Waypoint Centre for Mental Health Care

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

2022 UPDATE

Contents

Reporting Requirements

Waypoint's 2022 Energy Conservation and Demand Management Plan is a continuation of the reporting requirement of the Ontario Regulation 507/18: Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans.

The regulation requires:

1. A summary of annual energy consumption and greenhouse gas emissions provided to the ministry and made available online and in hard copy.
2. An Energy Conservation and Demand Management Plan updated every five years. Plans will be made available online and in hard copy.

This document was prepared by Waypoint Centre for Mental Health Care to assist meeting these requirements.

An Introduction to Our Organization

About Waypoint Operations

Waypoint Centre for Mental Health Care (Waypoint) is a mental health hospital serving residents from Penetanguishene, Midland, Barrie, Orillia, Collingwood, Parry Sound, Muskoka and surrounding communities on their path to mental health wellness. The main campus is comprised of 11 main buildings on approximately 200 acres, has over 300 patient beds and is the area's largest employer.

The main Waypoint campus includes six regional specialized inpatient programs (Acute Assessment, Dual Diagnosis, Concurrent Disorders, Geriatrics, Transition and Recovery, and Regional Forensics) where patients benefit from an environment focused on caring, compassion, and hope. There are also community-based programs (HERO Centre, Outpatient Services, Ontario Structured Psychotherapy (OSPP), Family, Child and Youth Program (FC&Y), North Simcoe Youth Wellness Hub (NSYWH), and Specialized Geriatrics Services (SGS)) providing a variety of mental health services to seniors, adults and youth in Simcoe County.

Waypoint's campus is also home to the Ontario's only High Security Forensic Program, providing assessment and treatment to clients served by both the mental health and justice system.

The hospital is also home to the Waypoint Research Institute, formally launched in 2013, building on over 40 years of internationally recognized research committed to providing excellence in mental health care rooted in the best scientific evidence.

The Effects of COVID-19

COVID-19 has created numerous challenges for all types of healthcare facilities and their operations.

Since the beginning of the pandemic in early 2020, Waypoint has dealt with multiple directives, orders, policy changes, procedural changes, staffing challenges, and health crises all of which affected day-to-day operations and disrupted previously planned energy initiatives.

Our Commitment to Responsible Energy Use

Waypoint is committed to consuming energy in an efficient, cost effective, and environmentally responsible manner when possible. It is recognized that utilities and related costs are necessary to operate the facility but do not directly contribute to the quality of services offered at the Hospital. As utility costs rise, it is imperative to reduce energy consumption in an effort to control costs, ultimately allowing continued outstanding customer service to our patients.

Waypoint's commitment to energy efficiency will employ the following key energy management principles:

Informed decision making – Energy will be monitored and tracked. Waypoint will develop, understand and communicate the key metrics so that informed decisions leading to efficient energy use can be taken. Energy audits will be undertaken to ensure optimal building operations and to determine successes of energy initiatives, ongoing monitoring and auditing of building systems.

Retrofit Program - Advance toward internal operational efficiency through a process of continuous improvement. Energy efficiency will be a key driver for retrofits and will be considered in all renovations and retrofits. Waypoint will annually take steps to reduce its footprint.

Operator Training - An ongoing commitment to continuously train and upgrade Building Operators' knowledge and understanding of building systems. Waypoint will adopt a program for re-commissioning and tuning of building systems for optimal operation.

Comfort Guidelines – Adopt industry accepted standards for building operations regarding temperature, humidity and CO2 levels to ensure optimal patient and staff comfort.

Procurement - Purchase utilities to ensure that lowest cost is achieved. Procurement will support the acquisition of energy efficient devices and technologies for the hospital.

Partnerships - Partner with industry and the public to improve energy conservation explore and develop economically viable alternative fuel sources.

Awareness & Education - Foster awareness to reduce the environmental impact of hospital activities and support realization of the hospital's Energy goals. Effectively communicate the progress and success of energy initiatives.

Building and Equipment Profiles

The following is a brief description of current systems employed at Waypoint.

