



PUSH-IT

Piloting Underground Seasonal Heat Storage In geothermal reservoirs

D5.1 Conceptual Project coordination handbook



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Author	Danitsja van Heusden-van Winden		
Co-authors and contributors			

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Martin Bloemendal	TUD	Scientific Project coordinator	28-02-2023
Danitsja van Heusden	TUD	Project coordinator	28-02-2023

Table of Contents

List of Abbreviations.....	4
1. Introduction	5
1.1. Purpose of this document	5
1.2. Precedence.....	5
2. General Project Information	6
3. Legal Aspects	8
3.1. Grant Agreement	8
3.2. Consortium Agreement.....	8
3.3. Amendments.....	8
4. Management Structure and Procedures.....	9
4.1. Project Organizational Structure	9
4.2. Roles	10
5. Communication.....	15
5.1. Internal communication.....	15
5.2. External communication.....	16
5.3. Document standards/Templates	17
6. Reporting	19
6.1. Reporting Calendar.....	19
6.2. Internal Progress Reports	19
6.3. Periodic Report.....	20
6.4. Final Report	21
6.5. Financial Reporting in Detail	21
6.6. Keeping records- supporting documentation	22
6.7. Budget transfer	23
7. Payments.....	24
8. Deliverables	25
8.1. List of Deliverables & Milestones	25
8.2. Approval process of deliverables	28
9. Dissemination of results and Open access.....	29
9.1. Open access to scientific publications.....	29
9.2. Dissemination rules.....	29
Annex 1: Templates	31
Annex 2: Budget	33

List of tables

Table 1: General PUSH-IT information	6
Table 2: PUSH-IT project coordination information	6
Table 3: PUSH-IT partners	6
Table 4: Steering Committee Members	11
Table 5: Preliminary External Advisory Board members	14

List of figures

Figure 1 PUSH-IT organizational structure	9
Figure 2: Work Package organizational structure	9

List of Abbreviations

AGA	Annotated Model Grant Agreement
CA	Consortium Agreement
CFS	Certificate on the Finance Statement
DoA	Description of the action
EAB	External Advisory Board
EC	European Commission
ECAS	European Commission Authentication Service
EU	European Union
EU GA	EU Grant Agreement project specific
GA	General Assembly
EC PO	Project Officer from the European Commission
PC	Project Coordinator
SL	Site Leader
SPC	Scientific Project Coordinator
SC	Steering Committee
TL	Task Leader
WP	Work Package
WPL	Work Package Leader

1. Introduction

1.1. Purpose of this document

This Project Handbook and quality manual for the PUSH-IT project has mainly two functions:

1. It is a reference source for all consortium partners describing how the PUSH-IT consortium acts in many day-to-day activities
2. It intends to standardise various elements of the project e.g. project reports, deliverables, etc. through the use of agreed procedures and templates where relevant.

The PUSH-IT handbook is an adaptive document and will be updated as required throughout the project. The maintenance and distribution of the project handbook during the whole duration of the project will be responsibility of the Project Coordinator as part of the management activities of WP5.

1.2. Precedence

The general principles for the project execution are defined in the EU Grant Agreement (EU GA), the Description of the Action (DoA) and the Consortium Agreement (CA). The Project Handbook does not replace any of these established agreements, nor does it replace any of the EU guidelines for project implementation and documentation.

Where there are any inconsistencies between these documents, the following order of precedence should be applied:

- EU Grant Agreement including Description of the Action, also referred to as the Grant Agreement (EU GA) Annex 1;
- Consortium Agreement (CA);
- Project Handbook (this document).

2. General Project Information

Table 1: General PUSH-IT information

Title	Piloting Underground Storage of Heat In geoThermal reservoirs
Acronym	PUSH-IT
Grant Agreement No.	101096566
Funding Programme	HORIZON-CL5-2022-D3-01 submitted for HORIZON-CL5-2022-D3-01
Type of Action	HORIZON-RIA
Start date	01-01-2023
Project duration	48 months

Table 2: PUSH-IT project coordination information

Scientific Project Coordinator (TUD)	Project Coordinator (TUD)
Martin Bloemendal Building 23 room 4.82 Faculty of Civil Engineering and Geoscience Stevinweg 1 2628 CN Delft M +31 6 2517 9849 J.M.Bloemendal@tudelft.nl	Danitsja van Heusden & Diana Keijzer Building 26.C Innovation and Impact Centre van den Burghweg 1 2628 CS Delft M +31 6 3432 1362 M +31 6 3910 7691 D.vanHeusden-vanWinden@tudelft.nl g.j.m.keijzer@tudelft.nl

Table 3: PUSH-IT partners

No	Beneficiaries name	Acronym	Country
1	Delft University of Technology	TUD	The Netherlands
2	Equans Nederland NV	EQS	The Netherlands
2.1	Aardyn bv	AARD	The Netherlands
2.2	EQUANS Energy Solutions B.V.	EES	The Netherlands
2.3	EQUANS Ventures & Integrated Solutions B.V.	EVIS	The Netherlands
3	KWR Water B.V.	KWR	The Netherlands
4	Technische Universität Darmstadt	TDA	Germany
5	Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. Ruhr-Universität Bochum	F-IEG	Germany
5.1	Ruhr Universität Bochum	RUB	Germany
6	Helmholtz Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ	GFZ	Germany

No	Beneficiaries name	Acronym	Country
7	Vlaamse Instelling voor Technologisch Onderzoek n.v.	VITO	Belgium
8	Ceska geologicka sluzba	CGS	Czechia
9	Huisman GEO b.v.	HGEO	The Netherlands
10	Bureau de Recherches Géologiques et Minières	BRGM	France
11	Universiteit Utrecht	UU	The Netherlands
12	Grondboorbedrijf Haitjema B.V.	GBBH	The Netherlands
13	Univerzita Karlova	UKR	Czechia
No	Associated partner name	Acronym	Country
14	Université de Geneve	UNIGE	Switzerland
15	Anglia Ruskin University Higher Education Corporation	ARU	United Kingdom
16	United Kingdom Research and Innovation	BGS	United Kingdom
17	Geothermal Engineering Ltd	GEL	United Kingdom
18	University of Exeter	UXT	United Kingdom

3. Legal Aspects

3.1. Grant Agreement

The Grant Agreement forms the legal basis for the implementation of the PUSH-IT project. It consists of:

- Terms and Conditions (this is the core contract);
- Annex 1 Description of the action (DoA) (Part A and part B);
- Annex 2 Estimated budget for the action;
- Annex 2a Additional information on unit costs and contributions (if applicable);
- Annex 3 Accession Forms (if applicable);
- Annex 3a Declaration on joint and several liability of affiliated entities (if applicable)
- Annex 4 Model for the financial statements;
- Annex 5 Specific rules (if applicable).

Although the core contract is signed between the EU and the Coordinator of the project, all partners have become individual contract partners with the commission by signing the Accession Forms

The Grant Agreement must be kept by all partners and should be provided to the auditor in case of an audit. It is downloadable in the EC participant portal, and in the document library of the PUSH-IT project.

3.2. Consortium Agreement

Whereas the Grant Agreement is signed between the EU and the partners, the Consortium Agreement is signed between the partners themselves. It arranges in more detail the provisions of the Grant Agreement, such as but not limited to financial issues, payments, management, decision-making, conflict resolution, intellectual property rights and liability.

The Consortium Agreement must also be kept by the partners and must be shown in case of audits.

3.3. Amendments

During the project, circumstances may arise to call for a request to the EU for an amendment of the Grant Agreement. Reasons may vary, but could be:

- Change of partner(s);
- Change of legal entity;
- Changes in the Budget (EU GA: Annex 2);
- Changes in the DoA (EU GA: Annex 1).

