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D10.5: Report on dissemination event and publications

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¹ Dissemination level security:

PU – Public (e.g. on website, for publication etc.) / **PP** – Restricted to other programme participants (incl. Commission services) /

RE – Restricted to a group specified by the consortium (incl. Commission services) / **CO** – confidential, only for members of the consortium (incl. Commission services)

GEO-C\$AT

DEVELOPMENT OF NOVEL AND COST-EFFECTIVE CORROSION RESISTANT COATINGS
FOR HIGH TEMPERATURE GEOTHERMAL APPLICATIONS



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1. EXECUTIVE SUMMARY

This deliverable provides a description of all dissemination activities that were conducted throughout the duration of the project. The document complements the deliverables D10.3 A communication plan (submitted M12) and D10.4 A dissemination plan (submitted M10) which describes Geo-Coat's communication and dissemination strategy to maximise project impacts and exploitation as described in D10.1 Diversified exploitation plan for flagship projects based on Geo-Coat concept (submitted M38).

2. DISSEMINATION TOOLS

As described in the dissemination and communication strategy, the Geo-Coat consortium has used a combination on physical and digital channels to promote project results to alleviate stakeholder concerns and eventual market uptake (see D10.7 Diversified business plan for four flagship projects based on the Geo-Coat concept).

2.1 Project website

The project website² (Figure 1) was launched in April 2018 (see D10.6 A project website) and has since been used to disseminate project results and activities. The website traffic has been monitored using google analytics. The website also hosts a repository that enables public access to project related publications³ and other dissemination materials.

² <https://www.geo-coat.eu/>

³ <https://www.geo-coat.eu/outreach>

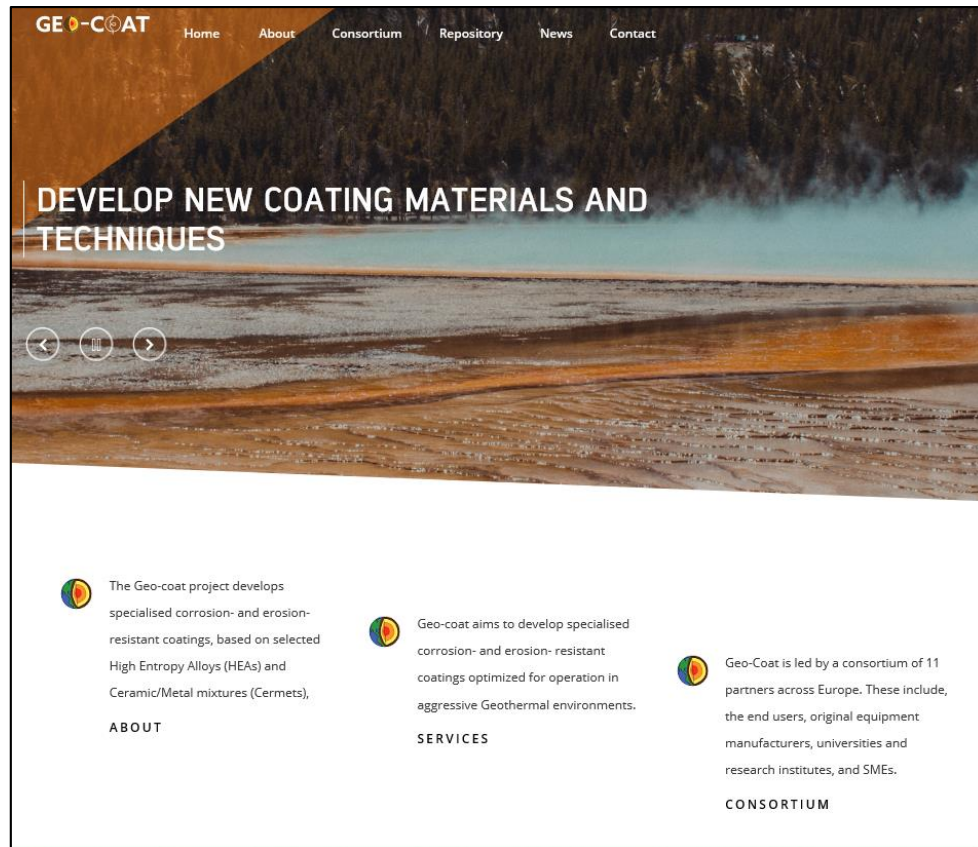


Figure 1 Geo-Coat website

2.2 Social media

The consortium has used LinkedIn⁴ as one of its social media platforms for sharing project related information and achievements. The project has posted over 60 posts during the project lifetime with some impressive post views (>2000 views) as shown Figure 2 in the below