Regional Buildings

Building	Approximate Gross Floor Area	Heating System(s)	Cooling System(s)	Ventilation System(s)	Hot Water System(s)
Administration	6,659 m^2 (71,675 ft^2)	Three boilers supplying radiators and fan coils	Portable spot cooling as required	Variable volume AHU with VFDs	Two hybrid electric heat pump water heaters
Toanche	13,761 m^2 (148,126 ft^2)	Three boilers supplying radiators, panels, and fan coils	One chiller and cooling tower supplying MUA units	Air handling units equipped with VFDs, VAV	Storage tanks heated by the boilers
Bayfield	2,930 m^2 (31,535 ft^2)	Three boilers supplying radiators and fan coils	Air handler and condensing unit	Air handling units equipped with VFDs, VAV	Storage tanks heated by the boilers
House 1 (Pineview)	799 m^2 (8,598 ft^2)	Two boilers supplying radiators	Two split DX units	Operable windows	Residential gas water heater
House 2 (Beacon House)	257 m^2 (2,770 ft^2)	Natural gas furnace	Split DX unit	Operable windows	Residential gas water heater
House 6	138 m^2 (1,485 ft^2)	Natural gas furnace	Split DX unit	Operable windows	Residential gas water heater
House 8	395 m^2 (4,252 ft^2)	One boiler supplying radiators	Window mounted AC	Operable windows	Residential gas water heater
Power House	549 m^2 (5,905 ft^2)	Two boilers supplying radiators and force flow units	None	Thermostat-controlled exhaust fans and exhaust interlocked with the diesel generators	One electric water heater
Environmental Services	2,273 m^2 (24,466 ft^2)	Two boilers supplying reheat coils and unit heaters	DX with rooftop condenser	Air handling unit equipped with VFDs, VAV	Storage tanks heated by the boilers
Storage	706 m^2 (7,602 ft^2)	None	None	None	None

Provincial Building

Building	Approximate Gross Floor Area	Heating System(s)	Cooling System(s)	Ventilation System(s)	Hot Water System(s)
Atrium	31,732 m^2 (341,579 ft^2)	Ground source heat pump with boilers providing peak capacity	Ground source heat pump with chillers providing peak capacity	Air handling units equipped with VFDs, VAV	Storage tanks heated by the boilers

The Atrium Building receives heating and cooling through a ground source heat pump system with chillers and boilers providing peak cooling and heating capacity, respectively. The ground source system operates to provide simultaneous heating and cooling when the outside air temperature is above -12°C.

In total, the ground source heat pump provides 296 kW of peak heating and 222 kW of peak cooling. At outside air temperatures below -12°C, the heat pumps can be switched back to cooling mode for cooling the IT rooms, for a total peak capacity of 230 kW. The heat rejected in this mode from the heat pumps can be used for building heating as needed or rejected to the ground. The chillers provide 5,950 kW of supplemental cooling, coupled with a two-cell induced draft cooling tower (5,451 kW total). The chilled water side of the system includes an economizer cycle that allows chilled water to be produced directly through the cooling tower when outside conditions permit, reducing the number of operating hours for the chillers.

Two near condensing boilers (3,212 kW total) and one condensing boiler (1,225 kW) provide supplemental heating. Energy consumption on both sides of the heat pump is measured to quantify the amount of energy this device is diverting from boiler and cooling tower consumption.

Energy Consumption

There are two sources of energy purchased for operations at the Waypoint main campus. Electricity is provided by Alectra Utilities while natural gas is provided by Enbridge. The following section summarizes the energy consumption for all buildings at Waypoint's main campus.

The following table summarizes total energy use for recent years.

Energy Utility	Year	Consumption	Cost
Electricity	2019	10,113,242 kWh	$ 1,362,765
	2020	10,163,031 kWh	$ 1,308,404
	2021	9,080,889 kWh	$ 1,201,104
Natural Gas	2019	1,034,490 m^3 (10,753,522 ekWh)	$ 127,722
	2020	957,982 m^3 (9,958,223 ekWh)	$ 143,697 *
	2021	919,866 m^3 (9,562,009 ekWh)	$ 160,130
Total	2019	20,866,764 ekWh	$ 1,490,487
	2020	20,121,254 ekWh	$ 1,468,534 *
	2021	18,642,898 ekWh	$ 1,361,234

* Price adjusted since last year's report to reflect new more reliable data available.

