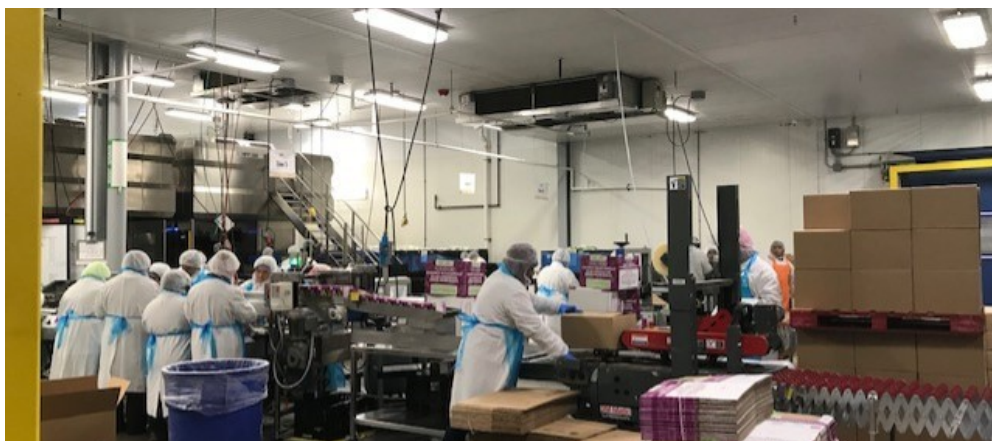




FOOD PROCESSING CASE STUDY

GOOD FOODS GROUP— AUTOMATION UPGRADE



Existing Condition

Energy costs were spiraling out of control due to uncontrolled building automation. Heating systems and cooling were operating at the same time and without central controls.

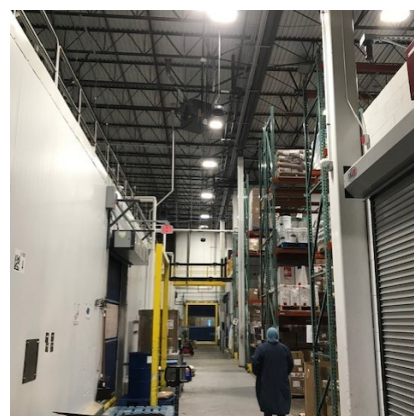
The center of the plant was all refrigerated which suffered from the uncontrolled heating in the adjoining areas. Growth of the plant and change in use led to a variety of conflicts from the

BUILDING AUTOMATION WAS ADDED TO ALL HVAC AND VENTILATION

All the RTU's, unit heaters, exhaust systems and waste heat was automation with visibility in order to take control of the building as a whole. Aisles adjoining the refrigerated areas were being heated to 68F all year which was affected by the opening and closing of large doors entering the process areas. This process cooling was then affecting the heating stats and causing the heating system to operate. The

REFRIGERATION SETPOINTS OVER COMPENSATED

When the refrigeration was not able to make temp the assumption was that the load was too high from production. The problem that was discovered however was that the load was artificially created from the adjoining area temps not being controlled. The higher temps also have more humidity which was causing condensation in the refrigerated areas and icing on the evaporator coils. This caused the reaction to not turn off the refrigeration even when in weekend shutdown or during cleaning fearing evaporator icing again. Air curtains were also not functioning which added to the problems— these were all re-



DE-STRATIFICATION FANS ADDED TO THE CEILING AND AUTOMATION

The high ceilings had no de-stratification fans which were allowing all the heat to float to the ceiling. Fifteen new fans were added and are now controlled by the automation. At 60F in the plant halls the destratification fans are the first to turn on when there is a call for heat. The plant hall temperatures are set to 55F. Heating systems down turn on until 55F but the refrigeration liquid lines above the cooler were also heating up the ceiling. This heat is now circulated down to the aisles.

Electric Saving

DATE	2018	2019	SAVINGS
11/26/19	718600	550335	\$ 14,194.26
12/28/19	683200	556412	\$ 9,908.02
1/29/2020	774400	568000	\$ 14,471.89

**THREE MONTH
ELECTRIC SAVINGS: \$38,574**

Note: Savings based on year over year



HEAT RECOVERY OFF COMPRESSORS USED FOR MUA AND PLANT HEATING

The plant had no dedicated MUA system to balance all the exhaust and all the compressed air heat was being discharged into the plant most of the year since the hall set-point was at 68F and the refrigerated spaces were cooling the halls below that when the doors opened. This added heat was adding to the refrigeration load. New controls were added to only allow the compressor heat into the area when needed.

Therm Saving with Automation

DATE	2018	2019	% Saved
10/23/2018	17,716	12,604	29%
11/25/2018	19,539	14,556	26%
12/25/2018	22,684	12,658	44%

Note: Project was starting and savings were accelerated during progress

Therms
3 Month Saving **\$ 14,951.81**

PROJECTED RETURN ON INVESTMENT AFTER GRANTS: YEARLY

10 YEAR PROJECTED SAVINGS

125%

\$ 1,596,500 +_



Ventilation Controlled

Existing ventilation was running 24/7 and exhaust all the heat off the ceiling all winter. Since the plant operation had changed the exhaust was no longer desired for most of the year. A control was set to only exhaust in summer when temps were over 76 at the ceiling. This also allowed for heat retention in

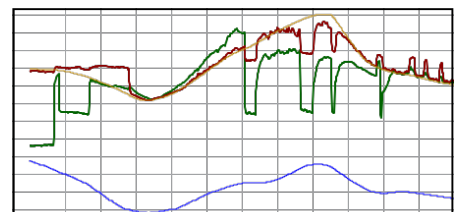
Split Heat Pump Added to Office

Conference rooms and side offices were fighting with the main RTU and had no VAV to control temps. The spaces were too cold in winter and too hot in summer. A split heat pump air handler was added to give supplemental control to these areas and take load off

Energy Tax Exemption

The sales tax exemption for energy used in manufacturing was not being taken. Tower calculated and submitted the paperwork for both a 5 year refund and exemption going forward. This substantial refund was then put to use to fund the new energy projects with an additional quick payback. There was also a tax saving on the investment itself since the improvements were deductible 100% in the year accrued.

Automation's Real Time Data



Modern Automation systems give real time data and control on how the units are operating. This information is invaluable for trouble shooting and tuning the system for the desired result.



Heat recovery off the 2– 50HP compressors was controlled by the new automation to not overheat the aisles next to the refrigerated production. With the lower setpoint and destratification in place the compressor or lights and not almost completely heating the spaces next to the production areas.