

D15.8 Report on Dissemination Events and Publications

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TABLE OF CONTENTS

TABLE OF CONTENTS	3
LIST OF TABLES	3
ACRONYMS	3
EXECUTIVE SUMMARY	4
1. INTRODUCTION	5
2. DISSEMINATION EVENTS	6
3. SCIENTIFIC PUBLICATIONS	11
4. NON-SCIENTIFIC PUBLICATION	12
5. CONCLUSION	13

LIST OF TABLES

Table 1: List of Events	10
Table 2: Scientific Publications	11
Table 3: Non-scientific publication	12

ACRONYMS

EC	European Commission
EU	European Union
INEA	Innovation and Networks Executive Agency
WP	Work Package
D&C	Dissemination and Communication
ROP	Rate of Penetration

EXECUTIVE SUMMARY

As part of geothermal well drilling and completion, the drilling industry faces several challenges, such as the low rate of penetration (ROP) and lack of bottom hole awareness, which result in the need for tripping and non-productive time (NPT). The OPTIDRILL project addressed and solved some problems when drilling for geothermal that increase uncertainty and therefore increase well completion costs.

The OptiDrill consortium developed a drilling advisory system based on integrating several ML models into a unified OPTIDRILL advisory system, where each module will be responsible for analysing, predicting, or optimizing one aspect of drilling or completion.

This deliverable reports all the dissemination events and publications undertaken by the consortium members during M1 to the end of the project.

Objective met:

The current deliverable contributes toward the following work package objective:

- Exploitation, Dissemination, and Communication

1. INTRODUCTION

In OptiDrill, WP15: Exploitation, Dissemination, and Communication is responsible for promoting and disseminating OptiDrill concepts and outcomes. With such purpose, this document reports the activities related to the dissemination events and publications of the OptiDrill project during its lifespan.

The main objective is to guide the consortium in creating and enhancing awareness of OptiDrill activities and results by reaching out to defined target groups, thus helping achieve the project's success. As a part of the dissemination activities in terms of participation and organisation of dissemination events and publication of the OptiDrill result, this report lists those activities, in particular.

This document is split into multiple sections corresponding to different activities: In Section 2, we report on the dissemination events undertaken jointly by the consortium and individually by the partners during the project lifetime. Our publications are outlined in Section 3.

2. DISSEMINATION EVENTS

The OptiDrill consortium has used various tools to promote project activities and results to increase stakeholder awareness, as described in OptiDrill's Dissemination and Communication strategy (15.1), Dissemination Plan (15.2), Communication Plan (15.3), and finally Updated Dissemination and Communication Plan (15.5). In addition, the entire consortium and partners have been involved in many activities, including the OptiDrill website and social networking presence, events, and publications. The goal is to reach the target stakeholders with the highlights and public presentations of the technical results for the OptiDrill design and technology.

The summary of the remarkable top results achieved is presented below, reporting on project activities in different dissemination areas:

- External events, participation in events and conferences
- Publications

Here is a list of all the conferences we've attended so far:

Event / Conference Name	Venue	Date	Participant	OptiDrill Presence / Description
<u>Geothermal Transition Summit, Europe (GTS 2024)</u>	Munich, Germany	8 - 9 Nov 2024	Shahin Jamali (IEG)	Presentation on "OptiDrill: Optimization of Geothermal Drilling operations with AI and Machine Learning Methods"
<u>Fifth EAGE Global Energy Transition Conference & Exhibition (GET 2024)</u>	Rotterdam, The Netherlands	4 - 7 Nov 2024	Henning Knauer (IEG), Shahin Jamali (IEG)	Poster and abstract presentation on "Optimising the Geothermal Drilling Process Using Artificial Intelligence Methods"
<u>DGK Potsdam 2024 (Der Geothermie Kongress)</u>	Potsdam, Germany	22 - 24 Oct 2024	Henning Knauer (IEG), Shahin Jamali (IEG)	Presentation on "OptiDrill: Optimizing the Geothermal Drilling Process Using Artificial Intelligence Methods"
Praxisforum Bayern	Munich, Germany	16 - 18 Oct 2024	Dr. Jörg Baumgärtner (BESTEC)	Introduction of OptiDrill System to clients
AI@BGS	Nottingham, UK	16 May 2024	Matt Arran (BGS), Andrew Kingdon (BGS), Mark Fellgett (BGS)	Presentation on "Machine Learning for Drilling Problem Identification"
<u>Machine Learning Prague 2024</u>	Prague, Czech Republic	22 - 24 Apr 2024	Henning Knauer (IEG), Shahin Jamali (IEG), Kevin Mallin (GEO)	Machine Learning Prague 2024 is one of the largest conferences about machine learning. Henning Knauer, from the IEG, participated in a poster session on the