In case an amendment is needed, the coordinator shall submit such a request after an autonomous decision by all partners in the General Assembly. After approval, the Project Coordinator shall distribute the revised Grant Agreement to the partners, replacing former versions.

Budget changes that do not affect the content of DoA can be taken care of by the consortium itself with a decision by the General Assembly followed by informing the EC Project Officer. Amendments may be requested by any of the project partners but are to be submitted for approval only through the Project Coordinator.

4. Management Structure and Procedures

4.1. Project Organizational Structure

The project organizational structure is represented in two diagrams: Figure 1 and Figure 2.

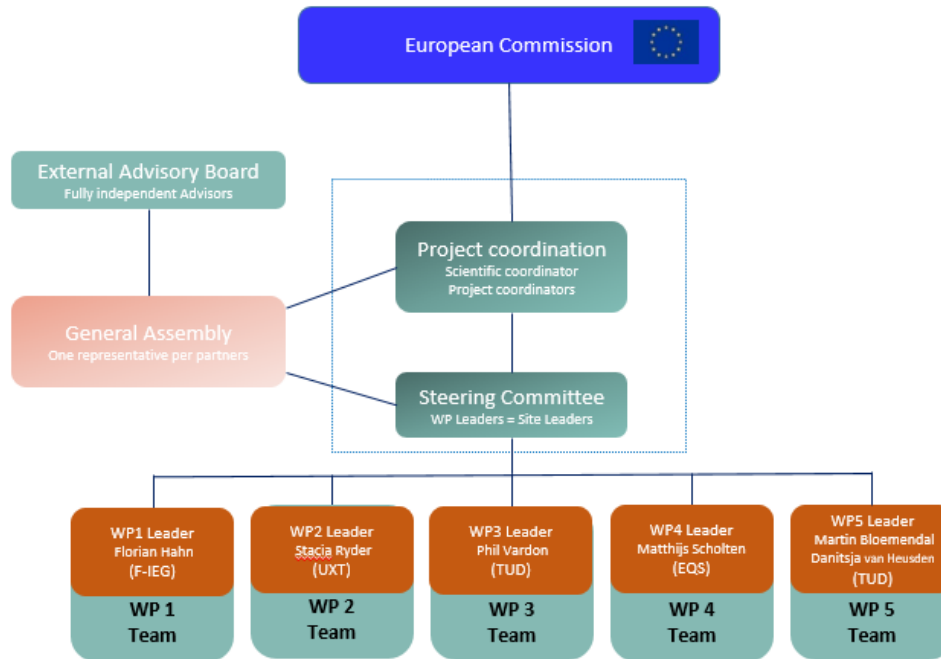


Figure 1 PUSH-IT organizational structure

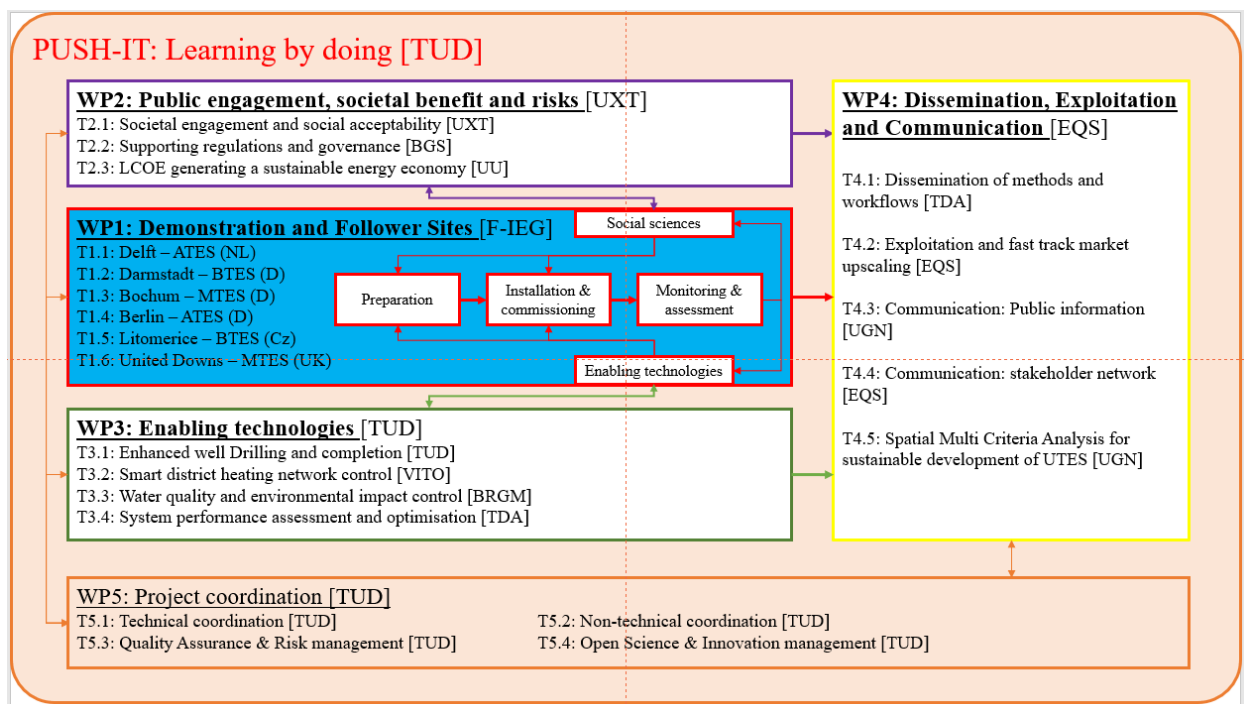


Figure 2: Work Package organizational structure

The project organizational structure has multiple layers of decision-making:

General Assembly (GA)

The General Assembly (GA) is the decision-making body of the consortium. The GA deals with partner enrollment and exit, budget changes, (IPR) issues and conflicts. The GA consist of one representative of each partner (both beneficiaries and associated partner), who has one vote.

Steering Committee (SC)

The Steering Committee (SC) is the supervisory body for the execution of the project, which shall report to and be accountable to the GA. Moreover, it is responsible for proper execution and implementation of the decisions of the GA. The SC consist of WPLs, SLs, Project Scientific Coordinator (PSC) and Project Coordinator (PC).

Work Package Leaders (WPL)

Work Package Leaders (**WPL**) are responsible for workflow, coordination and progress within their WPs and other WPs. They report to and are accountable to the GA. They ensure that the coordinator is informed about WP developments. Adjustments to the work must be agreed by the Project Coordinator.

Site Leaders (SL)

Site Leaders (**SL**) are responsible for workflow, coordination and progress within their Demo / Follower Site and other Demo / Follower Site. They report to and are accountable to the GA. They ensure that the coordinator is informed about Demo / Follower Site developments. Adjustments to the work must be agreed by the Project Coordinator.

Project Coordination (PC)

The Project Coordination team is responsible for efficient management of the project and all the individual activities with respect to time, budget and quality. It also functions as the intermediary for all communication between co-beneficiaries and the European Commission.

External Advisory Board (EAB)

The External Advisory Board (EAB) is the advisory body to the GA. The EAB shall assist and facilitate the decisions made by the GA.

An important element of PUSH-IT to ensure effect execution of the project and exploitation of the results is the External Advisory Board (EAB). The EAB members have a large network in industry and governmental organisations and can therefore advise on many aspects of the project. EAB members are invited by the SCP and/or PC, nominations are agreed by the SC.

4.2. Roles

4.2.1. General Assembly (GA)

The GA is ultimately responsible for the management of the project and consists of one representative from each partner in the consortium, both beneficiaries and associated partners. The PC shall chair all meetings of the GA, unless decided otherwise by the GA.

The GA shall be free to act on its own initiative to formulate proposals and take decisions in accordance with the procedures set out herein. In addition, all proposals made by the Steering Committee shall also be considered and decided upon by the GA.

