EGI Engagement Strategy

Version: February 2015

Document link: <https://documents.egi.eu/document/2079>

Author: Gergely Sipos (Gergely.sipos@egi.eu)

Contributors:

* NGI International Liaisons
* User Community Board
* EGI.eu user engagement team

**Abstract**

This document describes the Engagement Strategy of the European Grid Infrastructure (EGI) community. Engagement helps EGI reach scientific communities, national initiatives, members of the long tail of science as well as SMEs and industry to support collaborations and tackle scientific challenges using reliable and innovative ICT services. Engagement establishes and nurtures partnerships between EGI and scientific communities, national authorities and industry, ultimately helping building a sustainable digital e-infrastructure ecosystem for research. The Engagement Strategy describes the goals of EGI engagement, details the various tasks that this activity includes, and provides information about the human networks and online resources and tools that help EGI implement its engagement activities.

**The document provides an updated engagement action plan for the period February – August 2015 (see chapter 5).**

Feedback to: support@egi.eu.

**Copyright notice**

Copyright © Members of the EGI-InSPIRE Collaboration, 2010. See www.egi.eu for details of the EGI-InSPIRE project and the collaboration. EGI-InSPIRE (“European Grid Initiative: Integrated Sustainable Pan-European Infrastructure for Researchers in Europe”) is a project co-funded by the European Commission as an Integrated Infrastructure Initiative within the 7th Framework Programme. EGI-InSPIRE began in May 2010 and will run for 4 years. This work is licensed under the Creative Commons Attribution-Noncommercial 3.0 License. To view a copy of this license, visit http://creativecommons.org/licenses/by-nc/3.0/ or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, and USA. The work must be attributed by attaching the following reference to the copied elements: “Copyright © Members of the EGI-InSPIRE Collaboration, 2010. See www.egi.eu for details of the EGI-InSPIRE project and the collaboration”. Using this document in a way and/or for purposes not foreseen in the license, requires the prior written permission of the copyright holders. The information contained in this document represents the views of the copyright holders as of the date such views are published.

**Document Log**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Comment** | **Author/Partner** |
| Jan. 2014 | 14/01/2014 | January version | Gergely Sipos/EGI.eu |
| Nov. 2014 | 06/11/2014 | Major update based on EGI-InSPIRE PY5 progressAdding SMEs and Industry as a new target group | Gergely Sipos/EGI.eu |
| Feb. 2015 | 05/02/2015 | Update for EGI-Engage and with recent progress | Gergely Sipos/EGI.eu |

**Application area**

This document is a public report produced under the coordination of the EGI Technical Outreach Manager under the EGI-InSPIRE NA2 activity with guidance from the “EGI Engagement Advisory Board”, a body which includes representatives of the existing and prospective EGI user communities and user-facing activities.

**Terminology**

A complete project glossary is provided at the following page: <http://www.egi.eu/about/glossary/>.

Contents

[1 Introduction 4](#_Toc410900245)

[2 Target groups 4](#_Toc410900246)

[2.1 Research Infrastructures 4](#_Toc410900247)

[2.2 Research Collaborations 5](#_Toc410900248)

[2.3 Long-tail of science 6](#_Toc410900249)

[2.4 SMEs and industry 6](#_Toc410900250)

[3 Engagement approaches 8](#_Toc410900251)

[3.1 The blueprint 8](#_Toc410900252)

[3.1.1 Outreach 9](#_Toc410900253)

[3.1.2 Scoping 10](#_Toc410900254)

[3.1.3 Implementation 11](#_Toc410900255)

[4 Tools 11](#_Toc410900256)

[5 Plans for the next period (February-Aug 2015) 13](#_Toc410900257)

[5.1 For Research Infrastructures 13](#_Toc410900258)

[5.2 For research collaborations 13](#_Toc410900259)

[5.3 For the long-tail of science 13](#_Toc410900260)

[5.4 For SMEs and industry 14](#_Toc410900261)

# Introduction

Science today is no longer exclusively produced in single research labs or within national boundaries. Modern scientific challenges call for integrated solutions, cross-country collaborations and computing power with flexible usage to analyse vast amounts of data. E­infrastructures allow scientists to share information securely, analyse data efficiently and collaborate with colleagues worldwide.

