



Geological Analysis and Resource Assessment of selected Hydrocarbon systems

Deliverable

GARAH Dissemination and Exploitation Plan (DEP)

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1 DISSEMINATION AND EXPLOITATION PLAN

The GARAH Project Dissemination and Exploitation Plan (DEP) is in accordance with the general GeoERA DEP.

This plan specifies and elaborates the concrete measures for achieving the GARAH project expected impacts and fostering stakeholder engagement. (The expected impacts are listed in appendix 1, and the list of deliverables in appendix 2.)

- The GARAH project is represented at the three obligatory GeoERA dissemination seminars that the Projects need to actively join:
 - 1) Kick-off meeting, 3-5 July 2018
 - 2) Annual meetings.

- The GARAH project has several collaboration initiatives with other GeoERA projects.
 - Especially with 3DGEO-EU, where the two projects are cooperating on the generation of a 3D gridded pilot study area in the North Sea for 3D resource assessment.
 - With the HIKE project GARAH will be part in delivering fault planes for the Fault database, and GARAH will utilize the results from HIKE in the compilation of principal hazards associated with hydrocarbon production.
 - Close cooperation with GIP-P is essential for the presentation of the GARAH activities and results, and GIP-P need feedback to develop the information platform.
 - Special collaboration workshops will be organized with these other projects to discuss collaboration and exchange information and data (e.g. Workshop with 3DGEO-EU, 11-13 September 2018, GIP-P meeting in Brussels)

- The project will actively engage relevant stakeholders and end-users that are involved in the selected use cases for testing, demonstrating and implementing established methods and information systems. These stakeholders are
 - Norwegian Petroleum Directorate (NPD)
 - Danish Energy Agency (DEA)
 - Oil & Gas UK
 - DG ENER
 - DG ENV
 - DG JRC
 - International Energy Agency (IEA)
 - Petroleum industry



- The project will engage with other research institutes that are active in the field of HC research and which could be potential clients for the methods and data developed. The concrete institutes are:
 - GEOMAR, Helmholtz Centre for Ocean Research Kiel (Germany).
 - NOC, National Oceanographic Center (United Kingdom).
 - University of Southampton (United Kingdom).
 - OGS, Istituto Nazionale di Geofisica Sperimentale (Italy).
 - Ifremer, Institut Français de Recherche pour l'Exploitation de la Mer (France).
 - GSI, Geological Survey of Ireland.
 - NGU, Geological Survey of Norway.
 - USGS, United States Geological Survey
 - Approach the UK Oil and Gas Authority to gain their collaboration

1.1 Communication activities

As part of the Dissemination and Exploitation Plan, the GARAH project will undertake the following communication activities:

- The project will publish the results and efforts in two papers in peer reviewed journals.
- The project will present the results and achievements in at least three international forums and events, like EGU, EAGE, 36th IGC, GIMS and AAPG.
- The project has a dedicated GeoERA website in which the project goals, structure, deliverables and partners are presented to stakeholders.
- The project participates in joint events and workshops with other GeoEnergy/GroundWater/Raw Minerals projects to present the FDB and project achievements.
- The project is open to requests from the GeoERA Executive Board and the EGS secretariat to publish news on the project proceedings and deliverables in newsletters and at special occasions. As the project will accept interview requests etc.

Communication between relevant GeoERA projects will be set up as the need emerge.

- A joint confidential directory has been generated for data sharing between 3DGEO-EU and GARAH

1.2 Communication flow between partners

A shared workspace has been created on the GeoERA website to enable sharing of data, documents, and project information between all Partners. This shared workspace



will thus perform an important function in the overall communication flow among participants, and support work-package management (monitoring and reporting progress of activities). Furthermore, e-mail communication are instrumental. The dedicated mailing lists will be extended and updated at the start of and continuously during the project to enable efficient e mail communication. Skype meetings are set up for Board and WP meetings.

1.3 Contribution of Project Proposal to the Information Platform or vice versa

The GARAH project will extend the existing EGDI structure to enable incorporation, maintenance and dissemination of outcomes. An element of this project will be the identification of critical geological units that represent hydrocarbon reservoirs. Their distribution will be mapped along with principal geological faults that will define the spatial extent of these units in the target area. The project outcomes will be EGDI compliant, and this data structure will be used as a foundation for the new assessments, ensuring new data is both EDGI compliant and compatible with the all GeoERA dataset. These volumes will contribute to other proposed assessments, ensuring a common dataset to the different resource assessments. The results will provide improved access to integrated information of hydrocarbon resources. This will contribute to improving the dialogue between policy domains and stakeholders to support subsurface spatial planning and decision making. It will feed into pan European infrastructure projects e.g. OneGeologyEurope, EuroGeoSource and EMODNet. It will improve the ability of GSOs to effectively define future actions on with regard to improving key knowledge on geogeneity, mineral resources and/or geohazard through provision of a sustainable and expandable spatial information framework. It will support environmental assessment; risk analysis; spatial planning; evaluation and resolution of conflict of usage through implementation of standardised access (including INSPIRE compliant web services).



