Exploring the Benefits of Geography on Power Network Diagrams – **Reproducing the** [**Visualisation**](https://sgsep.com.au/maps/merry/sld-visualisation/)

**Merry Kim Hoang**

This document outlines how the prototype visualization was produced and can be used as a guide to digitise and animate different single line diagrams (SLDs). A familiarity with D3 and QGIS is required.

**DATA COLLECTION**

1. Obtain your data sources: a SLD and a geographical map of the SLD’s contextual area, if available. A map might be difficult if your SLD spans a large geographical area. PDFs are fine but digital copies are required.A diagram of a power plant

   Description automatically generated with medium confidence

**Map View**

1. Using Open Street Map (OSM), find the area your SLD covers and download the polygons and road network spatial files.A screenshot of a map

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A map of a city

Description automatically generatedA map of a city

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1. Open the spatial files in QGIS and clean up the data to include only the relevant buildings/areas and roads required in your visualisation. Trace any new buildings that have not been updated on OSM. Save your buildings and road network layers as GeoJSON to be read in D3.A map of a city

   Description automatically generated
2. Collect any additional data points you want to display in the visualisation, such as:
   * Battery locations
   * EV charging stations
   * PV cell locations etc

If no spatial layers exist, create them manually in QGIS. Save as GeoJSON for rendering in D3.

1. Download and save any additional data points to be made available on tooltips of the buildings in the visualisation’s map view. Google Earth was used to obtain the building images. The chart of the building’s energy usage is a sample static image but can be replaced with a real chart.A close-up of a building

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**SLD View**

1. Open the SLD as a PDF in QGIS over an OSM satellite layer. Ensure that your SLD layer covers your geographical area.
2. Trace the elements of your SLD and save each element of the SLD as individual spatial layers – substations, transformers, feeders. The SLD border is optional.

Ensure the CRS of all your spatial layers are the same and correct.

A map of a city

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A red rectangular object with many squares

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1. Extract the SLD details as images to use as hover tooltips.

A computer screen shot of a computer

Description automatically generated A diagram of electrical wiring

Description automatically generated

A computer screen shot of a computer screen

Description automatically generated

1. Substations and transformers were remapped using Photoshop to a simplified representation. A colour scale was used to differentiate the voltages. An SVG was created for each type of substation and transformer.A close-up of a number

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A diagram of a circuit

Description automatically generated with medium confidence

**CODE**

The animation between the SLD and Map view uses the following data structure:

A diagram of a data flow

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The source code can be edited in index.html