



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

MINUTES OF SECURE LAUNCH MEETING

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Disclaimer

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Dissemination Level

PU	<i>Public</i>
CO	<i>Confidential, only for members of the consortium (incl. the Commission Services)</i>
CL	<i>Classified, as referred to in Commission decision 2001/844/EG</i>

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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 geoeconomy 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 geoeconomy 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

This deliverable comprises the minutes of the SECURE kick-off meeting and General Assembly. The meeting was held at BGS Headquarters in Keyworth, Nottingham, UK. The 16 consortium beneficiaries were represented by participants (35 in person, 4 via remote connection) from 6 member states of the EU. The project officer represented the European Commission and was able to dial into the meeting for part of the first morning only. The Advisory Board was represented by 8 participants. The H2020 funded S4CE project was represented by Adrian Jones as an observer to the meeting on day 1 only.

The meeting comprised an initial administrative section including approval of documents and confirmation of the Management and Advisory boards by vote. This was followed by an introduction to SECURE and comments from the Project Officer. Five summary presentations that explained why SECURE was relevant to their respective organisations were given by the Advisory Board. A presentation was also given by project partner SCCS (University of Edinburgh), that emphasised the role of messaging and communications within SECURE. Work packages were introduced by WP leads, followed by individual WP meetings facilitated by respective WP leads, while in tandem, the Advisory Board met. These WP breakout meetings allowed participants to meet each other and roles, deliverables and milestones within the SECURE project to be affirmed. Day 1 closed with a networking evening dinner.

Project logistics were summarised by the Co-ordinator at the start of day 2, followed by a further session of WP breakout meetings. After a closed session of the Advisory Board, members then joined individual WP meetings of interest. Short verbal reports were received from WP leads, followed by feedback from the Advisory Board. Following a review of the meeting and summary of main actions, the meeting closed with a networking lunch.



Contents

Public introduction	ii
Executive report summary	ii
Contents	iii
1 Introduction	1
2 H2020 SECURE project General Assembly Kick-off meeting	3
2.1 Agenda	3
2.2 Attendees.....	4
2.3 Minutes of the Kick-off meeting	6
Appendix 1 Papers circulated prior to the meeting	11
Appendix 2 Signature list, Thursday 14 and Friday 15 June 2018	Error! Bookmark not defined.
Appendix 3 Group photograph	29



1 Introduction

The SECURE project was developed in response to the European Commission-INEA Horizon 2020 2016-7 ‘Secure Clean and Efficient Energy’ work programme, LCE-27-2017 ‘Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons’.

The potential environmental impacts of shale gas and CCS technologies need to be better understood. The recent expansion of the unconventional gas industry in North America and its potential advent in Europe has generated public concern regarding the potential detrimental impacts on air, water and the land. Mitigation of the steep rise of greenhouse gas emissions and the related climate changes will need to include CO₂ storage in deep geological reservoirs. Both activities utilise deep-lying geological formations and may induce similar impacts via similar pathways, including induced seismicity, detrimental fluid migration and displacement of brines.

A key objective of SECURE is to integrate the broad expertise that the consortium maintains in the fields of both CO₂ storage *and* shale gas monitoring across the key spatial and temporal domains relevant to geoenery project development (Figure 1). The membership of the SECURE partnership is a major asset as it includes several National Geological Surveys and major research organisations from EU member states that host shale gas and CCS projects at different stages of operation (from permitted to closed), as well as companies actively involved in the deployment of CCS and exploitation of unconventional gas.

The SECURE project has the following specific objectives:

1. To produce a risk assessment framework for assessing the hazards and likelihoods of specific risks that relate to the protection of the environment in CO₂ storage and shale gas operations.
2. To demonstrate best practice in establishing baseline conditions for subsurface geoenery operations by working across a network of both commercial, pilot and research-scale sites in Europe and internationally, underpinned by laboratory measurements and model up-scaling to the field scale.
3. To develop new technologies to improve the detection and monitoring of environmental impacts related to geoenery projects.
4. To investigate new methods for remediating potential environmental impacts of geoenery projects specifically to reduce leakage from wells or naturally occurring permeable pathways.
5. To develop best practice guidelines for the shale gas and CO₂ storage industries specifically in environmental baseline assessment and monitoring; the intention is that these will not unduly delay the development of new technologies or innovations.
6. To understand the needs of a range of stakeholders, including local communities, and to engage them through the development of appropriate communication strategies, including participatory monitoring and through the education of early-career researchers.
7. To leverage best practice through collaboration with leading groups in the USA, Canada and Australia.

