Contribution ID: **38**   Type: **Poster**

From Start to Finish- The Ideal Process of Using Simulation Software in Energy Research Projects

Wednesday 26 February 2025 19:40 (20 minutes)

There are many methods for conducting research in literature. The research and transfer cycle within energy system research projects by Stephan Ferenz describes how to carry out a FAIR research project in six steps. However, these steps are very general and do not focus on research software. In energy research, simulation software is especially a vital research artifact. Therefore, we are developing services to support researchers using simulations in their research within the National Research Data Infrastructure for Interdisciplinary Energy System Research (NFDI4Energy).

To better analyze the needs of researchers, we have collected multiple use cases that describe the different steps of energy system research with simulation software. Subsequently, we organized these use cases and designed a process for using simulation software in energy research. The process begins with providing teaching materials on simulation in energy system research. It ends with providing the simulation scenarios and the research results in a suitable data repository and a software registry. The process links the use cases relatively simply, but researchers with different levels of prior knowledge can also apply it. To this end, we have defined various entry points so that experienced researchers can skip the first steps and start directly with creating a simulation scenario, for example. The aim of the process is to support the research process and share the results of the simulations FAIRly in the end. In research, not only the data generated in a simulation is interesting, but also the developed models and software, so we encourage them to share these in a software registry. Our aim within NFDI4Energy is to develop services and tools from scratch and offer existing services by linking them to our platform.

We would like to present our process for using simulation software in energy research as a poster to get some feedback from the RSE community. This overview fits perfectly with the scope of the deRSE conference 2025.

I want to participate in the youngRSE prize

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Session Classification: Poster and Demo Session together with Reception

Track Classification: Research Software: RSE research