⁴ <https://www.linkedin.com/in/geo-coat/>

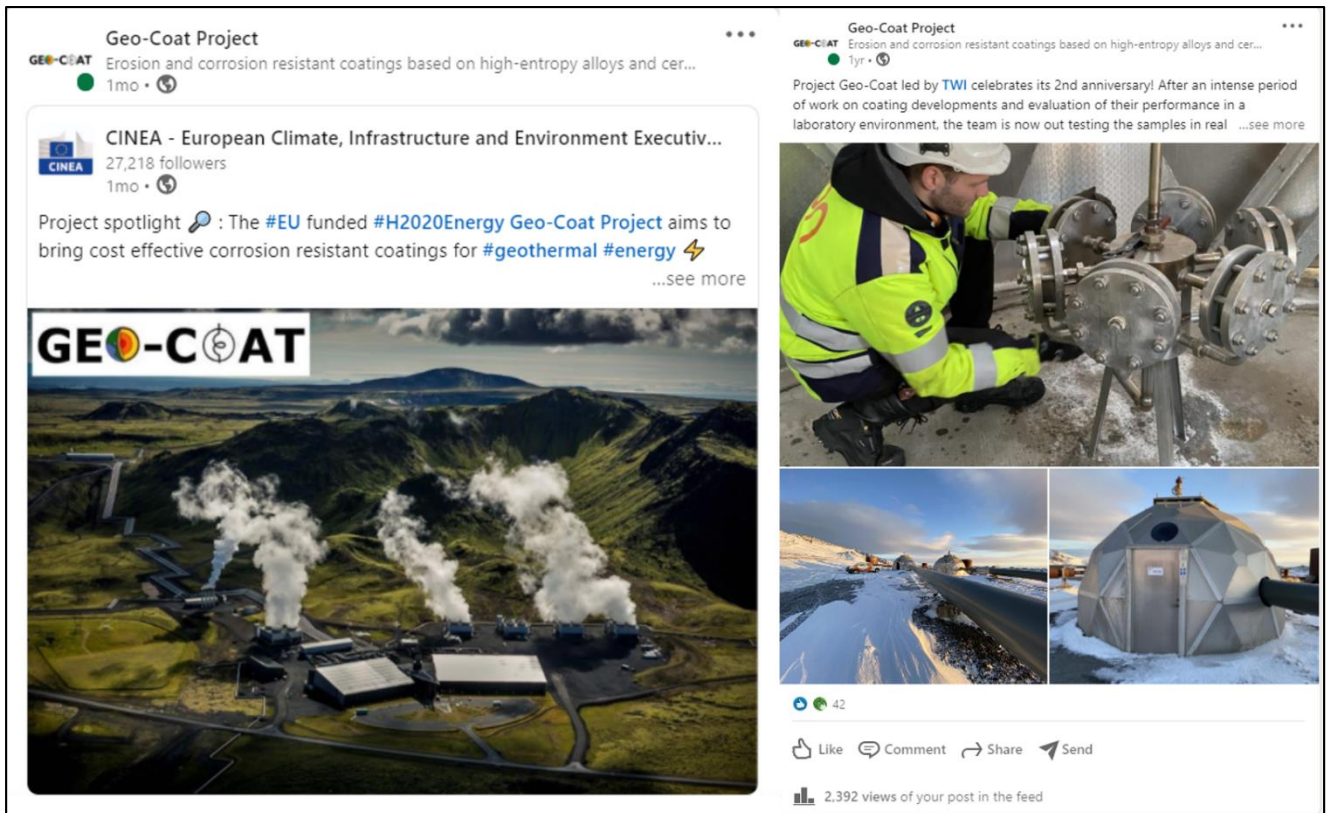


Figure 2 Geo-Coat LinkedIn.

A twitter channel⁵ (Figure 3) was also launched and was used jointly with LinkedIn for project outreach.



Figure 3 Geo-Coat Twitter page

⁵ <https://twitter.com/CoatGeo>

2.3 Press releases/Blogposts/New stories

Accomplishment of key milestones including attendance to events were published in the form of blogposts on the project website⁶ (Figure 4). These were further disseminated via a partner website and social media channels like LinkedIn and Twitter. The project has published more than 30 blogs since the launch of the website.



Figure 4 Geo-Coat news stories

2.4 Project Newsletters

The consortium published bi-annual newsletters to disseminate the consortium's activities and project related updates. The project has published six project newsletters⁷ (Figure 5 and Figure 6) Figure 1 during the duration of the project. These can be downloaded from the project website.

