**Pakistani Transmission grid**

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**Definitions of sheets and column names**

**File Pakistan transmission grid data contains three sheet.**

1. **Cities population and location**

This sheet contain 7 columns: Column A (cities) contains names of the cities, Column B (population) contains population of the cities, Column C (province) contain province or state, Column D (lat) contains latitude of the corresponding cities, Column E (lon) contains longitude of the corresponding cities, Column F (closest\_ distance) contains closest distance of the cities to the nearest substation in unit meter, Column G (closest\_substation\_index) contains index of the nearest substation to the corresponding city.

1. **Substation**

This sheet contains 10 columns: Column A (nid) contains index of the substations (some of the them are removed because they have same OSM id), Column B (osm\_id) contains open street map id of the substations, Column C (name) contains the name of the power plants, Column D (type) contains type of the osm\_id, column E (lat) contains latitude of the corresponding osm\_id, column F (lon) contains the longitude of the corresponding osm\_id, column G (nominal\_power\_output) contains the nominal power of the power plant in units MW, Column H (population) contains the sum of the population of the surrounding cities, column I (fraction\_of\_population) contains fraction of total population, column J (fraction\_of\_total\_consumed\_power) contains fraction of the total consumed power in units Wh,

1. **Industries**

This sheet contains 4 columns: column A (s.no) contains index of the industries, column B (industries) contains the name of the industries, column C contains (cities) contains names of the corresponding cities, column D (closest\_substation\_index) contains index of the closest substation to the industries.

**Sources**

1. [**https://www.openstreetmap.org**](https://www.openstreetmap.org/)
2. [**http://www.flosm.de/en/Power-Grid.html**](http://www.flosm.de/en/Power-Grid.html)
3. **[http://www.scribd.com/doc/12487960/List-of-100-Companies-of-Pakistan#scribd](http://www.scribd.com/doc/12487960/List-of-100-Companies-of-Pakistan" \l "scribd)**
4. [**http://www.citypopulation.de/Pakistan-20T.html**](http://www.citypopulation.de/Pakistan-20T.html)
5. [**https://www.google.com/maps/**](https://www.google.com/maps/)