



The Deep Borehole Demonstration Center

Update on plans for a non-profit, multi-national, public-private-partnership approach

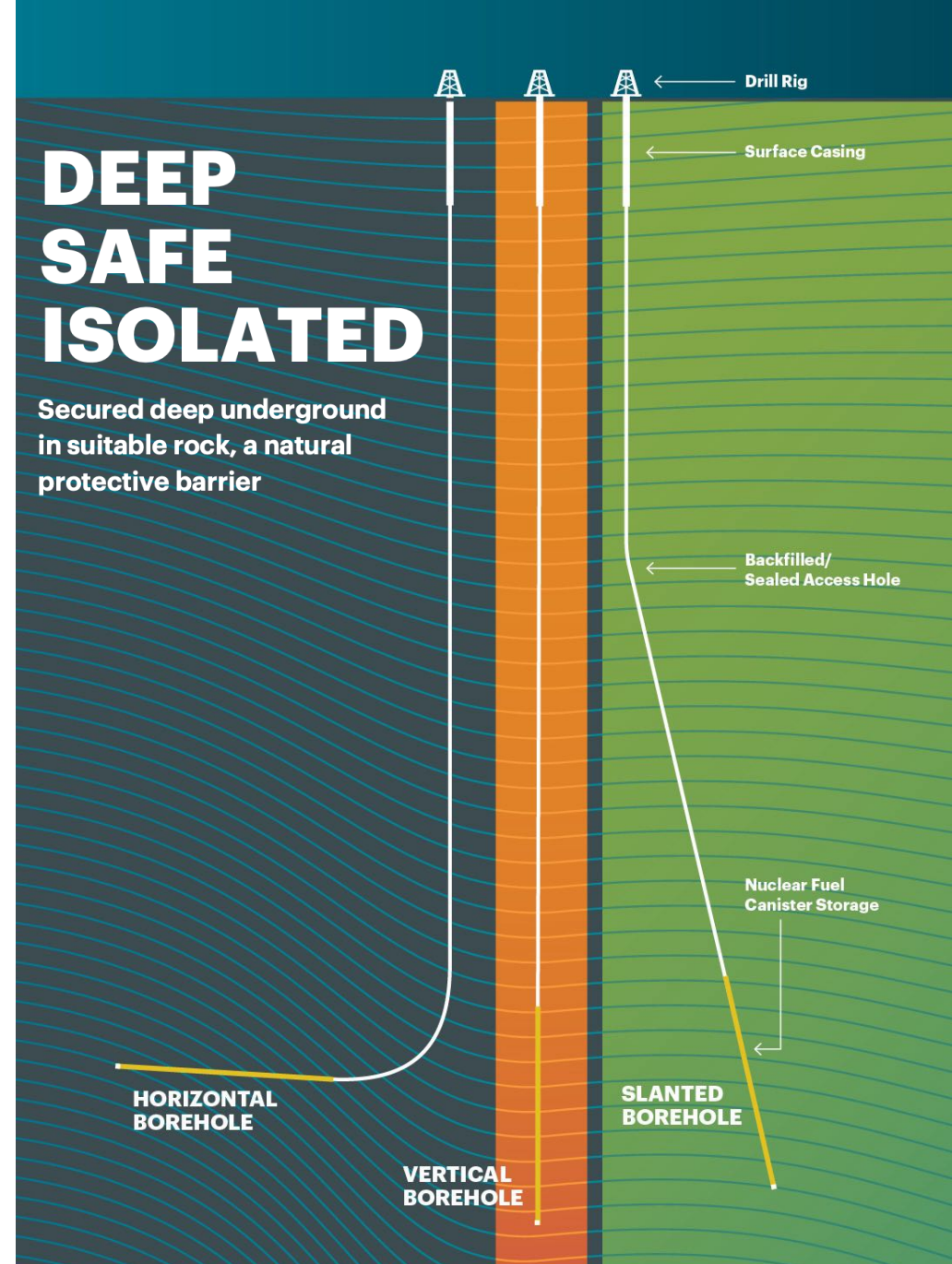
ERDO Association Webinar, 19.10.2022

What I will cover

- Overview of Deep Isolation
- The Deep Borehole Demonstration Center:
 - Context
 - Guiding principles
 - Phasing and priorities
 - Governance and funding model
 - Next steps

Overview of Deep Isolation

- Founded in US in 2016; Deep Isolation EMEA Limited launched in 2020, based in London.
- Our solution:
 - Places corrosion-resistant canisters containing spent fuel into borehole repositories deep underground (far deeper than feasible with a mined repository)
 - Uses directional drilling technology to drill into sedimentary, igneous or metamorphic host rocks that have remained isolated from the environment for millions of years
 - Leverages mature technologies that are widely used in industry and that we have integrated and enhanced with our own patented innovations
- We supported ERDO's Borehole Disposal Project in 2021 with a [study](#) that found this technology can dispose 100% of ERDO HLW and long-lived ILW with significant cost savings and siting flexibility compared to mined disposal



Why the Deep Borehole Demonstration Center?