SECURE will achieve this by:

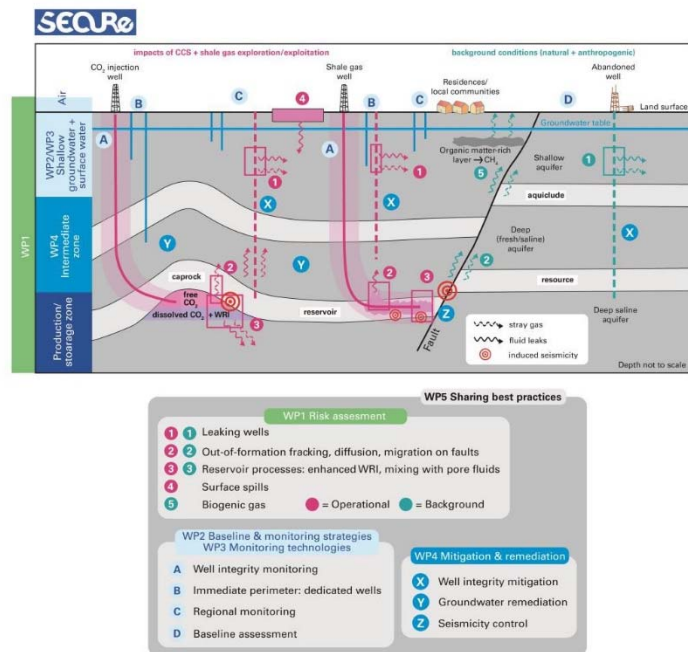


Figure 1 The SECURE Concept – providing best practice recommendations across these domains for the protection of groundwaters, surface environments and local communities. Courtesy W.Kloppmann



1. Developing frameworks for quantifying and managing risks including impact assessment (monitoring and characterisation) for developing and implementing effective remedial strategies and to contribute to the evidence base underpinning policy making;
2. Investigating leakage processes and impacts at the laboratory and field-scale using a portfolio of existing European and North American facilities and field sites to better characterise and quantify relevant risk factors;
3. Developing, applying and testing a range of monitoring technologies, systems and strategies to contribute to effective (best practice) risk evaluation, establishment of baseline conditions and monitoring and management of impacts;
4. Explore opportunities of participative monitoring as an aspect of public engagement.
5. Provide a series of recommendations for best practice that can be used as a dataset to inform effective regulation and monitoring strategies for shale gas and CCS sites.

The SECURE project is funded June 1 2018 – May 31 2021, and this report is the minutes of the kick-off meeting, held BGS Headquarters, Keyworth, Nottingham, 14-15 June 2018.



2 H2020 SECURE project General Assembly Kick-off meeting

2.1 AGENDA

Subsurface Evaluation of Carbon capture and storage and Unconventional Risk, grant agreement reference: ENER/H2020/764531/SECURE

Held at British Geological Survey, Keyworth, Nottingham, 14-15 June 2018.

Item	Day	Time	Lead	
	COACH departs Jury's Inn to BGS	Thursday 14 June	08.45	
	COFFEE and registrations	Thursday 14 June	09.00	
1	Welcome and housekeeping; Approval of meeting invitation, agenda, list of delegates and advisory board; structure of meeting	Thursday 14 June	09.30	EH
2	Election of Management and Advisory boards	Thursday 14 June	09.45	EH
3	The SECURE project	Thursday 14 June	10.00	DIS-JMPE
	COFFEE **(fire alarm test)**	Thursday 14 June	10.30	
4	Comments from Susanna Galloni, EU Project Officer	Thursday 14 June	10.45	SG
5	Advisory Board talks (x5); comment from S4CE	Thursday 14 June	11.15	KP; ST; AH; GVDL, GDLT; JBM
	NETWORKING LUNCH (provided)	Thursday 14 June	12.30	
6	Communication and consensus	Thursday 14 June	13.00	PP
7	Introduction to work packages- 10 minutes from each WP lead	Thursday 14 June	13.20	WP leads
8	WP breakout sessions; Advisory Board parallel session	Thursday 14 June;	14.10- 15.00	ALL
	PHOTOGRAPH followed by COFFEE	Thursday 14 June	15.00	



9	WP breakout sessions including interested Advisory Board members	Thursday 14 June	15.30 – 16.45	ALL
	COACH departs BGS to Jury's Inn	Thursday 14 June	17.00	
	NETWORKING MEAL, Nottingham Brewhouse	Thursday 14 June	19.30	
	COACH departs Jury's Inn to BGS	Friday 15 June	09.00	
	COFFEE	Friday 15 June	09.15	
10	Housekeeping and review of day 1	Friday 15 June	09.30	EH
11	SECURE – project logistics	Friday 15 June	09.45	EH
	COFFEE	Friday 15 June	10.15	
12	WP breakout sessions Advisory Board closed session	Friday 15 June	10.30	ALL
13	Reports from WP breakout sessions- 10 minutes from each WP lead	Friday 15 June	11.30	ALL
14	Report from Advisory Board	Friday 15 June	12.20	AD BOARD
15	AOB, Actions and concluding remarks	Friday 15 June	12.35	EH
	NETWORKING LUNCH (provided)	Friday 15 June	12.45	
	COACH departs BGS to Jury's Inn	Friday 15 June	13.30	

2.2 ATTENDEES

A scan of the attendance sign-in list is given in Appendix 2. A group photograph taken on the afternoon of Thursday 14 June is given in Appendix 3.