The following decisions shall be taken by the GA:

- Content, finances and Intellectual Property Rights;
- Proposals for changes to the GA Annexes;
- Evolution of the consortium;
- Appointments of partners / members;

Decisions at the GA shall be taken by a majority of two-thirds (2/3) of the votes, though the objective is unanimity. More details on the decision-making procedures can be found in section 6 of the Consortium Agreement.

The GA meets at least once a year. The quorum of the GA meetings is 2/3 of its members. In addition, teleconferences and written voting procedures may be organised if necessary. On a regular basis, the GA members will communicate via telephone, Teams and email.

4.2.2. Steering Committee (SC)

The SC is the supervisory body responsible for the proper execution and implementation of the decisions of the GA. The SC consists of all WP Leaders, Site Leaders, and the PC. The SC will be led by the PC and will review technical progress and formally report to the GA. Depending on the specific task progress and requirements for a more detailed report, other partner members can be invited to the SC meetings.

The PC shall chair all meetings of the SC. The PC shall convene ordinary meetings of the SC at least once every six months.

Table 4: Steering Committee Members

WP / Site No	Title	Name	Lead BEN
Work Package Leaders			
1	Demonstration and follower sites	David Bruhn	F-IEG
2	Public engagement, societal benefit and risks	Stacia Ryder	UXT
3	Enabling technologies	Phil Vardon	TUD
4	Dissemination, Exploitation and communication	Matthijs Scholten	EQS
5	Project coordination	Danitsja van Heusden	TUD
Site Leaders			
1	NL - Delft: ATES	Martin Bloemendal Phil Vardon David Bruhn	TUD
2	D - Darmstadt: BTES	Claire Bossennec Hung Pham	TDA
3	D - Bochum: MTES	Stefan Klein Florian Hahn	F-IEG
4	D - Berlin: ATES	Katrin Kieling Stefan Kranz	GFZ
5	CZ - Litoměřice: BTES	Antonín Tým	CGS
6	UK - United Downs: MTES	Hazel Farndale	GEL

4.2.3. Work Package Leaders (WPL)

Each WP has a leader, the so-called Work Package Leader (WPL) who is responsible together with the WP members and Task Leaders for the detailed implementation of the work packages and tasks and preparation of the corresponding Deliverables and Milestones for that WP.

The WPLs report to the SC and to the GA (if the latter requires more detailed information on some issue). The TLs assist the WPLs in planning, managing and performing their respective tasks in the WP context.

The WPLs perform operative management at the level of their work package. The WPLs manage the day-to-day technical planning and work and have the final responsibility for the work package activities and deliverables.

WPLs are responsible for the proper execution and implementation of the decisions of the GA on WP level. In particular, they are responsible for:

- Assessing the compliance of the project with the DoA and, if necessary, propose modifications of the Consortium Plan to the GA;
- Support the coordinator in preparing meetings with the Funding Authority and in preparing related data and deliverables;
- Prepare the content and timing of press releases and joint publications by the consortium or proposed by the Funding Authority.

Each WPL will report on the progress of the work package every 6 months to the SPC and PC and conform to the formal reporting periods (see also paragraph 6.2). It will also report to the SC and to the GA (if the latter requires more detailed information on some issue).

Any circumstances which may require changes in the work package must be immediately reported to the SPC and the PC.

4.2.4. Site Leaders (SL)

Each Demo / Follower Site has appointed a leader, the so-called Site Leader (SL) who is responsible together with the Demo / Follower Site members and Task Leaders for the detailed implementation of the work and tasks and preparation of the corresponding Deliverables and Milestones for that Demo / Follower Site.

The SLs perform operative management at the level of their demo / follower site. The SLs manage the day-to-day practical and technical planning and work and have the final responsibility for the Demo / Follower Site activities and deliverables.

SLs are responsible for the proper execution and implementation of the decisions of the GA on Demo / Follower Site level. In particular, they are responsible for:

- Assessing the compliance of the project with the DoA and, if necessary, propose modifications of the Consortium Plan to the GA;
- Support the coordinator in preparing meetings with the Funding Authority and in preparing related data and deliverables;
- Prepare the content and timing of press releases and joint publications by the consortium or proposed by the Funding Authority.

Each SL will report on the progress of the Demo / Follower Site every 6 months to the SPC and PC and conform to the formal reporting periods (see also paragraph 6.2). It will also report to the SC and to the GA (if the latter requires more detailed information on some issue).

Any circumstances which may require changes in the Demo / Follower Site must be immediately reported to the SPC and the PC.

4.2.5. Project Coordination

The PUSH-IT project is coordinated by TU Delft and acts as the intermediary between the partners and the European Commission (Funding Authority).

The coordination of the project is performed at two levels:

Scientific Project Coordinator (SCP)

Assistant Professor Martin Bloemendal (TUD) is the scientific project coordinator (SCP). He takes care of the scientific development of the project. The main responsibility is to ensure that the main goals of the project are met and to verify the quality of all deliverables resulting from the project. The SCP will cooperate closely with WPL and SL to guarantee that the project delivers the expected impact.

Project Coordinator PC)

Danitsja van Heusden is the project coordinator (PC) and will be assisted by Diana Keijzer, assistant project coordinator. They support the Scientific Project Coordinator (SCP) and the consortium on financial, legal, administrative as well as on organizational matters.

The SCP and PC work closely together to guarantee a smooth project communication internally (within the project) and externally (with the EU and the public at large).

The PC shall be responsible for:

- monitoring compliance by the Parties with their obligations under this Consortium Agreement and the Grant Agreement
- keeping the address list of Members and other contact persons updated and available
- collecting, reviewing to verify consistency and submitting reports, other deliverables (including financial statements and related certification) and specific requested documents to the Granting Authority
- preparing the meetings, proposing decisions and preparing the agenda of GA meetings, chairing the meetings, preparing the minutes of the meetings and monitoring the implementation of decisions taken at meetings
- transmitting promptly documents and information connected with the Project to any other Party concerned
- administering the financial contribution of the Granting Authority and fulfilling the financial tasks
- providing, upon request, the Parties with official copies or originals of documents that are in the sole possession of the PC when such copies or originals are necessary for the Parties to present claims.
- providing a copy of the Grant Agreement and its Annexes to the Associated Partners.

4.2.6. External Advisory Board (EAB)

The External Advisory Board (EAB) will be the advisory body to the GA. During the proposal phase of the project potential members for the EAB have been asked and responded positively to be involved in the PUSH-IT EAB once the project should be awarded funding – as shown in Table 5. Now the project received EU funding, all partners have been asked to propose potential EAB member. In the upcoming months, these potential EAB members will be contacted to gauge interest and establish the EAB. Throughout the implementation of the project, the consortium will seek the participation of suitable experts to join the EAB, which may include business experts and green-tech investors.

Table 5: Preliminary External Advisory Board members

Name	Organization
Mr. Philippe Dumas	European Geothermal Energy Council
Prof. dr. Javier Urchuegía	Universitat Politècnica de València
Dr. Marit Brommer	International Geothermal Association (IGA)
Dr. Gregor Goetzl	Geologische Bundesanstalt Österreich
Dr. Robin Wiltshire	Building Research Establishment Ltd. (BRE)

The EAB board members will advise on many aspects of the project. The purpose of this board is to advise on:

- Optimizing impact of the PUSH-IT results;
- High level technical, social, political and strategic issues and to increase the probability of wide market acceptance of the solutions developed for a better market penetration.

The EAB will be appointed and steered by the GA. The EAB members shall be allowed to participate in GA meetings upon invitation but have not any voting rights. The EAB shall assist and facilitate the decisions made by the GA. The EAB meets annually as part of the project meeting.

