

# Reviewing the Energy Semantic Artefacts Landscape

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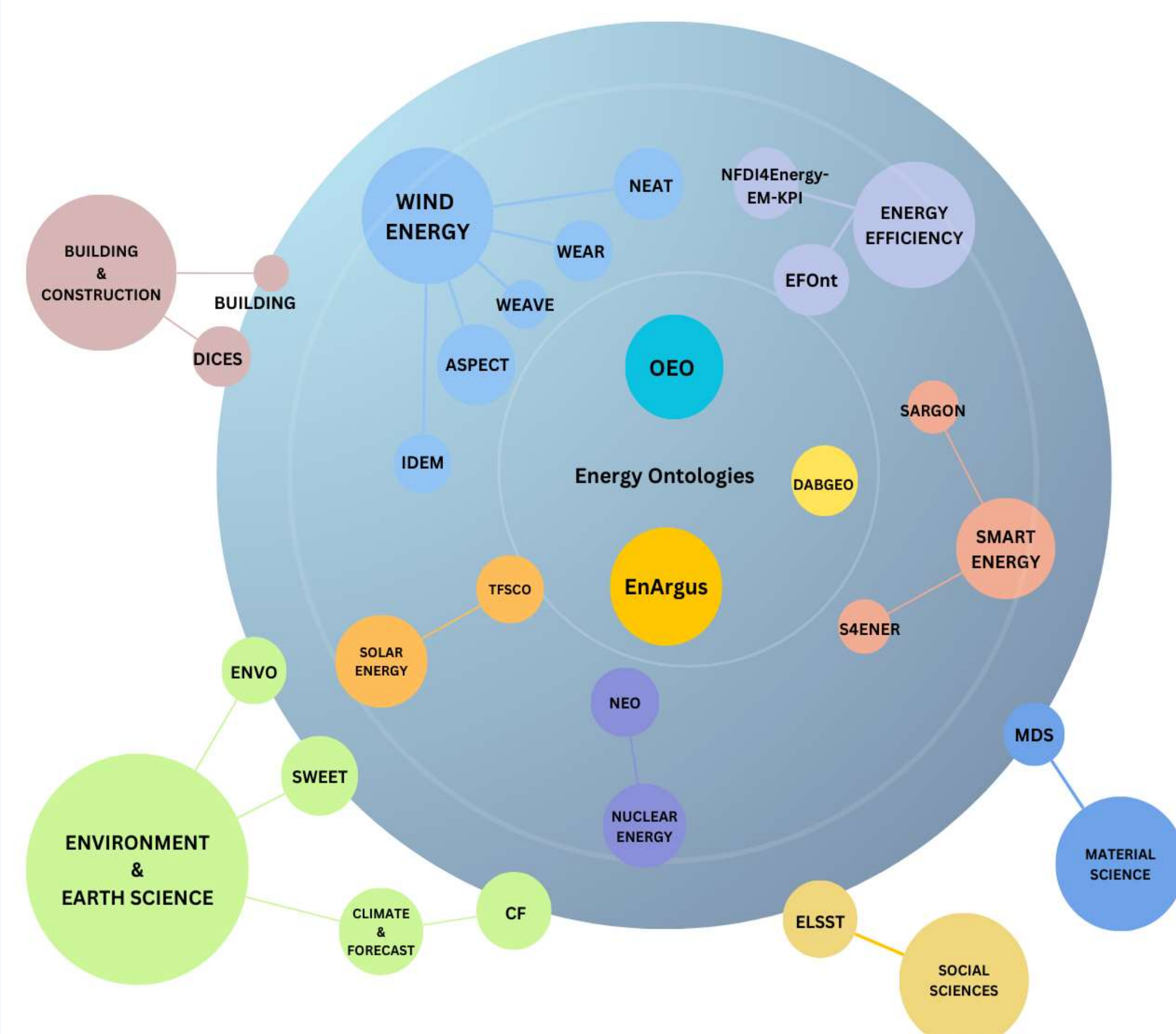
The UK Energy Research Centre ([www.ukerc.ac.uk](http://www.ukerc.ac.uk)) undertakes “Independent whole systems research for a sustainable energy future” and was formed in 2004. The Energy Data Centre (EDC) is a capability of UKERC and provides a discovery portal which provides additional subject facets for access.

