

Workshop: Kommunale Wärmeplanung

FAIR-KWP

Vorstellung der Open Energy Family für
das Datenmanagement der
kommunalen Wärmeplanung

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2024-11-19



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Reiner Lemoine Institut



1978

Energy Pioneer



1996

Founding Solon



1999

Founding Q.CELLS



2006

Founding RLS

2010

Founding RLI



2017

Move to Adlershof



2020




Foundation of the Graduate School and Network „EnergieSystemWende“

Objective of the RLI

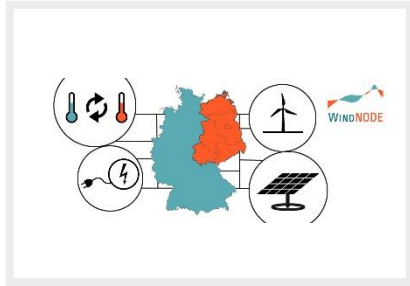
Scientific support for the energy transition towards 100% renewable energies

Team

About 100 employees, organized in three research units

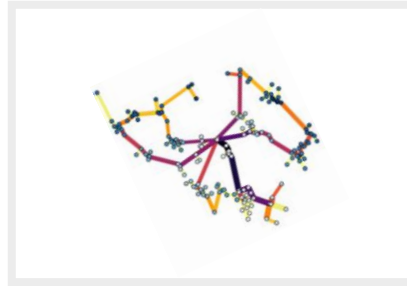
<p>Transformation of Energy Systems</p> 	<p>Off-Grid Systems</p> 	<p>Mobility with Renewable Energies</p> 
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Transformation of Energy Systems



Energy System Modelling

- Energy scenarios
- Sector coupling: electricity, heat, mobility
- Expansion scenarios



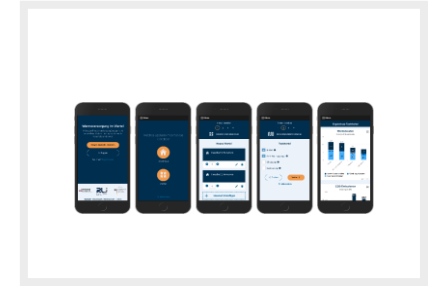
Power Grids

- Storage positioning
- Flexibility assessment
- Distribution grids



Data Management & Open Science

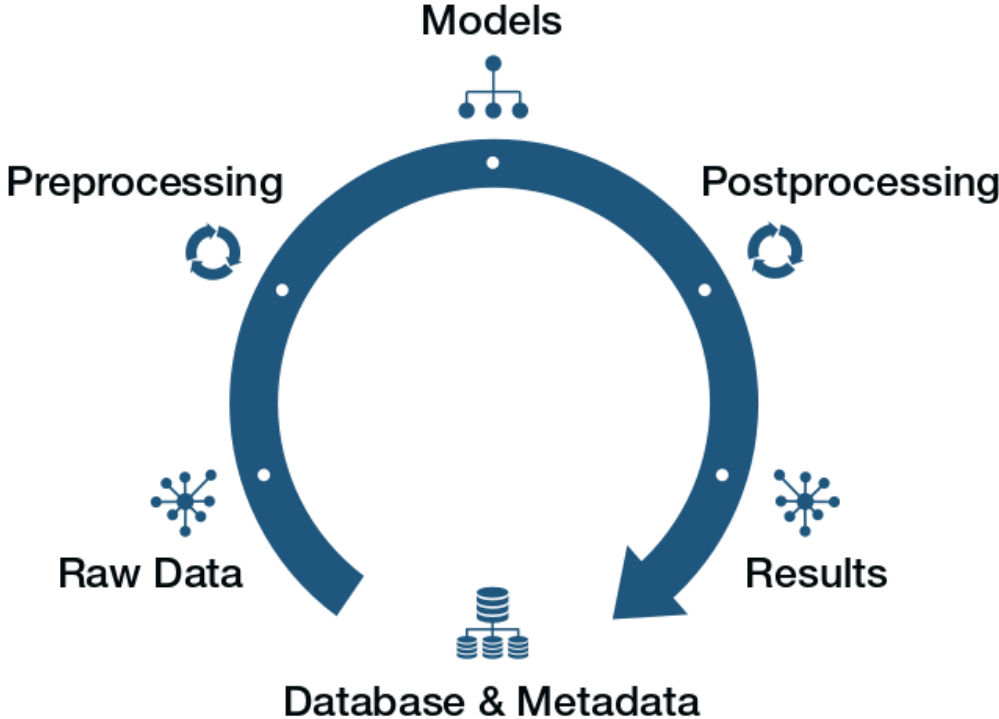
- Research Data Management
- Databases
- Data Processing
- Ontology and Knowledge Graphs