Project information will be communicated by TU Delft. The PC will ensure that a Non-Disclosure Agreement is executed between all Parties and each EAB member.

4.2.7. Meetings

Project meetings are plenary meetings and parallel sessions combining technical progress. The PC shall give written notice of a meeting to each member as soon as possible and no later than 14 calendar days preceding an ordinary meeting and 7 calendar days preceding an extraordinary meeting. The PC will organise in person project meetings in conjunction with GA meetings for the duration of the project at regular intervals. The PC shall convene ordinary meetings of the GA at least once a year, SC meeting every month and extraordinary meetings at any time upon written request of any member and once to twice a year including an EAB meeting.

Technical meetings may be called for by the WPL within a WP or between technical WP in order to coordinate progress at a WP level. Meetings will be held with regular intervals, in order to assess the degree of completion of work, including technical results and deliverable preparation. This continuous quality watch is performed by the PC. A summary of progress made and follow-up actions should be sent to the PC and will be reported in meetings and the periodic progress reports. Meetings of each project partner may also be held by teleconference or other telecommunication means.

External Advisory Board (EAB) meetings will take place in conjunction with the project meetings of the GA at least once a year or as agreed within the GA related to critical milestones of the project. The EAB members can be invited to participate in an online teleconference/call if needed.

Costs for travel and accommodation to participate in meetings must be covered by each partner's own budget as per Annex 2 Estimated budget for the action of the GA.

For every meeting taken place, **minutes** should be produced by the chairperson (and should be sent to the PC). The chairperson shall produce minutes of each meeting which shall be the formal record of all decisions taken. He/she shall send draft minutes to all members within 15 calendar days of the meeting. The minutes shall be considered as accepted if, within 15 calendar days from receipt, no party has sent an objection to the chairperson with respect to the accuracy of the draft minutes by written notice.

5. Communication

5.1. Internal communication

Internal communication refers to the communication within the consortium.

5.1.1. Email

Many people may be working on a number of different projects and are likely to receive numerous emails every day, therefore, a standard subject title is proposed. This helps to quickly recognise the project related emails.

Project related emails should include in the subject title: “PUSH-IT” followed by a more specific description of the subject, deadline for feedback or reply, see below an example:

[Subject: PUSH-IT: WP1 Meeting plan, 26 January 2023]

[Subject: PUSH-IT: Minutes Kick-Off Meeting (Deadline feedback 16 February 2023)]

It is required to copy the PCs Danitsja van Heusden-van Winden D.vanHeusden-vanWinden@tudelft.nl and Diana Keijzer g.j.m.keijzer@tudelft.nl into important email communications related to project management and Martin Bloemendal J.M.Bloemendal@tudelft.nl into important communication related to the technical content.

As agreed within the consortium, there are distribution lists created for:

- Consortium (all): PUSH-IT-all@tudelft.nl
- Steering Committee (SC): PUSH-IT-SC@tudelft.nl
- Work Package Leaders (WPL): PUSH-IT-WPL@tudelft.nl
- Site Leaders (SL): PUSH-IT-SL@tudelft.nl
- Work Package 1 (WP1) [PUSH-IT -WP1@tudelft.nl](mailto:PUSH-IT-WP1@tudelft.nl)
- Work Package 2 (WP2) [PUSH-IT -WP2@tudelft.nl](mailto:PUSH-IT-WP2@tudelft.nl)
- Work Package 3 (WP3) [PUSH-IT -WP3@tudelft.nl](mailto:PUSH-IT-WP3@tudelft.nl)
- Work Package 4 (WP4) [PUSH-IT -WP4@tudelft.nl](mailto:PUSH-IT-WP4@tudelft.nl)

The contact details can be found on the MS Teams channel under the folder ‘Contacts’.

The distribution lists will be maintained by the PC. Required changes to the contact list can be sent to Danitsja van Heusden-van Winden D.vanHeusden-vanWinden@tudelft.nl and Diana Keijzer g.j.m.keijzer@tudelft.nl hence the distribution list(s) can be updated accordingly.

5.1.2. Internal Communication Platform

An internal project communication platform: MS TEAMS was set up to act as repository for all working documents, minutes and reports. To access TEAMS, the following link should be used:

[MS Teams PUSH-IT General Channel](#)

Every member of the consortium has access to the TEAMS platform. They have rights to read/download/edit/upload documents. In case of problems and or adding / removing members from TEAMS, please contact Danitsja van Heusden-van Winden D.vanHeusden-vanWinden@tudelft.nl and Diana Keijzer g.j.m.keijzer@tudelft.nl.

5.2. External communication

External communication refers to communication to parties outside the consortium, target groups of the project, stakeholders and the EU Project Officer.

The external communication (with the exception of that to the EC Project Officer for which the PC is responsible) is part of WP4 Dissemination, Exploitation and Communication for which EQUANS is responsible: Matthijs Scholten matthijs.scholten@equans.com

Communication of project results is an important part of a Horizon Europe project. More information can be found in deliverable D4.1 ‘Detailed dissemination, exploitation and communication plan, PUSH-IT website and SM channels’, due at 31 March 2023 (M6).

All external PUSH-IT communication and dissemination actions undertaken before and during the project should be communicated to the partner responsible for the external communication and the PC, providing information about:

- The date and place of the publication;
- The content of the publication, sharing the texts, photos, videos, or any other material used in the publication;
- Contact person.

5.2.1. Project website and social media

The project website (launch M6 – June 2023) is set up for external communication purposes. It can be found at <https://www.project-PUSH-IT.eu>. The project website is created with information about the project, its objectives, results, partners and events.

When communicating in social media about the project, make sure to link to the PUSH-IT, relevant PUSH-IT partners and CINEA website and/or social media channels.

5.2.2. General Requirements

All consortium members are required to indicate at all times that the project has received funding from the European Union (See article 17 of the GA). Using the following:

- display the [EU emblem](#) (When displayed together with another logo, the EU emblem must have appropriate prominence.):



See also: download centre for visual elements [\[LINK\]](#)

Note: When displayed in association with other logos (e.g. of beneficiaries or sponsors), the emblem must be displayed at least as prominently and visibly as the other logos.

- include the following disclaimer:

“Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them.”

- include the following project logo (horizontal / vertical):



PUSH-IT

You can find the logo on TEAMS (-> folder Dissemination).

5.2.3. Specific Project Presentation

On TEAMS you can find the standard PUSH-IT PowerPoint presentation that can be used in external communication.

5.3. Document standards/Templates

All public documentation needs to conform to the document standards provided by the PC. The document standards should be used for:

- Official EU reports (such as Periodic, Final);
- Public documents by the consortium;
- Project deliverables (in a report format);
- Any documents that are declared as public by the consortium.

All project templates (deliverables, presentations, document standards) are saved on TEAMS

For internal project documents, it is also advised to apply the document standards/templates, such as WP meeting agenda and minutes.

