



Project acronym and title:
SECURE – Subsurface Evaluation of Carbon capture
and storage and Unconventional risks

**TARGETED EDUCATIONAL TALKS WITH SCIENCE
JOURNALISTS AND NON-EXPERT STAKE
HOLDERS AT ALL LEVELS INCLUDING THE
GENERAL PUBLIC**

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6.10

Revision:1

Disclaimer

This report is part of a project that has received funding by the *European Union's Horizon 2020 research and innovation programme* under grant agreement number 764531.

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Project funded by the European Commission within the Horizon 2020 Programme

Dissemination Level

| | |
|-----------|--|
| PU | Public |
| CO | Confidential, only for members of the consortium (incl. the Commission Services) |
| CL | Classified, as referred to in Commission decision 2001/844/EC |

| | |
|---|--|
| Deliverable number: | D6.10 |
| Deliverable name: | Targeted educational talks with science journalists and non-expert stake holders at all levels including the general public |
| Work package: | WP6 |
| Lead WP/deliverable beneficiary: | |

| Status of deliverable | | |
|-------------------------------|-------------------|-------------------|
| | By | Date |
| Submitted (Author(s)) | Corin Jack | 26/05/2021 |
| Verified (WP leader) | Jonathan Pearce | 26-5-21 |
| Approved (EB member) | Wolfram Kloppmann | 26-5-21 |
| Approved (Coordinator) | E HOUGH | 27-5-21 |

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Public introduction

Subsurface Evaluation of CCS and Unconventional Risks (SECURE) is gathering unbiased, impartial scientific evidence for risk mitigation and monitoring for environmental protection to underpin subsurface geoenergy development. The main outputs of SECURE comprise recommendations for best practice for unconventional hydrocarbon production and geological CO₂ storage. The project is funded from June 2018–May 2021.

The project is developing monitoring and mitigation strategies for the full geoenergy project lifecycle; by assessing plausible hazards and monitoring associated environmental risks. This is achieved through a program of experimental research and advanced technology development that includes demonstration at commercial and research facilities to formulate best practice. We will meet stakeholder needs; from the design of monitoring and mitigation strategies relevant to operators and regulators, to developing communication strategies to provide a greater level of understanding of the potential impacts.

The SECURE partnership comprises major research and commercial organisations from countries that host shale gas and CCS industries at different stages of operation (from permitted to closed). We are forming a durable international partnership with non-European groups; providing international access to study sites, creating links between projects and increasing our collective capability through exchange of scientific staff.

Executive report summary

A range of educational and communication activities have taken place to convey the key research findings and their implications for subsurface energy developments in the EU. While CV19 meant that the nature of these activities had to change from in person contact, a wide range of audiences were engaged, including industries across several sectors, academia, interested members of the public, local politicians, local and national government officials, consultants and students. A highlight was the fact-finding tour to the USA and Canada, which took place prior to CV19 closing down face-to-face meetings. It was possible to build-upon the discussions that occurred in North America through subsequent online interactions, extended then in an online form post-CV19 to Australia. A set of detailed talks, followed by discussion, have occurred in the final six months of SECURE through webinars and online workshops, the topics ranging from the more technical to the more psychological and ethical.



Contents

Public introductionii

Executive report summary.....ii

Contentsiii

1 Introduction1

2 Outreach activities1

2.1.1 Webinars 1

2.1.2 Discussions with stakeholders and operators, North America and Australia 1

2.1.3 Social media activities 2

2.1.4 Mine-Water Geothermal research talks 3

2.1.5 North Lanarkshire Council 4

2.1.6 Advisory board meetings 4

3 Remarks5

4 References6

FIGURES

Figure 1: Video 1 - GeoEnergy journey: Learning from the US and Canada.....2

Figure 2: Video 2 – SECURE fact-finding visit 2019: New perspectives from North America.....2

Figure 4: Video 4 - Reactions from Australia virtual visit.....2

Figure 3: Video 3 - SECURE: USA & Canada - Reactions from trip2

Figure 5: Social media blog post- A sociologist on a geologists' mission3

Figure 6: Social media blog post- Banff National Park’s (Canada) remarkable geology provides valuable CCS insights.....3