Deep borehole disposal is a maturing technology offering significant potential benefits – but with a need for full-scale demonstration

2021/22 study of international stakeholder views from the regulatory, policy & waste management communities

- Research undertaken by:   The University Of Sheffield.
- Sponsored for presentation to IAEA by:  Department for Business, Energy & Industrial Strategy 
- Methodology: mixture of quantitative research through web survey and qualitative research through in-depth interviews, covering 38 participants from 18 countries
- Results published at:



International Conference on Radioactive Waste Management: Solutions for a Sustainable Future, IAEA, Vienna, Austria, November 2021,



Waste Management Symposium 2022, Phoenix, USA, March 2022

Key findings

- Regulators, policymakers and waste management practitioners see deep borehole disposal (DBD) as a significant opportunity for all types of national radioactive waste management programs

- Four key areas of perceived benefit:

1. Increased choice & siting flexibility

2. Potential for cost, risk and time reductions in national disposal programmes

3. Potentially attractive features from perspective of community consent

4. Potential for economies of scale around regulatory processes

- 4 out of 5 research participants would welcome greater international collaboration on deep borehole disposal – **with full-scale, end-to-end demonstration the Number 1 priority**

Why the Deep Borehole Demonstration Center?

Deep borehole disposal is a maturing technology offering significant potential benefits – but with a need for full-scale demonstration

Somebody just needs to do it. Several studies that show that ... the actual operation is feasible, the safety assessment is feasible, compliance with existing standards is feasible. The problem is that no one has done it.

I think the biggest obstacle is not having a demonstration borehole.

I think the biggest barrier remains to actually show that it can be done.... Show that we've got the engineering to put down containers and retrieve them should one get stuck. I think people will then see that it is an off-the-shelf technology.

Key findings

- Regulators, policymakers and waste management practitioners see deep borehole disposal (DBD) as a significant opportunity for all types of national radioactive waste management programs

- Four key areas of perceived benefit:

1. Increased choice & siting flexibility

2. Potential for cost, risk and time reductions in national disposal programmes

3. Potentially attractive features from perspective of community consent

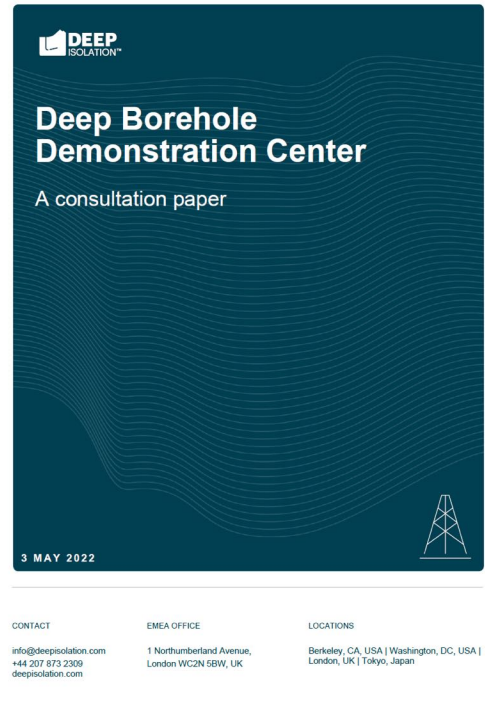
4. Potential for economies of scale around regulatory processes

- 4 out of 5 research participants would welcome greater international collaboration on deep borehole disposal – **with full-scale, end-to-end demonstration the Number 1 priority**

Deep Isolation is a US-European company group proposing a multi-national, public-private-partnership response to this challenge



“Deep Isolation is currently in discussion with partners in governments and industry on how we can build on this demand for end-to-end full-scale demonstration, starting in 2022”



Deep Borehole Demonstration Center Concept Demonstration Objectives and Requirements (CONDOR)

- Preliminary set of objectives & requirements
- Solicits feedback from international community
 - Scope
 - Objectives
 - Priorities
 - Policy/regulatory dialogue
 - Governance structure

Guiding principles

Based on initial stakeholder feedback and a review of successful governance models implemented by Underground Research Laboratories such as Äspö and Grimsel

1. Transparency and Inclusion:

- Managed by a special-purpose, non-profit organization with a Board of Directors that is not controlled by any one organization – and is subject to external scrutiny by an independent Advisory Committee bringing together representatives of key stakeholder groups.

2. Community Engagement:

- Work closely with the local community to maximize local economic impact from this non-radioactive demonstration facility and to ensure consent, including through community representation on the Advisory Committee.