5.3.1. Document Titles

	Deliverables	Meetings	Conferences
First letters	PUSH-IT	PUSH-IT	PUSH-IT
Underscore	–	–	–
Next letters	Deliverable number [Dx.y]	Type of document (i.e. Agenda, Minutes, Presentation) In case of	Event title

	Deliverables	Meetings	Conferences
	[x=WP number, y=deliverable number]	presentation, include WP number.	
Underscore	–	–	–
Next letters	Short explanatory title for the document.	Location and date of the meeting	Location and date of the event
Underscore	–		
Next letters (for presentations only)		Short name of organisation and Initials of presenter	Short name of organisation and Initials of presenter
Underscore		–	–
Next letters	"v" and number of revision of this specific report [v0.1=draft version, v1.0=final version v2.0=updated final version]	"v" and number of revision of this specific report [v0.1=draft version, v1.0=final version v2.0=updated final version]	"v" and number of revision of this specific report [v0.1=draft version, v1.0=final version v2.0=updated final version]

Deliverable documents: **[PUSH-IT_Dx.y_Title_v0.1]**

example: PUSH-IT_D1.1_ProjectHandbook_v0.1

Meeting documents:

[PUSH-IT_Type of Doc_Location_YYYYMMDD_Organisation/Initials)_v0.1]

example: **PUSH-IT_Agenda_Delft_2023112022_v0.1**

example: **PUSH-IT_Minutes_Delft_2023112022_v0.1**

example: **PUSH-IT_(WP2_)Presentation_Delft_2023112022_TUD_v0.3**

Conference presentations:

[PUSH-IT_Event_Location_YYYYMMDD_Initials/Organisation_v0.1]

example: PUSH-IT_KickOff2016_Delft_20231123_DS/TUD_v1.0

5.3.2. Internal Document Release

All final versions of internal documents will be released in PDF format by uploading them in TEAMS in the specific folder.

Additionally, those documents that must be public will be made accessible through the PUSH-IT project website.

6. Reporting

Throughout the lifetime of the project there are:

- (Internal) progress report(s) (financial & technical progress);
- Periodic report(s) to the EU (financial & technical progress);
- Final Report to the EU (financial & technical).

6.1. Reporting Calendar

To ensure timely submission the partners should respect the following deadlines:

Table 5 Reporting Calendar

Kind of report	Period covered - From (Date)	To (Date)	From (M)	To (M)	Template ready and uploaded in TEAMS by PC	Deadline to send to PC	By whom?	Finalised submit to EC (by COO)
Internal Progress Report 1	01-01-2023	30-06-2023	1	6	June-23	July-23	All consortium partners	n/a
Internal Progress Report 2	01-07-2023	31-12-2023	7	12	December-23	January-24	All consortium partners	n/a
Periodic Report 1	01-01-2023	30-04-2024	1	16	April-24	May-24	All (finance), WPL (technical)	20-6-2024
Internal Progress Report 3	01-05-2024	31-10-2024	17	22	October-24	November-24	All consortium partners	n/a
Internal Progress Report 4	01-11-2024	30-04-2025	23	28	April-25	May-25	All consortium partners	n/a
Periodic Report 2	01-05-2024	31-08-2025	17	32	August-25	September-25	All (finance), WPL (technical)	20-10-2025
Internal Progress Report 5	01-09-2025	28-02-2026	33	38	February-26	March-26	All consortium partners	n/a
Periodic Report 3	01-09-2025	31-12-2026	33	48	December-26	January-27	All (finance), WPL (technical)	20-2-2027

6.2. Internal Progress Reports

A progress report is an internal project document, meaning that it is not sent to the EU, thus, for internal purpose only. The objective of this internal report is to monitor technical progress and project expenditure. It should be a brief summary of the technical work completed as well as a brief explanation for any deviations (content and budget!) from the DoA (*EU GA: Annex 1*).

An internal progress report includes:

- A description of the **technical progress**, per WP; WPL are responsible for gathering all information about the technical progress in their WP from their task leaders and for compiling a WP report before sending it to the PC.
- A **financial overview** from each partner: The PC provides an Excel template, to be filled out by all the partners. This Excel sheet provides the PC with valuable information needed for monitoring purposes and management reporting.

The PC consolidates the provided technical and financial information and sends the complete report to the consortium for review.

6.3. Periodic Report

The [Periodic Report](#) (EU GA: Article 21) must be submitted by the PC **within 60 days** following the end of each reporting period. This report must include explanations for any deviations (content and budget) from the DoA (*EU GA: Annex 1*). Just like the internal progress report, the periodic technical report consists of a technical report and a financial report.

The '**Periodic Technical report**' consists of two parts: Part A and Part B:

Part A is generated by the IT system and contains the structured tables with project information (retrieved from the Grant Management System). It is based on the information entered by the participants through the periodic report and continuous reporting modules of the electronic exchange system in the Participant Portal. This Part A includes:

- the cover page;
- a summary which can be used for publications by the EC, and
- the answers to the questionnaire (covering issues related to the project implementation and the economic and social impact).

The participants can update the information in the continuous reporting module at any time during the life of the project. Part A contains:

Part B is the narrative part that includes explanations of the work carried out by the beneficiaries during the reporting period and the use of resources spent within that respective period. Part B needs to be uploaded as a PDF document following the template of Part B Periodic Technical report.

The PC will collect the necessary information from all the consortium partners for the Part A, summary and the questionnaire modules. WPLs compile a report on their WP together with their task leaders (Part B) and send it to the PC. The PC consolidates the provided information and sends the complete periodic technical report to the consortium for review. The final approved version will be uploaded in the Participant Portal by the PC.

The Periodic Report Template can be found on the EC website under Horizon Europe reference documents:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/reference-documents;programCode=HORIZON>

The 'Periodic Financial report' consists of:

- An **Individual financial statement** (*EU GA: Annex 4*) for each partner, for the reporting period concerned. This financial statement must detail the eligible costs for each budget category. Each partner *and affiliated entities* must declare all eligible costs, even if costs exceed the amounts indicated in the estimated budget.

- An **explanation of the use of resources** and information on subcontracting and in-kind contributions provided by third parties from each partner for the reporting period concerned;
- A **'periodic summary financial statement'** will be created automatically by the electronic exchange system, consolidating the individual financial statements of the partners, including the request for interim payment.

The Financial Signatory of each partner will be able to complete online their own Financial Statement including the explanations on the use of resources, (also for their third parties). The PC will have a final check on the statements and submit electronically to the EC.

6.4. Final Report

In addition to the periodic report for the last reporting period, the PC must submit the final report **within 60 calendar days** following the end of the last reporting period.

The Final Report Template is available on the EC website under Horizon Europe reference documents:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/reference-documents;programCode=HORIZON>

The **final report** will most probably include the following:

1. A **'final technical report'** with a **summary** for publication containing:

- an overview of the results and their exploitation and dissemination;
- the conclusions on the action and
- the socio-economic impact of the action.

The PC compiles this final technical report in consultation with the partners.

2. A 'final financial report' containing:

- **'final summary financial statement'** will be created automatically by the electronic exchange system, consolidating the individual financial statements of the partners for all reporting periods;
- **'certificate on the financial statements'** for each partner (*and for each affiliated party*), if it requests a total contribution of EUR 430 000 (or more) reimbursement of actual costs and unit costs.

6.5. Financial Reporting in Detail 1

6.5.1. Budget

The budget (Annex 2) contains the estimated eligible costs, broken down by Partner (and affiliated entities) and budget category (EU GA: Articles 5.4, 6.2).

The budget is based on estimated costs and person months. Frequent internal reporting assures that these budgets are monitored well and that under- and overspending is noticed at an early stage. Please note that in reporting, actual costs must be reported and not budgeted ones.

¹ All amounts must be specified in Euros. Beneficiaries and affiliated parties with accounting established in a currency other than the euro must convert the costs recorded in their accounts into euros. Use the average of the daily exchange rates published in [the Official Journal of the European Union](#), calculated over the corresponding reporting period. If no daily euro exchange rate is published, the costs must be converted at the average of the monthly accounting rates published on the [Commission's website](#), calculated over the corresponding reporting period. Beneficiaries and affiliated parties with accounting established in euros must convert costs incurred in another currency into euros according to their usual accounting practices.

The budget categories are listed in the EU GA: Article 6.2, these are:

- A. Personnel costs:
 - A.1 Employees (or equivalent);
 - A.2 Natural persons under direct contract;
 - A.3 Seconded persons by a third party against payment;
 - A.4 SME owners or natural person beneficiaries.