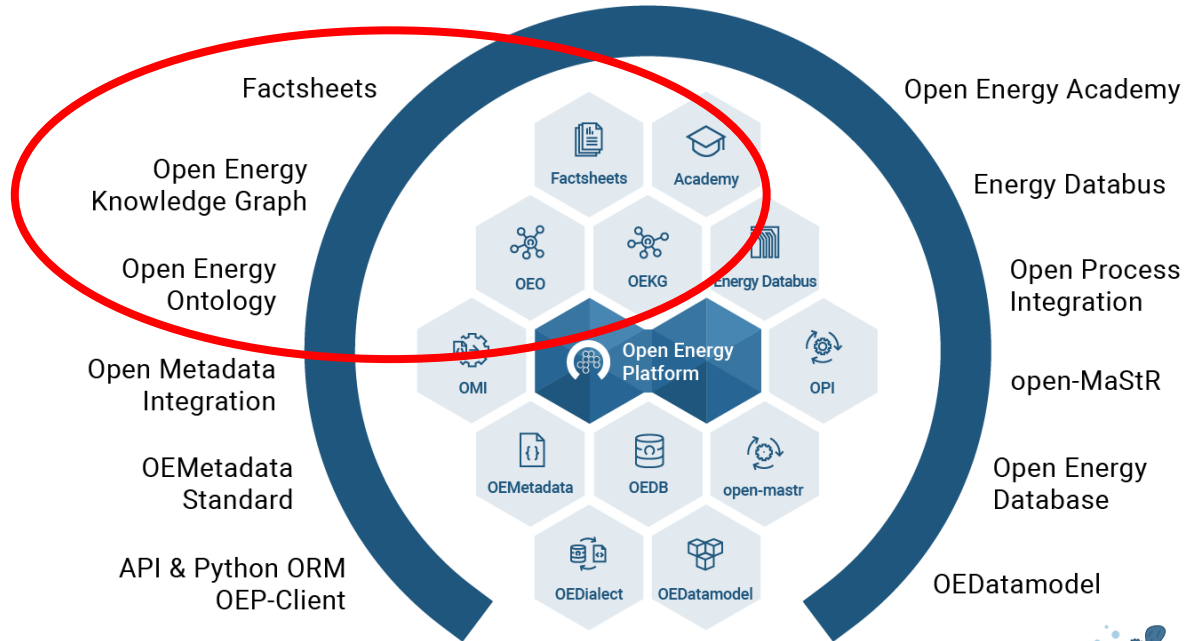
Visualisation & Participation

- Interactive maps & Tools
- Web interfaces
- Participation

Images not licensed!



Open Energy Family – An Energy-Data-Ecosystem



Open Energy Family



Open Energy Family



openenergyplatform.org

- University Magdeburg is host and Reiner Lemoine Institut (RLI) the main developer
- Funded projects until 2028
- Cross-tier community project
- Code available at [GitHub](#)

Gefördert durch:



Bundesministerium
für Wirtschaft
und Energie

aufgrund eines Beschlusses
des Deutschen Bundestages



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Open Energy Family



Open Energy Metadata

➤ An energy metadata standard (v2.0: 86 keys in 13 sections)

Dataset

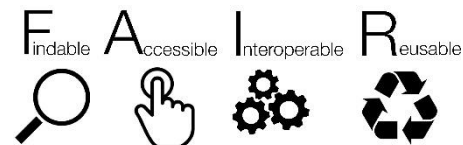
- Resources
- Linked Data
- General Keys
- Spatial
- Temporal
- Sources
- Licenses
- Provenance
- Type
- Fields
- Field Properties
- Review
- MetaMetadata



Open Energy Metadata (OEMetadata)

The energy metadata standard including a metadata schema, templates, and examples.