Electricity Consumption

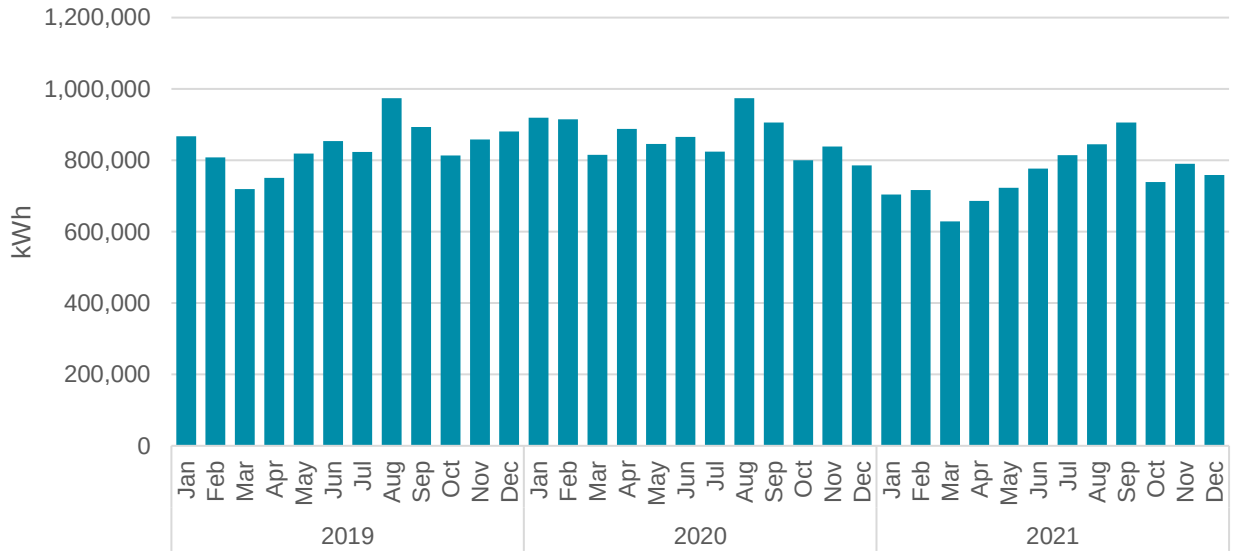
Electricity Metering

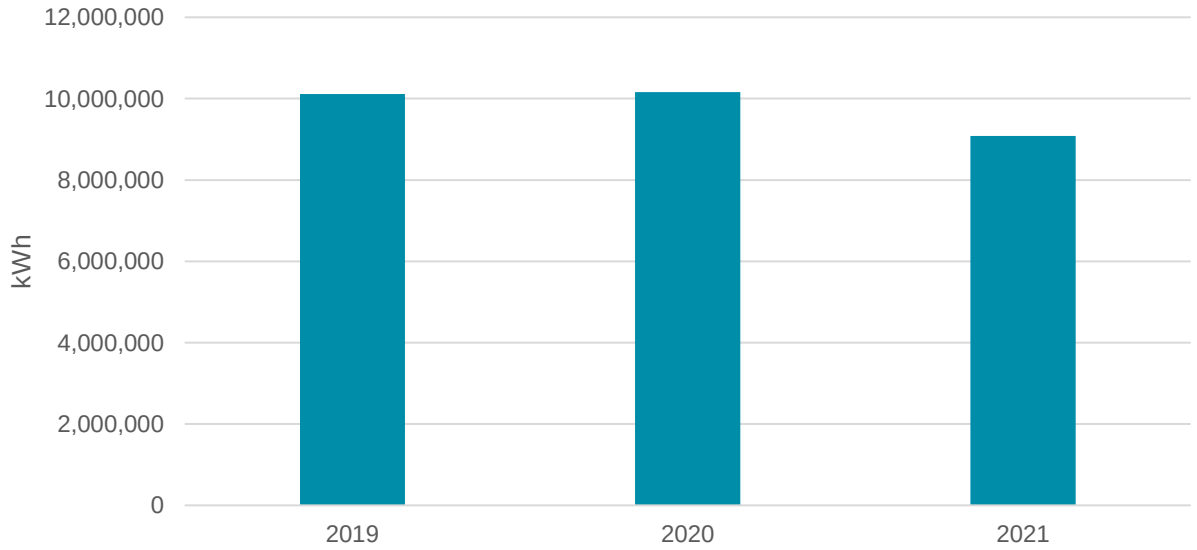
There is only one billed electricity meter which services the main Waypoint campus.

Building	Account Number	Meter Number
Site	2768520000	PWST265574

Electricity Consumption History

Past electricity consumption is illustrated in the following graphs. The three most recent complete years are shown below.





The following tables further summarize electricity consumption at Waypoint from year to year.

KPI	2019	Change from Previous (%)	2020	Change from Previous (%)	2021	Change from Previous (%)
Total Consumption (kWh)	10,113,242	- 0.4	10,163,031	0.5	9,080,889	- 10.6
Total Cost ($)	1,362,765	4.7	1,301,533	- 4.5	1,201,104	- 7.7
Cost /Unit ($/kWh)	0.135	5.4	0.128	-5.2	0.132	3.1
Electrical Intensity (kWh/ft^2)	15.49	- 0.4	15.56	0.5	13.91	- 10.6