Chair:	David Schofield (DIS), BGS Director, Energy Systems (remote, 14 June only)		
Co-ordination			
Ed Hough (EH)	BGS; acting chair	Karen Kirk	BGS
Jan Hennissen	BGS	Sally Stone	BGS
Observers			
Susanna Galloni (SG)	EU project officer (remote, 14 June only)		



Adrian Jones	S4CE project co-director		
WP leads			
Jens Wollenweber	TNO		
Wolfram Kloppmann	BRGM (remote)		
Matteo Icardi	UNOTT		
Pierre Cerasi	SINTEF		
Jonathan Pearce (JMPE)	BGS		
Beneficiaries			
Rasmus Jakobsen	GEUS	Trine Dahl-Jenses	GEUS
Tina Brundgaard Bech	GEUS	Piotr Letkowski	INIG
Mirek Wojnicki	INIG	Olga Lipinska	PGI
Adam Wojcicki	PGI	Stephanie Zihms	Heriot Watt
Katarzyna Iwinska	Adam Mickiewica	Krzysztof Maczka	Adam Mickiewica
Bruno Garcia	IFPEN	Martin Frederic	IFPEN
Philippa Parmiter (PP)	SCCS/UEDIN	Indira Mann	SCCS/UEDIN (remote)
Vanessa Mather	SCCS/UEDIN (remote)	Mike Duijn	ERASMUS
Andy Lidstone	Risktec	Matt Beeson	Risktec
Conny Schmidt- Hattenberger	GFZ	Laurant Cazes	TOTAL
Anthony Credoz	TOTAL	Barend van Engelburg	TNO
Jan Ter Heege	TNO	Thomas le Guenan	BRGM
Michaela Blessing	BRGM	Frederik Gal	BRGM
Bagus Muljadi	UNOTT	Veerle Vandeginste	UNOTT
Bastien Dupuy	SINTEF	Amir Ghaderi	SINTEF
Ceri Vincent	BGS	Rhian Kendall	BGS
Pauline Smedley	BGS	Jim White	BGS
Mary Mowat	BGS	Colm Jordan	BGS
Chris Rochelle	BGS	Helen Taylor	BGS
Robert Ward	BGS		
Advisory Board			
Kevin Parks (KP)	Alberta Energy Regulator	Katherine Romanak	Bureau of economic geology, Texas (remote, 14 June only)
Alwyn Hart (AH)	Environment Agency	Gerhard van der Linde (GVDL)	Golder Associates
Gareth Digges La Touche (GDLT)	Golder Associates	Steve Thompsett (ST)	UK Onshore Oil and Gas
Jose Bermudez Menendez (JBM)	UK Department for Business, Energy and	Marcella Dean	Shell



	Industrial Strategy (remote on 15 June)		
<u>Apologies</u>			
Simon Shackley	UEDIN	Sonia Noirez	IFPEN
Andrzej Maksym	PGNIG	Krzysztof Lyczko	PGNIG
Carsten Nielsen	GEUS		

2.3 MINUTES OF THE KICK-OFF MEETING

Thursday June 14, meeting started at 09.30.

Item 1

Following a welcome by Ed Hough, the papers sent prior to the meeting (invitation, agenda, list of delegates and advisory board) were approved.

Item 2

The membership of the Management Board were confirmed by unanimous vote.

The SECURE Management Board comprises Technical WP leads of:

WP2 Jens Wollenweber	TNO
WP3 Wolfram Kloppmann	BRGM
WP4 Donald Brown	UNOTT (Matteo Icardi from September 2018)
WP5 Pierre Cerasi	SINTEF
WP6 Jonathan Pearce	BGS
And management WP lead and Co-ordinator	
WP1/7 Ed Hough	BGS

The membership of the Advisory Board were confirmed by unanimous vote.

The SECURE Advisory Board comprises:

Kevin Parks	Alberta Energy Regulator
Katherine Romanak	Bureau of Economic Geology, Texas
Don Lawton	CMC (Carbon Management Canada Inc)
Alwyn Hart	Environment Agency (UK)
Patricia Fosselard	European Federation of Bottled Waters
Gerhard van der Linde	Golder Associates
Steve Thompsett	UKOOG (UK Onshore Oil and Gas)
Jose Bermudez Menendez	Department of Business, Energy and Industrial Strategy (UK)
Marcella Dean	Shell Global Solutions International BV
Krzysztof Lyczko, Andrzej Maksym	PGNiG
Luke Warren	CCSA (Carbon Capture and Storage Association, UK)



Item 3

David Schofield (DIS), BGS Director, Energy Systems & Basin Analysis, explained the importance of the SECURE project to BGS and how it fits with several elements of the BGS strategy. As he was presenting remotely, he apologised that he would be unable to chair the meeting, which was passed to Ed Hough.

Jonathan Pearce gave an introduction to the SECURE project, giving an overview of some of the main elements of the original call text, and outlining some of the broad objectives of the project.

Pierre Cerasi asked if Student Exchanges could be part of the project. **JMPE** said they were.

Item 4

Susanna Galloni (SG) gave a presentation reviewing operational aspects of the SECURE project with regard to operating in conjunction with the European Union.

Importantly, the Annotated Model Grant Agreement is the key document that describes what is proposed for the SECURE project. The requirement for high-quality deliverables on time was emphasised. There is a need for partners to maintain timesheets detailing who has worked on the project and for how long. Care must be taken to let subcontracts according to EU and host institution rules.

