY BUS Project

Methane and Hydrogen blend for public city transport bus: technical demonstrative application and strategic policy measures

climate change | carbon emissions | greenhouse gas | mitigation

PROJECT DESCRIPTION



The MHyBus project (Methane and Hydrogen blend for public city transport bus: technical demonstrative application and strategic policy measures) was aimed at **reducing the environmental impact of the urban public transport** (in terms of CO_2 and pollutant emissions into the atmosphere) through the implementation of the first prototype in Italy of a **hydro-methane bus** (mixture of 15% hydrogen and 85% methane by volume). The vehicle run more than **45.000 km in Ravenna** with over **10.000 passengers** on-board circulating in the regular public transport service. During the road tests, environmental parameters relating to pollutant emissions and fuel consumption were monitored. These data provided a solid knowledge base for the **air quality and climate change** policies **at regional level**.

The project results showed that the hydro-methane has a great potential to reduce the environmental impact of the public transport. Taking advantage from the circulation of the vehicle on the urban roads, MHyBus also intended **to raise the awareness** of Emilia-Romagna citizens on climate change and air quality issues.

PROJECT PHASES

The main phases of the project were:

- **bench test** and bus prototype development;
- implementation of a special hydro-methane **fuelling station** as well as of **road tests with and without passengers** carried out according to a **protocol** defined together with the Ministry of Infrastructure and Transport. In this phase, the absence of technical problems and the monitoring data of the engine's performance demonstrated that the use of hydro-methane blend **does not limit the vehicle's standard operation**;
- development of **technical guidelines** (addressing local transport agencies) for transformation of a public transport vehicle powered by methane into one powered by hydro-methane, as well as of a roadmap for introducing hydro-methane as **alternative fuel**;
- set up of a **hydro-methane Community**, also operating on the project website, where all the outputs and deliverables are available;
- dissemination and information activities which involved several organizations, companies, professionals and technical experts in workshops and seminars.

PROJECT RESULTS

MHyBus demonstrated that the use of hydro-methane blend increases the **sustainability** of public transport, thanks to a **reduction of the CO_2 emissions by 15% and of the fuel consumption by 13%.** The project can be considered a pilot initiative as far as it tests new technical aspects and it **also defines the type-approval procedures for a new vehicle** to be used in the public transportation.

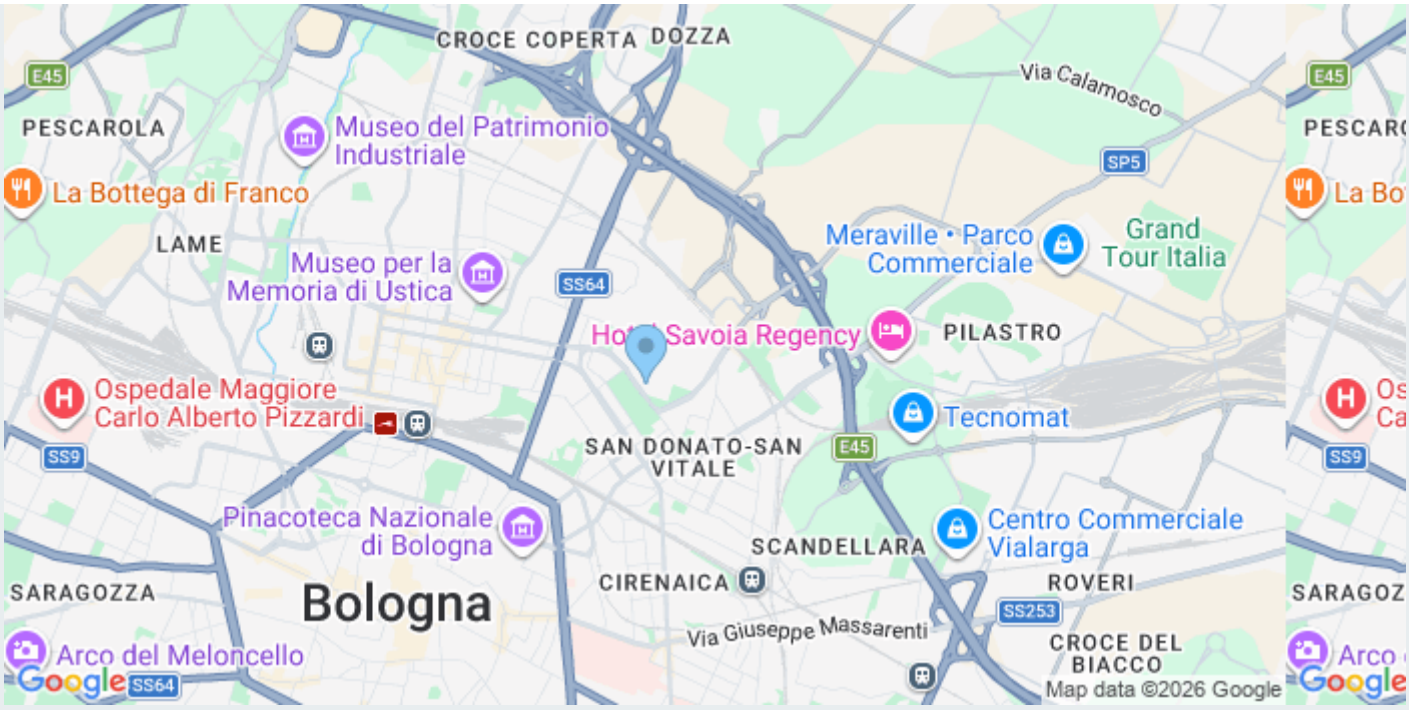
Therefore the project is a possible solution to fight climate change and to improve air quality at a local scale, with a high potential also on wider scale.

Given the good results of its experimentation, the vehicle is presented at several **sustainable mobility** events for demonstration purposes. The project's success moved over the regional borders, attracting interest at international level, especially in Lithuania and Korea.

Results in figures:

- **1 bus prototype** running on hydro-methane (15% hydrogen and 85% methane by volume). The type-approved vehicle runs regularly in Ravenna;
- **1 hydro-methane fuelling station** built within the production plants of the "SOL S.p.A" company in Ravenna;
- **1 experimental protocol to obtain approval for circulation on public roads** agreed with the "*Centro Prova Autoveicoli*" (Ministry of Infrastructure and Transport);
- **4 series of tests passed successfully**: preliminary tests; tests during experimental operations; final tests including engine bench test; components testing and final leakage tests;
- **more than 10.000 transported passengers** on the regular scheduled service **"START Romagna"** in Ravenna;
- **45.898 km run** on road without technical problems potentially caused by the hydro-methane blend;
- **12.600 kg of** produced **hydro-methane**;
- **13% less of fuel consumption** compared to a natural gas vehicle;
- **1.800 kg of** saved **methane**;
- **15% of avoided CO_2 emissions** compared to a similar vehicle powered by natural gas;
- **5.980 kg of CO_2 emissions avoided** in the atmosphere.

MHybus was awarded "Best LIFE Environment project 2014".



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Acronym
MHY BUS

Number of reference
LIFE07 ENV/IT/000434

Reference Programme
LIFE

Beneficiary Coordinator
Regione Emilia-Romagna Direzione Generale Reti Infrastrutturali, Logistica e Sistemi di Mobilità

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EU contribution
589.079,00

Call Year
2007

Start Year
2009

End Year
2013

Beneficiary headquarters

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Region
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