

Deep!U

DELIVERABLE D7.7

Report on the second year activities

Subtitle

Lead Beneficiary: RED

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Date: 13/02/2025

Dissemination Level

PU	Public, fully open	
SEN	Sensitive - limited under the conditions of the Grant Agreement	X
CI	EU classified - RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444	



This research is funded by the European Union (G.A. 101046937). The views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or EISMEA. Neither the European Union nor the granting authority can be held responsible for them.

Document History

Version	Date	Authors	Description
1	12/11/2024	Phillip Planitzer / Georg Cerwenka	First draft
2	22/12/2024	Nicola Mutinelli	First Draft updated with inputs from most partners
3	10/01/2025	Arno Romanowski	Draft updated with input from Prevent
4	13/02/2025	Luc Pockele	Final version reviewed by coordinator for submission

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This publication was completed with the support of the European Innovation Council and SMEs Executive Agency (EISMEA) under the HORIZON-EIC-2021-PATHFINDEROPEN-01 programme. This research is funded by the European Union (G.A. 101046937). However, the views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or EISMEA. Neither the European Union nor the granting authority can be held responsible for them.

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ABBREVIATIONS AND GLOSSARY OF ACRONYMS

Acronym	Extended definition
CA	Consortium Agreement
D	Deliverable
DCM	Dissemination and Communication Manager
D&C	Dissemination and Communication
DPM	Data Management Plan
EC	European Commission
FAIR	Findable, Accessible, Interoperable and Reusable
GA	Grant Agreement
HE	Horizon Europe
IPR	Intellectual Property Rights
M	Month
PC	Project Coordinator
PDEC	Plan for Dissemination and Exploitation including Communication activities
PM	Program Manager
PO	Project Officer
SC	Steering Committee
VRE	Virtual Research Environment
WP	Work Package

PUBLISHABLE SUMMARY

The DeepU project started in March 2022 and was planned to run for three years. It involves at the start six participants but through a widening grant a seventh partner joined the consortium 16 months after the start of the project. The project coordination changed from the University of Padova (Italy) to RED Srl (Italy) also 16 months after the start. The project structure is based on eight work packages (WPs). Six of these (WP1 to WP5, WP8) address the technological and scientific development of the project and are assisted by two WPs devoted to dissemination and communication (WP6) and management (WP7). DeepU is expected to achieve technical and environmental/standardization innovation goals. This deliverable reports on the project activities from month 13 until month 30.

The project focuses in that period on developing a lightweight drill string to transport the cryogenic gas and shield the laser beam (WP1, WP8) and on developing further the drilling head, run tests in the experimental test stand (WP2). The tests aim to assess the thermal effects of the laser beam and cryogenic gas on different rock types in terms of drilling feasibility, energy requirements, borehole wall vitrification (WP2-WP3). Lab analysis are done to characterize the drilling residues generated by the laser (WP3). The regulatory aspects and the environmental, health and safety (EHS) of the DeepU technology (WP4) are assessed and evaluated. Work started to assess the commercial attractiveness of DeepU (WP5).

The introduction focuses on (i) summarizing the context and overall objectives of the project, (ii) presenting the work carried out from month 13 of the project up to month 30 (18 months in total) and the main results achieved, (iii) presenting the progress beyond the state of the art, the expected results until the end of the project and the potential impacts.

Then, the core of this deliverable highlights the activities performed in the second year of the project, pointing out the main achievements reached up to now, in agreement with the project workplan. Proceeding by WP, an overview of the work carried in each WP is provided, together with an explanation of the main outcomes.

Finally, an overview of the next project steps considering the cooperation between different WPs is presented.