Chair of Renewable and Sustainable Energy Systems
Department of Electrical and Computer Engineering
Technical University of Munich

Master's Thesis / IDP / Research Internship (Forschungspraxis)

Ontology Enhancement in the Field of Energy System Modelling

Background

As the importance of energy system modeling is increasing to achieve carbon-neutrality transformation targets, data requirements in the area of energy research also grow rapidly and hence it gets difficult to keep track of large and scattered datasets. To handle this challenge, an ontology for the domain of energy system modelling is openly being developed as community effort. Ontologies can help to provide a common understanding of a domain by providing a formal collection of terms and their relationships with precise definitions and logical interpretations. Applying an ontology to data annotation in databases allows flexible, content-oriented data integration and aggregation. Moreover, ontologies represent the backbone of enhanced methods such as knowledge graphs to handle vast amounts of data in a sophisticated manner.

source: grid4EU
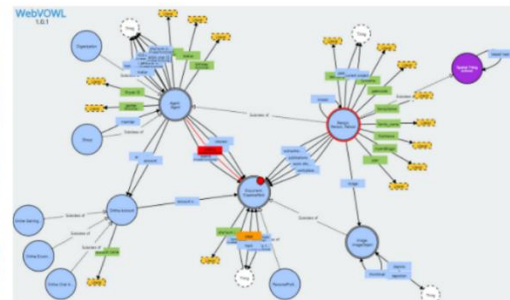
source: WebVOWL

What are the goals of this work?

First, you will become acquainted with the structure of a chosen energy system sector and the theory and application of ontologies. Next, you will develop the ontology in the chosen field in accordance with the existing Open Energy Ontology and integrate your results within the related GitHub repository. Finally, depending on the working progress you could additionally develop a small knowledge graph application to test the defined relations on an exemplary data model. With this work, you will contribute to develop a domain ontology that forms a basis for enhanced data and model interoperability and at the same time support the ongoing national research project SEDOS by improving its data management.

What should you bring with you?

- Interests in energy systems and skills in structured working methods
- Knowledge of ontology principles and the protégé editor (not mandatory)
- Please attach your CV and grade report to your application

Contact

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