The ‘European Grid Infrastructure’ (EGI) operates one of the largest, collaborative e-infrastructures in the world. EGI supports the digital European Research Area (ERA) through its pan-European infrastructure, based on an inclusive federation of reliable ICT services, which provide uniform, cost effective, user oriented and collaborative access to computing and data storage resources in more than 30 countries. EGI’s mission is to help scientists to make the most of the latest computing technologies, such as grids, grids big data and cloud services.

In this respect sustainability is an essential consideration for e-Infrastructures and scientific communities that they support. Many of these scientific communities have research agendas measured in decades and need to be assured of the continued operational presence of the e-infrastructures that they adopt to support their work. EGI’s sustainability plans have become increasingly coupled with its long-term strategy: connect researchers from all fields of science with the reliable and innovative ICT services from EGI that they need to undertake their research, and to evolve these services according to researchers’ needs to continue providing value for them. Engagement is a key activity to achieve this goal. Engagement in EGI has to:

1. Identify scientific communities from the ERA that could break current scientific barriers with the use of EGI solutions.
2. Reach out to and carry out discussions with these communities about ICT technologies to capture details of their e-infrastructure use cases and requirements.
3. Help the communities address their scientific challenges with existing EGI solutions, by evolving these solutions and by bringing in new solutions to EGI as required.
4. Support scientific communities during the whole process they have to go through to become active, and self‑sufficient users of EGI e-infrastructure services.
5. Act as a meeting point of research communities for exchange in best practices and repository of ICT (e-infrastructure) services of common interest.

# Target groups

## Research Infrastructures

EGI’s provides a world-class e-infrastructure that can support researchers in pushing the frontiers of science, in particular within areas with massive data or computational requirements. In the next two years a growing number of Research Infrastructures (RIs) from the ESFRI roadmap[[1]](#footnote-1) and from national roadmaps are expected to reach implementation or operational stage. These RIs are already exploring needs of their user communities and thus they are key instruments in bringing together a wide diversity of stakeholders to look for solutions to many of the problems science is facing today. Given their international nature and awareness of the benefits of e-infrastructures the European RIs, their preparatory projects, and other similarly large, multinational and structured scientific collaborations are considered as the primary long-term beneficiaries of EGI services and therefore the prime targets for EGI to engage with. RIs come with some advantages, and disadvantages, which need to be considered when engaging with them.

Advantages:

* Usually one point of contact exists per RI for ICT / e-infrastructure-related matters, for example a technical coordinator.
* Requirement gathering should be simpler and can build on the established network of contacts within the RIs.
* Acceptance and integration of EGI into the internal plans of the RIs should lead to a long term partnership between e-infrastructure and research infrastructures.
* Awareness of their problems and typically also of the benefits of using e-infrastructures in addressing them.
* More likely to have some internal expertise that can work with EGI and speed up collaborative work.

Disadvantages:

* Convincing a large community of an outside solution can be difficult and effort-intensive.
* RIs sometimes need to work with existing/previously chosen tools and EGI needs to integrate these to achieve technical compatibility.
* The full pay off (i.e. scientific breakthrough enabled by EGI solutions) may not be seen for a number of years.

## Research Collaborations

A second target group for EGI Engagement is the large number of highly dynamic, small-medium size research collaborations and research networks. Unlike RIs, these groups may scarcely, or not be aware of e-infrastructures and their benefits to science, so discussions have to start at a more basic level. Such collaborations come with different unique advantages and disadvantages that need to be recognised by EGI when engaging with them.

Advantages:

* Being usually more flexible on using new technologies and tools.
* Bringing new insights and tools that could have a wider use.
* Be the possible first step in integrating a much wider community.
* Be more suited to establish spinoffs and start-ups.

Disadvantages:

* Could be not as big a pay off from a usage perspective.
* May not be aware of their e-science problems and the benefits of e-infrastructures.
* Requirement gathering may not be straightforward because of the lack of structure/connection among groups.
* Might be lacking in technical expertise.

## Long tail of science

A third target of EGI Engagement is the very small research teams and researchers who work on their individual projects, or personal research tasks. These researchers are typically unaware of e-infrastructures, and despite they can benefit from e-infrastructure services, they are likely to require only a very limited subset of the services that e-infrastructures can offer. Their focus is more on pursuing personal research agendas then contributing to a structured scientific collaboration. Working with the long-tail of science comes with different unique advantages and disadvantages that need to be recognised by EGI when engaging with them.

