

General Information	
Preliminary title of the European Partnership	European Partnership on a Geological Service for Europe (EP-GSE)
Short description of the partnership	<p>The Geological Service for Europe aims to further integrate national services to provide key advice and data services to the European Union on sustainable subsurface management, integrating geo-resources (energy, water, raw materials) and environmental conditions (energy storage, natural hazards, anthropogenic impacts) across all relevant economic and societal clusters, supported by a world leading subsurface information platform. A coordinated approach to geoscientific research and innovation under the Partnership mechanism will help improve pan-European harmonisation, standardisation, knowledge sharing and cutting edge developments in 3D and 4D modelling and geological mapping.</p>
Services directly involved	<p>Lead services: RTD.D1, GROW.DDG1.C2</p> <p>Other services: JRC.D3</p>
Context and problem definition	<p>Geoscience, and understanding Earth's systems, is not only essential to providing the resources we need in the pursuit of climate and carbon neutrality targets but will also play a key role in mitigation of and adaptation to climate change (for example the increased frequency of extreme events and landslides across Europe). Sustainable management of natural resources from the subsurface, such as groundwater, geo-energy raw materials and energy storage solutions represent essential elements in delivering on the EU 2050 targets and the UN Sustainable Development Goals (SDGs).</p> <p>The expected socio-economic developments across Europe will lead to a higher demand for natural resources, in particular for non-energy raw materials when considering the industrial transformation envisaged by the EU, including energy storage solutions, which will increase the need for coordinated subsurface research and innovation. Although the extraction of subsurface resources stimulates economic growth, if not managed correctly it may have negative consequences to the environment and future economy. Therefore, trans-national knowledge, development and sharing of improved processes and the use of new innovative technologies throughout the value chain will be essential.</p> <p>Some of the main challenges outlined within Clusters 3 to 6 of Horizon Europe can be overcome with the input of R&I efforts foreseen under the European Partnership on a Geological Service for Europe (GSE), for example in implementing the EU Civil Protection Mechanism, ensuring a secure and sustainable supply of raw materials for EU industry, geothermal potential as both a heat and energy source and ensuring healthy soils and clean water for Europe.</p> <p>The role of the Geological Survey Organisations (GSOs), in advising their governments directly on subsurface management and providing information to the public, requires a large and diverse range of skills. Considering the pressures facing Europe in relation to climate change and our natural resources, it is now time to scale this knowledge and expertise to a European service. A European Partnership in this area would facilitate research based solutions being taken up at policy and legislative level supporting the EU drive towards a climate neutral economy by 2050.</p>
Objectives and expected impacts	<p>The GSE can provide key advice to the EU on all aspects of subsurface related questions and challenges, in line with the EU objective to promote global action on climate change. With improvements in monitoring and mitigating environmental extremes and their impacts on society, while guaranteeing a secure, responsible and affordable supply of water, energy and mineral resources to meet basic societal needs, the GSE would contribute towards a safe and healthy environment.</p> <p>The GSE may also contribute to the adaptation needs, that is, anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. A well planned, early adaptation action could contribute to economic development through reducing imports of energy and mineral resources, increasing resilience and reducing the impact of extreme natural events such as floods or</p>

	<p>landslides, securing and enhancing safety in a long-term strategy on use of scarce water resources and improved land-use planning.</p> <p>The GSE will be built around two main Horizon Europe objectives, with an overarching advanced subsurface information platform providing open access to all research results and data developed under the Partnership.</p> <p>1st: Strengthen the impact of subsurface R&I in developing, supporting and implementing EU policies and support the uptake of innovative solutions in industry and society to address global challenges.</p> <p>2nd: Create and diffuse high-quality new knowledge, skills, technologies and solutions to global challenges.</p> <p>One of the core overarching missions of the GSE will be to develop the world's most advanced subsurface information platform that will include access to both geoscientific data, metadata, reports and papers and efficient links between these. The GSE will represent a strong knowledge and leading research base for Earth system sciences, founded on the long-standing expertise of GSOs and trans-national cooperation in the areas of mineral resources, geo-energy, groundwater, geochemistry, earth observation, geo-hazards, marine geology, spatial information and urban geology. The coordinated application of expertise in these areas can provide significant input and advice in EU policy developments (energy, climate, raw materials, water resources, environment, civil protection, marine environment, climate neutral cities/urban planning, healthy soils, international cooperation/policy dialogues, etc.), while also providing a valuable resource of knowledge and data for society at large.