Innovative uses of the model by clients in addition to its original analysis function.

Validate the energy consumption recorded by the public utility meters and obtain invoice credits when deviations are identified

On two separate occasions for two distinct clients, while the facility consumption was being monitored through our mathematical model, a drift in the utility meter was identified. The historical data of the model showed an increase of approximately 3 to 5% the first month. The drift gradually increased to reach 13-14% in the following months. The ensuing consumption analysis and the observations showed a lack of factors to explain the drift, therefore the utilities were asked to verify the accuracy of their meters. The verification of the meters, by the utilities, confirmed an error in the readings, as detected by the model. Now that the source of the error was identified, the utilities issued a credit in accordance with the figures calculated by the mathematical model.

Establish the energy consumption by department

A landlord of a commercial building with a single electricity meter approached us to establish the energy consumption for each of his tenants. Since the building hosted, 5 different companies in completely different economic sectors, a simple distribution of the energy loads over the rented surface wouldn't have been accurate or fair. The model allowed for a better redistribution of the energy loads by tenants and enabled the landlord to establish the appropriate charge backs for each tenant.

Calculate the energy consumption linked to the temperature modification of finished goods

A fries and pizza plant received a request from one of their clients to receive frozen fries delivered at a temperature of -22 °C instead of the usual -18 °C. The mathematical model detected a surge in energy consumption. After verification, no operational parameter modification could justify this surge. After a thorough verification it was confirmed that their client had requested the modification of the delivery temperature of the frozen fries. The model permitted the facility to establish the energy cost of associated to the modification request and was able to invoice the surcharge back to the client.

Predict the energy consumption linked to a planned modification of the usage of refrigerated areas

A client, operating a refrigerated warehouse composed of several refrigerated storage areas, asked us to estimate what his energy consumption would be, following a planned modification of the usage of some of the storage areas. The mathematical model analysis of the energy costs based on the forecasts changes to the storage areas convinced the client to modify the project before moving forward.

Adjust the refrigeration system operating parameters to obtain the best energy efficiency available

An ice cream facility was approached by a supplier to modify the control parameters of their refrigeration system. The facility then requested that we use the mathematical model in order to determine the control parameters that would return the best ratio of cold produced / energy consumed. A close monitoring and the cooperation of the different actors helped the facility to establish their preferred operation and control parameters and reduce the energy consumption of the refrigeration system by 22% annually.

Detect breakdowns and shutdowns of non-monitored equipment

In this powder beverage facility, the mathematical model was used to validate the results of an automatic impedance adjustor. When an additional reduction suddenly occurred in the energy consumption an investigation was started to find the root cause of this new change. After a period of time necessary to eliminate some of the potential causes and obtain additional data on the issue, it was determined that an HVAC compressor had broken down. The diagnostic came from the model, away from the site, and was confirmed by the maintenance team onsite. The difference in consumption represented 0.3% of the total annual electrical consumption of the facility. However, the loss of the compressor could have had an impact on the quality of the finished product due to a sufficient increase in the humidity content of the product.

Detect operational modifications due to human factors

In this prepared food factory, the mathematical model was used to validate the results of an automatic impedance adjustor. When a sharp increase of the energy consumption occurred, an investigation was started in order to understand where the increase came from. Once the automatic impedance adjustor was confirmed to be operating as intended, the search continued. Then, after the elimination of all possible causes linked to the facility's equipment, the change of shift of a foreman was identified as being the cause of the increase in the facility's consumption. The facility operated on 2 working shifts and 1 cleaning shift per day. At the end of his work shift the foreman who worked the day shift had no equipment to shut down since production continued on the following shift. However when he was transferred to the evening shift his failure to shut down the production equipment, that wasn't being used during the cleaning shift that followed, generated the increase in energy consumption. Once the cause of the increase in energy consumption identified, the appropriate adjustments where implemented and the energy consumption of the facility returned to normal.