## Semantic Artefacts: what are they and why are they useful?

Semantic artefacts covers a variety of knowledge management tools including glossaries, controlled vocabularies, taxonomies, thesauri and ontologies. They all provide mechanisms to formally describe concepts so that shared understanding can be achieved. Using these to add context to data in repositories aids discovery.

The FAIR principles recommend that for interoperability FAIR vocabularies should be used, i.e. those that are both human and machine understandable. There is also an emphasis on domain standards. The Energy sector is multi-disciplinary community(s), and this work reviewed the landscape of energy semantic artefacts to better understand what is available and how well used it is.

## What we found



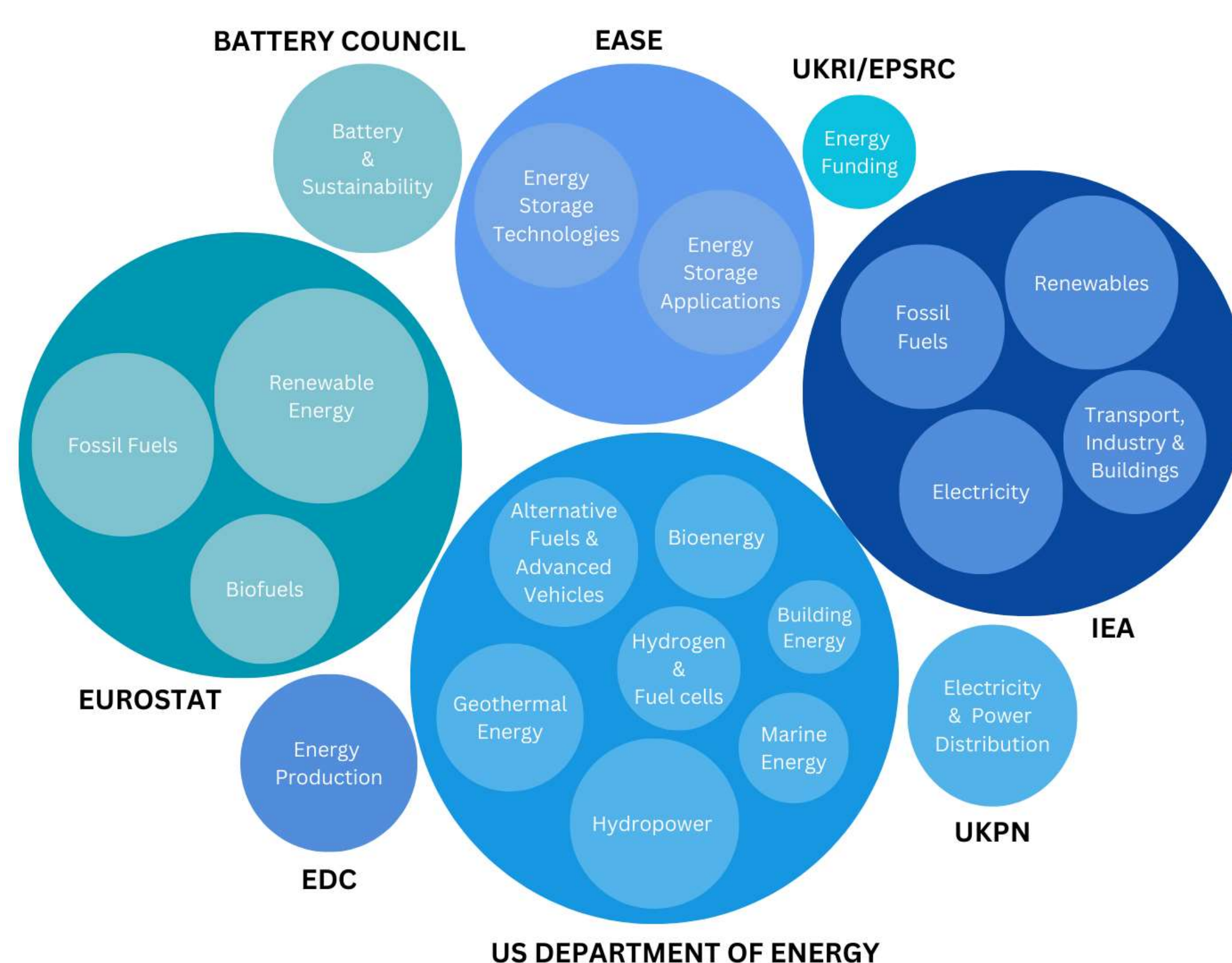
Various **ontologies** were reviewed, and **Open Energy Ontology (OEO)** was identified as the largest ontology with energy in focus.