APPENDIX 1: THE GARAH PROJECT EXPECTED IMPACTS

A variety of different evaluation methods have been employed to assess the hydrocarbon resource in different areas of the EU. Consistent evaluation methods and data processing on newly released and legacy data will help rationalize the resource estimates across the EU, allowing for improved planning for the exploration, development and closure of hydrocarbon reservoirs.

Technological improvements may result in resources previously considered uneconomic (e.g., shale gas and methane hydrates) to be considered viable exploration targets in areas with little exploration history. The identification of these areas and quantification of resource will contribute to the development of planning strategies for member states in terms of licensing and policy development.

A consistent estimation of hydrocarbon resource will be a first step in assessing and quantifying the hydrocarbon reserves in the main hydrocarbon basin in Europe.

The GARAH project will result in the identification of new potential areas for hydrocarbon exploration, directly addressing the requirement for identifying secure energy HC sources. This will give further information regarding basin development and evolution, and the HC resources will be systematically assessed. Outcomes will feed into planning and policy (licensing of areas for exploration) by Member States, commercial exploration strategies and also highlight remaining knowledge gaps which may inform about further academic research or programmes of exploration. The datasets generated will also highlight areas of potential risks associated with exploitation of fossil fuels and the closure of mature fields. Areas with the potential for multiple uses of the subsurface that may require the development of appropriate legislation or guidance will also be identified, therefore partially mitigating delays in bringing energy to market that are related to those issues.

The generated catalogue of the multiple-use (or sequential-use) potential and impacts of hydrocarbon reservoirs will enable the European community to improve efficient, sustainable, and climate-friendly use of the subsurface.

Our mission is to generate a catalogue of the multiple-use, potential for these resources, enabling synergies between various uses and securing a sustainable development, whilst reducing overall climate impact of fossil fuel use. For example, utilizing existing infrastructure and the potential of associated geothermal-shale and or depleted reservoir schemes could enable the possibility of a climate neutral HC production.

The identification of potential hydrate resources in the European margins provides a unified database and maps detailing potential distribution of gas hydrates (energy source), and potential geohazard areas. This identification will be lead by the geological surveys also including relevant non-geological stakeholders hydrate data. In addition, we will aim to identify zones that could be used to store CO₂ as a hydrate (subsurface CO₂ storage resource) within the European offshore and onshore areas.

The results of this work programme will foster the development of new HC technologies in Europe and will feed into planning, policy (licensing of areas for exploration) by Member States, and commercial exploration strategies.



By mapping zones of interest, there will also be a contribution to marine spatial planning, including possible conflicts between deep hydrocarbon resources; gas storage (i.e. CO₂, Hydrogen) positioning and impacts of deep sea infrastructure; fishing activities and deep-sea habitats; and national security issues. The GARA project will contribute to the development of appropriate legislation and guidance (e.g., storage vs. production, preservation).

The outcomes of this project idea will inform EU Member States of potential frontier plays in a pan-EU perspective, allowing for the currently poorly understood offshore methane hydrate and shale gas/oil resource to be acknowledged in developing legislation and regulation.



APPENDIX 2: LIST OF DELIVERABLES

Deliverable number	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D1.1	Dissemination and Exploitation plan	1	GEUS	Report	Public	M3
D1.2	Project data management plan	1	GEUS	Report	Public	M6
D1.3	Annual progress report 2018	1	GEUS	Report	Public	M8
D1.4	Annual progress report 2019	1	GEUS	Report	Public	M20
D1.5	Annual progress report 2020	1	GEUS	Report	Public	M32
D1.6	Final Project report	1	GEUS	Report	Public	M36
D1.7	Project review with EU stakeholders – Formal presentation	1	GEUS	Report	Public	M36
D2.1	Data base & harmonization report	2	GEUS	Report	Public	M9
D2.2	Petroleum system report and GIS maps	2	BGS/TNO/GEUS	Report	Public	M32
D2.3	Resource assessment „EUOGA“	2	GEUS/TNO	Report	Public	M33
D2.4	Resource assessment 3D pilot Unconventional	2	BGR/GEUS	Report	Public	M23
D2.5	Resource assessment 3D pilot Conventional	2	BGR/GEUS	Report	Public	M33



D2.6	Alternatives + risks	2 (& 3)	BGS/GEUS	Report	Public	M36
D3.1	Collection data report on available Hydrates data	3	BGS/IGME	Report	Public	M9
D3.2	Hydrates GIS-database	3	IGME	GIS	Public	M27
D3.3	Gas Hydrate overview report	3	IGME	Report	Public	M33
D4.1	Preliminary data selection, IP guidelines, QA procedures	4	GEUS	Report	Public	M6
D4.2	Description of Extensions - EGDI	4	GEUS	Report	Public	M30
D4.3	Assist in HC planning	4	GEUS	Report	Public	M30
D4.4	Online available results	4	GEUS	Report	Public	M35
D4.5	Data input to IP	4	GEUS	GIS data	Public	(M1-M34)