TABLES

Table 1: SECURE advisory board delegates and associated industry representation4



1 Introduction

Education through engagement with the media and other non-expert stakeholders has been recognized as a valuable way of furthering the dissemination of research from the SECURE project. Education activities can utilise various modes and platforms for communicating the research outputs from SECURE, these can include both online platforms (e.g. social media, webinars) as well as direct exchanges with stakeholders (e.g. face to face discussions, conferences). Through sharing research outputs using multiple outreach channels this can support interactions to benefit a variety of audiences with interests in subsurface energy projects (e.g. project and facility developers, government, citizens). The global Covid-19 (CV19) pandemic from early 2020 to the end of the project has meant that face-to-face interactions have all had to be cancelled, with a pivot to online communications. This has meant continuous learning of new skills and re-design of planned-for activities and has run into challenges that have become commonplace during CV19, such as screen fatigue and parts of society disengaging due to use of remote media.

The following sections detail the different communication activities conducted within SECURE, as well as how they were conducted and the audiences involved.

2 Outreach activities

2.1.1 Webinars

In order to deliver best practice educational talks based on key findings from experts within SECURE, a two-part series of webinars was conducted in March and April 2021. The first webinar addressed: *Deterministic and probabilistic approaches to well integrity risk investigation and remediation strategies*. This talk discussed modelling tools that were developed within SECURE and applied to two case studies in the Netherlands and Poland to assess well integrity risks. The webinar also discussed methods for reducing fracturing in injection wells. Such approaches can serve as tools for decision making for CCS and shale gas operators.

The second webinar presented studies undertaken by SECURE project partners on a site in France, in order to develop strategies for environmental baseline assessment, which cover the full project lifecycle – from operational to post operational – and can be applied to different scales of project. The research also involves developing state-of-the-art sensors to monitor flow leaks and using gas composition and changes in microbiology. The novel technologies will expand the suite of methodologies used for detecting gas seeps and leakages

In regards to the analytics measured from both webinars, the total number of attendees for both webinars was 65, and the attendance rate (i.e. relative to those who had registered) was 64% and 72% for the first and second webinars respectively. To gauge attendee level of interest during the webinar, an interest rating score (ranging from 1-100) was also determined based on several parameters, which resulted in an interest score of 63 and 72 respectively.

2.1.2 Discussions with stakeholders and operators, North America and Australia

In September 2019, a team of thirteen social and geoscientists from BGS, TNO, AMU, SINTEF, Risktec, and Heriot-Watt and Edinburgh universities, completed a ten day mission to North America aimed at gathering examples of good practice in CO₂ storage, shale gas and enhanced oil recovery (EOR) projects. The trip involved visits to research teams, operators and regulators as well as operational sites in Illinois and Alberta.

Due to travel restrictions associated with CV19, a planned factfinding mission to Australia was translated to a series of stakeholder meetings (Autumn 2020) with representatives from industry, regulation, legislation, research and public communications that were held online.



Although the main purpose of the fact-finding visits was to acquire knowledge from experienced researchers, operators and regulators of subsurface energy projects in North America and Australia, the SECURE team did share knowledge from the EU perspective with the various organisations that hosted the SECURE team with regards to the following:

- Aims and objectives of the SECURE project
- Requirement to decarbonise results in the need for innovative solutions, including shale and CCS
- Status and evolution of shale gas exploration in EU
- Status of CCS deployment in EU
- Technologies and innovations being developed in SECURE

Furthermore, depending on the site visit in question, the discussion points raised with the host organisation varied considerably e.g. from research facilities discussing atmospheric gas monitoring, hydrogeology, geochemistry etc. to operators discussing monitoring requirements, site communications, stakeholder analysis and cost reduction.

The meetings with North American and Australian stakeholders formed the basis of the development of the International Platform for Environmental Monitoring, an important legacy of the SECURE project.

2.1.3 Social media activities

An additional set of outputs from the North America and Australia fact-finding missions were various social media activities including the development of four short videos (Figures 1 - 4) which explain the purpose of the visit, describes highlights from the group's visit and how the group's findings will support Europe's long-term ambitions. Furthermore, several participants from the trips also created blog posts which shared various personal accounts and reflections from the trip (Figure 5 and 6).