License	license MIT
Documentation	build no status
Publication	pypi v2.0.1 downloads 563/month
Development	open issues 17 closed issues 102 open pull requests 0 closed pull requests 81
Community	contributions welcome contributors 9 hits 113



Open Energy Ontology

The Open Energy Ontology (OEO) is a dynamic domain ontology for energy system modeling, updated regularly following a release cycle.

Access the latest version 2.5.0 [here](#).

Domain ontology: What is that?

An ontology is a structured collection of terms and their relationships, providing clear definitions and logical interpretation. The OEO aims to create a common language for energy system modeling, bridging various disciplines.

Standardising Terminology

Provides a controlled vocabulary with clear definitions, disambiguating terms

Visualisation

Makes complex knowledge comprehensible through various visual formats

Data Annotation and Integration

Enhances data integration, aggregation, and search functions

Text and Data Mining

Automates searches across resources, aiding discovery, data synthesis, and meta-analysis

Templates for Data Capture

Ensures uniform and detailed reporting structures

Ontologies

Name	Version
Open Energy Ontology (OEO)	2.5.0
Open Energy Ontology Extended (OEOX)	1.0.0

Get the latest OEO release

Get the [Glossary](#) to get an overview of the OEO contents.

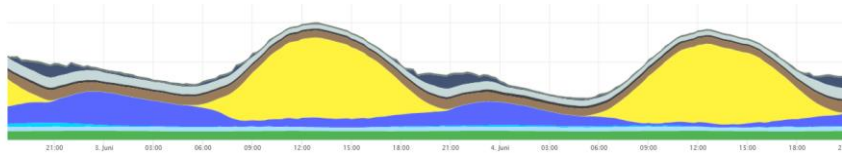
[Download latest release 2.5.0](#)

Download the latest oeo version 2.5.0 in OWL format:

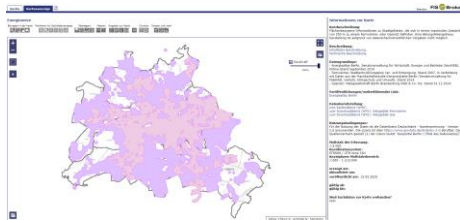
[Download full-oeo](#) ⓘ

[Download closure](#) ⓘ

Open Energy Family



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MaStR ID	Name	Standort	Maximale Erzeugungskapazität (MW)	Regelungsart	Bezeichnung des Einheits
EMER00000001	Reaktor	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000002	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000003	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000004	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000005	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000006	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000007	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000008	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000009	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN
EMER00000010	PKW	BRUNNEN	1000	Stromerzeugungseinheit	BRN

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Marktstammdatenregister“
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Terminologie:

SMARD: „Installierte Erzeugungleistung“

FIS-Broker: „Installierte Leistung“

MaStR: „Bruttoleistung“

```
"isAbout": [ {  
  "name": "nameplate capacity",  
  "@id": "https://openenergyplatform.org/ontology/oeo/OEO_00230003/" }, ],
```



Annotate the **most important** parameters!

- ▼ quantity value
 - > areal power density
 - > areal energy density
 - global warming
 - potential
 - emission quantity value
 - power value
 - forecast error
- ▼ maximum value
 - ▼ power capacity
 - power rating
 - declared net
 - > capacity
 - nameplate capacity
 - energy storage
 - capacity

Definition:

Nameplate capacity is the *power capacity* stating the *maximum power* an artificial object, e.g. a power generating unit or a power plant, can generate, and the sum of the power ratings of all energy converting component of that power plant.

Open Energy Family



- **Bundles** for Studies, Scenarios and standardised **Factsheets** for frameworks and models

← View Edit Save Share Delete

Basic information	Study detail	Publications	Sectors and technology	Scenarios	Models and frameworks
Study name ⓘ	<input type="text"/>				
Acronym ⓘ	<input type="text"/>				
Institutions ⓘ	<input type="text"/>				
Contact person ⓘ	<input type="text"/>				