3. Scientific Excellence:

- Outcome and performance data from the demonstration program should be published and subject to international peer review.

4. A Long-Term, Phased and Prioritized Approach:

- Not a one-time event, but an ongoing facility to test cost and safety models in real-world scenarios. Priorities to be agreed upon in consultation with stakeholders as the DBD Center develops a multi-year work program over the coming months.

5. Public Private Partnership:

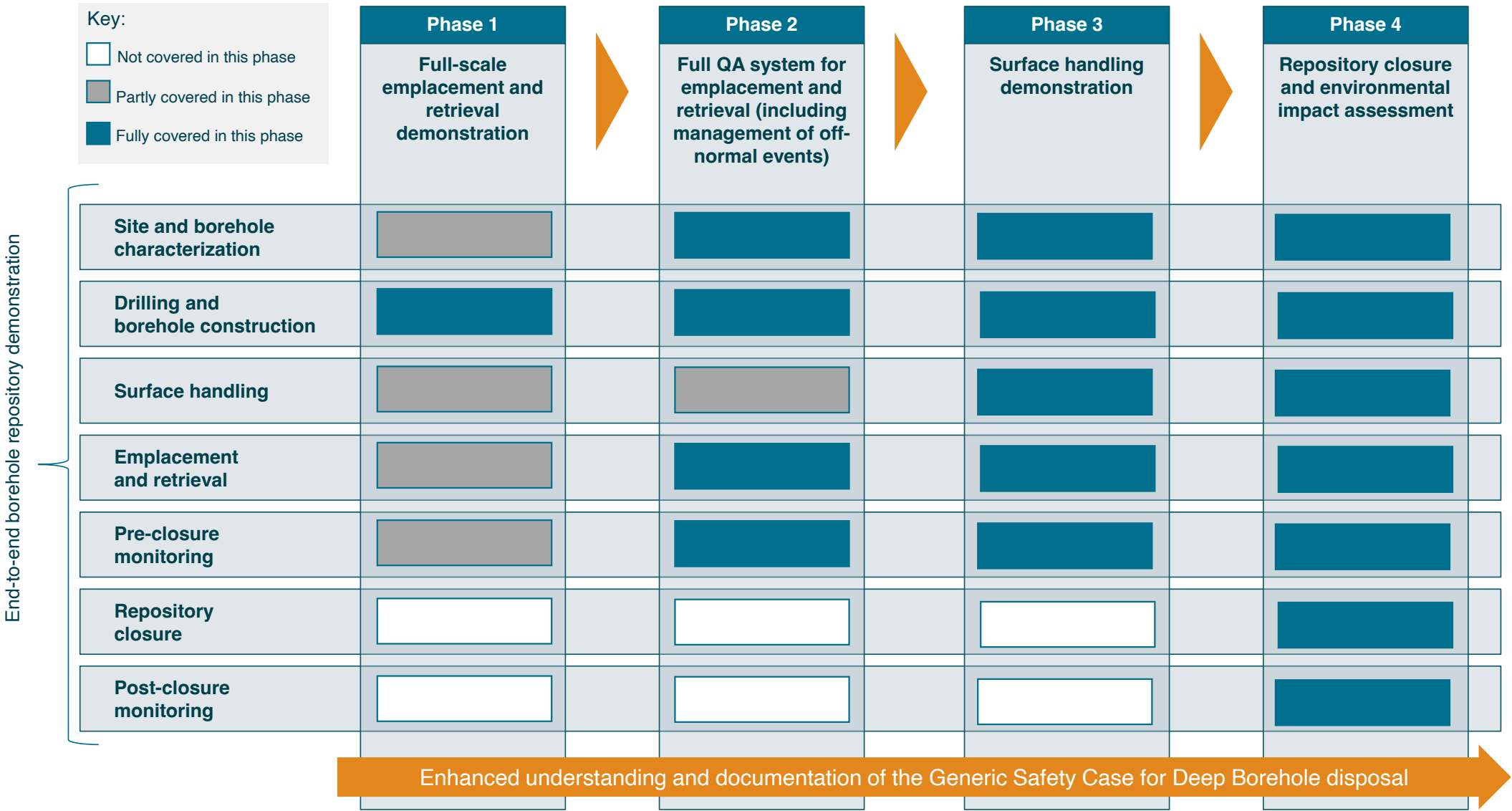
- The DBD Center should seek funding from both the private sector and public sector - recognizing that the latter will take longer to mobilize.

6. Early Results:

- Deep Isolation and its partners are committed to early action to kick-start the demonstration, through an initial foundational project.

