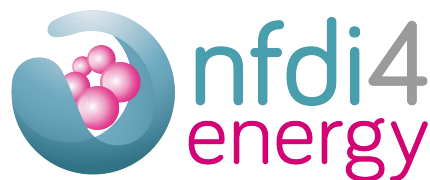




NFDI4ING



Memorandum of Understanding

The consortia NFDI4ING and NFDI4Energy in the German National Research Data Infrastructure (NFDI) hereby agree to collaborate in the field of research data management in the following areas of cooperation.

About the consortia

NFDI4ING unites engineering research communities to make engineering research data Findable, Accessible, Interoperable, and Reusable (FAIR) through effective research data management. By developing, sharing, standardizing, and offering robust methods and services, NFDI4ING strengthens the sustainability of research processes and solutions.

NFDI4Energy is the consortium for the energy research community, providing services for energy researchers to manage, publish, and reuse data and software throughout the research process. NFDI4Energy sees FAIR data and software as the scientific foundation for a sustainable energy future.

Goals for the collaboration

NFDI4Energy and NFDI4ING are jointly targeting engineering scientists in energy research from two perspectives. While NFDI4ING covers the community from a methodical focus, NFDI4Energy has a high focus on the content of the research. To better serve this community, both consortia intend to intensify their collaboration. By combining their expertise, they seek to create new opportunities that support their respective missions and generate benefits for their communities. Through coordinated efforts, the consortia aim to achieve their common goals more effectively and to foster sustainable progress in research and innovation.

Areas of cooperation

Cooperation areas include, but are not restricted to:

- Mutual invitations and participation in consortia meetings and conferences
- Helpdesk cooperation
- Approaching stakeholders together

- Training
- Teaching Data Literacy in university courses
- Joint calls for cross-consortial use cases
- Opening services for the other community
- Joint service development
- Joint development of metadata and ontologies

The consortia plan to **mutual invite** each other to relevant **consortia meetings** and **consortia conferences** (e.g., the yearly NFDI4Energy / NFDI4ING conferences, the events NFDI4ING regarding energy science community by its Task Area Archetype ELLEN). Thereby, the consortia have opportunities to learn from each other's experiences, exchange insights, and stay updated on the latest developments in the consortia. **Attending** each other's events allows members of both communities to meet, network, and foster collaboration and potential joint initiatives. This engagement helps both consortia to align their strategies and to advance their shared objectives more effectively.

The **helpdesks** of both consortia plan to **closely collaborate** to allow the communities to access a wider pool of expertise, receive faster and more accurate support, and benefit from shared resources and best practices. This enhances user support and improves efficiency.

The consortia plan to **jointly approach external stakeholders** to increase visibility and inform on research data management together. Joint commitment enables them to present unified positions, share resources, and build stronger networks. Relevant stakeholders to both consortia are the related DFG-Fachkollegien, the VDI, and the VDE.

The consortia plan to collaborate in the area of **training** by hosting joint events both on- and offline, e.g., webinars, coffee lectures and summer schools. Furthermore, they will exchange training materials, e.g., via [DALIA](#), expertise, and best practices. They foster networking and collaboration among members, while increasing efficiency through shared resources and coordinated efforts. The consortia intend to incorporate joint material for training purposes.

The consortia plan to work on the **integration of data literacy elements** in university curricula together. By adding data literacy to university courses, students learn about good data management from early on.

The consortia plan to arrange funding for **cross-consortial use case calls**. A use case demonstrates RDM services, concepts and processes in realistic projects with a typical research question to establish these and support their use in the community. By providing example applications, tutorials or best practices or making existing data easily accessible, a use case aims to improve RDM processes throughout the research lifecycle. A use-case becomes cross-consortial if it uses services from both consortia and/or makes a service from one consortia usable for the other. This allows us to combine our expertise, share insights and develop practical solutions to common problems.

Both consortia agree to introduce and highlight their respective services to the specific communities of the other consortium. Where feasible, both consortia will work together on making existing add-ons, adaptations, templates, and similar components developed by one consortium available in the services of the other (e.g., Coscine templates, RDMO questionnaires, etc.).

NFDI4ING will explore options for making the services Coscine and Jupyter available to the NFDI4Energy community within the bounds of legal and financial limitations. NFDI4Energy does not operate access-restricted services, therefore, its services are generally open to the NFDI4ING community.

Both consortia will work together to support interoperability between their respective community repositories, e.g. RADAR4ING and Leibniz Data Manager. This includes exploring and, where feasible, implementing mechanisms for the exchange of metadata to improve discoverability and reuse across both communities.

Additionally, both consortia use RDMO as DMP and SMP tool and will deepen their collaboration in developing DMP/SMP templates and the technical integration. The consortia also both offer the ORKG and the Terminology Service which are, and will continue to be, jointly developed.

Metadata and ontologies are developed jointly. Here, collaborative work on research software metadata is underway. To further strengthen **semantic interoperability**, both consortia will coordinate on shared metadata profiles based on Metadata4Ing, controlled vocabularies, and ontologies (including mappings between community schemas) and promote the consistent use of persistent identifiers, wherever appropriate.

Both consortia will further collaborate on improving AI assisted workflows for RDM processes of the engineering and energy science community, e.g. in the context of ORKG Ask.

Signatories of the memorandum

For NFDI4ING

- Peter Pelz (Technische Universität Darmstadt)

For NFDI4Energy

- Astrid Nieße (Carl von Ossietzky Universität Oldenburg)

Acknowledgement

The authors would like to thank the German Federal Government, the German State Governments, and the Joint Science Conference (GWK) for their funding and support as part of the NFDI4INGg and NFDI4Energy consortia. The work was funded by the German Research Foundation (DFG) – 442146713, 501865131 within the German National Research Data Infrastructure (NFDI, www.nfdi.de).