</p> <p>The broad scope of subsurface issues related to demand on resources and the negative environmental impacts of modern development will be tackled within the partnership programme and demonstrated in 3D and 4D models, in order to serve EU policy level needs as well as providing data, information and knowledge to other stakeholders, such as industry and academia. With regards to geo-resources (energy, water, raw materials), the main topics will be related to resource inventories, monitoring and assessments in order to serve relevant policies and regulation (Raw Materials Initiative, Water Framework Directive, Energy Union). Within these activities some would be more exposed, for example CO₂ geological utilisation and storage, energy storage, battery raw materials etc. With regards to environment, the GSE will address issues related to soil health, landslide inventory and mitigation, groundwater and surface water interaction, marine geology, improved geological integration at the land / sea interface, contaminant transport from land to sea, Earth observation related to resources and environment and geological issues related to subsurface management is the drive for sustainable and smart cities (including the integration on geological data and conditions in Building Information Modelling (BIM)).</p> <p>To support open access to data and information developed through the above topical research areas, the current European Geological Data Infrastructure (EGDI) will further develop its interoperability with other resource-oriented European platforms, such as the Raw Materials Information System (RMIS) and the water and climate information systems developed by the JRC, as well as with the European Plate Observing System (EPOS-ERIC) and in the European Open Science Cloud (EOSC).</p> <p>While the GSE would build capacity amongst the national and regional geoscience services across the EU, the evolving geological information and knowledge would also be shared beyond. International cooperation with other regions that have similar trans-national geoscientific programmes in place (mainly Africa, Latin America and South East Asia) will form part of the objectives within the partnership, providing mutual benefit from sharing best practices, capacity building exercises, standardisation and innovation in most geological domains.</p>
Necessity test: rationale for a European Partnership	<p>The GSE will support the EU in its transition to a low-carbon, climate-neutral, resource-efficient and biodiversity respecting economy in full compliance with the EC strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (A Clean Planet for All), as well as the United Nations 2030 Agenda and the 17 UN SDGs. In order to fulfil such commitments, the GSE will</p>

	<p>offer a unique gateway to unbiased geoscientific data at European level, establish a common European Geological Knowledge Base and jointly provide tailored information to EU Institutions and Agencies. Furthermore, it would bind national programmes at the EU level, relating its topics to EU agenda priorities and policies and redefining its position towards other e-infrastructures like the EPOS-ERIC or the RMIS. Special attention will be given to IT developments in subsurface research and to preparation for future challenges and technological developments in this field.</p> <p>The GSE Partnership is seen as a necessary step further than GeoERA, that will expand not only on the topics dealt with but also on the community involved. Geo-resources (energy, water, raw materials) will continue to play a central role but cross thematic research on wider issues involving natural hazards, Earth observation, urban geology and geochemistry will be included in the GSE. Following successful networking of the GSO community within GeoERA, the GSE will now invite the relevant players from industry, SMEs, academia and research institutes to join the Geological Surveys in carrying out the projects under the Partnership, contributing towards an orchestrated, science-based response to the Paris Agreement and to several UN Sustainable Development Goals. Establishing closer collaboration with the wider community will provide them with the opportunity to bring new, innovative ideas to market and develop business opportunities in Europe and abroad.</p> <p>Whilst GSOs have the mandate to provide information and expertise on the national level, they require EC programmes such as Horizon Europe to support such activities at European level. The proposed GSE envisages the most up to date pan-European data and information being made readily available, enabling a more harmonised response to targeted requests from the Commission and stakeholders.</p> <p>The GSE is seen very much as a Cross Cluster endeavour that would support a number of cross-thematic projects both within the geoscience community as well as with wider related sciences. It is of most relevance to the Clusters Digital, Industry and Space; Climate, Energy and Mobility; and Food, Bioeconomy, Natural Resources, Agriculture and Environment; with potential to also address some challenges under the Cluster Civil Security for Society.</p>
Relevant for the following parts of Horizon Europe	<p>Pillar II 'Global Challenges and European Industrial Competitiveness'</p> <p><input type="checkbox"/> Cluster Health</p> <p><input type="checkbox"/> Cluster Culture, creativity and inclusive society</p> <p><input checked="" type="checkbox"/> Cluster Civil Security for Society</p> <p><input checked="" type="checkbox"/> Cluster Digital, Industry and Space</p> <p><input checked="" type="checkbox"/> Cluster Climate, Energy and Mobility</p> <p><input checked="" type="checkbox"/> Cluster Food, Bioeconomy, Natural Resources, Agriculture and Environment</p> <p><input checked="" type="checkbox"/> Cross-cluster</p> <p><input type="checkbox"/> Pillar III 'Innovative Europe'</p>
