

# Circular Economy Ontology Network (CEON) - Energy Module

## Metadata

**IRI**

<http://w3id.org/CEON/ontology/energy/>

**Title**

Circular Economy Ontology Network (CEON) - Energy Module

**Creator**

Huanyu Li

**Contributor**

Eva Blomqvist  
Mikael Lindecrantz  
Robin Keskisärkkä

**Date Created**

2024-11-01

**License**

<https://creativecommons.org/licenses/by/4.0/>

**Version Iri**

<http://w3id.org/CEON/ontology/energy/0.1/>

**Version Info**

0.1

**Preferred Namespace Prefix**

energy

**Preferred Namespace Uri**

<http://w3id.org/CEON/ontology/energy/>

**Description**

A module of the CEON ontology network defining aspects of the energy concept.

**Covers Requirements**

Covers the following requirements from Onto-DESIDE D2.3: CE1-2, CE4-3, CE6-3, CE7-4, CE8-2, CE10-7, CE10-9, CE11-6, CE12-5.

## Classes

Anergy <sup>C</sup>	
IRI	<a href="http://w3id.org/CEON/ontology/energy/Anergy">http://w3id.org/CEON/ontology/energy/Anergy</a>
Sub Class Of	<a href="#">Energy<sup>C</sup></a>
In Range Of	<a href="#">hasAnergy<sup>OP</sup></a>

Biofuel <sup>C</sup>	
IRI	<a href="http://w3id.org/CEON/ontology/energy/Biofuel">http://w3id.org/CEON/ontology/energy/Biofuel</a>
Sub Class Of	<a href="#">Biomass<sup>C</sup></a>

## Biogas<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/Biogas>

**Sub Class Of** [Biomass<sup>C</sup>](#)

## Biomass<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/Biomass>

**Sub Class Of** [EnergySource<sup>C</sup>](#)

**Super Class Of**  
[Biofuel<sup>C</sup>](#)  
[Biogas<sup>C</sup>](#)

## Coal<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/Coal>

**Sub Class Of** [FossilFuel<sup>C</sup>](#)

## Energy<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/Energy>

**Sub Class Of** <http://w3id.org/CEON/ontology/resourceODP/Resource>

**In Domain Of** [hasEnergySource<sup>op</sup>](#)

**Super Class Of**  
[Anergy<sup>C</sup>](#)  
[Exergy<sup>C</sup>](#)  
[NonRenewableEnergy<sup>C</sup>](#)  
[RenewableEnergy<sup>C</sup>](#)

## Energy Composition<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/EnergyComposition>

**Sub Class Of** <http://w3id.org/CEON/ontology/actorODP/ResourceParticipation>

**In Domain Of** [hasEnergyComponentPercentage<sup>dp</sup>](#)

## Energy Conversion<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/EnergyConversion>

**Sub Class Of** <http://w3id.org/CEON/ontology/actorODP/ResourceRelation>

## Energy Infrastructure<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/EnergyInfrastructure>

**Sub Class Of** <http://w3id.org/CE0N/ontology/actorODP/Infrastructure>

## Energy Source<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/EnergySource>

**In Domain Of** [hasCarbonIntensity<sup>dp</sup>](#)  
[hasSustainability<sup>dp</sup>](#)

**In Range Of** [hasEnergySource<sup>op</sup>](#)

**Super Class Of** [Biomass<sup>C</sup>](#)  
[FossilFuel<sup>C</sup>](#)  
[GeothermalEnergySource<sup>C</sup>](#)  
[Hydropower<sup>C</sup>](#)  
[SolarEnergySource<sup>C</sup>](#)  
[Wind<sup>C</sup>](#)

## Exergy<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/Exergy>

**Sub Class Of** [Energy<sup>C</sup>](#)

**In Range Of** [hasExergy<sup>op</sup>](#)

## Fossil Fuel<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/FossilFuel>

**Sub Class Of** [EnergySource<sup>C</sup>](#)

**Super Class Of** [Coal<sup>C</sup>](#)  
[NaturalGas<sup>C</sup>](#)  
[Petroleum<sup>C</sup>](#)

## Geothermal Energy Source<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/GeothermalEnergySource>

**Sub Class Of** [EnergySource<sup>C</sup>](#)

## Hydropower<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/Hydropower>

**Sub Class Of** [EnergySource<sup>C</sup>](#)

## Natural Gas<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/NaturalGas>

**Sub Class Of** [FossilFuel<sup>C</sup>](#)

## Non Renewable Energy<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/NonRenewableEnergy>

**Sub Class Of** [Energy<sup>C</sup>](#)

## Petroleum<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/Petroleum>

**Sub Class Of** [FossilFuel<sup>C</sup>](#)

## Renewable Energy<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/RenewableEnergy>

**Sub Class Of** [Energy<sup>C</sup>](#)

## Solar Energy Source<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/SolarEnergySource>

**Sub Class Of** [EnergySource<sup>C</sup>](#)

## Wind<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/Wind>

**Sub Class Of** [EnergySource<sup>C</sup>](#)

## Object Properties

### has anergy<sup>op</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/hasAnergy>

**Sub Property Of** <http://w3id.org/CEON/ontology/actorODP/participatingObject>

**Range** [Anergy<sup>C</sup>](#)

has converted energy<sup>op</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/hasConvertedEnergy>