Figure 1: Video 1 - GeoEnergy journey: Learning from the US and Canada



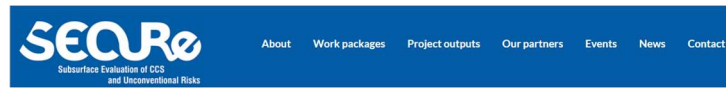
Figure 2: Video 2 – SECURE fact-finding visit 2019: New perspectives from North America



Figure 3: Video 3 - SECURE: USA & Canada - Reactions from trip



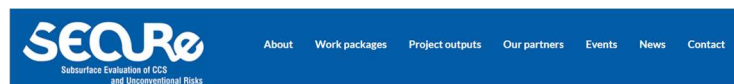
Figure 4: Video 4 - Reactions from Australia virtual visit



BLOG: A sociologist on a geologists' mission



Figure 4: Social media blog post- A sociologist on a geologists' mission



BLOG: Banff National Park's remarkable geology provides valuable CCS insights



Figure 5: Social media blog post- Banff National Park's (Canada) remarkable geology provides valuable CCS insights

2.1.4 Mine-Water Geothermal research talks

SECURE partners at the University of Edinburgh presented the main research findings of the UK mine-water geothermal public perceptions survey at three online events. The events comprised of the following:

- **THE HEAT ACADEMY** (<https://heatacademy.eu>) is an international training, collaboration and innovation platform offering a modular training concept in a broad range of topics related to decarbonisation of heating and cooling. While the Heat Academy HQ is in Stockholm, it operates in a highly distributed fashion across the EU and beyond. Its mission is to address the competence and capacity gaps in the sector by offering hands-on training and facilitating collaboration and sharing of best practice. The Heat Academy is a fully independent organisation based on a collaborative model involving partnerships with local colleges, universities, public institutions, energy operators, investors and the wider supply chain. This particular event was hosted virtually by Bridgend College in Wales in December 2020 and included around 60 participants.
- **THE COAL AUTHORITY (CA)** – An online meeting with interested individuals at the CA was arranged in November 2020, owing to the CA's involvement with providing GIS data which was utilised for selecting relevant mining areas for the survey sampling. This meeting provided useful information for the CA who had limited prior insight into public perceptions towards mine-water geothermal technology.



- **EDINBURGH CLEAN HEAT** – Organised in March 2021 by Elizabeth Hall at the Edinburgh City council and Johanna Carrie, a leading activist, this online event was designed with the aim "To help implement the vision of an integrated energy infrastructure serving zero carbon Edinburgh 2030, focusing initially on heat networks using zero carbon sources of energy." The audience of c. 30 individuals included a range of parties interested in developing heat networks in Edinburgh including local councillors, developers, academics, specialist consultants and interested citizens.

2.1.5 North Lanarkshire Council

In December, 2019, The Executive Director (Enterprise and Communities) and affiliated members of the North Lanarkshire Council were approached to assist in the development of public engagement (PE) events concerning the prospect of subsurface energy projects in the region.

Details of the SECURE project and the proposed PE events were presented to the council members. The resulting discussions which followed facilitated the sharing of information as well as the sharing of views of the council members towards the various subsurface technologies considered in SECURE i.e. CCS, Shale gas and geothermal. A strong interest in working with SECURE on a stakeholder and community dialogue around geothermal (from mine waters arising from now-closed coal mines in the area) was subsequently established. The Council was willing to provide key contacts in communities in the area as well as to provide facilities for the meetings which we plan to hold. Unfortunately due to the emergence of CV19 in the subsequent period after the council discussions these PE events were not able to take place. A request to hold a follow-up meeting was made but CV19 has created additional work for the Council so, to date, this has not been feasible but efforts will continue.

2.1.6 Advisory board meetings

The SECURE advisory board (AB) provided the project with a third party, expert grouping of international practitioners whose collective expertise and experience supported input and advice directly with industry experts (list detailed below in Table 1). The biannual AB meetings served multiple purposes including ensuring that the SECURE research addressed relevant topics and utilised/or developed appropriate techniques, but furthermore the AB meetings also provided a platform for sharing the latest findings and best practice guidance developed within the SECURE project. This exchange of knowledge and ideas was a valuable component for optimising the standard of research conducted within the SECURE project.

