Optimization Project Requirements

Requirements goals:

- Optimize heat production for a district heating utility.
- Heat availability for all buildings in the district heating network.
- Produce heat at the lowest costs.
- APIs should be implemented for communication between modules.

Our Components or Modules:

1. **Asset Manager (AM)**
2. **Source Data Manager (SDM)**
3. **Result Data Manager (RDM)**
4. **Optimizer (OPT)**
5. **Data Visualization (DV)**

Scenarios for iteration:

- Scenario 1: Single heating area with one gas boiler and one oil boiler.

- Scenario 2: Single heating area with one gas boiler, one oil boiler, one gas motor, and one electric boiler.

Different measurement time:

- Winter period: high levels of production.
- Summer period: low levels of production.

Data Management of Modules:

Asset Manager (AM): manage static system information:

Name of the heating grid.

Image of the heating grid.

Production units.

Source Data Manager (SDM): manage dynamic information:

like heat demand time series and electricity price time series.

Result Data Manager (RDM): store optimization results

1- Heat production
2- Electricity production
3- Electricity consumption
4- Expenses
5- Profit
6- CO2 emissions.

Optimizer (OPT)

Produce and availability heat in favorable cost.

produce electricity when a market price is high.

Data Visualization (DV): visualize results:

1- Heat demand.
2- Electricity prices.
3- Production metrics.