Demonstration phases

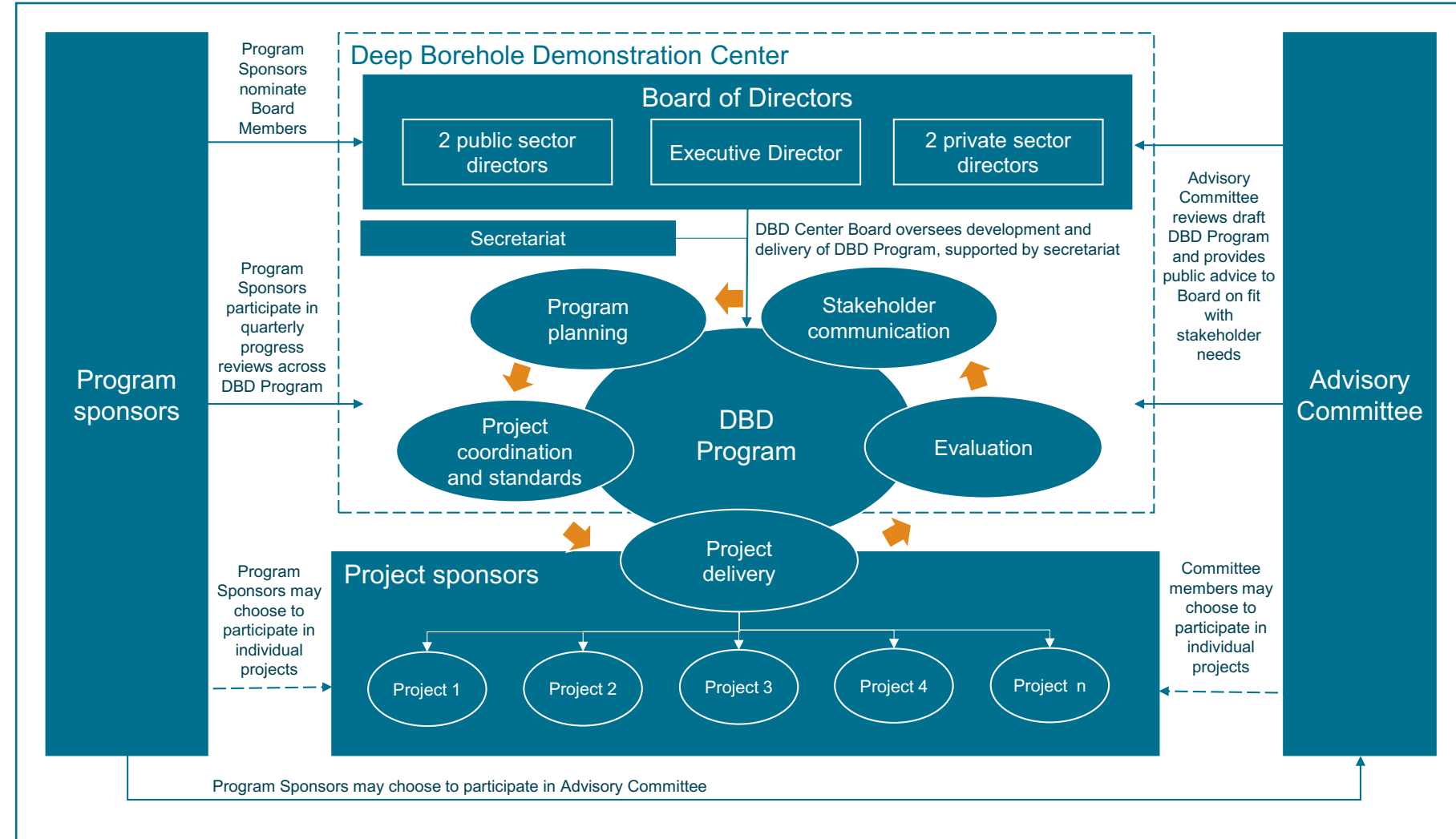
The prioritization that Deep Isolation has proposed – and is receiving good support



Proposed governance and funding model

Reflects feedback from governments, regulatory bodies and industry in initial consultation

- An independent, non-profit organization
- An initial foundational project fully funded by Deep Isolation and partners (> \$2 million)
- Several governments and nuclear industry players interested in becoming 'Program Sponsors'
- Scientific and community leaders keen to participate in Advisory Committee



Next steps

- **Set-up:** We now have enough confirmed interest from relevant government, regulatory and industry bodies to set up the DBD Center as an organization, recruit its Executive Director and establish its independent Board of Directors – which we are doing over the coming weeks
- **Launch:** We plan to run in ‘stealth mode’ for a couple of months, ahead of public launch at Waste Management Symposium 2023 – where we have been invited to present a paper on multinational demonstration of deep borehole disposal
- **Finalizing ERDO participation:** We are delighted that several ERDO countries and ERDO itself are keen to support this important initiative and look forward to working with them to finalize this over the coming weeks.
- **Growing the partnership:** If you are not yet involved and would like to learn more – please get in touch!

Thank you!

rod@deepisolation.com