



Project acronym and title:

RETURN - Reusing depleted oil and gas fields for CO<sub>2</sub> sequestration

D6.1

## Communication Plan

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## Public Introduction

The RETURN project focuses on unlocking the potential for CO<sub>2</sub> storage in depleted oil and gas reservoirs. These sites are promising, as they are well characterized from previous oil and gas activities, and they have large pressure margins for safe storage. There are, however, some technical challenges related to CO<sub>2</sub> injection and storage in such sites. Upon CO<sub>2</sub> injection, the low pressure in the depleted reservoirs results in strong cooling and potential freezing of the well and near-well region due to expansion and associated phase changes of the CO<sub>2</sub>. This may jeopardize not only injectivity, but also near-well stability and well integrity. Large depletion can be accompanied by strong stress concentration and hysteresis effect upon re-pressurisation, added to the development of thermal stress. Today's available solutions include heating of the CO<sub>2</sub> and gas phase injection, implying many injectors. This is both expensive and emission-intensive. Novel solutions are thus required, which will be searched for and investigated in the RETURN project.

The primary objective of the project is to enable safe and cost-efficient long-term CO<sub>2</sub> storage in depleted O&G reservoirs by understanding and handling cooling and CO<sub>2</sub> phase change effects during injection. Research required to reach this goal is addressed in three main scientific work packages focusing on: (i) Coupled well-reservoir flow modelling, (ii) Near wellbore processes, and (iii) Wellbore integrity. The work, comprising both experiments, numerical modelling and larger scale field tests, will focus on understanding how CO<sub>2</sub> flows down the well and into the depleted reservoir. The research will have special emphasis on near-wellbore cooling effects, CO<sub>2</sub> phase transformations, pressure and temperature cycling, and the impact thereof on wellbores, reservoir rock and sealing formations. The project will develop: (i) coupled well-reservoir simulations and reference solutions that incorporate multiphase, multicomponent, thermal and transient physics, (ii) enhanced quantitative understanding of the effects of near-wellbore processes on near-wellbore integrity and injectivity, and (iii) safety windows for integrity of well barriers during CO<sub>2</sub> injection as a support tool for operators. The main project impact will be to enable 'cold' CO<sub>2</sub> injection into depleted reservoirs, by offering operators safe operational windows for CO<sub>2</sub> injection and recommendations on controllable parameters such as operational patterns and well designs.

## Executive Summary

WP6 "Outreach and Dissemination" aims to ensure an effective communication within the consortium, including associated partners, and to disseminate project information and results. Our outreach and dissemination efforts will ensure that relevant findings are shared within and outside the CCUS community using modern and accessible methods.

The aim of this report is to outline the communication plan both between the project partners during project duration, and outreach and dissemination plan towards general international public. This plan will be the basis for the outreach and dissemination activities in WP6, and it will be updated along the course of the project. The communication plan will help to establish a fruitful collaboration and smooth exchange of information within the consortium, and the communication of project progress and results to external parties, including research organisations and industry, but also the non-scientific sector.



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# 1 Introduction

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CCS has been shown, not least in the last reports of the IPCC, to be an indispensable technology in the toolbox of measures needed to fulfil the commitments agreed at the Paris COP. CCS is however not well received in the wider public and often seen as an excuse to continue using and developing fossil fuels. In particular, there is resentment towards the leading role the oil and gas industry has taken in CO<sub>2</sub> storage demonstrations worldwide; this was clearly expressed at the recent Norway-Netherlands CCUS workshop in Rotterdam. This is why publicly funded research projects on CCS have a duty to disseminate as clearly and transparently as possible the obtained results, together with a repeated message on the necessity of CCS. This message should clarify that CCS and other climate mitigation measures such as transition to renewable energy sources and to more sustainable practices go hand in hand instead of being antagonistic. Also, the leading role of energy companies including oil and gas companies should be acknowledged, explaining what it takes technically, logistically and financially to successfully plan and execute CO<sub>2</sub> storage operations, not least offshore. The RETURN project will take a leading role in this needed dissemination action.

WP6 "Outreach and Dissemination" aims to ensure an effective communication within the consortium, including associated partners, and to disseminate project information and results. Our outreach and dissemination efforts will ensure that relevant findings are shared within and outside the CCUS community using modern and accessible methods.