				first day of the conference, representing the OptiDrill Project and concept.
EGEC Geothermal: Updates on Drilling for Geothermal Drilling Design & Technologies- Webinar	Virtual	19 Apr 2024	Henning Knauer (IEG)	The webinar featured speakers discussing geothermal drilling design, technologies, and market trends. Henning Knauer from Fraunhofer IEG presented on "Optimisation of Geothermal Drilling with Machine Learning" in the second session, moderated by Miklos Antics, GPC, co-leader of ETIP-Geothermal WG on Well Technologies.
Geotherm exhibition	Offenburg, Germany	29 Feb to 01 Mar 2024	BESTEC personnel	Introduction of OptiDrill System to clients
EGEC Geothermal	Virtual	Dec 2023	Tamanna Khan (TVS)	OptiDrill Project Presentation
10th UK Geothermal Symposium	Burlington House, UK and virtual	20 to 22 Nov 2023	Kevin Mallin (GEO)	Kevin J Mallin, Technical Manager and Managing Director of Geolorn Limited, presented a paper titled "OptiDrill-Back to the Future" at the Symposium. The event, a hybrid event, highlighted the rapid development of geothermal energy, exploring and developing new projects and increasing funding levels.
Digital Geoscience 2023	London, UK	13 to 14 Nov 2023	Matt Arran (BGS), Andrew Kingdon (BGS), Mark Fellgett (BGS)	Poster presentation on "ML for Drilling Problem Identification"
EGPD 2023	Glasgow, Scotland	4 to 6 Apr 2023	Henning Knauer (IEG)	The EGPD 2023 programme included talks from geothermal experts, poster and presentation sessions, networking events and field trips. On day 2 of

				the programme Henning Knauer, IEG, presented a poster on “Deep Geothermal Drilling Optimization Using Artificial Intelligence Methods”, referring to the OptiDrill project. The poster presentation was based on the abstract “Optimising the drilling process for geothermal wells using legacy oil field data and machine learning”. The contents of the presentation mostly included OptiDrill deep drilling database, and OptiDrill advisory system objectives.
EGU 23	Vienna, Austria	23 to 28 Apr 2023	Andrew Kingdon	OptiDrill's partner, Andrew Kingdon from BGS, presented a paper on 'Optimising the drilling process for geothermal wells using legacy oil field data and machine learning' at the European Geosciences Union (EGU) general assembly, showcasing the development of OptiDrill's drilling advisory system. The paper was written under the collaboration of BGS, IEG, and GEO.
World Geothermal Congress 2023	Beijing China	Apr 2023	IEG	Accepted manuscript
Street festival Büchel exhibition	Aachen	14 Apr 2022	IEG	OptiDrill project featured on IEG stand
Geotherm exhibition	Offenburg, Germany	2 to 3 Mar 2023	BESTEC personnel	Introduction of OptiDrill System to clients
Technology Transfer and Synergies Meeting at IEG Fraunhofer, Germany	Bochum, Germany	28 to 29 Mar 2023	Filipa Vieira-Matias (EG CINEA), OptiDrill	Technical partners of GeoDrill and OptiDrill met to discuss technology transfer and synergy between their projects, focusing on cost-efficient drilling technologies and drilling