⁶ <https://www.geo-coat.eu/news#/>

⁷ <https://www.geo-coat.eu/outreach>



Figure 5 Screen shots from Geo-Coat newsletters Issues 1-3

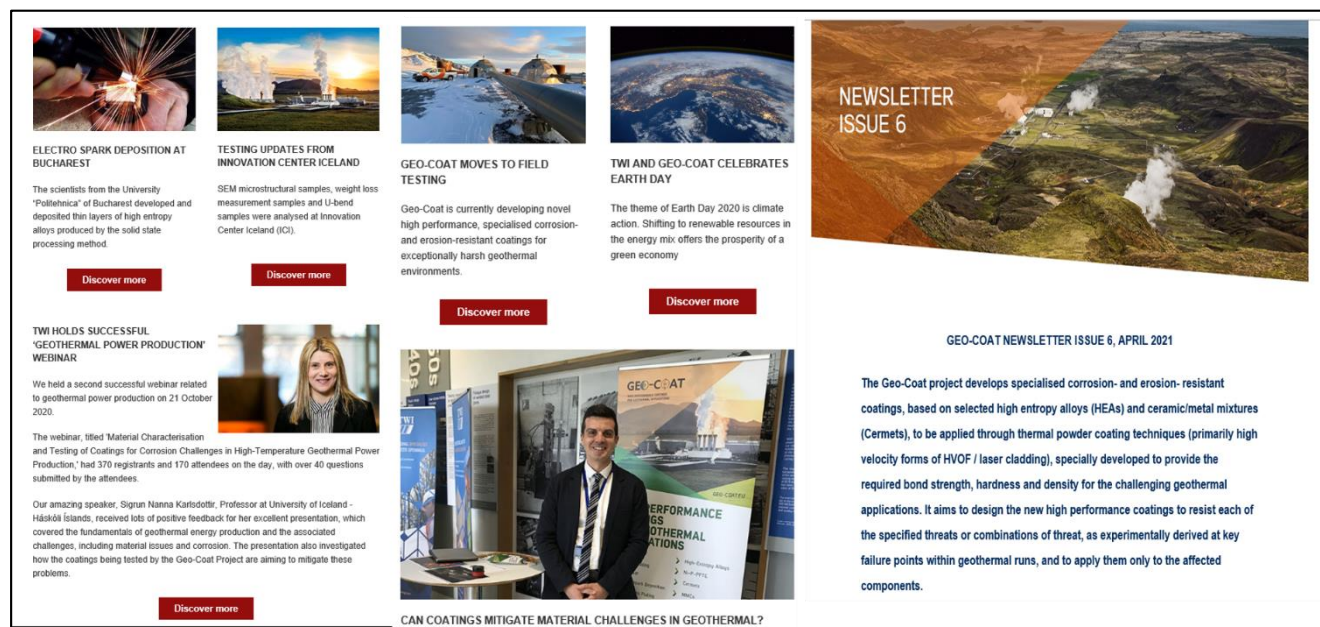


Figure 6 Screen shots from Geo-Coat newsletters Issues 4-6

2.5 Flyers, brochures and banners

The project has released a trifold (Figure 7) and a banner (Figure 8) as dissemination materials for distribution/display at stakeholder events. Digital copies are also available as downloadable versions via the project website.

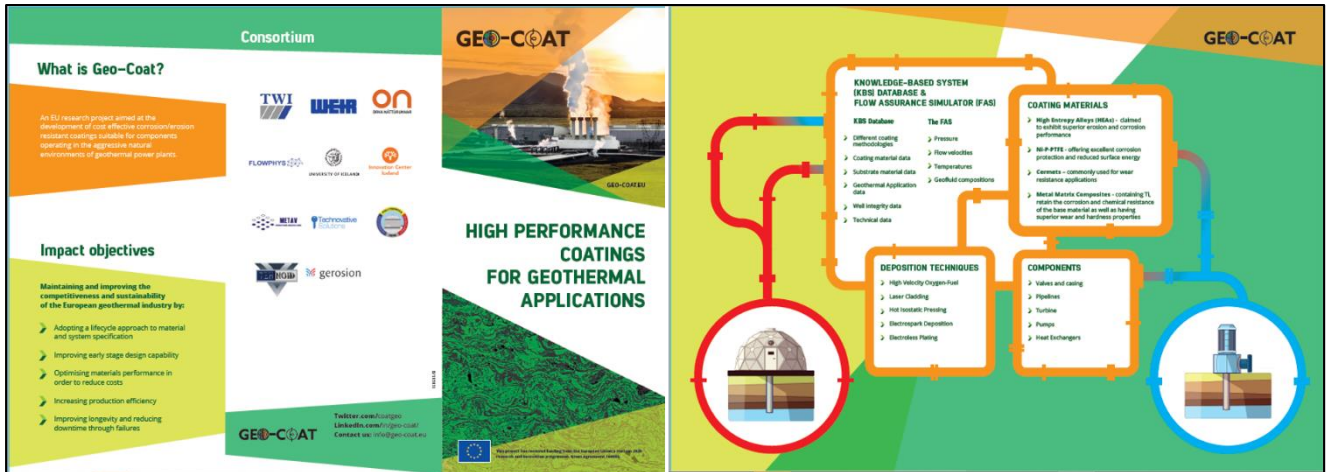


Figure 7 Geo-Coat trifold⁸

⁸ <https://www.geo-coat.eu/outreach>



Figure 8 Geo-Coat banner at UK welding exhibition

2.6 Webinars and videos

The consortium has hosted two webinars during the project lifetime as part of its dissemination activities. Recordings of the webinar have been made available as YouTube videos that can be accessed via the project website.

Table 1 provides details about the project webinars.

Table 1 Geo-Coat webinars

#	Title	Presenting Partner	Number of registrations
1	Can coatings help <i>mitigating</i> material challenges in geothermal energy production? ⁹	TWI	90
2	Material characterization of testing of coatings for corrosion challenges in high-temperature geothermal power production ¹⁰	UoI	370

An introductory video¹¹ (Figure 9) was also released highlighting project objectives and impacts.