Advantages:

* Successful examples of serving members of the long-tail in many of the NGIs.
* Require only a limited set of services from e-infrastructures – typically HTC, HPC and cloud services for individualistic computing without collaboration capabilities.
* A very significant source of innovation and innovative research results.

Disadvantages:

* Very difficult to tell who and when belongs to this group. The long-tail is invisible and has no identifiable contacts for pro-active engagement.
* Difficult to measure scientific outcome of the long-tail and the impact of e-infrastructures on this.
* Most of its members lack the technical expertise in using e-infrastructures. Support can be very effort intensive if considered for the whole length of the long-tail.
* May not be aware of e-infrastructures and that some of their problems can be served by e-infrastructure services.
* Requirement gathering is very difficult because of the very loose link to the long-tail and because of the dynamics of these users accessing the infrastructure.
* Most of the EGI-related national and European projects that provide support for the long-tail are coming to an end in 2014-2015.

## SMEs and industry

There is a renewed requirement for stimulating the knowledge transfer activities and outcomes produced in science and scientific innovation into business and society. This requirement are in many cases translated into requisites for funding for EGI members in such a way that knowledge transfer is not anymore a nice-to-have, but has become essential for sustainability/survival. Moreover, H2020 programmes include an ‘impact’ section that aims to go beyond the exploitation and dissemination plan at the end of each project. From now on, EGI-related H2020 proposals need to demonstrate that outcomes have a positive impact onto business and society from day 1 of the initiative. Strengthening the relationship with the business sector EGI is also fundamental part of the Open Science Commons strategy and a way to show the leadership that has been asked to take.

In order to achieve this, EGI needs a network of people with skills in business development, backed with specific, co-ordinated organisational structures, and dedicated personnel resources to establish fluid and sustained relationships with other partners for the creation of these value networks. One of the main issues to-date was having no dedicated effort within the EGI community to reaching out to the private sector. In spite of some efforts and some encouraging examples, the initiatives for business engagement have not yet progressed towards any meaningful impact. At local level there are few good examples, but they are the result of the individual initiative of some NGIs that have a clear mandate by the national or local administration, which is not the case in many other NGIs. Despite EGI members have for many years engaged a variety of research communities with mature structures, procedures and expertise for this engagement, but there is no structure or procedures for business engagement, which includes activities such as identifying the SMEs with interest to collaborate, have a clear value proposition, and create a formal engagement relationship with its associated business model.

The EGI community recently defined a ’Business Engagement programme’[[2]](#footnote-2) to help the community overcome these barriers. The programm is a framework underlying the specific future joint activities between EGI members and the different representatives of the business sector. The programme defines:

* Potential areas of collaborations between EGI members and industry:
	+ Promotion
	+ Market intelligence
	+ Networking
	+ Access to dedicated consultancy and support
	+ Exploiting EGI services for pre-commercial R&D
	+ Testing proof of concepts
	+ Developing added-value services for reusing open research data sets.
* Provides details on the various benefits that engagement between EGI and industry would bring to the parties:
	+ Increased visibility on a European and global scale.
	+ Access to key information to relevant European policies.
	+ Possibility to develop new products and technologies to enhance your product portfolio.
	+ Adoption of new and innovative technologies.
	+ Reduction of learning curve and ensuring faster and trustable results.
	+ High rate of Return on Investment (ROI) for consumer partner.
	+ Greater potential market for commercial services as academia moves from CAPEX to OPEX model.
	+ Opportunity to expand and strengthen the customer base with new and repeated clients.
	+ Access to market intelligence to gain competitive edge.
	+ Possibility to provide direct input to shape future services of EGI for business opportunities.
	+ Opportunity to contribute as a partner to proposals for funded projects.
* A three-tier structure for engagement that would provide formalisation of the collaboration activity and make easier starting the common activities at a local and European level:
	+ EGI Business Engagement Programme Member
	+ EGI Business Associate
	+ EGI Business Partner
* An activity plan to implement the programme. The plan consists of
	+ A promotion plan to raise awareness about engagement opportunities with EGI within the business community.
	+ Establishing a network of business engagement experts within EGI. The network would be responsible for implementing and evolving the EGI Business Engagement Programm, including identifying funding opportunities.

