Description for the ER Diagram of Graph DB

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Dataset (Swissgrid):

- Dataset which downloaded from Swissgrid contains data which are the key elements of the data model. They containerize the entities by the ‘CONTAINS’ relation in a and realize the description of the data through attributes ‘name' and ‘description'.
- The relation ‘HAS_LOCALIZATION’ link for each Spatial Data. ‘HAS_TIME_PROPERTY’ allows the expression of properties which related to temporal properties. Our data come from different data set which means not all data will be shown in one existing data set, therefore the dataset should be added with the relation ‘SUPERSET_OF’.

DataSource:

- Data source means the origin of the data. It was defined by "name" and "description" and can be hierarchically be ordered.
- The relation "SOURCED_FROM" which connects the data set to the data source, contains the "confidentiality" property, which means these data were marked as confidential. There exists probability that the data source contains data which were not sources into dataset, then the datasource should be added with the relation ‘SUBSET_OF’.

Spatial Data:

- Spatial data store geographic data.
- Their name are unique in the data set in order to identify them.
- Usually, if the spatial data only require one canton, then the spatial data represents one point and don’t have a direction. If the data indicate a relationship such as cross border exchange data or cantons across data, then directions are needed, so that the visualization will be able to represent the point of an arrow.

Temporal Data:

- Temporal data store time series, each data represents a value based on measurement.
- Power data from the dataset always come with a specific ‘time stamp’, and the data consists of a ‘value’ and its fixed ‘unit’.
- All the data are supervised upon two time ‘duration’: 15min and 1h.
- For water power data, the ‘duration’ value is gained by implementing year (“Inbetriebnahme”) and the ‘expiration’ year is also provided.

Unit:

- For the unit, different unique type such as minutes, years can be assigned. An inner relationship, like 60min = 1h, will be satisfied between these data.
- In addition to measurements, a description which explain further characteristics of time can be can be assigned in case the application needs.

Power Data:

- Power data can be sorted into 'categories' like total energy, secondary/tertiary control energy, energy across cantons, etc.
- Energy consumed or produced by users or in total will be marked as two directions to show the opposite contribution to the value. Usually, production and feed-in is positive, while consumption and outflow is negative.
- There're two relations start from this entity. First, the attribute 'region' and 'description', refers to the previous entity, which also indicates some properties of power data. Second, dataset provides us the 'price' of certain kind of energy, which can be expressed and visualized via a combination of value and unit.
- Power data itself also come with a combination of a 'value' and a 'unit', which usually is kWh.

Water Power Data:

- With additional information from another dataset, some properties of water power data can be merged to previous relationships. They generally have unique 'number' for every line of information.

- The attribute 'center' and 'description', refers to the previous entities, which also indicates some properties of water power data, such as type, label and other text formed information.
- Water power data also come with a combination of a 'value' and a 'unit'.
- The categories of water power data are turbine performance and pump performance, with unit of MW.

The full entity relationship diagram of the database is shown in this url:
https://www.lucidchart.com/documents/view/8e70442d-4ffa-4d16-ade6-5568adeb5d8b