⁹ <https://www.youtube.com/watch?v=4HIQVfyk9f4>

¹⁰ <https://www.geo-coat.eu/outreach>

¹¹ <https://www.youtube.com/watch?v=g6RKOowCTPg>

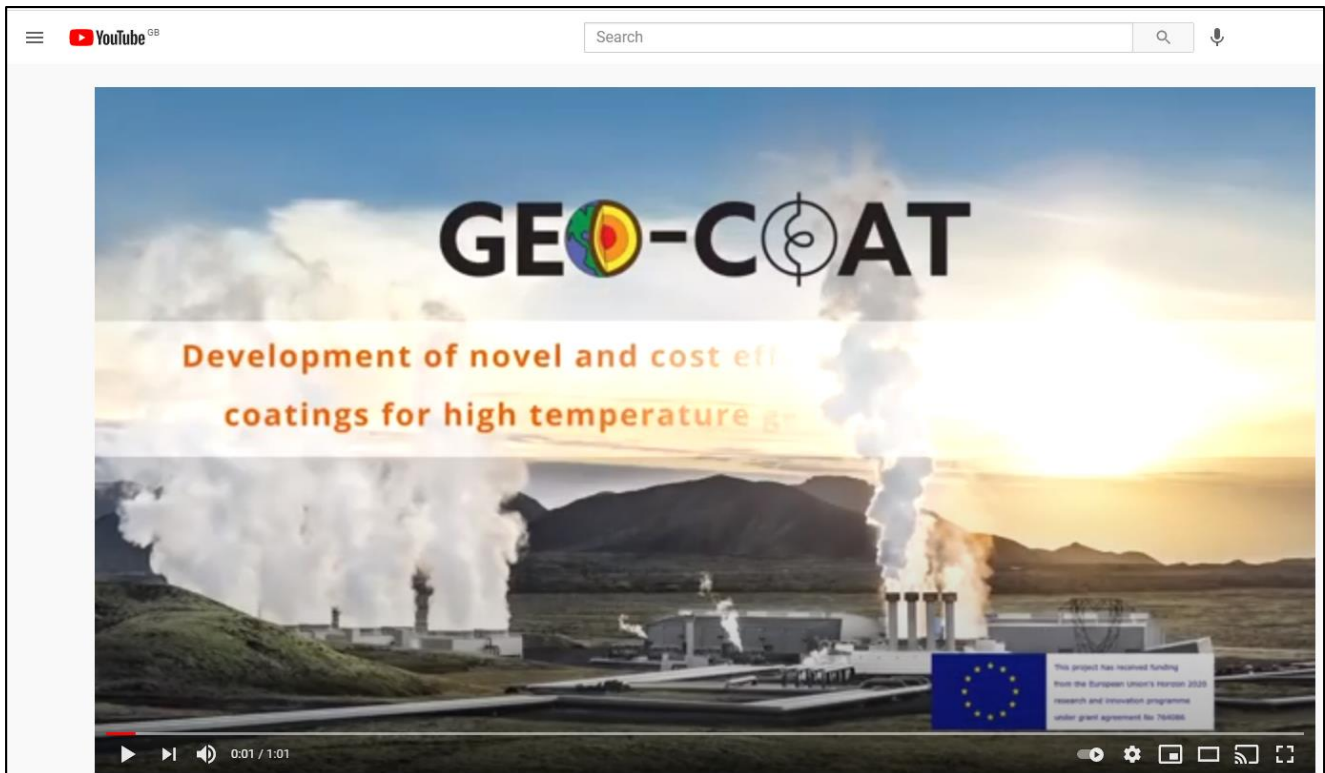


Figure 9 Geo-Coat project video

Project workshops

The Geo-Coat project has hosted two workshops during the project lifetime.

2.6.1 Geothermal: challenges and opportunities

The workshop was hosted jointly with S4CE, a H2020 project (grant agreement number 764810) at TWI in October 2019¹². The event was focussed on identification of challenges with geothermal exploitation and demonstration of the techno-economic solutions through contributions of H2020 projects S4CE and Geo-Coat. The workshop was attended by external stakeholders such as geothermal power plant operators, energy experts and researchers as well as members of the consortia. The event also included short interview sessions where questionnaires were tailored to capture participants' thoughts on:

- Role of H2020 calls in shaping the future of geothermal;
- Challenges in exploitation of geothermal energy;
- Role of technology and innovation in addressing challenges in geothermal;
- Role of projects like S4CE and Geo-Coat in addressing the needs for harnessing of the geothermal potential.

¹² <https://www.twi-global.com/media-and-events/press-releases/2019/geothermal-energy-opportunities-and-challenges>

The interviews have been published as YouTube videos¹³ and part of news stories¹⁴ published on the project website and social media channels as shown in Figure 10. The event provided an interesting platform for understanding the current issues with exploitation of geothermal energy and the potential solutions offered via advances in material sciences as part of the Geo-Coat project.