				advisory systems. OptiDrill's project officer, Filipa Vieira-Matias, EC CINEA, was present during the meeting.
ETIP DG'S Annual General Meeting 2022		13 Dec 2022	Tamanna Khan (TVS)	Introduction to OptiDrill
EGC 2022	Berlin	Oct 2022	Henning Knauer (IEG)	<p>The Congress is organised every 3 years by EGEC, the European association representing the geothermal sector, the European Geothermal Congress – EGC – is the largest geothermal event in Europe. It brings together all the various stakeholders involved in the sector, whether they be academics, industrial companies, financial partners, policy-makers or social organisations. OptiDrill presented a paper and a poster on “Deep Geothermal Drilling Real-Time Performance Prediction and Optimization Using Artificial Intelligence Methods” on the second day of the EGC 2022. Henning Knauer, from IEG, conducted a lecture and presented the poster on the theme of “Geothermal drilling and Construction of geothermal wells”.</p>
Society of Petroleum Engineers – “Geothermal at What Cost”	Global Webinar	27 May 2022	Kevin Mallin (GEO)	Presentation to SPE members, focusing on transitioning to Net-Zero and how technologies such as OptiDrill will play a significant role.
Fraunhofer Kuratorium(external board) members meeting	Virtual	May 2022	Shahin Jamali (IEG)	presented as a lighthouse project

Fraunhofer curation meeting	Virtual	Dec 2021	Shahin Jamali (IEG)	Presentation on OptiDrill
Using Groundwater for a Sustainable Future	Eden Project, Cornwall	9 Dec 2021	Kevin Mallin (GEO)	Presentation on issues associated with deep drilling and how OptiDrill will advance the successful outcomes of projects
The German Geothermal Congress DGK 2021	Essen, Germany	30 Nov to 2 Dec 2021	Henning Knauer (IEG)	The German Geothermal Congress, Germany's largest specialist congress on geothermal energy, was held digitally due to COVID-19 restrictions. Scientists and projects presented their findings. Henning Knauer from IEG presented a poster on "Deep Geothermal Drilling Optimization Using Artificial Intelligence Methods" focusing on data collection, drilling database, ROP prediction model development.
Geological Society, London	London, UK	17 Nov 2021	Kevin Mallin (GEO)	Presentation on drilling risks in geothermal – how OptiDrill will help lower the risks.
World Geothermal Congress 2021	Reykjavik, Iceland	24 to 27 Oct 2021	Ashadul Hoque (TVS)	OptiDrill project featured on a shared stand
CSM Business Breakfast	Virtual	9 Jul 2021	Kevin Mallin (GEO)	Kevin Mallin, GeoLorn Ltd. Managing Director and Technical Manager at OptiDrill project, discussed a real-time drilling advisory system platform using sensor and machine learning methods at the meeting.

Table 1: List of Events

3. SCIENTIFIC PUBLICATIONS

During the project lifespan, the research findings and project related work have been published in journals and conferences. A list of publications is displayed in the table below:

Org	Author	Title	DOI	Journal
BGS, IEG, GEO	Andrew Kingdon, Matthew Arran, Mark Fellgett, Shahin Jamali, Henning Knauer, and Kevin Mallin	Optimising the drilling process for geothermal wells using legacy oil field data and machine learning	https://doi.org/10.5194/egusphere-egu23-3408	EGU General Assembly 2023
IEG	Henning Knauer, Shahin Jamali	Optimizing the Geothermal Drilling Process Using Artificial Intelligence Methods	https://doi.org/10.3997/2214-4609.202421310	Fifth EAGE Global Energy Transition Conference & Exhibition (GET 2024)
IEG	Henning Knauer, Shahin Jamali, Volker Wittig, Rolf Bracke	Deep Geothermal Drilling Real-Time Performance Prediction and Optimization Using Artificial Intelligence Methods	10.24406/publications-1119	EGC 2022

Table 2: Scientific Publications

4. NON-SCIENTIFIC PUBLICATION

Apart from scientific publications, The OptiDrill Projects has made some non-scientific publications as well for several journals. The published articles are listed below:

Title	DOI/Link
The OptiDrill project is optimising geothermal drilling operations with Machine Learning	https://www.innovationnewsnetwork.com/optimising-geothermal-drilling-operations-with-machine-learning/32579/

Table 3: Non-scientific publication

5. CONCLUSION

This deliverable is part of OptiDrill's ongoing dissemination and communication efforts. The OptiDrill project consortium has actively participated in several prominent geothermal events across Europe and globally. Additionally, the consortium remains committed to publishing project results in reputable scientific journals.