Anthony Credoz asked about the EU position regarding Shale gas and CCS. It was suggested that this is followed up with WP leads.

Item 5

The following talks were given by the Advisory Board:

Kevin Parks (Alberta Energy Regulator): Intro to AER.

Jose Bermudez Menendez (UK Department of Business, Energy and Industrial Strategy): Science and Innovation for Climate and Energy Directorate (SICE).

Steve Thompsett (UK Onshore Oil and Gas): Onshore O&G Industry Perspective.

Alwyn Hart (UK Environment Agency): Onshore Oil and Gas: problems and perceptions, evidence and solutions.

Gerhard van der Linde/Gareth Digges la Touche (Golder Associates): The importance of the SECURE project to Golder.

Due to time constraints, the S4CE presentation was moved to later in the afternoon.

A networking lunch was held.

Item 6

Philippa Parmiter, Indira Mann and Vanessa Mather (all SCCS-UEDIN) presented on the importance of effective communications within the SECURE project. PP highlighted that input from all partners will be required to feed the communications strategy, and public engagement will be an important part of the project.

Indira Mann summarised some of the communications tools that may be used during the SECURE project, including website, news and blog feeds, targeted events, media and social media engagement; and that H2020 guidelines must be adhered to.

Vanessa Mather said that there will be an aim for a consistent brand throughout the project and communication channels. It will be important to consider copyright of images.



Item 7

The following overviews were given of the technical work packages:

WP2	Jens Wollenweber	TNO
WP3	Michaela Blessing	BRGM
WP4	Matteo Icardi	UNOTT
WP5	Pierre Cerasi	SINTEF
WP6	Jonathan Pearce	BGS

(Item 8)

Due to time over-runs, Item 8 was deleted and replaced by WP descriptions and a presentation by Adrian Jones regarding the S4CE project.

Adrian Jones said there were many areas where the S4CE and SECURE projects could benefit from close understanding of activities between projects. Adrian mentioned the Carb-fix (International Carbon Conference) meeting in Iceland (September 2018). He will send an invite to the SECURE project.

Item 9

WP breakout sessions were held.

The Advisory Board discussed the SECURE project with Ed Hough and Rhian Kendall (SECURE innovation manager).

The proceedings for 14 June closed at 16.45.

A networking meal was held at Nottingham Brewhouse in the evening, attended by 42 SECURE participants.

Friday June 14, meeting started at 09.30.

Item 10

An overview of Thursday 14 June was given by Jonathan Pearce.

Item 11

Ed Hough gave a presentation outlining some important logistical and operational aspects of the project. This also included a review of Work Package 1 Ethics, within which the first deliverable is due in Month 1.

Thomas le Guenan asked if there would be a publications board. EH said that publications would first be reviewed by WP colleagues, then the WP lead before submission to Co-ordinator to ensure consistency and quality.

Laurant Cazes asked about the philosophy of project development, and if 'Unconventional' needs splitting from 'CCS' outputs. JMPE said that this is a question for WP6 to lead on, to develop an appropriate narrative.

Pierre Cerasi said we should cater for both instances, but some activities by their nature will be specific to either Unconventional Hydrocarbons or CCS.

Marcella Dean recommended tailoring message to specific audiences, with appropriate guidance from communications professionals.

Item 12

Work package breakout sessions continued, attended by the Advisory Board for 30 minutes.



Work package breakout meetings concluded; The Advisory Board held a closed session.

Item 13

Reports from the WP breakout sessions were given by:

WP2 Jens Wollenweber TNO

Highlighted the need to understand dependencies between equipment purchases and outputs. WP2 suggested an inventory of sites and data available to the project, and enquired as to effective communications within WP's (filesharing). Also there is a strong potential link between SECURE and Project DETECT.

WP3 Wolfram Kloppmann BRGM

WP3 suggested there was a strong synergy between monitoring strategies associated with CCS and Shale. Asked whether deliverable titles are set [EH responded that they are]. Suggested WP3 should be structured around available and suitable sites. Strong links with WP4, some common activities are envisaged. Noted that PGI have suggested a methane monitoring workshop with WP4, potentially for Spring 2019 (enquired about support from SCCS).

WP4 Matteo Icardi UNOTT

WP4 will arrange further meetings to confirm involvement in various tasks.

WP5 Pierre Cerasi SINTEF

WP5 reported that many deliverables were broad and internal clarification would be required. Several minor changes could be made to improve the outputs without changing the deliverables. Pierre suggested that SECURE could use a standard rock and cement library of samples. There were several subtasks where close co-operation between other WP subtasks would be advantageous.

WP6 Jonathan Pearce BGS

WP6 reported that there were some early/immediate actions required. These include an understanding of stakeholders, scope of the project and commonalities identified. Workshops are planned in 4 different countries. For online resources, input will be required from WPs 2-5. Data management will be important, likely facilitated by a data portal. A data management webinar is one early possibility in the project. WP6 is intending monthly tele-meetings, with two face-to-face meetings a year, the first possibly proposed for September (TNO, The Hague?).