**Sub Property Of** <http://w3id.org/CEON/ontology/actorODP/participatingResource>

**Range** [NonRenewableEnergy<sup>c</sup>](#) or [RenewableEnergy<sup>c</sup>](#)

has energy source<sup>op</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/hasEnergySource>

**Domain** [Energy<sup>c</sup>](#)

**Range** [EnergySource<sup>c</sup>](#)

has exergy<sup>op</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/hasExergy>

**Sub Property Of** <http://w3id.org/CEON/ontology/actorODP/participatingObject>

**Range** [Exergy<sup>c</sup>](#)

has original energy<sup>op</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/hasOriginalEnergy>

**Sub Property Of** <http://w3id.org/CEON/ontology/actorODP/participatingResource>

**Range** [NonRenewableEnergy<sup>c</sup>](#) or [RenewableEnergy<sup>c</sup>](#)

participating energy<sup>op</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/participatingEnergy>

**Sub Property Of** <http://w3id.org/CEON/ontology/actorODP/participatingSubject>

## Datatype Properties

has carbon intensity<sup>dp</sup>

**IRI** <http://w3id.org/CEON/ontology/energy/hasCarbonIntensity>

**Domain** [EnergySource<sup>c</sup>](#)

has energy component percentage<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/hasEnergyComponentPercentage>

**Domain** [EnergyComposition](#)<sup>c</sup>

has sustainability<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/energy/hasSustainability>

**Domain** [EnergySource](#)<sup>c</sup>

## Annotation Properties

description<sup>ap</sup>

**IRI** <http://purl.org/dc/elements/1.1/description>

contributor<sup>ap</sup>

**IRI** <http://purl.org/dc/terms/contributor>

created<sup>ap</sup>

**IRI** <http://purl.org/dc/terms/created>

creator<sup>ap</sup>

**IRI** <http://purl.org/dc/terms/creator>

description<sup>ap</sup>

**IRI** <http://purl.org/dc/terms/description>

license<sup>ap</sup>

**IRI** <http://purl.org/dc/terms/license>

title<sup>ap</sup>

**IRI** <http://purl.org/dc/terms/title>

preferred namespace prefix <sup>ap</sup>	
IRI	<a href="http://purl.org/vocab/vann/preferredNamespacePrefix">http://purl.org/vocab/vann/preferredNamespacePrefix</a>
preferred namespace uri <sup>ap</sup>	
IRI	<a href="http://purl.org/vocab/vann/preferredNamespaceUri">http://purl.org/vocab/vann/preferredNamespaceUri</a>
covers requirements <sup>ap</sup>	
IRI	<a href="http://www.ontologydesignpatterns.org/schemas/cannotation-schema.owl#coversRequirements">http://www.ontologydesignpatterns.org/schemas/cannotation-schema.owl#coversRequirements</a>
definition <sup>ap</sup>	
IRI	<a href="http://www.w3.org/2004/02/skos/core#definition">http://www.w3.org/2004/02/skos/core#definition</a>
pref label <sup>ap</sup>	
IRI	<a href="http://www.w3.org/2004/02/skos/core#prefLabel">http://www.w3.org/2004/02/skos/core#prefLabel</a>

## Namespaces

:	<a href="http://w3id.org/CE0N/ontology/energy/">http://w3id.org/CE0N/ontology/energy/</a>
dc	<a href="http://purl.org/dc/elements/1.1/">http://purl.org/dc/elements/1.1/</a>
dcterms	<a href="http://purl.org/dc/terms/">http://purl.org/dc/terms/</a>
geo	<a href="http://www.opengis.net/ont/geosparql#">http://www.opengis.net/ont/geosparql#</a>
odp	<a href="http://www.ontologydesignpatterns.org/schemas/cannotationschema.owl#">http://www.ontologydesignpatterns.org/schemas/cannotationschema.owl#</a>
owl	<a href="http://www.w3.org/2002/07/owl#">http://www.w3.org/2002/07/owl#</a>
prov	<a href="http://www.w3.org/ns/prov#">http://www.w3.org/ns/prov#</a>
rdf	<a href="http://www.w3.org/1999/02/22-rdf-syntax-ns#">http://www.w3.org/1999/02/22-rdf-syntax-ns#</a>
rdfs	<a href="http://www.w3.org/2000/01/rdf-schema#">http://www.w3.org/2000/01/rdf-schema#</a>
skos	<a href="http://www.w3.org/2004/02/skos/core#">http://www.w3.org/2004/02/skos/core#</a>
vann	<a href="http://purl.org/vocab/vann/">http://purl.org/vocab/vann/</a>

## Legend

c	Classes
op	Object Properties
dp	Datatype Properties
ap	Annotation Properties