Network Definition and Input Data

- Inputs : Network information, thermal demands and modelica templates for pipe, supply station and substations.
- Input formats: CSV (Comma-Separated Values) files, TXT (Plain Text) files, OpenStreetMap (OSM) data, GIS formats (GEOJSON, Shapefiles), DWG files, and CityGML datasets.

Graph-Based Network Representation

- Prepare the district graph structure.
- Assign nodes and edges to represent buildings, supply units, and pipes.
- Allocate relevant data to the corresponding nodes and edges.

Hydronic Sizing and Topology Simplification

- Calculates building peak demand and required flow rates.
- Selects pipe sizes from catalogs and assigns pipe properties.
- Simplifies network topology while preserving hydraulic accuracy.

Modelica Model Generation

- Generates connections based on graph topology data.
- Assigns model templates to components automatically.
- Exports network as Modelica model for simulation.

Simulation and Post-Processing

- Simulates Modelica models in Dymola, outputs MAT files.
- Analyzes simulation results with KPI and constraint checks.
- Visualizes results with network plots and 3D models.