# Engagement approaches

## The blueprint

EGI is to serve as a community of communities to help share knowledge and services for establishing the digital science ecosystem in the ERA. This is achieved via collaborations with communities of research infrastructures, research collaborations, the long tail of science, SMEs and industry as well as national and international initiatives including various national and FP7-H2020 projects.

To reach its goals, EGI Engagement has to identify and reach relevant members of these communities, draft and communicate relevant messages about the opportunities and benefits that collaboration with EGI could bring, deepen relationships until the scope and conditions of the collaboration are understood, and finally implement and maintain the relationships to bring benefits for the stakeholders. This process can be defined in a generic way and used as a blueprint to implement engagement with each of the various types of communities in different and most suitable way. The blueprint is depicted in Figure 1 and it consists of three phases:

1. **Outreach**: This phase aims to identify those communities of the ERA whose engagement with EGI could bring mutual benefit for both parties and the ERA as a whole. Using communication and marketing approaches this phase raises awareness of EGI within the communities, and generates interest towards collaboration with EGI (e.g. to use specific EGI solutions in case the target community is a research infrastructure). While some of these communities (or individuals from these communities) can immediately become users/partners/contributors of EGI by simply following the tutorials or other forms of guides that exists on EGI/NGI websites, complex and new ways of e-infrastructure partnerships typically requires further discussions. These complex cases have to be handed over to, and followed in the second phase of the engagement workflow.
2. **Scoping**: In this phase engagement with the new community is deepened and details about the requirements, constraints, possible solutions or contributions of the parties are exchanged and understood. An integration project is defined[[3]](#footnote-3) to capture the scope, timeline and other aspects of the collaboration that will result in the integration of this new community with EGI. The primary output of this phase is an integration project plan endorsed by both the EGI community and the prospective partner community. The plan is handed over to the third phase of Engagement.
3. **Implementation:** This phase initiates, and then executes the integration projects based on to the endorsed plans. During execution the projects are monitored by EGI.eu to ensure timely delivery and update plans if necessary. The projects – after successful completion – result a new, integrated community in EGI, and therefore can increase EGI’s sustainability, diversity and attractiveness.



Figure . EGI Engagement process

### Outreach

This phase uses communication, marketing and proactive outreach techniques to communicate and disseminate EGI solutions to communities within the ERA, with the main goal to raise awareness within these communities about how these solutions could help them overcome their current problems. To be effective, this activity has to use both online and offline (face-to-face) mechanisms, and must involve a large number of experts who convey messages from EGI to the various target groups. These experts and their involvement in the Outreach phase are the following:

* EGI.eu staff:
	+ Prepare online (web) and offline (printed) materials about EGI and its services that emphasise the benefits of these solutions to science, and thus can attract the attention of scientific communities of the ERA. Keep the materials up to date using input and feedback from the community.
	+ Identify prospective partner/target communities for EGI within the ERA, proactively engage with them to promote EGI to their representatives using the most suitable message format and channels, such as web, email, conferences, exhibitions, ‘cold calls’.
	+ Coordinate the distribution of materials, and the promotion of EGI within the NGIs through the International Liaisons (NILs), the Distributed Competence Centre (DCC) and the EGI council.
	+ Coordinate the distribution of materials, and the promotion of EGI within scientific communities through the Champions, the User Community Board (UCB) and at EGI and community events.
* NGIs and Competence Centres (NILs, CCs, council):
	+ Using content and templates from EGI.eu, and from the NGIs prepare online (web) and offline (printed) materials about EGI and NGI solutions to the attention of members of the ERA. Keep the materials up to date based on input and feedback from EGI members and national partners.
	+ Identify prospective partner communities for EGI and NGI from the ERA, but primarily in your country, and promote EGI/NGI opportunities to them using the most suitable message format and channels, such as web, email, conferences, exhibitions, proactive ‘cold calls’.
	+ Provide feedback to EGI.eu on a regular basis about progress and achievements in community engagement and the achievements made available within these communities with the support of EGI.
	+ For NILs: Coordinate the distribution of materials, and the promotion of EGI/NGI within the country and report back about this on a regular basis to EGI.eu.
* Other communities in EGI (Champions, UCB, projects with EGI MoU, etc.):
	+ Promote EGI within your community using the most suitable message format and channels, such as presentation at conferences, leaflets/demos at exhibitions, email lists, websites, social networking, etc.
	+ Publish scientific papers or other impactful materials that acknowledge EGI/NGIs for the resources and services that enabled scientific progress.
	+ Use the online and offline promotional materials provided by EGI.eu and help us keep these up to date.
	+ Provide feedback to EGI.eu on a regular basis about progress and achievements in engagement within your community.