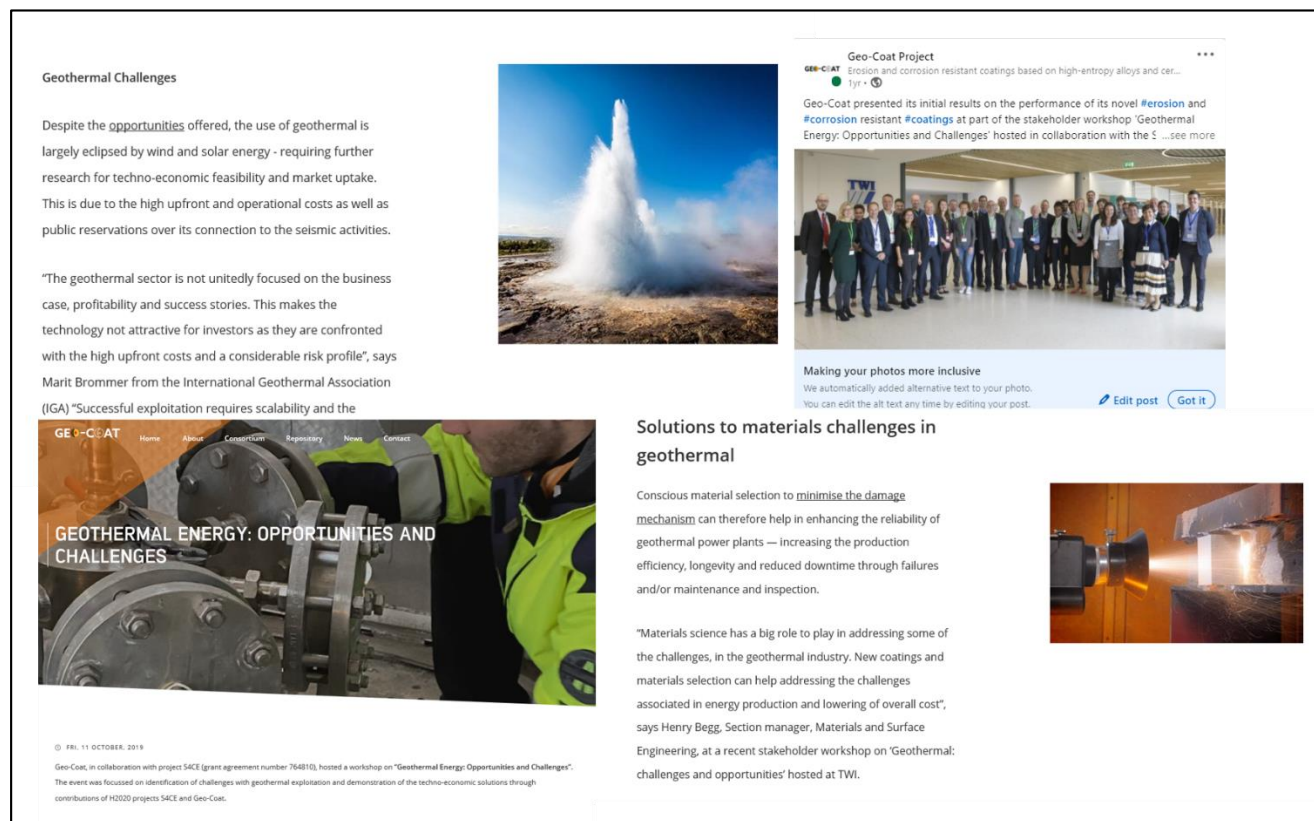


Figure 10 Geo-Coat workshop "Geothermal Energy: Opportunities and Challenges"

2.6.2 Geo-Coat: Materials Challenges in Geothermal Energy Production

The Geo-Coat consortium hosted its final workshop (Figure 11) showcasing project results in March 2021¹⁵. In view of the ongoing pandemic, the workshop was hosted online¹⁶ attracting >300 registrations. The event included presentations from partners exhibiting project success stories on:

- The Geo-Coat project;
- In-situ durability testing of Geo-Coat developed coatings;
- Geo-Coat Geothermal Flow Assurance Simulator;
- The environmental footprint results with and without Geo-Coat technology components adopted in geothermal power plant;
- Economic impact of Geo-Coat in highly corrosive geothermal environment;

¹³ <https://www.youtube.com/playlist?list=PL3f0O-D3NXi87dq-XAatNG8FXyagLsUJtK>

¹⁴ <https://www.twi-global.com/media-and-events/insights/pioneering-innovations-in-geothermal>

¹⁵ <https://www.geo-coat.eu/news/2021/geo-coat-workshop>

¹⁶ <https://www.youtube.com/watch?v=TWwHIn-10RM>

- Benefits of using coatings in geothermal power plants from an end-user perspective: lessons learned.