Specific objectives are:

- Definition and organization of dissemination activities for the RETURN project.
- Provide information on the project activities and results within and outside the project consortium, including general public dissemination on the importance of CCUS.
- Organize project conferences and knowledge-sharing workshops to inform the scientific community and the public on relevant results.
- Support project partners in the organization of technical meetings and workshops.
- Build and maintain the project website and ensure communication via social media.
- Maintain an up-to-date data management plan, and ensure compliance with EU GDPR and data protection guidelines across the project.

The aim of this report is to outline the communication plan both between the project partners during project duration, and outreach and dissemination plan towards general international public. This plan will be the basis for the outreach and dissemination activities in WP6, and it will be updated along the course of the project.

## 2 Communication Plan

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WP6 will ensure a wide outreach and dissemination to the CCUS community and the general public via the RETURN project website, regular newsletters, social media channels, reports, presentations at conferences and peer-review journal articles. A close collaboration with related international CCUS research projects, such as DIGIMON, REX-CO<sub>2</sub> and SHARP, and with associations such as CO<sub>2</sub>GeoNet, will be established to ensure public outreach and knowledge exchange.

The execution of the outreach and dissemination activities will be monitored and presented at the project management and steering committee meetings. The dissemination and communication strategy will be evaluated regularly and adapted, if necessary, during project duration.

### 2.1 Communication within the Consortium

At the project start-up, the Consortium partners have established meetings on different levels of project management:

- Regular WP meetings are organized by WP leaders, typically on monthly basis. These meetings serve to discuss plans, progress and results of each WP. Partners involved in respective WPs are invited to these meetings, as well as other participants who are interested to connect work in their WP with another WP.
- Regular Project Management Team (PMT) meetings have been established since the project start between the Coordinator (SINTEF), WP leaders and other key personnel. Other project participants will be invited when there is a need to discuss specific points that are of concern for all WPs. These meetings are held on monthly basis.
- Internal project management meetings (e.g. Coordinator and Consortium partners may hold internal meetings according to their needs).
- General Assembly meetings will be held two times in 2022, and the second one will be online. General Assemblies will be also organized in association with in-person project meetings and workshops for practical purposes.
- Steering Committee meetings: two meetings are planned for 2022, and thereafter will be decided on the frequency.
- Project meetings with all partners, preferably in-person, but also possible as a hybrid solution, will be organized at least once per year.
- Industry workshops, involving consortium partners, are planned in WP4 and WP5. These workshops can be also correlated with General Assemblies, especially if in-person meeting is organized. Next WP5 workshop will be in-person meeting in February 2023 and will be combined with General Assembly.
- Regular meetings with VAB will be established upon the settlement of NDA between the vendor companies and the Consortium. The meetings can be distributed between the WPs and tailored according to the relevance for different VAB members.

## 2.2 Website and social media

One of the first tasks in WP6 was to develop a dedicated project website. The website is intended to serve as an information base for the public and to provide updates on project results and accomplishments. During the project, we will focus more on other means of outreach and dissemination and use the website as the basis for the information that will be shared with the public.

Various social media were evaluated for the outreach activities. To reach the relevant audience, LinkedIn is seen as the most promising given that it hosts the major target groups. This medium has been chosen as the most relevant for frequent short stories from the project, as many interested professionals are present on this platform and are likely to share these posts further. As the project progresses, other social media may be evaluated for further outreach (e.g. Twitter). All project participants will be encouraged to share updates via different social media channels to access a broader audience.

### 2.2.1 Project Website

A dedicated website is up and running since March 2022, at <https://return-act.eu/> (see Figure 1). The page presents the project goals, work package structure and consortium partners. There is a section with short news, updates and events. The website also hosts the project newsletter and will contain public reports and links to publications as deliverables are completed.

Originally, it was planned to use the project website for sharing the project results between consortium partners. However, better digital solutions have been implemented for this purpose. A sharepoint site has been set up, and this solution has so far proved to be safe and effective for data sharing, joint work on deliverables and communication between the partners.

### 2.2.2 Communication plan for the LinkedIn account

Updates on the LinkedIn account will be correlated to the milestones and deliverables throughout the project duration (Table 1). In Q3 and Q4 of 2022, there are no planned deliverables (until December) from the scientific WPs. However, progress in different WPs (e.g. results, field trips, meetings) will be shared before the deliverables are officially completed.