### Scoping

During this phase engagement with prospective communities is deepened, and formalised in a project plan that describes the focused activity that the new community and EGI wants to carry out jointly. During this process the technical challenges and/or opportunities of the new community must be captured, understood, and matched with possible solutions and/or needs in EGI. The project initiation document must be endorsed by the representatives of both EGI and the new community, and then handed over for execution to the ‘implementation phase’. The members who are involved in the scoping phase and their responsibilities are:

* EGI.eu staff:
	+ Provide guidance and templates for project formalisation (as required: template for project initiation document, Virtual Team project, MoU, etc.)
	+ Invite relevant experts from EGI and the broader e-infrastructure communities to participate process of collecting and analysing the needs, opportunities and constraints for joint work with the new community (from the Competence Centres, NGIs, partner projects, etc. as required)
	+ Get approval and support for the integration project from EGI, and from scientific communities.
* Members of the new community and members of EGI:
	+ Capture and analyse the technical challenges and requirements of the integration
	+ Participate in the technical analysis
	+ Identify solutions by which the requirements can be addressed, offerings can be integrated/matched
	+ Contribute to project initiation document
	+ Approve project initiation document

### Implementation

During the implementation phase the integration projects are instantiated according to the plans, then executed. The projects are monitored by EGI.eu staff to ensure progress and to initiate corrective actions (such as update to project plan) if required. Compared to previous phases the execution of projects may require a different set of members. These members, their commitment level (e.g. hours/week), and expected contributions to the project should be defined as much as possible already in the project initiation document. The responsibilities of project members are:

* EGI.eu staff:
	+ Help the project choose a coordinator.
	+ Support the coordinator as required, e.g. monitor the project and if necessary initiate corrective actions (e.g. change to project plan).
	+ Provide logistics support for the project (e.g. public website, email list, booking teleconference system for meetings, etc).
	+ Contribute to project as required according to the project initiation document.
	+ Disseminate project results.
* Other members of EGI and the new community:
	+ Contribute to project as required according to the project initiation document.
	+ Disseminate project results.

# Tools

A number of online resources and tools exist to support the execution of the Engagement strategy. These are:

* Repository of communication and marketing materials and templates: <http://www.egi.eu/news-and-media/publications/>
* Registry of upcoming events that can be relevant for EGI members to attend and promote EGI (with planned contributions from EGI): <http://wiki.egi.eu/wiki/Research_Conferences>
* How to capture scientific leads with who scoping should follow up:
	+ Report back during the regular NIL, Champion, UCB teleconference meetings
	+ Email contacts to support@egi.eu
* Regular meetings for the Engagement Board:
	+ <https://indico.egi.eu/indico/categoryDisplay.py?categId=36>
* Email lists:
	+ NILs: ngi-international-liaisons@mailman.egi.eu
	+ Champions: Champions-discuss@mailman.egi.eu
	+ UCB: UCB-discuss@mailman.egi.eu
* NIL contact table: <http://www.egi.eu/community/ngis/NILs.html>
* Requirements Tracker: The evolution of the European Grid Infrastructure is driven by the users. Therefore capturing and following up feedback from users reached during Engagement is a key goal for all the three phases of the Engagement activity. The EGI-InSPIRE project has established a process and a database to collect, capture, process, and resolve user requirements and recommendations. Requirements and recommendations from users must be captured in the ‘RT system’, and are followed up by technical experts in EGI, and externally through the Technology Coordination Board. Details are described on this page:
	+ <https://wiki.egi.eu/wiki/Requirements_Tracking>
* Templates for Virtual Team projects:
	+ project initiation document template, and project final report template: <https://documents.egi.eu/document/1991>
	+ VT project wiki page template: <https://wiki.egi.eu/wiki/VT_Template_Wiki_page>