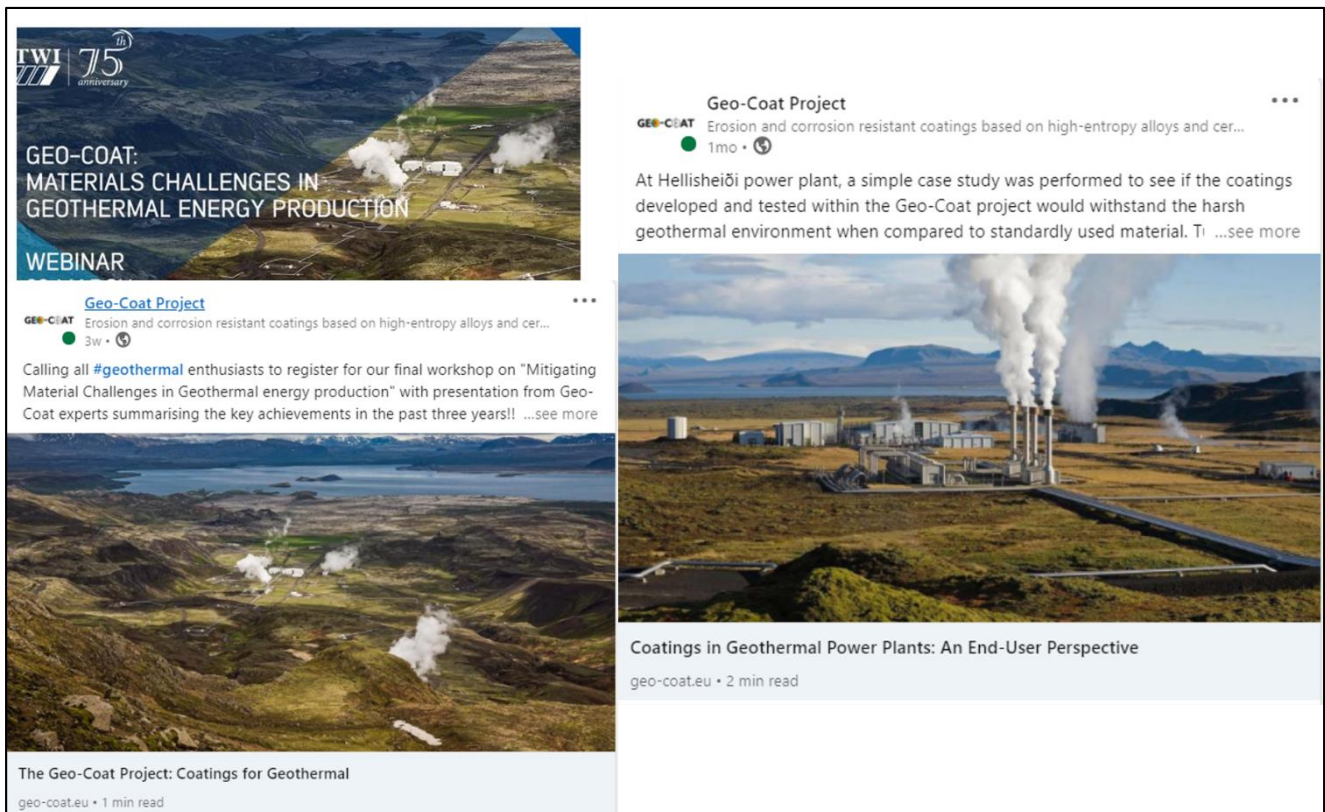


Figure 11 Geo-Coat workshop “Materials challenges in geothermal energy production”

The workshop announcement was published via partners’ website and social media, H2020 initiatives like REFLECT project¹⁷, newsletters such as ThinkGeoenergy¹⁸, COSVIG¹⁹ and European Energy Innovation magazine (Spring edition 2021²⁰). See Figure 12.

¹⁷ <https://www.linkedin.com/showcase/reflect-project/>

¹⁸ https://www.thinkgeoenergy.com/webinar-geo-coat-materials-for-geothermal-production-march-22-2021/?utm_source=linkedin&utm_medium=social&utm_campaign=news

¹⁹ <https://www.cosvig.it/workshop-finale-del-progetto-geo-coat/>

²⁰ <http://www.europeanenergyinnovation.eu/OnlinePublication/Spring2021/index.html#p=38>