B. Subcontracting costs

If necessary to implement the action, the partner may award subcontracts covering the implementation of certain action tasks described in the GA. The partner must award the subcontracts ensuring the best value for money or, if appropriate, the lowest price. In doing so, it must avoid any conflict of interests (*EU GA: Article 12*).

C. Purchase costs:

- C.1 Travel and subsistence ;
- C.2 Equipment costs;
- C.3 Other goods, works and services.

D. Other cost categories (if option applies)

- D2. Internally invoiced goods and services

E. Indirect costs

Will be reimbursed at the flat-rate of 25% of the eligible direct costs (categories A, C, D, except volunteers costs, subcontracting costs, financial support to third parties and exempted specific cost categories, if any).

6.5.2. Individual Financial Statement – Declaration of Eligible Costs

The individual financial statement needs to be submitted electronically by each partner to the EU through the Participant Portal (*EU GA: Annex 4*).

6.5.3. Audit – Certificate on the Financial Statements

A Certificate on the Financial Statements (CFS) is requested for each partner in case of total EU contribution of EUR 430.000 or more, (including the surcharge of 25% for overhead), as reimbursement of actual costs and unit costs (Art. 24.2 of the GA).

An obligatory CFS has to be issued once for the whole duration of the action. The certificate and related costs need to be submitted with the final financial report. Alternatively, it is possible to prepare several CFS during the action duration (e.g. per reporting period). In both cases, however, the certificate(s) may be submitted only at the end of the project (together with the final report).

Please note that you have to keep the financial records of the expenses in this project, for a minimum of 5 years after the final payment has been received – digital or hardcopy.

The template is available on the EC website under [Horizon Europe Reference Documents](#).

6.6. Keeping records- supporting documentation

Each partner must — for a period of five years after the payment of the balance keep records and other supporting documentation in order to prove the proper implementation of the action and the declared costs to be eligible. The documents need to be the original documents. Digital and digitalised documents are accepted if national law accepts these documents as originals.

The partners must keep the records and documentation according to their usual cost accounting practices and internal control procedures. There must be a track between the amounts declared, the amounts recorded in accounts and the amounts stated in the supporting documentation (audit trail).

For the different cost categories, consider the following documents:

Direct personnel costs:

- monthly signed time sheets (6.6.1 Time recording);
- calculation of daily rate (EU GA: Article 6.2);
- proof of paid salary;
- labour contracts.

Purchase costs (travel costs and related subsistence allowances, equipment costs, costs of other goods and services):

- quotations (sub)contracts;
- all receipts of expenditure;
- meeting docs: signed presence lists, minutes, agendas;
- calculations of depreciation costs charged to the project.

Direct costs of subcontracting:

- quotations (sub)contracts;
- signed (sub)contracts.

6.6.1. Time recording

For personnel costs (declared as actual costs or on the basis of unit costs), the partners must keep time records for the number of hours declared. The time records must be in writing and approved by the persons working on the action and their supervisors, at least monthly (*EU GA article 20*).

The time recording can be done by using a timesheet on paper or in a computer-based system. A template for time declaration is available on the Participant Portal:

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/temp-form/report/time-declaration_en.docx

This template is not mandatory; beneficiaries may use their own model, provided that it fulfils the minimum conditions and it contains at least the information detailed below.

Time records should include:

- the title and number of the project, as specified in the EU GA;
- the partner's full name, as specified in the EU GA;
- the full name, date and signature of the person working for the project;
- the number of hours worked for the action in the period covered by the time record; for reasons of assurance and legal certainty it is highly recommended that the number of hours is detailed per day (hours worked for the action in each day);
- the supervisor's full name and signature;
- a reference to the work package described in the DoA (*EU GA: Annex 1*), to easily verify that the work carried out matches the work assigned and the person-months reported to the action.

Information included in timesheets must match records of annual and sick leave taken, and work-related travel.

6.7. Budget transfer

With the consent of the GA, a re-distribution of person-months between partners may be considered. This re-distribution is allowed without requesting an amendment (*EU GA: Article 5.5*) provided that it does not imply a substantial change to the action as described in the EU GA. All other re-allocations of budget items need to be discussed in order to decide whether to apply for an amendment to the EU GA.

Note however, that the maximum grant amount (*EU GA: Article 5*) cannot be increased.

7. Payments

The following types of payments are foreseen:

- Pre-financing at the start of the project:
Pre-financing funds remain EU property until they are 'cleared' against eligible costs accepted by the European Commission.
- Interim payment following the approval of the periodic reports:
After approval of the formal periodic reports an interim payment will be issued.
- First Periodic Report: 01 January 2023 (M1) – 30 April 2024 (M16) → followed by 60 days official reporting to EC (July 2024) + 90 days for the EC to proceed with the interim payment as result of the approved periodic reporting (at the latest, October 2024).
- Second Periodic Report: 01 May 2024 (M17) – 31 August 2025 (M32) → followed by 60 days official reporting to EC (November 2025) + 90 days for the EC to proceed with the interim payment as result of the approved periodic reporting (at the latest, February 2026).
- Third Periodic Report: 01 December 2025 (M37) – 30 November 2026 (M48) → followed by 60 days official reporting to EC (February 2027) + 90 days for the EC to proceed with the interim payment as result of the approved periodic reporting (at the latest, May 2027).
Note that the EC will proceed with payments up to 90% ceiling of the total grant.
- Final payment following the approval of the final report:
The final payment will be transferred after the approval of the final report and consists of the difference between the calculated EU contribution (on the basis of the eligible costs) minus the amounts already paid.

8. Deliverables

8.1. List of Deliverables & Milestones

Table 6 List of Deliverables

D No.	Title	Lead Beneficiary	Type	Dissem. Level	Due [M]	Est. Date (annex I)	Del.
D1.1	Workplan for Delft, Darmstadt, Bochum, Berlin and Litoměřice activities: drilling, monitoring, service plant, integration/control, community engagement plan, permits	F-IEG	R	SEN	8	30-08-2023	
D1.10	Assessment of feasibility of Berlin ATES site for heat storage: community/stakeholder engagement plan, integration/control strategy, groundwater quality control	F-IEG	R	PU	46	31-10-2026	
D1.11	Assessment of feasibility of Litoměřice BTES site for heat storage: community/stakeholder engagement plan, integration/control strategy	F-IEG	R	PU	46	31-10-2026	
D1.12	Assessment of feasibility of United Downs Mines site for heat storage: community/stakeholder engagement plan, regulatory framework integration/control strategy, mine properties assessed, water/rock quality	F-IEG	R	PU	46	31-10-2026	
D1.2	Commissioning report of installations Litoměřice report of works, functioning of system, learnings from, integration, push-pull test	F-IEG	R	SEN	18	30-06-2024	
D1.3	Commissioning report of installations Berlin report of works, functioning of system, learnings from drilling, push-pull test.	F-IEG	R	SEN	18	30-06-2024	
D1.4	Commissioning report of installations BTES-Darmstadt report of works, functioning of system, learnings from, integration, push-pull test	F-IEG	R	SEN	20	31-08-2024	
D1.5	Commissioning report of installations MTES-Bochum: report of works, functioning of system, learnings from drilling, integration, push-pull test	F-IEG	R	SEN	20	31-08-2024	
D1.6	Commissioning report of installations ATES-Delft: report of works, functioning of system,	F-IEG	R	SEN	26	28-02-2025	