**Table 1 Overview of deliverables and milestones that will be correlated to the outreach activities. A – journal article; C – conference paper; M – milestone; R – report.**

| Work Package                                | 2022 |       | 2023 |      |    |         | 2024 |       |    |      |
|---|------|-------|------|------|----|---------|------|-------|----|------|
|   | Q3   | Q4    | Q1   | Q2   | Q3 | Q4      | Q1   | Q2    | Q3 | Q4   |
| WP1 Project management and coordination     | R    | R     |      | M, R |    | R       |      | R     |    | R    |
| WP2 Well-Reservoir Flow Modelling           |      | M, 2R | M    |      |    | A, R    |      |       | M  | M, R |
| WP3 Near Wellbore Processes                 |      |       | R    | M, R |    | M, A, C |      | M, 2R | R  | M, R |
| WP4 Well Integrity                          |      |       | M    | M, A |    | A       |      | M, C  | C  | R    |
| WP5 Enabling Cold CO <sub>2</sub> Injection |      |       | M    |      |    |         |      | M     | R  | R    |

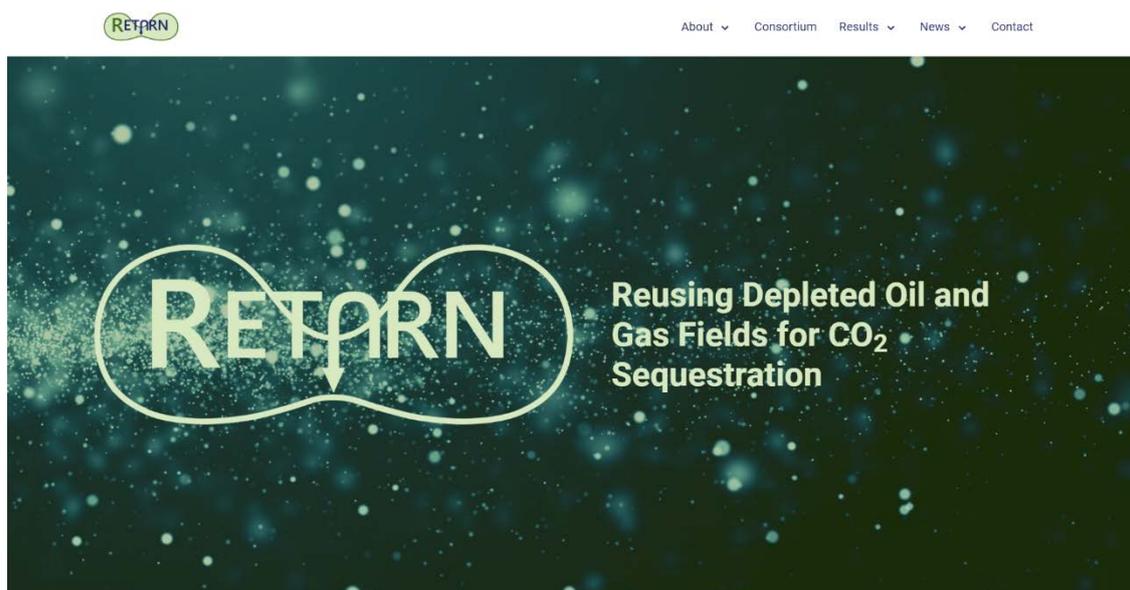


Figure 1 Front page of the project website, at <https://return-act.eu/>.

### 2.2.3 Newsletter

A newsletter informing about activities of the RETURN project during the project duration will be designed, published on the project website and sent out to interested recipients. The link to newsletter will be also posted on the social media accounts (e.g. LinkedIn). Key outcomes from the WPs will be highlighted in these newsletters, as well as relevant project news and updates. The newsletter will be published quarterly during the project duration. Quarterly newsletters will be arranged into yearly newsletters, as shown in the overview of the remaining deliverables and milestones in WP6 (Table 2). The kick-off newsletter was published in May 2022, after the kick-off meeting and official start-up of the work in all WPs, see Figure 2.

Table 2 Remaining deliverables (D) and milestones (MS) in WP6.

| Deliverable ID | Title   | Responsible partner | Due date      |
|----------------|---|---------------------|---------------|
| D6.3           | Newsletter from the first year                  | SINTEF/<br>NZTC     | January 2023  |
| D6.4           | Newsletter from the second year                 | SINTEF/<br>NZTC     | January 2024  |
| D6.5           | Educational program for high school students    | SINTEF              | November 2024 |
| Milestone ID   |   |                     |               |
| MS6.3          | Knowledge sharing conference/workshop arranged  | SINTEF              | October 2023  |
| MS6.4          | Open end-of-project webinar series from WPs 2-5 | SINTEF              | October 2024  |
| MS6.5          | Stakeholder workshop                            | SINTEF              | November 2024 |



## is Officially Underway

**The ACT3 RETURN project aims to enable safe and cost-efficient long-term CO<sub>2</sub> storage in depleted O&G reservoirs by understanding and handling cooling and CO<sub>2</sub> phase change effects during injection.**

The main impact of the project will be to enable 'cold CO<sub>2</sub>' injection into depleted reservoirs, by offering operators recommendations on controllable parameters such as operational patterns and well designs. This will reduce costs and increase safety.

