

Data Infrastructure for Energy System Models

Using Linked Open Data and the Global Earth Observation Systems of System in Energy Systems Analysis

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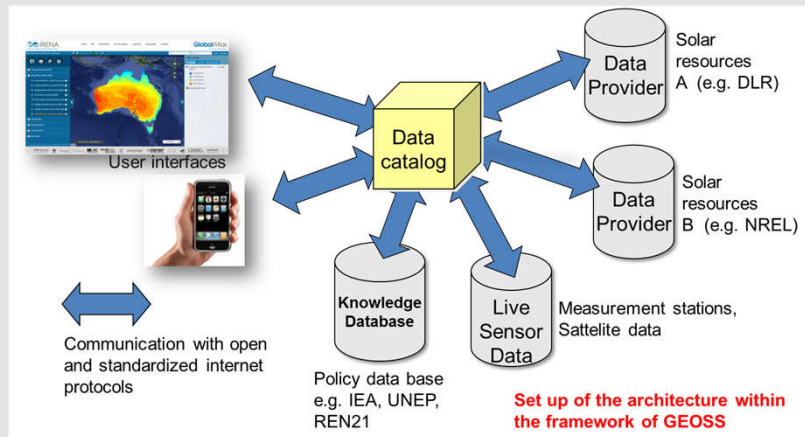
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Challenges

Modeling in energy systems analysis needs a lot of data from a variety of sources as:

- Meteorological time series for renewable power generation
- Electricity demand from the transparency platforms
- Technology data
- Socio economic data
- Geographical land use data
- etc.

There are a lot different sources available, but they are sometimes hard to find and each has different ways of accessing the data and different ways how data fields are defined.



Concept of networked data bases in GEOSS applied to the Global Atlas of Renewable Energy Sources of IRENA. All data sources are registered in the data catalog and can be discovered there. Data sources provide standardized descriptions of access mechanisms, e.g. through WSDL (Web Service Description Language). Geo data is provided according to the standards of the Open Geospatial Consortium (OGC).
Source: Own Composition.

Learning from Earth Observation and Linked Open Data

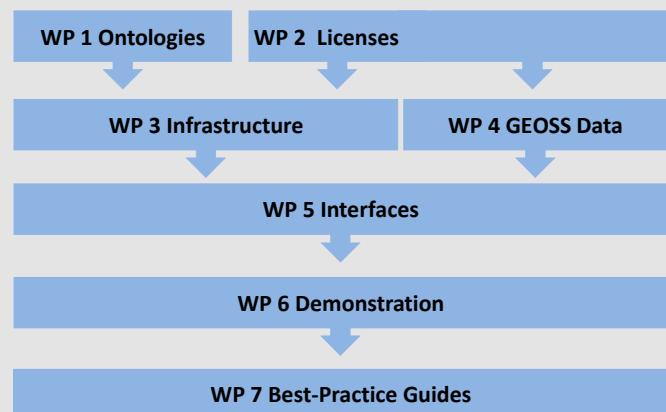
Similar problems arose in earth observation about two decades ago. The answer was the development of a distributed data infrastructure for Earth Observation data, the Global Earth Observation Systems of Systems (GEOSS) under the coordination of GEO (Group of Earth Observation). Data could be found through data catalogs, where providers registered their metadata and ways of data access could be discovered through standardized interface descriptions like e.g. WSDL (Web Service Description Language).

As the data remained within the hosting institutions, they remained responsible for the data and data maintenance, which eases legal questions and updates of the data.

The idea is the development of a networked data base concept based on the ideas of linked open data and the semantic web for input and output data of energy system models in energy systems analysis.

Activities

- **Ontologies**
Update and enhancement of the Open Energy Ontology as a dictionary of energy systems analysis
- **Licenses**
Promotion of open licenses for data
- **Concept for a distributed data base infrastructure**
Development of a concept for a distributed data base infrastructure
- **Linking to GEOSS data**
A link will be established to the Global Earth Observation System of Systems for spatially and temporally resolved data.
- **Interfaces, Demonstration and Best Practice Guides**
The developed tools will be tested with various energy system models within the project. Finally best practice guides will be developed which support the further use of the tools in energy systems analysis.



Community Networking

A successful data infrastructure needs to be rooted within the community (such as OpenMod). Therefore, this work is integrated in the "German Research Network on Energy Systems Analysis." Furthermore we plan to enhance our outreach in the European and global community, so that everyone can profit from the easier future access to data. We will present our progress on conferences and workshops and conduct stakeholder workshops throughout the project.