# Plans for the next period (February-Aug 2015)

## For Research Infrastructures

* Prepare for the launch of EGI Competence Centres of the EGI-Engage project:
	+ EISCAT\_3D
	+ ELIXIR (with the involvement of Open Science Grid – US)
	+ EPOS
	+ BBMRI
	+ MoBrain (structural biology, neuroscience with links to the Human Brain Project) - with the involvement of Open Science Grid – US
	+ DARIAH
	+ LifeWatch
	+ Environmental science for disaster mitigation

The CCs will be focussed during the period on engaging with members of their scientific communities to collect technical requirements from them, document these requirements and start preparing suitable project and system plans to address the emerging needs.

* Continue the implementation of the on-going technical projects at European and national level:
	+ Integrating ELIXIR reference datasets into EGI
	+ Support for genome analysis and protein folding
	+ Implementation of integrated science gateway for CTA (follow-up of the ‘Technology Study for CTA VT project’)
	+ KM3Net
	+ At a NGI level
		- CLARIN – BG, CZ, PL
		- ICOS – CZ
		- ELI – CZ
		- ESS – PL
		- KM3Net – DE, GR by EGI.eu
* Futher evolve the EGI Federated Cloud use cases
* Instantiate new collaborations for
	+ EuroBioImaging
	+ ICOS (in collaboration with EUDAT)
	+ Medical Metabolomics (in collaboration with the PhenoMeNal project)
	+ Marine and fresh water sciences (in collaboration with the iMarine project)

## For research collaborations

* Formalise Service Level Agreements and related Operation Level Agreements with the Heavy User Communities of EGI (largest VOs) from the following domains:
	+ Astronomy & Astrophysics
	+ Computational Chemistry, Materials Sciences and Technology
	+ Earth Sciences (incl. VERCE)
	+ Life Sciences Grid Community
	+ WeNMR (Structural Biology)
	+ DRIHM VRE (hydrometeorology)
	+ Biodiversity sciences (BioVeL)
	+ Nanotechnology
	+ Agricultural sciences

## For the long-tail of science

* Conclude the implementation of the ‘EGI Platform for the Long-tail’ and release this for the NGIs. The following milestones have to be reached:
	+ Full implementation of the User Registration Portal including integration with EGI SSO identity provider.
	+ Completing and testing the support for user-specific proxies in CREAM middleware, and OpenNebula and OpenStack cloud management frameworks. Roll-out of the new releases to sites that willing to offer resources for the European long-tail VO.
	+ Testing user-specific proxy generation mechanism in the following science gateways:
		- Catania Science Gateway Framework
		- WS-PGRADE
	+ Integration of the science gateways with the User Registration Portal (its database).
	+ Investigation of the status of identity and attribute release from EduGAIN IdPs, decide about and implement EduGAIN integration with the User Registration Portal and the science gateways accordingly.
	+ Setup the European virtual organisation for the long tail from voluntary grid and cloud computing resources. Formalise commitments with a lightweight OLA.
	+ Configure the virtual organisation in the science gateways.
	+ Perform integrated tests on the setup then begin promotion campaign of the platform to the NGIs and to scientific communities.

## For SMEs and industry

* The EGI Business Engagement Programme will be discussed by the EGI Council on the 12th of February. Council members will answer the following questions:
	+ Is the programme fit for purpose in terms of aim and scope?
	+ Are the benefits and opportunities offered by EGI exemplary?
	+ Does the three-tier structure offer the right range of options for enterprises and SMEs?
	+ Does the draft of implementation plan appropriately match resources and required activities?

Based on the answers the community will start implementing the strategy based on the implementation plan included in the strategy document itself.

* Actions:
	+ Develop Cloud SaaS business use cases for CAE software
	+ Provide big data value access of commercial relevance for integrated cloud and data offering
	+ Concept definition of the EGI Marketplace
1. ESFRI roadmap: <http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri-roadmap> [↑](#footnote-ref-1)
2. EGI Business Engagement Programme: <https://documents.egi.eu/document/2339> [↑](#footnote-ref-2)
3. This action plan is captured in the most appropriate form that satisfies the parties. E.g. as a Memorandum of Understanding, as a Virtual Team project, as a H2020 initiative, as an email agreement, etc. [↑](#footnote-ref-3)