**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.