Item 14

A verbal report from the Advisory Board members present was received:

Kevin Parks Alberta Energy Regulator

Recommended cost implications of monitoring is taken into account, and that recommendations are appropriate; consider also economies of scale.

Alwyn Hart Environment Agency (UK)

Highlighted the importance of ethics and trust associated with effective regulation. We need to be clear about the risks to be addressed in the project and the mitigation strategies- these will be useful to build trust between stakeholders. Is there a requirement for alternative views in the project (e.g., NGO organisations).

Jose Bermudez Menendez Department of Business, Energy and Industrial Strategy (UK)

(delivered by Marcella Dean), Suggested that communications and messaging will be vital to this project, to deliver neutral, balanced, unbiased outputs that do not favour any organisations that may benefit.

Gerhard van der Linde Golder Associates

The legacy of the project will be very important- is there a destination for the 'best practice' recommendations?



Steve Thompsett UKOOG (UK Onshore Oil and Gas)

Said the project needs to manage pre-conceived ideas (e.g., risk vs. perceived risk), for which the outputs of WP6 will be important.

Marcella Dean Shell Global Solutions International BV

Questioned how the project will come together in the end. Suggested consideration of a monitoring atlas linked to risks they address and their potential uses. You-tube or similar may help deliver messages with video insights from the main project partners.

Item 15

Ed Hough invited AoB:

AoB1: Stephanie Zihms said that some communications training would be beneficial when generating social media outputs (e.g., blog output).

AoB2: Ceri Vincent said that there should be strong links to the ENOS communications strategy.

AoB3: Barend van Engleburg said participatory monitoring was strongly represented in ENOS, with obvious links to be made.

AoB4: Anthony Credoz highlighted that stakeholder views should be taken account of when developing recommendations of best practice and that these should be pragmatic given the likely scale of CO₂ storage that will be needed to meet the IEA 2 degree scenario (2DS) or better.

Ed Hough reviewed the meeting and noted the following actions:

ACTION 1: BGS to send project document and PPT templates, and advise on website progress.

ACTION 2: BGS to circulate the latest version of the project proposal (including new WP numbering).

ACTION 3: ALL please respond to Ethics questions

ACTION 4: ALL please input to project plan via WP leads, highlight dependencies between WP's and equipment purchases for example.

DATE OF NEXT MEETING: EH proposed the next Annual General Assembly will be week of 10 June 2019, location to be confirmed.

The meeting closed at 12.45, Friday 15 June 2018. A networking lunch followed.

Appendix 1 Papers circulated prior to the meeting



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL



Keyworth
Environmental Science Centre
Keyworth
Nottingham
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NG12 5GG

To delegates to the SECURE General Assembly- Kick-off meeting

Call for SECURE General Assembly kick-off meeting at British Geological Survey, Keyworth, Nottingham, 14-15 June 2018.

Venue: Conference suite,
British Geological Survey,
Nicker Hill,
Keyworth,
Nottingham NG12 5GG, UK

Time: 14 June, 08.45 coach departs Jury's Inn Hotel, Station Street, Nottingham city centre, NG2 3BJ
coffee 09.00, start 9.30 - 16.45
17.00 coach departs BGS to Jury's Inn Hotel, Nottingham city centre
Networking meal at Nottingham Brewhouse

15 June, 09.00 coach departs Jury's Inn Hotel, Station Street, Nottingham city centre, NG2 3BJ
Coffee 09.15, start 09.30 – 13.30
13.30 coach departs BGS to Jury's Inn Hotel, Nottingham city centre

Attached: agenda and documents for the meeting

If you are unable to attend, please inform Ed Hough, eh@bgs.ac.uk, or telephone +44 115 9363016

Yours sincerely

David Schofield
Director, Energy Systems & Basin Analysis

Ed Hough
Co-ordinator, SECURE




INVESTOR IN PEOPLE



SECURE- work packages

Please note, work packages have been re-numbered and differ from those in the original submission, to accommodate a new Ethics work package, WP1.

Number	Title	Lead Beneficiary	Start Month	End Month	Deliverables No.	Status
1	 Ethics requirements	NERC	1	36	1, 2, 3 ...	Active
2	Risk assessment for leakage and induced seismicity: methodology and case studies	TNO	1	32	4, 5, 6 ...	Active
3	Environmental baseline and monitoring strategies	BRGM	1	36	10, 11 ...	Active
4	Advanced monitoring and sensor technologies	UNOTT	1	32	19, 20 ...	Active
5	Impact Mitigation and Remediation	SINTEF AS	1	32	27, 28 ...	Active
6	Development and Exchange of Best Practice to ensure SECURE impact	NERC	1	36	35, 36 ...	Active
7	Management and co-ordination	NERC	1	36	45, 46 ...	Active