Figure 2 The kick-off newsletter, front page.

In addition, brochures, information sheets and posters presenting work from the RETURN project will be designed on demand and/or related to the events and conferences where the consortium partners will participate on behalf of the project.

### 2.3 Dissemination plan

The RETURN project has an ambitious plan for dissemination of the results and general information about CCUS to the international public. A minimum ambition level, set in the proposal phase, will be to achieve the following:

- Publications: Each of the scientific WPs 2-5 in the project is aiming to publish at least three peer-reviewed journal papers and three conference papers in the course of the project. This makes a total of 24 papers from the project (12 peer-reviewed and 12 conference).
- Popular scientific contributions: Each of the WPs 2-5 will disseminate a yearly popular scientific contribution. This makes a total of 12 popular scientific contributions from the project. These can be for example blog posts, videos, newspaper articles or visits to schools. Popular scientific dissemination will be broadcasted through the project website and social media.
- CCUS general information: The RETURN project acknowledges the need to inform the general public about the importance of CCUS to counteract the increasing global CO<sub>2</sub> emissions. To this end, WP6 will build an educational program for high school students on CCUS with focus on the storage potential of depleted reservoirs. The program will be made available for all countries participating in the project. This task is corresponding to the deliverable D6.5 (see Table 2).

## 2.4 Knowledge dissemination and international collaboration

In order to monitor and evaluate the project progress and benefit, exchange and communication with related projects and communities will be encouraged. RETURN will participate in knowledge sharing events such as those arranged by ACT or CO<sub>2</sub>GeoNet and will support the initiation of communication events inside and outside the CCUS community.

### *2.4.1 ACT Knowledge sharing workshops*

The RETURN project was presented to the attendants of the Knowledge sharing workshop organised by ACT in Rotterdam (June 2022) and similar presentations, with achieved results will take place in the next yearly ACT workshops. All active ACT projects are expected to be present at these annual workshops; this makes for a perfect meeting arena for learning about each other's research and exchange ideas, often resulting in concrete collaboration plans. These can include common experimental campaigns, as was the case between DIGIMON and RETURN at the Svelvik field laboratory, or common participation at own workshops (Pre-ACT, DIGIMON, ALIGN CCUS and Elegancy, at the Brussels workshop in 2018).

In Rotterdam, immediate synergies were seen between RETURN and SHARP (<https://sharp-storage-act.eu/>), leading to useful discussions on how to perform laboratory experiments on temperature cycling effect on well integrity, on the one hand, and how to best preserve and sample shale cores, on the other hand. The workshop also included site visits to Delft University of Technology and TNO.

### *2.4.2 Dedicated knowledge sharing workshops*

As a 'large' ACT project, RETURN is expected to host a knowledge-sharing workshop. A RETURN knowledge-sharing workshop and a dedicated conference session is planned in the second year of the project (MS6.3, see Table 2). It will be strived towards arranging a RETURN session at an existing technical conference on CO<sub>2</sub> storage/CCUS. The most appropriate candidates for this are TCCS and GHGT conferences, as well as ARMA which gained stronger focus on CCS. To this end, a significant number of contributions from the RETURN project are needed, and all partners will be encouraged to submit abstracts.

The next TCCS conference (TCCS-12) will be held 19<sup>th</sup>-23<sup>rd</sup> June 2023 in Trondheim, Norway. The intent is to arrange an ACT knowledge-sharing workshop in connection to TCCS-12. Next opportunity for a dedicated conference session will be the GHGT conference in 2024, when the project will have accomplished most of the goals, which would be excellent timing for RETURN. Until then, RETURN will participate in the coming up GHGT-16 conference.

### *2.4.3 Presence at international conferences*

In 2022, the RETURN project will be represented at:

- The first online conference organised by CCS Brasil on 20<sup>th</sup> of September, showcasing international collaboration with contribution of field data to further research for accelerating CCS (<https://www.congressobrasileiro.ccsbr.com.br/en>).
- The 15<sup>th</sup> Open Forum organised by CO<sub>2</sub>GeoNet, in oral presentation, on 21<sup>st</sup> of September (<https://conference2022.co2geonet.com/>).



