



Retrofitting towards climate neutrality

D2.1 Preliminary report on results of land-based testing

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EXECUTIVE SUMMARY

This document is deliverable “D2.1 – Preliminary report on results of land-based testing” of the European Union project “Retrofitting towards climate neutrality” (herein referred to as “**Green Marine**”), with **Grant Agreement** No. 101096522.

The current document discusses about the deliverable D2.1 which is a part of WP2 - Land based test and integration of solutions. It describes the testing and mapping of the performance of a marine genset with similar specifications onboard the candidate vessel “MV Coruisk” with IMO/LR No.: 9274836, integration of Green Marine solutions along with scientific and technical support within the consortium. A dedicated and rigorous performance-based analysis will be carried out at the land-based facility available at Port of Limassol, Cyprus for the various proposed technological solutions by four members of the consortium (SINTEF, CCM, SMP and its affiliated entity WPS).

This deliverable contains details about the test location, engine specifications, sensors, data acquisition system, IoT platform development, test methodology, risk, hazard and quality standards, back pressure requirements, bypass actuation system and policies to be followed at the test centre and during the operation. The deliverable presents the bypass system with the aim to provide exhaust flue gases at 50 – 150 Nm³/h as well as incorporate safety measures for emergency cutoff of the Green Marine technologies. Note that the manufacturer of the genset to be used in WP2 land-based tests is recommending a **max backpressure of 10.1 kPa and minimum of 5.0 kPa at rated conditions** [1, 2].

In addition, the report also serves as a reference document providing the step-by-step desktop evaluation process of syngas on-board production from flue gas & reinjection by the genset. The analysis is part of the overall assessment of Green Marine technologies (and their combinations) to establish “lessons learned” regarding the syngas solution. The analysis revealed the technical difficulties for onboard syngas production and the negative energy balance from production and consumption of syngas onboard. Therefore, the analysis suggests a “no-go decision” for the syngas production pathway thus eliminating it as a potential solution for further investigations in WP1, WP2 and WP3 following the relevant provisions of the Description of Work. Hence, technologies that will not be further investigated as part of the syngas solution are 1) PEM development for Hydrogen production from the flue gases, 2) Catalyst and regeneration (i.e. the ThorSpin Unit) for the RWGS for CO production from the flue gases, and 3) Retrofits and reinjection of syngas in marine genset. However, the TEE will be further investigated to exploit the waste heat recovery from the genset’s water coolant or exhaust flue gases.

The report serves as a reference document for all **Green Marine** consortium members and follows up with the land-based testing of proposed technologies. This report is understood to be a living which will be updated with measurements and assessments per Green Marine technology in D2.4 “Summary report of results of land-based testing” in M31.