SECURE- milestones

Number	Title	Lead Beneficiary	Due Date (in months)	Description	Work Package No.	Status
M1	Metrics for Ethical and Responsible Research and Innovation	NERC	6	Agreed metrics for Ethical and Responsible Research and Innovation. Ethical assessment completed and reviewed by independent panel. Minutes of GA, confirming both Ethical and RRI protocols.	6	Active
M2	Collaboration with Third parties initiated	NERC	12	Collaboration with Third parties initiated - Agreements completed with Third Parties Data portal operational	3, 6	Active
M3	Defined strategies for participatory monitoring	TNO	12	Defined strategies for participatory monitoring - Record of workshops on participatory monitoring	6	Active
M4	Criteria for baseline monitoring defined	BRGM	18	Criteria for baseline monitoring defined - Field-based monitoring demonstrations for SECURE sites in UK, Canada reviewed by Advisory Board	3	Active
M5	Best available well-remediation technologies defined	SINTEF AS	18	Best available well-remediation technologies defined. Review approved by General Assembly	5	Active
M6	Stage gate for SECURE continuation	NERC	18	Stage gate for SECURE continuation - EC Evaluators report for mid-term review.	7	Active
M7	Risk assessment framework agreed	TNO	24	Risk assessment framework agreed. Minutes from two workshops.	2	Active
M8	Ethics & Integrity Assessment of the SECURE R&D with recommendations	UEDIN	24	Ethics & Integrity Assessment of the SECURE R&D with recommendations. Written conclusions from independent review from Ethics Committee at University of Edinburgh.	1, 6	Active
M9	Advanced tool development plans	NERC	27	Advanced tool development plans. Exploitation plans completed for new tools developed and demonstrated Minutes of workshops with stakeholders.	4, 7	Active
M10	Launch of International Platform of environmental monitoring for geenergy projects	NERC	34	Launch of International Platform of environmental monitoring for geenergy projects. Conference report completed Data-sharing platform launched internationally.	6	Active
M11	Review of scientific outputs Review of scientific outputs	NERC	34	Review of scientific outputs Review of scientific outputs. SECURE management board summary	7	Active

SECURE deliverables

Please note, deliverables have been re-numbered and differ from those in the original submission, to accommodate deliverables associated with a new Ethics work package, WP1.

Number	Relative Number in WP	Title	Lead Beneficiary			Due Date (month)	
D1	D1.1	POPD - Requirement No. 1	NERC	ETHICS	CO	3	Active
D2	D1.2	NEC - Requirement No. 2	NERC	ETHICS	CO	3	Active
D3	D1.3	EPQ - Requirement No. 3	NERC	ETHICS	CO	1	Active
D4	D2.1	Report on state of the art microseismicity techniques	BRGM	R	PU	10	Active
D5	D2.2	Report on effects of long-term sequestration	INIG	R	PU	24	Active
D6	D2.3	Report on induced seismicity models	BRGM	R	PU	24	Active
D7	D2.4	Report on geochemical models	GEUS	R	PU	26	Active
D8	D2.5	Report on risk factors in fluid and CO2 migration.	TNO	R	PU	28	Active
D9	D2.6	Guidelines for Risk assessment for leakage and induced seismicity risks	TNO	R	PU	32	Active
D10	D3.1	Report on methods on baseline methods	GEUS	R	PU	14	Active
D11	D3.2	Report Focusing on best practice methods to establish baseline levels post operational activity	GEUS	R	PU	15	Active
D12	D3.3	Report on synergies of environmental baseline strategies for CCS and shale gas plays	NERC	R	PU	24	Active
D13	D3.4	Report on downhole monitoring as part of environmental baseline assessment for carbon storage and shale gas development	BRGM	R	PU	30	Active
D14	D3.5	Report on state of the art and new developments for defining the seismic baseline for gas storage and exploitation	BRGM	R	PU	30	Active
D15	D3.6	Report on integrated multi-tracer fingerprinting of gas and fluid migration upon CCS and hydraulic fracturing	NERC	R	PU	30	Active

D16	D3.7	Guidelines for common strategies in gas storage and exploitation baseline assessment and monitoring	GFZ	R	PU	32	Active
D17	D3.8	Report on long-term post-operational monitoring of Ketzin (CCS) and Polish (shale gas) sites	PIG-PIB	R	PU	34	Active
D18	D3.9	Integrated data platform for multisource multiscale sensor data	UNOTT	OTHER	PU	36	Active
D19	D4.1	Report on applicability of UAV technology for monitoring design of large sites and the impact of remote sensing on monitoring design. The effectiveness of hyperspectral monitoring in CCS/Shale gas.	NERC	R	PU	24	Active
D20	D4.2	Best practice report on methods for monitoring of induced and triggered seismicity	GEUS	R	PU	24	Active
D21	D4.3	Report on the potential for exploiting methane oxidiser genes for monitoring stray CH4 intruding into aquifers and assessment of the area that can be monitored	GEUS	R	PU	27	Active
D22	D4.4	Report on modelling and simulation	UNOTT	R	PU	28	Active
D23	D4.5	Report on integrated local-global geomechanics	SINTEF AS	R	PU	31	Active
D24	D4.6	Report on the effectiveness of gas and microbial sensors	TNO	R	PU	31	Active
D25	D4.7	Guidelines for next generation measurement and monitoring of Shale Gas/CCS	GEUS	R	PU	31	Active
D26	D4.8	Report on noble gases sampling and analyses	IFPEN	R	PU	31	Active
D27	D5.1	Report on remediation strategies for tubings and cement sheaths	SINTEF AS	R	PU	14	Active
D28	D5.2	Report on the experiment-based knowledge on acoustic emission characteristics of CCS and shale gas operations and suggestions on how to mitigate seismicity for both operations	SINTEF AS	R	PU	16	Active
D29	D5.3	Report on remediation strategies for tubing and casings	GEUS	R	PU	16	Active
D30	D5.4	Guideline with ranking of various squeeze sealant materials with respect to ease of placement.	SINTEF AS	R	PU	24	Active