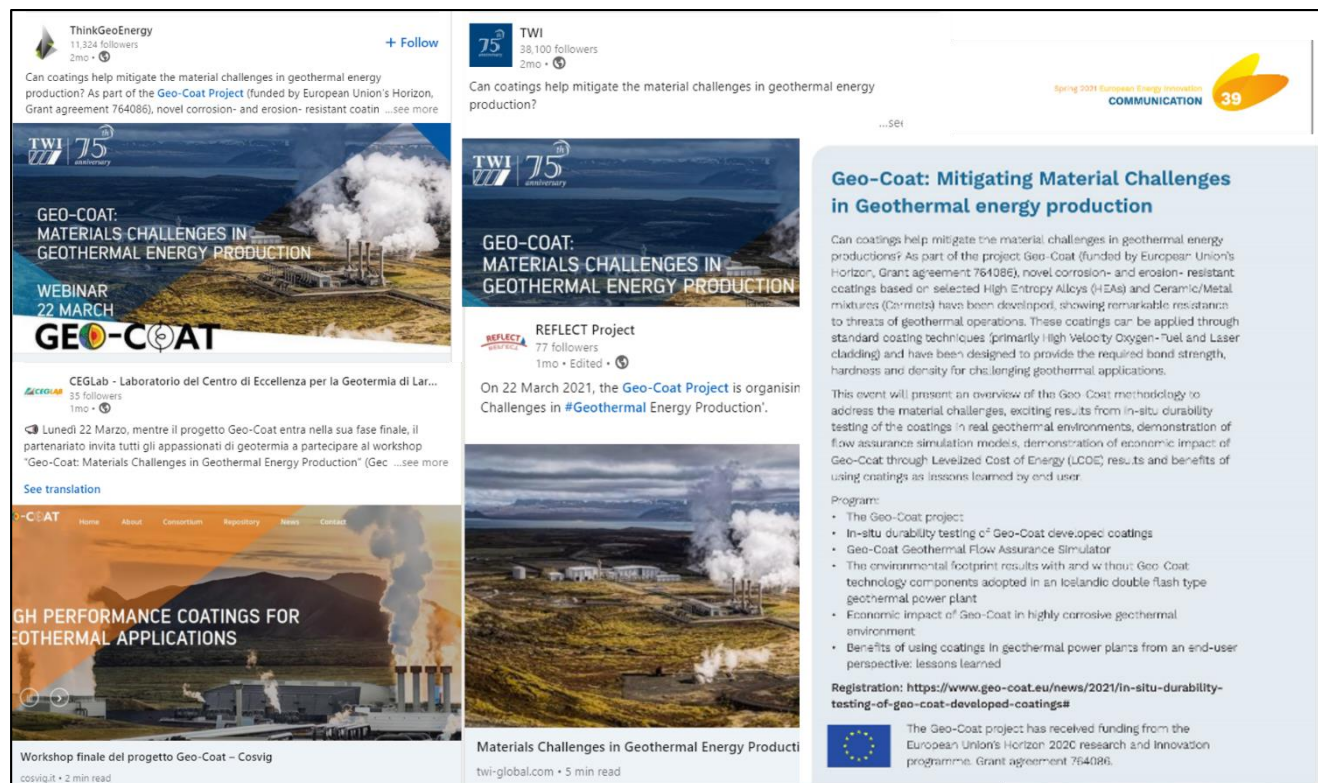


Figure 12 Dissemination via external platforms

2.6.3 External events

The consortium has participated in several national and international events to disseminate project activities. Provides a list of various events attended by partners during the duration of the project.

Table 2 Participation in events

#	Event	Activity	Partner
1	Iceland Geothermal Conference 2018	Presentation	GER, ICI, UoI
2	IRCSEEME 2018, July 2018, Spain	Presentation	MET, UPB, THE
3	H2020 Geothermal Research and Innovation projects, Brussels	Presentation	ICI
4	NACE Corrosion 2018	Presentation	ICI, TWI, UPB, UoI, Ger
5	Romat 2018	Presentation	UPB
6	Georg Geothermal Workshop 2018	Poster	ICI, Ger, UoI, ON
7	BIOMEDD 2018, section Surfaces	Poster	UPB, Tehnoid

8	NACE Corrosion 2019	Presentation	UPB, Tehnoid, UoI
9	UK Welding and Joining Exhibition 2019, TWI	Booth	TWI
10	Parsons 2019 International Turbine conference	Presentation	TWI
11	EUSEW 2019	Workshop*	TWI
12	Icelandic Industrial corrosion workshop 2019	Workshop*	ICI, UoI
13	INEA clustering event 2019	Presentation	TWI
14	Euro PM 2019 – International Powder Metallurgy Congress & Exhibition.	Presentation	MET
15	ICIR Euroinvent 2019	Presentation	MET
16	GRC conference 2019	Presentation	UoI
17	World geothermal congress 2020/2021	Presentation, poster, booth ²¹	TWI, ICI, UoI, TVS, UPB
18	EUROCORR 2020	Poster	UoI, TWI
19	NACE Corrosion 2021	Presentation	TWI, UoI, ON, ICI
20	Piping Solutions for Energy Applications –TWI event ²²	Presentation	ON

*workshop was organised in collaboration with other projects

2.6.4 Publications

Shows the consortium's publications in peer reviewed journals, conference proceedings, newsletters and magazines.

Table 3 Geo-Coat publications

#	Title	Journal	Status	Partners
1	Considerations regarding WC-cermets depositions by HVOF and ESD techniques used for reinforced steel components for geothermal turbines	IOP Conference Series: Materials Science and Engineering, Volume 572, 2019	Published	THE, MET, UPB

²¹ A booth was planned for WGC 2020. However the event was postponed due to COVID-19.

