Feasibility study of a LNG powered tugboat in the port of Barcelona

EV4

To extend the use of the LNG in the port domain, tugboats represent an important point to be considered.

EV4 will evaluate the feasibility of a natural gas-powered tugboat construction, which will be designed specifically for the characteristics of the ports of the Western Mediterranean.

Partners involved

Port de Barcelona

UTE Remolcadores de Barcelona · SAR

The solution will count with a dual fuel engine solution and the study of the needs and performance of the boat will be completed soon.

Objective:

The objective of this activity is to conduct a feasibility study for the construction of a natural gas-powered tugboat, designed specifically for the characteristics of the ports of the Western Mediterranean.

Specific objectives:

- To break down barriers to speed up the implementation of natural gas as a fuel used in the fleets of the service port operators.
- To contribute to the reduction of pollutant gas emissions and suspended particulates in the port that affects the air quality in the city.

Description:

Operational feasibility study of a new tug gas propulsion engine, directly coupled to the propeller shaft to carry out towing services in the port of Barcelona.

The project aims to complete the specific design of the boat which will have the same performance and potential as the current diesel-powered tugs, along with a detailed analysis of their performance, fuel consumption, emissions and operating costs. The action will be carried out by two towing service companies of the Port of Barcelona and it will help break the initial barriers of the operators to incorporate gas service into their fleets of vessels. The expected penetration of gas engines among the tugs in the Port of Barcelona is estimated to be between 7% by 2020 and 20% by 2030.

In the project options using natural gas in compressed or liquefied will be analysed, which is an important factor because it will determine the forms of the tugboat and the logistics of the fuel supply.

LNG may be supplied from a pipe, truck or barge and be stored in a storage tank (much like gas oil) which may be placed under the deck. In this case of CNG, the gas supplied and stored in properly stowed bottles. LNG will require working with cryogenic liquids, but it will also open a range in the methods of fuel supply to the vessels and optimize logistics according to the characteristics and needs of the port.

Other aspects to consider when deciding on the use of natural gas-powered tugboats are autonomy, consumption and energy efficiency. These parameters are closely related, since lower consumption translates into increased autonomy and energy efficiency. Moreover, consumption

is linked to the operating profile of the tugboat, which is marked by the needs of the port of Barcelona in terms of numbers frequency of operations to be performed, their duration, type of operation (vessel arrival, vessel departure, change of the mooring, etc.), number of tugs working at once, etc..

We must also take into account the reduction in emissions that will result through the use of a cleaner fuel. Currently, the fleet of 8 tugboats in the harbour emits an estimated 130 tons of NOx and SOx 6.2 tn. Through the use of natural gas, SOx emission will be reduced by 100% and for NOx by 85%.