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Developement of a power grid ontology and a sample application

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March 15, 2017

1 Ontology details

The power grid ontology is aimed to give a basis for representing power grids in terms of power production, consumption and transmission. For that purpose the following classes, as listed in figure 1 were designed. The most basic building blocks are the *NetworkEntities* which model all physical entities a network may consist of and are disjoint. There are *Producers* adding power to the network, *Consumers* drawing energy from the network, *TransportEntities* transporting the energy between exactly two other network entities and *Transformers* managing splits, merges and changes in the transmission type of *TransportEntities*.
Those transmission types are modelled in the *TransmissionType* class. This class is divided into two disjoint subclasses *ACTransmission* for alternating current and *DCTransmission* for direct current.
Each *TransportEntity* furthermore has a *CableType* indicating the layout of a power line. There are 3 disjoint alternatives: regular *TransmissionLines*, *UndergroundCables* and *UnderseaCables*.
Finally every *NetworkEntity* is part of a specific *Network*.

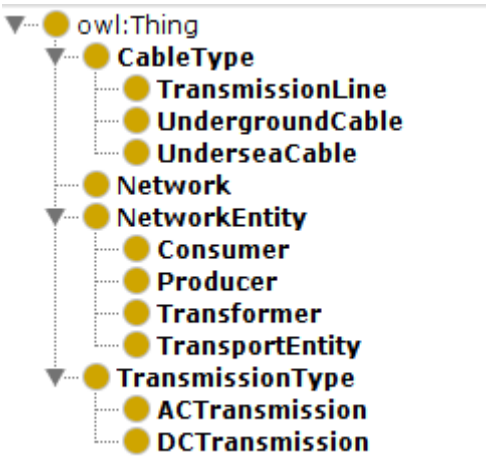

Figure 1.1: Class hierarchy of the Power Grid ontology.