²² <https://www.geo-coat.eu/news/2021/geocoat-project-partner-to-present-at-online-twi-event>

#	Title	Journal	Status	Partners
2	Properties of HVOF Protective Cermet Surface Coatings for Geothermal Applications	Euro PM2019 – High Temperature Alloys	Published	THE, MET, UPB
3	High-Temperature Corrosion Testing Facility for Coating Materials in Simulated Geothermal Environment	GRC Transactions, Vol. 43, 2019.	Published	Uol
4	Phase Evolution and Microstructure Analysis of CoCrFeNiMo High-Entropy Alloy for Electro-Spark Deposited Coatings for Geothermal Environment	Coatings 2019, 9(6), 406	Published	Uol, UPB
5	Structural Properties Ni20Cr10Al2Y Coatings for Geothermal Conditions	<i>Proceedings</i> 2018 , 2(23), 1434	Published	THE, MET, UPB
6	Effect of Microstructural Modifications on the Corrosion Resistance of CoCrFeMo0.85Ni Compositionally Complex Alloy	Coatings 2019 , 9(11), 695;	Published	TWI, UPB
7	High-Temperature Corrosion Testing Facility for Coating Materials in Simulated Geothermal Environment	GRC Transactions, Vol. 43, 2019	Published	Uol
8	GeoCoat – High Performance Coatings For Aggressive Geothermal Environments	GRC Bulletin, March/April 2019.	Published	All
9	Solutions to materials challenges in geothermal	European Energy Innovation, Winter Edition 2019, Pages 30-31	Published	All
10	Friction and Wear Behaviour of Surface Coatings for Geothermal Applications	WGC2020/2021 proceedings	Accepted	Uol
11	Design and Operation of Testing Facility for Investigation of Novel Corrosion Resistant Coatings for High Temperature Geothermal Applications	WGC2020/2021 proceedings	Accepted	Uol

#	Title	Journal	Status	Partners
12	Development of Powder Metallurgy Based Metal Matrix Composites for Geothermal Applications	WGC2020/2021 proceedings	Accepted	TWI, WEIR
13	Development of Novel and Cost Effective Corrosion and Erosion Resistant Coatings for High Temperature Geothermal Applications: Geo-Coat	WGC2020/2021 proceedings	Accepted	All
14	Importance of Steel Alloying Elements in Geothermal Environment – Nickel Sulphur Interactions	NACE Corrosion 2021 proceedings	Published	ICI, ON
15	Corrosion Testing of PM HIPed UNS N06625 and PM HIPed UNS R56400 in Geothermal Environment at Hellisheidi Site	NACE Corrosion 2021 proceedings	Published	ICI, TWI, ON
16	The Synergy Effect of the Geothermal Corrosion Environment on Ni-P Coatings	NACE Corrosion 2021 proceedings	Published	ICI, TWI, ON
17	Corrosion Performance of Laser Metal Deposited High-Entropy Alloy Coatings at Hellisheidi Geothermal site	MDPI – Coatings-Special Issue	Submitted	ICI, TWI
18	Comparative Study of Corrosion Resistance of Hot Isostatically Pressed Ti6Al4V+10vol%TiB2 Titanium Matrix Composite Vs. Wrought Ti6Al4V (UNS designation R56400) Alloy in Simulated High-Temperature Geothermal Environment	NACE Corrosion 2021 proceedings	Published	UoI, TWI
19	Mechanically Alloyed CoCrFeNiMo high entropy alloy behavior in geothermal steam	NACE Corrosion 2019 proceedings	Published	UPB, UoI
20	The Effect of Polytetrafluoroethylene (PTFE) Particles on Microstructural and Tribological Properties of Electroless Ni-P+PTFE Duplex	Coatings, 2021	Submitted	UoI, TWI

#	Title	Journal	Status	Partners
	Coatings Developed for Geothermal Applications			

2.7 Geo-Coat Dissemination summary and KPI analysis

Table 4 provides a summary of all the dissemination activities of the project against the KPIs as established.

Table 4 Geo-Coat dissemination summary

#	Activity	KPI identified	Target achieved	Remarks
1	Project Website	Number of visits	>1700 users ²³	
2	Tradeshows	3 tradeshow	2 ²⁴	Conferences were either cancelled or moved to online platform which affected the participation of consortium in tradeshows.
3	Project workshops	2 workshops Positive feedback from users	2	Due to COVID-19 the 2 nd workshop was held virtually.
4	Project Newsletters	Bi-annual publication	6	
5	Project webinars	Number of webinars Visits on YouTube	2 >800 views	Webinar “Material characterization of testing of coatings for corrosion challenges in high-temperature geothermal power production” was not recorded due to confidentiality issues with the data presented.

²³ Since the website was launched

²⁴ A booth was planned at WGC 2020 which has been postponed.

7	Number of Conferences	20		Conferences were either cancelled or moved to online platform which affected the participation of consortium in tradeshow.
8	Social media post analytics	Visits on LinkedIn	>2000 ²⁵	
9	Publications	Number	20	Peer reviewed journals and others
10	Dissemination materials	Banners, trifold, video	3	

²⁵ On a single post