

BLDG 5301 Building Energy Management and Optimization
Group Project

You are hired to identify energy use and operational anomalies of Canal Building as well as to develop recommendations to improve its energy performance.

Following data are given in the canal energy use.csv file:

- Chiller electricity use (kW);
- Electricity use for the supply and return fans of the two AHUs (kW);
- Floor-level breakdown of the electricity use by the plug-in equipment (kW);
- Floor-level breakdown of the electricity use for lighting (kW).

In addition, for the same time period as the energy data, canal ahus.csv file contains hourly data about the operation of the two main air handling units of the building:

- Supply air pressure (Pa);
- Supply fan state (%);
- Outdoor and exhaust air dampers (%);
- State of the heat recovery wheel (%);
- State of the heating and cooling coils (%);
- State of the humidifier valve (%);
- Return, supply, and outdoor temperature (°C) and humidity (%);
- Supply air temperature and pressure setpoints;
- Chilled water pump (%);
- Binary availability schedule for the AHU fans.

In addition to the data, files including the architectural, mechanical and controls drawings and sequence of operations are provided for reference.

Apply a subset of the fundamental principles and procedures of inverse modelling, energy use benchmarking, fault and anomaly detection and diagnosis learned in the class. The final deliverables of the project are as follows:

- A final report (**maximum 6 pages including graphics, tables, references**) – single-spaced, Times New Roman font size 11;
- Matlab / Python / R scripts used to carry out data analysis and graphics;
- A presentation on the final day of the class (10-min presentation).

The deliverables will be graded based on the following criteria:

- Technical soundness and breadth of data analysis (40%)
- Data visualization and writing quality of the report (30%)
- Potential to generate actionable insights that can result in energy savings (10%)
- Quality of presentations (clarity and format of the slides, effective communication) (20%)