D31	D5.5	Report on the small scale processes occurring during engineered precipitation and models to assist in the upscaling.	SINTEF AS	R	PU	28	Active
D32	D5.6	Report on application of the optimisation workflow to a field case with available seismicity data	TNO	R	PU	30	Active
D33	D5.7	Recommendations on how to minimize damage to cement sheath and surrounding rock during hydraulic fracturing and CO2 injection.	SINTEF AS	R	PU	30	Active
D34	D5.8	Report on kinetics of enhanced cementation reactions for CO2 leakage remediation and fault healing processes	UNOTT	R	PU	30	Active
D35	D6.1	Overview report of ethical issues associated with CCS and with Shale Gas R&D	UEDIN	R	PU	6	Active
D36	D6.2	Workshop on co-designing tailor made strategies for participatory monitoring including training on working with local stakeholders.	TNO	OTHER	PU	12	Active
D37	D6.3	Best practice recommendations for implementing responsible research and innovation for CCS and shale gas R&D	UEDIN	R	PU	24	Active
D38	D6.4	Online e-resources, for online training and school children in STEM, on environmental monitoring for shale gas and CO2 storage.	UNOTT	OTHER	PU	24	Active
D39	D6.5	Training software and dataset	GEUS	OTHER	PU	24	Active
D40	D6.6	Best practice recommendations on participatory monitoring of the impacts of CCS and shale gas development projects in four selected sites	TNO	R	PU	30	Active
D41	D6.7	Summary of recommendations for environmental monitoring for geoenergy operations in Europe.	TNO	R	PU	36	Active
D42	D6.8	Best practice recommendations for the environmental monitoring of CO2 storage operations in Europe.	NERC	R	PU	36	Active
D43	D6.9	Best practice recommendations for the environmental monitoring of shale gas operations in Europe.	NERC	R	PU	36	Active
D44	D6.10	Targeted educational talks with science journalists and non-expert stake holders at all levels including the general public.	UNOTT	OTHER	PU	36	Active

D45	D7.1	Minutes of the SECURe launch meeting for the Management Board, General Assembly and Advisory Board; data management plan	NERC	R	PU	2	Active
D46	D7.2	Minutes of Management Board, General Assembly and Advisory Board meetings from the 1st annual meeting	NERC	R	PU	12	Active
D47	D7.3	First period reports to the EC	NERC	R	PU	19	Active
D48	D7.4	Minutes of Management Board, General Assembly and Advisory Board meetings from the 2nd annual meeting	NERC	R	PU	24	Active
D49	D7.5	Minutes of Management Board, General Assembly and Advisory Board meetings from the final annual meeting	NERC	R	PU	34	Active
D50	D7.6	Final period reports to the EC	NERC	R	PU	36	Active
D51	D7.7	Project Management Plan	NERC	R	PU	3	Active
D52	D7.8	Data Management Plan	NERC	ORDP	PU	2	Active

Item 1

Welcome and housekeeping:

- **Schedule**
- **Facilities**
- **Lunch and refreshments**
- **Fire alarms- one scheduled today (10,30)**
- **Networking meal**
- **Taxis and transport**

Approval of meeting invitation, agenda, list of delegates, Advisory Board and observers

Proposed conclusion:

The General Assembly approves the invitation, agenda, list of delegates and Advisory Board for SECURe.

Item 2

Election of Management Board

The first General Assembly is a kick-off meeting to present and approve to proceed with plans for setting up the structure of SECURE according to formal requirements.

We will appoint the **Management Board**, with the following proposed membership:

Technical WP leads:

Work package 2	Jens Wollenweber	TNO
Work package 3	Wolfram Kloppman	BRGM
Work package 4	Donald Brown*	UNOTT
Work package 5	Pierre Cerasi	SINTEF
Work package 6	Jonathan Pearce	BGS

*Matteo Icardi from September 2018

SECURE Co-Ordinator: Ed Hough BGS (Chair)

Proposed conclusion:

The General Assembly approves the appointment of the Management Board for SECURE.

The Management Board will meet monthly via remote connection. Minutes of Management board meetings, once accepted, shall be sent by the Coordinator to the General Assembly Members for information. The Management board shall collect information at least every 6 months on the progress of the Project, examine that information to assess the compliance of the Project with the Consortium Plan and, if necessary, propose modifications of the Consortium Plan to the General Assembly. The Management Board will support the Coordinator in preparing meetings with the Funding Authority and in preparing related data and deliverables. The Management Board will prepare the content and timing of press releases and joint publications by the consortium or proposed by the Funding Authority in respect of the procedures of the Grant Agreement Article 29.