D No.	Title	Lead Beneficiary	Type	Dissem. Level	Due [M]	Est. Date (annex I)	Del.
	learnings from drilling, integration, push-pull test.						
D1.7	Performance evaluation of ATES-Delft demonstrate HT-ATES TRL 7/8	F-IEG	R	PU	46	31-10-2026	
D1.8	Performance evaluation of BTES-Darmstadt demonstrate HT-BTES TRL 7	F-IEG	R	PU	46	31-10-2026	
D1.9	Performance evaluation of MTES-Bochum demonstrate HT-MTES TRL 7	F-IEG	R	PU	46	31-10-2026	
D2.1	Review of state of the art in geothermal regulation and regulatory barriers and opportunities in different countries, relevant for technologies in use, feeding into T4.2	UXT	R	PU	24	31-12-2024	
D2.2	Open-source framework for LCOE and CRC assessment code and documentation	UXT	R	PU	28	30-04-2025	
D2.3	Risk assessment and LCOE reduction report	UXT	R	PU	36	31-12-2025	
D2.4	'Best practices' recommendation for engagement and acceptance of geothermal heat storage & future energy interventions	UXT	R	PU	40	30-04-2026	
D2.5	Final work package report summarizing societal aspects of geothermal underground storage & recommendations for developing spatial multi-criteria analysis in sustainable energy development (T4.5)	UXT	R	PU	48	31-12-2026	
D3.1	Evaluation of drilling/completion methods recommendations for application and future development	TUD	R	SEN	32	31-08-2025	
D3.2	HPPT and eGRT conclusions and design	TUD	R	SEN	32	31-08-2025	
D3.3	Evaluation of Co-simulation results lessons learned for application and optimisation	TUD	R	PU	42	30-06-2026	
D3.4	Evaluation of Control system recommendations for application and future development	TUD	R	PU	46	31-10-2026	
D3.5	Manage water quality issues for heat storage in geothermal reservoirs: recommendations for application and future development	TUD	R	PU	46	31-10-2026	

D No.	Title	Lead Beneficiary	Type	Dissem. Level	Due [M]	Est. Date (annex I)	Del.
D3.6	Workplan for cross site activities: Co-simulation, control, Push-pull, water quality	TUD	R	SEN	18	30-06-2024	
D4.1	Detailed dissemination, exploitation and communication plan, PUSH-IT website and SM channels	EVIS	R	PU	6	30-06-2023	
D4.2	Updated dissemination, exploitation and communication plan, PUSH-IT website and SM channels	EVIS	R	PU	24	31-12-2024	
D4.3	GIS web-app for potential mapping	EVIS	OTHER	PU	46	31-10-2026	
D4.4	Webinar series/vocational training	EVIS	OTHER	PU	46	31-10-2026	
D4.5	Key Exploitable Results business plan and road maps	EVIS	R	PU	46	31-10-2026	
D5.1	Conceptual Project Coordination handbook	TUD	R	SEN	2	28-02-2023	
D5.2	Quality and risk management report TUD update in Periodic Reports	TUD	R	SEN	3	31-03-2023	
D5.3	Data Management Plan	TUD	DMP	SEN	6	30-06-2023	
D5.4	Lecture about Open Science principles and practice	TUD	OTHER	SEN	6	30-06-2023	
D5.5	Interim Project coordination handbook update	TUD	R	SEN	15	31-03-2024	

Table 7 List of Milestones

MS No.	Title	Means of Verification	WP	Lead Beneficiary	Due month	Due Date
1	Installations Berlin & Litoměřice completed (GFZ & CGS)	Commissioning reports D1.1, D1.2 and D1.3	WP1	GFZ	18	30-06-2024
2	Installations Delft, Darmstadt and Bochum completed (TUD, TDA, F-IEG)	Commissioning reports D1.4, D1.5, D1.6	WP1	TUD	26	28-02-2025
3	Results of 1st survey and interview round across sites collected (UXT)	Minutes of WP meeting/workshop processing those results	WP2	UXT	20	31-08-2024
4	Development of framework from LCOE and CRC assessment and LCOE and CO2 emissions for project sites without heat	D2.2	WP2	UXT	28	30-04-2025

MS No.	Title	Means Verification of	WP	Lead Beneficiary	Due month	Due Date
	storage in geothermal reservoirs Heating systems simulation including dynamics and LCOE (UXT)					
5	Framework for water quality control and monitoring (TUD)	Minutes of meetings with site owners on implementation of monitoring + D3.6	WP3	TUD	6	30-06-2023
6	Constitution of co-simulation models for all the demo-sites (TUD)	Minutes of meetings with site owners on testing/handling over model + D3.6	WP3	TUD	6	30-06-2023
7	Training data for controller ready from co-simulation, Controller logic and sites specific controller design ready (TUD)	Minutes of meetings with site owners on implementation of control + D3.6	WP3	TUD	12	31-12-2023
8	Assembled mobile HPPT measuring and data recording unit (TUD)	D3.6	WP3	TUD	18	30-06-2024
9	Project website launch (EVIS)	Website online	WP4	EVIS	9	30-09-2023
10	Demo/follower site video's (EVIS)	Video's	WP4	EVIS	26	28-02-2025
11	Public stakeholder Demo site workshops (EVIS)	List of participants + Minutes of meeting or recording	WP4	EVIS	36	31-12-2025
12	PUSH-IT Summer school (EVIS)	List of participants + Program	WP4	EQS	40	30-04-2026
13	PUSH-IT final Symposium (EVIS)	List of participants + Minutes of meeting or recording	WP4	EQS	48	31-12-2026
14	Establishment of External Advisory Board (TUD)	List of participants	WP5	TUD	12	31-12-2023

8.2. Approval process of deliverables

WP leaders are responsible for their WP deliverables. In agreement with the project partners there is an internal review procedure defined with appointed internal reviewers for each of the deliverable. The list of appointed consortium experts is in progress at the moment of writing this report.

9. Dissemination of results and Open access

The partners must - as soon as possible (but not before a decision on their possible protection) - disseminate their results (i.e. make them public). Some of the classic forms of dissemination are:

- Website;
- Peer reviewed publication (open access);
- Presentation at a scientific conference.

The dissemination measures should however be consistent with the 'Detailed dissemination, exploitation and communication plan' (D4.1) and proportionate to the impact expected from the action. D4.1 will be ready in June 2023 (M6). This document will provide more guidelines.

When deciding on dissemination, the partners must also consider the other partners' legitimate interests.

9.1. Open access to scientific publications

Each partner must ensure open access (free of charge online access for any user) to all peer reviewed scientific publications relating to its results.

In particular, it must ensure that:

- at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications;
- Moreover, the partner must aim to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications.
- immediate open access is provided to the deposited publication via the repository, under the latest available version of the Creative Commons Attribution International Public Licence (CC BY) or a licence with equivalent rights; for monographs and other long-text formats, the licence may exclude commercial uses and derivative works (e.g. CC BY-NC, CC BY-ND) and
- information is given via the repository about any research output or any other tools and instruments needed to validate the conclusions of the scientific publication.
The bibliographic metadata must be in a standard format and must include all of the following:
 - the terms "European Union (EU)" and "Horizon Europe";
 - the name of the action, acronym and grant number;
 - the publication date, and length of embargo period if applicable, and
 - a persistent identifier.

9.2. Dissemination rules

The complete rules for dissemination are covered in Section 8.4 of the CA and Article 17 of the EU GA.

More precisely, the partner wishing to publish, present or disclose information about the project must adhere to the following procedure:

- Send an email at least **30 calendar days** before publication / disclosure of information to the whole consortium. Provide the foreseen title, list of contributing authors, abstract of the content and the purpose of the publication;
- Any objections to the planned publication can be made within **14 calendar days** after receipt of the notice; if no objection is made within the time limit stated above, the publication is permitted.

- An objection is justified if:
 - the protection of the objecting Party's Results or Background would be adversely affected, or
 - the objecting Party's legitimate interests in relation to its Results or Background would be significantly harmed, or
 - the proposed publication includes Confidential Information of the objecting Party.
- The objection has to include a precise request for necessary modifications.
- The objecting partner can request a publication delay of not more than 90 calendar days from the time it raises such an objection. After 90 calendar days the publication is permitted, provided that confidential information has been removed from the publication as indicated by the objecting partner.

