Implementing FAIR in the Domain of Energy Systems Analysis



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Open Energy Metadata

Open Energy Metadata (OEMetadata) is a metadata standard for energy, climate and technology data. It is an extensive set of metadata based on the tabular data package and the FAIR principles.

It describes the content, structure of related files or database tables. In its latest version (1.5.1) we have refined it to allow references to ontologies.

The metadata is implemented as JSON to be machine and human readable.

Metadata Description - selected keys

ID	Key	Description	Example
1	name	A file name or database table name.	rli_dea_td_generation_wind_turbine
2	title	A human readable full title including author.	RLI- Techn. Data for Generation of Electricity
4	description	A description or abstract of the data package.	Data catalogue for ren. Technologies
6	subject	An array of objects with topics of the data in OEO terms.	OEO_00000044: wind energy converting unit
9	context	About the research project like homepage and funding.	grantNo: 03EI1005D
19	spatial	The spatial context like location or extend and resolution.	Europe
11	temporal	Temporal information about the reference date or timeseries.	Reference: 2021; Start: 2015; End: 2050
12	sources	Used and underlying sources of the data and metadata.	Danish Energy Agency - Technology Data
13	licenses	License(s) under which the data is provided.	CC-BY-4.0
14	contributors	People who contributed to the data or metadata.	2022-02-11 Create data and Metadata
15.6	fields	An array (list) describing all columns.	
15.6.1	name	The name of the column (field).	generating_capacity
15.6.2	description	A text describing the field.	Generation capacity for one unit
15.6.3	type	The data type of the field.	decimal
15.6.4	unit	Preferably a SI unit.	MW
15.6.5	isAbout	An array of objects with describe the field in OEO terms.	OEO_00230002: declared net capacity
15.6.6	valueReference	Extended description of the values in the column in OEO terms.	type - OEO_00000447: wind farm
15.7	foreignKeys	A foreign key is a field that refers to a column in another table.	null
18	review	Based on the completeness and guality badges are rewarded.	Platinum

Excerpt of keys used in the Open Energy Metadata

Databus as Metadata Catalog

The Databus is a virtual bus. It can address files on the web and coordinate data flows based on DataID metadata. No actual data is uploaded to the bus. Data sources are registered by their metadata and can be searched on the Databus.





https://energy.Databus.dbpedia.org

Open Energy Ontology

The Open Energy Ontology (OEO) is a domain ontology of the energy system modeling context. It contains a formal naming and definition of classes, properties and their relationships. It serves as a reference for concepts, terms and definitions in energy and climate research.

The ontology is based on the Basic Formal Ontology (BFO) in its general structure, which eases mapping and imports of other ontologies following the same structure.

The annotation with the OEO eases data interpretation and increased interoperability of the data.

The definitions, hierarchical structure and relations allow for semantic searches within data annotated with the OEO.



The modular structure and import into the OEO https://github.com/OpenEnergyPlatform/ontology/

Searching Data

The DataID Metadata and the Open Energy Metadata are combined on the Open Energy Databus in the metadata overlay search system. The system allows to identify suitable ontology terms and use them for searching data.



Example of improved visibility and discovery of data through the annotation with OEMetadata metadata and the OEO and the registration of the data on the Databus.

https://moss.tools.dbpedia.org/







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