Election of Advisory Board

In addition to delegates, we will appoint an **External Expert Advisory Board**, with the following proposed membership:

Kevin Parkes	Alberta Energy Regulator
Katherine Romanak	Bureau of economic geology, Texas
Don Lawton	CMC
Alwyn Hart	Environment Agency
Patricia Fosselard	European Federation of Bottled Waters
Gerhard van der Linde	Golder Associates
Steve Thompsett	UKOOG
Jose Bermudez Menendez	UK DBEIS
Marcella Dean	Shell
Krzystof Lyczko, Andrzej Maksym	PGNIG
Luke Warren	CCSA

Proposed conclusion:

The General Assembly approves the appointment of the External Expert Advisory Board for SECURE.

Item 3

The SECURE project

Relevance of SECURE to BGS science objectives- David Schofield, Director, Energy Systems & Basin Analysis

Introduction to the SECURE project- Jonathan Pearce, WP6 lead

Item 4

Comments from Susanna Galloni, EU Project Officer

Item 5

Presentations from Advisory Board: relevance of SECURE to the aims and objectives of host organisations

Comment from S4CE project

Item 6

Communications and consensus: SCCS (Scottish Carbon Storage & Storage)

Item 7

Introduction to individual technical work packages

Work Package 2

In **WP2** well integrity, fractures, fault permeability, induced seismicity and water quality impacts will be evaluated in geological settings typical for CO₂ injection and unconventional gas exploitation. In this context, numerical models that predict leakage and induced seismicity threats will be produced. Ultimately, this will result in a set of guidelines that permit conducting transparent and verifiable risk assessments.

Work Package 3

WP3 will develop multi-scale strategies for environmental baseline assessment and operational to post operational monitoring. Synergies between approaches designed for CCS and unconventional gas operations will be explored. Emphasis will be on cost-effective monitoring of the whole lifecycle of both subsurface energy operations.

Work Package 4

WP4 enhance seal and fracture characterisation by developing state-of-the-art sensors to monitor flow leaks and geomechanical stresses. Within the scope of **WP4**, new technologies will be tested to improve sensor measurement thresholds for toxic quantities that fall below the detection limit of current state-of-the-art sensors.

Work Package 5

WP5 contributes to the development and implementation of effective remedial and mitigation strategies for subsurface geoenergy operations. The focus in **WP5** lies on near well and far-field leakage monitoring and seismicity prediction and mitigation.

Work Package 6

WP6 ties together the lessons learned in WPs 2–5 and will result in recommendations on best practice for maintaining and re-establishing baseline conditions on surface and in the subsurface. It will also provide models and best practice guidelines for participatory monitoring. **WP6** aims to contribute to the development of commercial CCS and the responsible exploitation of shale gas reserves in Europe and the dissemination of information on these geoenergy operations to non-technical audiences such as policymakers and European citizens.

Item 8,9

Work Package breakout sessions;

Advisory Board parallel session

Item 10

Housekeeping and review of day 1

- **Schedule**
- **Facilities**
- **Lunch and refreshments**
- **Fire alarms- none scheduled today**
- **Taxis and transport**

Item 11

SECURE project- logistics and operational aspects

Item 12

WP breakout sessions, including interested Advisory Board members

Item 13

Verbal reports from WP breakout sessions- 10 minutes per WP lead

Item 14

Verbal report from Advisory Board

Item 15

AOB, Actions and concluding remarks

Please advise of any points for inclusion as AOB prior to the meeting.

Minutes will be circulated for comment within 15 calendar days of this meeting.
After which, members have 15 days to send through comments/corrections.

Once accepted, minutes will be circulated as final and stored.

Annex 1- General Assembly (from draft Consortium Agreement)

The General Assembly 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 Management board shall also be considered and decided upon by the General Assembly.

The following decisions shall be taken by the General Assembly:

Content, finances and intellectual property rights

- Proposals for changes to the Consortium Agreement, to be further approved by each Party
- Proposals for changes to Annexes 1 and 2 of the Grant Agreement to be agreed by the Funding Authority
- Changes to the Consortium Plan including the Consortium Budget,
- Modifications to Attachment 1 (Background Included)
- Additions to Attachment 3 (List of Third Parties for simplified transfer according to Section 8.3.2)
- Additions to Attachment 4 (Identified Affiliated Entities)

Evolution of the consortium

- Entry of a new Party to the consortium and approval of the settlement on the conditions of the accession of such a new Party
- Withdrawal of a Party from the consortium and the approval of the settlement on the conditions of the withdrawal
- Identification of a breach by a Party of its obligations under this Consortium Agreement or the Grant Agreement
- Declaration of a Party to be a Defaulting Party
- Remedies to be performed by a Defaulting Party
- Termination of a Defaulting Party's participation in the consortium and measures relating thereto
- Proposal to the Funding Authority for a change of the Coordinator
- Proposal to the Funding Authority for suspension of all or part of the Project
- Proposal to the Funding Authority for termination of the Project and the Consortium Agreement

Annex 2. Location of networking meal. 19.30hr

Nottingham Brewhouse

Trent Bridge, Nottingham, NG2 2GS

Brewhouseandkitchen.com

Appendix 2

Signature list, Friday 15 June 2018

Appendix 3 Group photograph