**OEO** is also the most comprehensive covering energy models, energy generation and social and economic aspects of energy.

Additionally, other domain ontologies that include energy terms were also reviewed and represented.

We identified **schemas and glossaries** from various global organisations, some of which are represented here.

**Controlled vocabularies** such as The UKRI's NERC Vocabulary Server (NVS), the energy-related **taxonomy** from International Renewable Energy Agency (IRENA) and the **STW Thesaurus for Economics** were also found to cover energy terms.

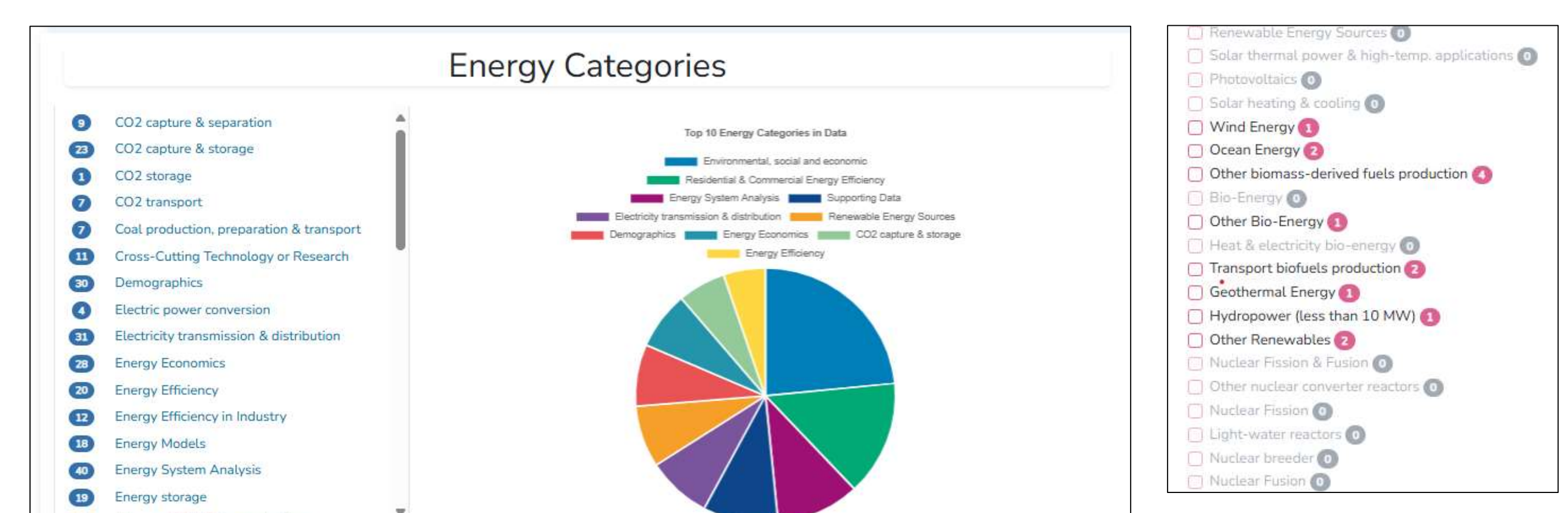


## EDC's use of semantic artefacts

The portal uses semantic artefacts to enhance discoverability, filtering and to ensure consistency.

### Energy Categories

- based on the IEA scheme from 2004. Covers a range of energy topics, with an energy production focus. 3 level hierarchy, no explicit relationships
- Pro: a large corpus of records classified consistently with recognised terms
- Con: Gaps for new technologies or demand reduction concepts. No ability to traverse relationships



Examples showing use in search/browse and filtering

## Conclusions

This is an active area. There are many semantic artefacts at many different levels of abstraction.

There remains no well accepted semantic artefact at the overarching level, although the Open Energy Ontology may achieve this.

EDC will look to extend energy categories with terms from other schemas to cover coverage gaps.