Open Energy Family



Filter Reset Compare scenarios LIST CARDS

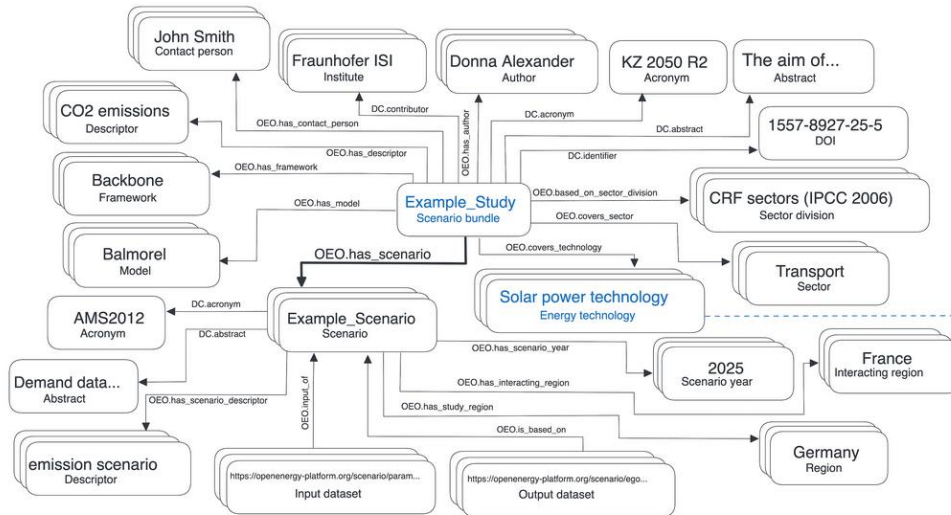
Study name ↑	Acronym	Scenarios
Klimaschutzszenario 2050 - 2. Modellierungsrunde	DE-KSz-2050-R2	AMS (2012) KS 80 KS 95
De karbonisierung Verkehr - Rückkopplung Energiesystem	DeV-KopSys	
Untersuchungen zur Energiestrategie Brandenburgs	appBBB_gruene2030	appBBB_ES2030 appBBB_gruene2030 appBBB_kohlefret_gruene2030
Consolidated and Harmonised GHG Emission Projections from European Legislation	EU-CH-GHG	WEM WAM WOM
Politiksznarien für den Klimaschutz XI	DE-PB-2023	WEM WAM
GHG emission projection data submitted in 2019 by Germany under Regulation (EU) 5252013	DE-MMR-2019	WEM
PROJECT SEDOS - Die Bedeutung der Sektorintegration im Rahmen der Energiewende in Deutschland Modellierung mit einem nationalen Open Source ReferenzEnergieSystem	SEDOS	Scenario frame
PROJECT Stadt-Land-Energie - Robustheit und Übertragbarkeit von interkommunalen Energiewendeszenarien im Stadt-Land-Nexus	Stadt-Land-Energie	
Politiksznarien für den Klimaschutz IX	DE-PB-2019	WEM

Open Energy Family



- Open Energy **Knowledge Graph** (OEKG)
 - Scenario Bundles and Scenario Comparisons

Open Energy Knowledge Graph schema



Criteria

- Scenario abstract
 Study name
 Study abstract
 Study descriptors
 Scenario types
 Regions
 Interacting region
- Input datasets
 Output datasets

AMS (2012)
Base scenario

Study name:
Klimaschutzszenario 2050 - 2. Modellierungsrunde

Study descriptors:

sufficiency
 Greenhouse gas emissions
 CO2 emissions
 total net electricity generation
 degree of electrification
 peak electricity generation

Scenario types:

with existing measures scenario
 policy scenario

WAM

Study name:
Consolidated and Harmonised GHG Emission Projections from European Legislation

Study descriptors:

Greenhouse gas emissions
 CO2 emissions
 scenario projection comparison

Scenario types:

emission scenario
 greenhouse gas emission scenario
 policy scenario
 CO2 emission scenario
 with additional measures scenario

- Die OEFamily ermöglicht State-of-the-Art Datenmanagement
- Offene Infrastruktur entwickelt von einer breiten Community
- Weiterentwicklung zur NFDI4Energy Plattform

- Die Funktionalitäten der OEP eignen sich gut für das FDM der KWP
- Eingangsdaten und Ergebnisse werden damit FAIR

Herausforderungen:

- Harmonisierung der Datenstrukturen / Synergien bei der Datenerfassung
- Beachtung von Rechten und strikte Einhaltung des Datenschutzes

„The opposite of ‘open’ isn’t ‘closed’. The opposite of ‘open’ is ‘broken’.“



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