Throughout the SECURE project there was a total of seven AB meetings organized (Three meeting designed specifically for the AB and an additional four in association with the SECURE annual general assembly meetings). Within the meetings SECURE project partners presented the main activities and findings within each of the six SECURE Work Packages, spanning a wide range of research activities from risk assessment of leakage and monitoring strategies to social/ethical issues associated with CCS and shale gas extraction.

Table 1: SECURE advisory board delegates and associated industry representation

| Advisory board delegates | Industries represented |
|--|--|
| Ken Cronin/ Charles Macalister | UK Onshore Operators Group |
| Marcella Dean | Shell Global Solutions International B.V. |
| Don Lawton | Carbon Management Canada Inc |
| Tony Lemay | AER; Alberta Geological Survey |
| Noramalina Mansor/ Jose Bermudez Menendez | UK Government- Department of Business, Energy and Industrial Strategy (BEIS) |
| Kevin Parks | AER; Deep Time |



| | |
|--|--|
| Gerhard van der Linde David Love | Golder Associates |
| Katherine Romanak | Bureau of economic geology, Texas |
| Luke Warren | Carbon Capture and Storage Association (CCSA) |
| Steve Thompsett | (UK Onshore Oil and Gas): Onshore O&G Industry Perspective |
| Alwyn Hart | Environment Agency (UK) |
| Patricia Fosselard/ Ermis Panagiotopoulos | European Federation of Bottled Waters |
| Andrzej Maksym/ Krzysztof Lyczko | Polskie Górnictwo Naftowe i Gazownictwo (PGNIG) |

3 Remarks

Despite the sizable limitations that the CV19 pandemic had on SECURE partners capacities to engage with and educate subsurface energy stakeholders, the SECURE project has managed to deliver numerous educational related activities which has helped to target a variety of possible stakeholders from developers, operators, regulators, local councillors, academics, interested citizens etc. The diverse use of communication and engagement formats has helped to ensure that the majority of audiences information preferences have been represented. The delivery of research findings from the SECURE project is an important requisite for effective outreach and helps to ensure that best practice messages continue to be communicated and shared among all stakeholders concerned with subsurface energy development and implementation.



4 References

FIGURE 1: VIDEO 1 - GEOENERGY JOURNEY: LEARNING FROM THE US AND CANADA
([HTTPS://WWW.YOUTUBE.COM/WATCH?V=DXFz5RNjXR4](https://www.youtube.com/watch?v=DXFz5RNjXR4))

FIGURE 2: VIDEO 2 – SECURE FACT-FINDING VISIT 2019: NEW PERSPECTIVES FROM NORTH AMERICA
([HTTPS://WWW.YOUTUBE.COM/WATCH?V=AHWsiY5c7qY](https://www.youtube.com/watch?v=AHWsiY5c7qY))

FIGURE 3: VIDEO 3 - SECURE: USA & CANADA - REACTIONS FROM TRIP
([HTTPS://WWW.YOUTUBE.COM/WATCH?V=VNzD03WP-M0](https://www.youtube.com/watch?v=VNzD03WP-M0))

FIGURE 4: VIDEO 4 - **REACTIONS FROM AUSTRALIA VIRTUAL VISIT**
([HTTPS://WWW.YOUTUBE.COM/WATCH?V=7XxAMEYOW_4](https://www.youtube.com/watch?v=7XxAMEYOW_4))

FIGURE 5: BLOG: BANFF NATIONAL PARK'S REMARKABLE GEOLOGY PROVIDES VALUABLE CCS INSIGHTS | SECURE | SUBSURFACE EVALUATION OF CCS AND UNCONVENTIONAL RISKS (SECUREGEOENERGY.EU)

FIGURE 6 BLOG: A SOCIOLOGIST ON A GEOLOGISTS' MISSION | SECURE | SUBSURFACE EVALUATION OF CCS AND UNCONVENTIONAL RISKS (SECUREGEOENERGY.EU)