

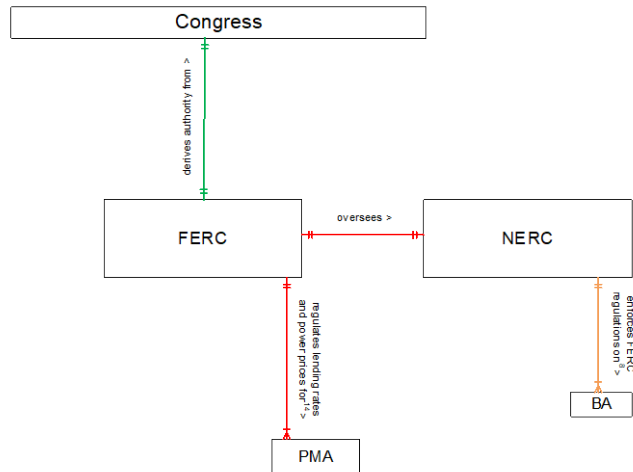
Summary of the United States Electricity Sector Regulatory Structural Model

The regulatory structure model is an E-R diagram that describes the structure of the United States electricity sector regulatory system. The purpose of this diagram is to aggregate structural information about the complex regulatory environment of the US electricity sector, and present that information in a graphical form that can be used by stakeholders to study and reason about existing and future regulatory structures. The diagram was developed from early 2017 through 2019 by the Grid Modernization Laboratory Consortium Grid Architecture project. It has been informed and reviewed by regulatory and legal experts in the field of electricity regulation.

The Entity-Relationship (E-R) diagram is a graphical depiction of structure that was originally used to design relational databases. In Grid Architecture, it is used to depict the structure of entire industry segments via entity classes and relationships. These entity classes do not represent a single organization, except on the rare occasions in which a class has only one member. Instead, they represent an entire group of entities, such as distribution utilities or customers.

The relationships in the E-R diagram show groups of behaviors between two entity classes. When two classes are involved, it shows cardinality such as one-to-many, one-to-one, or many-to-many, for the relationships between the members of the entity classes. However, E-R diagrams are not interaction diagrams that show individuals and sequences of behaviors between single entities. Instead, they show groups of behaviors at a high level of abstraction.

E-R diagrams consist of entities or classes of entities (shown as boxes) and relationships (shown as lines connecting the boxes). Entities in this diagram consist primarily of those who regulate, and those who are regulated. Relationships generally describe how regulation is achieved, or how authority to regulate is delegated or derived; each relationship has a cardinality that describes the scope of the relationship as applied to the connected entities. Very little emphasis is placed on what specifically is regulated, although the description of some relationships is accompanied by one or more footnotes (found at the bottom of the diagram) that outline examples of regulation. Consider the following excerpt from the diagram:



In plain language, this excerpt states:

- The (one and only) Federal Energy Regulatory Commission (FERC) derives its authority to regulate entities from the (one and only) Congress of the United States.
- FERC oversees the (one and only) North American Electric Reliability Corporation (NERC).
- FERC regulates lending rates and power prices for (one or more) Power Marketing Administrations (PMA).
- NERC enforces FERC regulations on (one or more) Balancing Authorities (BA).

Generally, entities that are prime authorities are at the top of the diagram. Authority and regulation mostly flow downward.

A nomenclature key is available at the bottom of the diagram. A legend describing the meaning of the entities and relationship symbols is available at the left of the diagram.