CASE STUDY

CopperTree Analytics

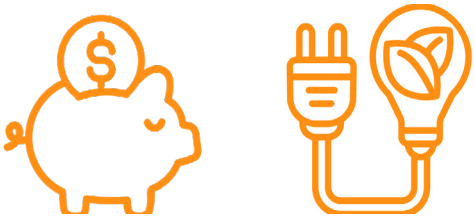
Connecting **Buildings** | Connecting **People**

KAIZEN FDD OPTIMAL HEATING PERFORMANCE OF A CENTRAL STEAM PLANT

CLIENT **OVERVIEW**

Our client is a polytechnic institute offering more than 110 career programs in technology, trades and business. Established in 1916, it is Calgary's second oldest post-secondary institution and Canada's first publicly funded technical institute. With its wavy roof and walls of glass, it is a stunning landmark and the largest building in Trades and Technology Complex, adding 440,000 square feet of l eading-edge classrooms, labs and gathering spaces to campus. Opened in 2012, the building sits along the south side of the campus, and it houses the School of Construction and Applied Research and Innovation Services.

BENEFITS



Kaizen estimated a cost potential saving of over CAD $12,900 per year for running more efficient local boilers and less more expensive steam from central plant without undersupplying heat for the high building demand. This is equal to around 129,000 kWh of energy saving or an equivalent 91,400 kg of CO2 gas emissions reduction. In context, that is the amount of gas emitted from 10,287 gallons of gasoline consumed.

THE PROJECT

Heating of the building primarily comes from the cheaper local boilers with the more expensive central steam plant as supplementary or backup. A central steam plant can support a hot water load with steam-to-hot-water heat exchangers, but it is inherently less efficient with the higher operating temperatures along with steam-to-condensate transition and blowdown losses. The operational cost of steam heating is transferred to the client from the plant for any additional heating in their smaller monthly utility cost, even though running local boilers with natural gas is their larger primary heating cost.

THE CHALLENGE

The gas and steam costs are much closer than expected. Each winter, there are many periods of time that there is more heating demand from the building than local boilers can supply. Boiler output from specification may not be a realistic high limit that the building automation system could use to determine when the switchover is most optimum. Running with more conservative lower limit around 250 kWh, control system switches to the more expensive steam heating from central plant usually too early, and end up using more expensive steam than local boilers for heating than necessary.

THE SOLUTION

Kaizen traced the maximum output steadily from local boilers to be consistently over 550 kWh. This is the actual output for the building application with all factors that affect boiler performance considered. This can be projected with little deviation of boiler performance in the next winter much more optimally.