- The 16<sup>th</sup> Greenhouse Gas Control Technologies Conference (GHGT-16) in Lyon, France, in an e-poster presentation, on 26<sup>th</sup> of October (<https://ghgt.info/>).

#### *2.4.4 Stakeholder workshop*

At the end of the project, when recommendations for industry have been drawn up in WP5, the RETURN project will invite stakeholders from all participating countries (e.g. regulating bodies, authorities, governmental institutions) to a stakeholder workshop where they will be given science-based advice based on the outcomes of the project. This will include advice for how to proceed to unlock the capacity of depleted reservoirs in each of their respective countries. Stakeholder workshop is one of the milestones in WP6 (MS6.5, see Table 2).

## **2.5 Role of Vendor Advisory Board**

In addition to the communication efforts described above, the RETURN project has ambitions of securing a rapid time-to-market for the scientific findings in the project. As the project has a short three-year time frame, commercialisation of project results is not a part of the project plan for the R&D providers. To this end, the consortium has teamed up with a group of relevant vendors to form a Vendor Advisory Board (VAB). This board will be open to any company with relevant technologies or products. The VAB will be given insight into selected scientific findings and will be invited to selected project meetings and workshops. In turn, they will provide free licences for their commercial software packages during project duration, and instructions on how to use their software for benchmarking, case studies and attempts to couple different parts of the system (e.g. well-reservoir). The VAB will be encouraged to implement the simulation and modelling results obtained in RETURN in their own software during or after the project time frame.

## Glossary

| Item       | Description  |
|------------|--|
| ACT        | Accelerating CCS Technologies. <a href="http://www.act-ccs.eu/">http://www.act-ccs.eu/</a>   |
| ALIGN CCUS | Accelerating low-carbon industrial growth through CCUS. The ALIGN CCUS project has received funding from PTJ (DE), RVO (NL), Gassnova (NO), UEFISCDI (RO) and BEIS (UK) and is co-funded by the European Commission under the Horizon 2020 programme and the ACT Programme, Grant Agreement No 691712; Project No 271501. <a href="https://www.alignccus.eu/">https://www.alignccus.eu/</a>                                  |
| CCS        | Carbon Capture and Storage   |
| CCUS       | Carbon Capture, Utilization and Storage  |
| CO2GeoNet  | The European Network of Excellence on the Geological Storage of CO <sub>2</sub>  |
| DIGIMON    | Digital Monitoring of CO <sub>2</sub> storage projects. DIGIMON project is funded through the ACT programme. <a href="https://digimon.norcesprosjekt.no/home">https://digimon.norcesprosjekt.no/home</a>   |
| ELEGANCY   | Enabling a low-carbon economy via hydrogen and CCS. The ELEGANCY project has received funding from DETEC (CH), BMWi (DE), RVO (NL), Gassnova (NO), BEIS (UK), Gassco, Equinor and Total, and is co-funded by the European Commission under the Horizon 2020 programme, ACT Grant Agreement No 691712; Project No 271498. <a href="https://www.sintef.no/projectweb/elegancy/">https://www.sintef.no/projectweb/elegancy/</a> |
| GHGT       | Greenhouse Gas Control Technologies conference, <a href="https://ghgt.info/">https://ghgt.info/</a>  |
| IPCC       | Intergovernmental Panel on Climate Change  |
| NDA        | Non-Disclosure Agreement   |
| R&D        | Research and Development   |
| REX-CO2    | Re-using Existing Wells for CO <sub>2</sub> Storage Operations. The REX-CO <sub>2</sub> project is funded through the ACT programme and Horizon2020, Project No. 294766. <a href="https://rex-co2.eu/">https://rex-co2.eu/</a>   |
| SHARP      | Stress history and reservoir pressure for improved quantification of CO <sub>2</sub> storage containment risks. SHARP project is funded through the ACT programme, Project No 327342. <a href="https://sharp-storage-act.eu/">https://sharp-storage-act.eu/</a>  |
| TCCS       | Trondheim Carbon Capture & Storage conference, <a href="https://www.sintef.no/projectweb/tccs-12/">https://www.sintef.no/projectweb/tccs-12/</a>   |
| VAB        | Vendor Advisory Board  |
| WP         | Work Package   |