Currently identified links with other partnership candidates / Union programmes	<p>There are potential complementarities with the following Partnership candidates:</p> <ul style="list-style-type: none"> - Cluster Digital, Industry and Space: Carbon Neutral and Circular Industry - Cluster Climate, Energy and Mobility: Batteries: Towards a competitive European industrial battery value chain; Clean Energy Transition - Cluster Food, Bioeconomy, Natural Resources, Agriculture and Environment: Environmental Observations for a sustainable EU agriculture; A climate neutral, sustainable and productive Blue Economy; Circular bio-based Europe: sustainable innovation for new local value from waste and biomass (Sustainable, inclusive and circular bio-based solutions); Water4All: Water security for the planet - Other Pillars: European Science Cloud (EOSC); EIT Climate-KIC; EIT InnoEnergy; EIT RawMaterials <p>Whilst the topical matters being dealt with by the aforementioned Partnerships can benefit from geological data and information, they do not seem to take into account the importance of understanding the subsurface in the context of, for example,</p>

	<p>healthy soils, clean water supplies, non-energy raw materials potential within Europe, etc. This is where the EP-GSE can provide real added value in addressing European and global challenges.</p> <p>EuroGeoSurveys also has well-established links to the following ongoing initiatives: Raw Materials Initiative, European Innovation Partnership on Raw Materials, Copernicus, Group on Earth Observations (GEO), UNECE / UN Sustainable Resource Management (UNSRM), EIT RawMaterials, ERA-MIN 2, EGS-JRC Collaboration Agreement, EPOS ERIC, KINDRA/EIGR – the European Inventory of Groundwater Research</p>
Does the proposed partnership build on currently active ones?	<p>The GSE will build on the current ERA-NET Cofund Action GeoERA: “Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe” (2017-2021), a 30M EUR programme supported by 45 national and regional Geological Survey Organisations from 33 countries in Europe. It contributes to the sustainable use of the subsurface by delivering expertise, data and information to policy and decision makers through a single access point, based on the European Geological Data Infrastructure (EGDI). From its beginnings, GeoERA was established with the vision for a follow-up programme that expanded on the current thematic focus of resources.</p>
Expected type and composition of partners	<p>The Partnership would expand on the network established under GeoERA, opening the calls to participation of key stakeholders from industry, academia, SMEs and research institutes. The national and regional European Geological Survey Organisations would remain as the main drivers and coordinators of the Partnership programme, forming a structured network of European GSOs. The Partnership would be coordinated by a core group of Geological Surveys, whilst other stakeholders would be invited to join projects launched under the Partnership where their input would add value (e.g. in bringing the R&I results to market).</p>
Contributions and commitments expected from partners	<p>In 2014, EuroGeoSurveys – the Organisation of National Geological Surveys representing 36 European countries – launched its Strategy towards establishing a GSE. Since then, the GeoERA joint programme and the European Geological Data Infrastructure were developed. They are fully committed to the next step involving the development of a wider research programme that aims to include coordinated services to EU institutions and agencies along with other stakeholders. The members of EuroGeoSurveys and wider research community involved in GeoERA have expressed their intent to contribute with in-kind commitments to the next phase in their collaboration, although a number of them would appreciate a stronger financial contribution through Horizon Europe than currently exists in Horizon 2020 ERA-NETs, since it represents the Member States’ investment in European research and innovation rather than the national investment in their GSOs.</p>
Currently envisaged implementation mode(s).	<p><input type="checkbox"/> Co-programmed European Partnership</p> <p><input checked="" type="checkbox"/> Co-funded European Partnership</p> <p><input type="checkbox"/> Institutionalised European Partnership</p> <p style="padding-left: 40px;"><input type="checkbox"/> Article 185</p> <p style="padding-left: 40px;"><input type="checkbox"/> Article 187</p> <p style="padding-left: 40px;"><input type="checkbox"/> EIT-KIC</p>
Justification of the implementation mode	<p>The co-fund method has already proven successful in GeoERA, even with a large proportion being invested by the GSOs from their national budgets. National Geological Surveys are mandated to collect, analyse and report data and information within the national interest. Their outputs collected on the EU level would assist in improving overall data quality, harmonisation, standardisation and service provision on both a national as well as EU level.</p> <p>A Co-funded European Partnership would allow for the smooth uptake of the coordinated cross-thematic approach required to establish a fully functioning GSE.</p>
Proposed starting year	<p>2021: this would ensure a smooth transition from the GeoERA ERA-NET.</p>