A partner shall not include in any dissemination activity another partner's results or background without obtaining written approval, unless they are already published.

The author informs the PC when the planned publication has been accepted for publishing (for monitoring proposes).

Annex 1: Templates

Deliverable

 PUSH-IT																																																					
Piloting Underground Seasonal Heat Storage In geothermal reservoirs		<table border="1"> <tr> <td>Grant agreement number</td> <td colspan="3">101096566</td> </tr> <tr> <td>Project title</td> <td colspan="3">Piloting Underground Storage of Heat In geoThermal reservoirs</td> </tr> <tr> <td>Project acronym</td> <td colspan="3">PUSH-IT</td> </tr> <tr> <td>Start date</td> <td>01-01-2023</td> <td rowspan="2">DURATION</td> <td rowspan="2">48 months</td> </tr> <tr> <td>End date</td> <td>31-12-2026</td> </tr> <tr> <td>Work Package No. and Title</td> <td colspan="3">Choose an item</td> </tr> <tr> <td>Deliverable number</td> <td colspan="3">DX.X</td> </tr> <tr> <td>Deliverable title</td> <td colspan="3"></td> </tr> <tr> <td>Actual date of delivery</td> <td colspan="3">dd-mm-yyyy</td> </tr> <tr> <td>Nature</td> <td>Choose an item</td> <td>DISSEMINATION LEVEL</td> <td>Choose an item</td> </tr> <tr> <td>Deliverable Leader</td> <td colspan="3">Choose an item.</td> </tr> <tr> <td>Author</td> <td colspan="3"></td> </tr> <tr> <td>Co-authors and contributors</td> <td colspan="3"></td> </tr> </table>		Grant agreement number	101096566			Project title	Piloting Underground Storage of Heat In geoThermal reservoirs			Project acronym	PUSH-IT			Start date	01-01-2023	DURATION	48 months	End date	31-12-2026	Work Package No. and Title	Choose an item			Deliverable number	DX.X			Deliverable title				Actual date of delivery	dd-mm- yyyy			Nature	Choose an item	DISSEMINATION LEVEL	Choose an item	Deliverable Leader	Choose an item.			Author				Co-authors and contributors			
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PowerPoint

- 1


Piloting Underground Seasonal Heat Storage in geothermal reservoirs
 Presentation Title
 Name, Organisation

- 2


- 3

Thank you for your Attention




Agenda



Title meeting
 Date, e.g. 25 January 2023
 Place, e.g. Location with address / Online MS TEAMS

Agenda

Start	End	Subject	Presenter	Duration

Agenda Title meeting - date 1

Minutes



Piloting Underground Seasonal Heat Storage in geothermal reservoirs

Minutes
 PUSH-IT Title Meeting
 Date, e.g. 20 January 2023
 Place, e.g. Online TEAMS meeting

Recorded by: Martin Bloemendal, Danitja van Heusden-van Winden & Diana Kaijzer – TUD



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Annex 2: Budget

No.	Partner Short Name	A. Personnel costs / €	B. Subcontracting costs / €	C. Purchase costs / €	D. Other cost categories / €	Total Direct Costs / €	E. Indirect costs / €	Total costs / €	Funding rate
01.0	TUD	1.366.870,00	100.000,00	451.700,00	0,00	1.918.570,00	454.642,50	2.373.212,50	100%
02.0	EQS	24.165,70		0,00		24.165,70	6.041,43	30.207,13	70%
02.1	AARD	87.496,50		1.600,00		89.096,50	22.274,13	111.370,63	70%
02.2	EES	262.489,50		1.602.250,00		1.864.739,50	466.184,88	2.330.924,38	70%
02.3	EVIS	95.829,50	250.000,00	113.250,00		459.079,50	52.269,88	511.349,38	70%
03.0	KWR	232.000,00	0,00	23.000,00		255.000,00	63.750,00	318.750,00	100%
04.0	TDA	357.201,36	600.000,00	389.600,00	43.750,00	1.390.551,36	186.700,34	1.577.251,70	100%
05.0	F-IEG	921.600,00	1.100.000,00	664.000,00	728.000,00	3.413.600,00	396.400,00	3.810.000,00	100%
05.1	RUB	79.200,00	0,00	12.200,00		91.400,00	22.850,00	114.250,00	100%
06.0	GFZ	948.001,14	350.000,00	177.000,00		1.475.001,14	281.250,29	1.756.251,43	100%
07.0	VITO	643.100,00	45.000,00	257.700,00		945.800,00	225.200,00	1.171.000,00	100%
08.0	CGS	135.395,00	780.000,00	28.400,00		943.795,00	40.948,75	984.743,75	100%
09.0	HGEO	336.960,00	11.900,00	630.600,00		979.460,00	241.890,00	1.221.350,00	70%
10.0	BRGM	439.468,40	49.280,00	106.670,00		595.418,40	136.534,60	731.953,00	100%
11.0	UU	363.661,87	0,00	53.600,00		417.261,87	104.315,47	521.577,34	100%
12.0	GBBH	399.990,00	100.000,00	1.115.400,00		1.615.390,00	378.847,50	1.994.237,50	70%
13.0	UKR	139.801,00	0,00	24.000,00		163.801,00	40.950,25	204.751,25	100%

No.	Partner Short Name	A. Personnel costs / €	B. Subcontracting costs / €	C. Purchase costs / €	D. Other cost categories / €	Total Direct Costs / €	E. Indirect costs / €	Total costs / €	Funding rate
	TOTAL	6.833.229,97	3.386.180,00	5.650.970,00	771.750,00	16.642.129,97	3.121.049,99	19.763.179,96	
14.0	UNIGE	10.375,39	57.250,00	37.930,00	0,00	447.943,26	97.673,32	546.616,58	
15.0	ARU	162.832,00	0,00	32.800,00	0,00	195.632,00	48.908,00	244.540,00	
16.0	BGS	224.802,00	0,00	53.346,00	0,00	278.148,00	69.537,00	347.685,00	
17.0	GEL	214.520,00	0,00	53.400,00	0,00	267.920,00	66.980,00	334.900,00	
18.0	UXT	355.708,86	0,00	170.332,75	0,00	526.041,61	131.510,40	657.552,01	
		1.366.870,00	100.000,00	451.700,00	0,00	1.918.570,00	454.642,50	2.373.212,50	

The EU aims to have a net-zero greenhouse gas (GHG) economy by 2050, with 55% reduction on 1990 levels by 2030. At present, heating and cooling represent around 50% of the final energy demand in Europe and are mainly supplied by fossil fuel derived energy. It is therefore essential for heating and cooling to decarbonise to achieve EU ambitions.

A challenge for decarbonizing heat systems is the size of the seasonal mismatch between demand for heat and heat generation from sustainable sources – this mismatch is much larger than the equivalent intermittency in electricity supply and demand. The two main solutions to address this mismatch are: (i) to install a large capacity, so that peak demands can be met even at low production levels; or (ii) to store energy for later use if it is not needed at time of conversion. Many sustainable heat supply systems are characterised by high capital expenditure and low operational costs. Therefore, an installed capacity tailored at peak demand is not cost effective, while extending the annual operation period is advantageous for meeting energy needs, reducing levelised cost of energy (LCOE) and decarbonisation. Optimal utilisation of sustainable heat requires storing large amounts of heat to account for seasonal supply and demand fluctuations. Various technologies have been proposed for large-scale heat storage in geothermal reservoirs and low temperature storage is routinely applied. PUSH-IT focuses on extending storage temperature ranges to high temperatures. We will tackle remaining barriers, demonstrate applicability, increase public engagement, and optimise and de-risk operations. We will showcase three technology options that are fit for a wide variety of geological conditions covering most locations in Europe.



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