Natural Gas Consumption

Natural Gas Metering

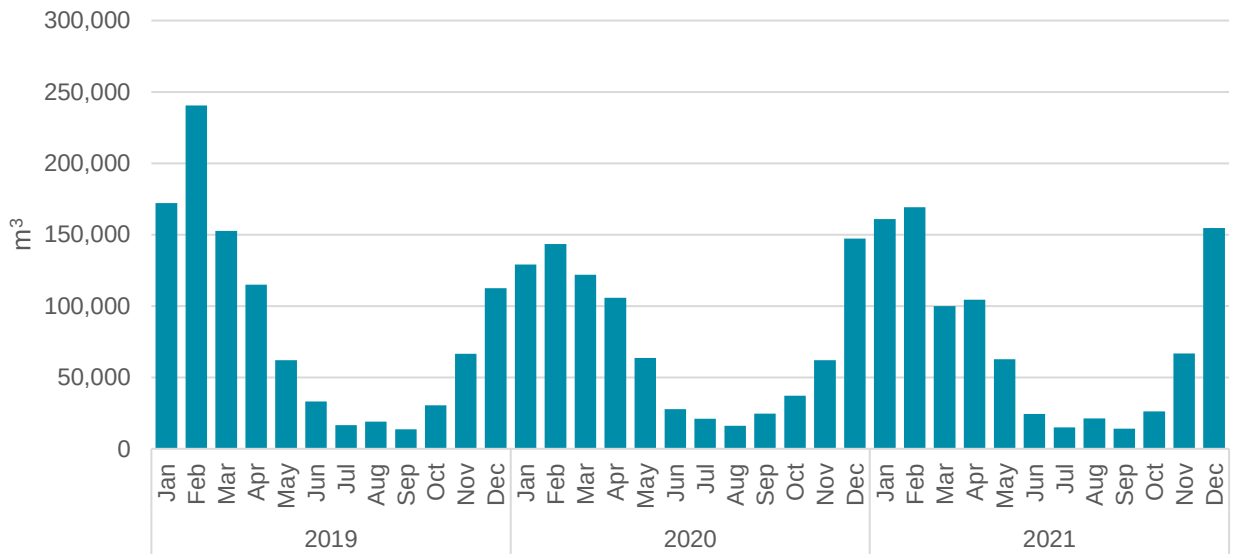
There are several natural gas meters at Waypoint; they are summarized in the following table.

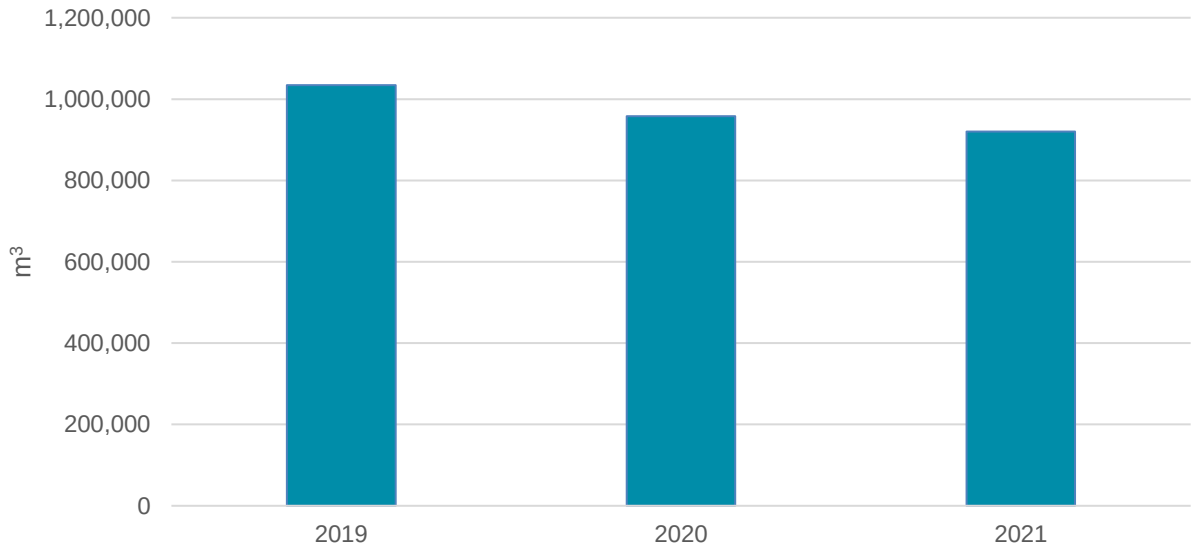
Building	Account Number	Meter Number
Bayfield	91 00 06 68776 2	950124
Environmental Services	91 00 04 13268 6	946940
Administration	85 33 87 62999 0	345731
Atrium	93 06 10 07702 1	1005477 *
Toanche	85 30 98 81999 4	1008693 *
Power House	07 53 45 78453 2	909099
House 1	07 53 45 37101 0	1098368
House 2	0 753 45 37001 1	3318764
House 6	91 00 04 09771 1	3219521
House 8	07 53 45 37601 2	2064473

* Meter changed since last year's report.

Natural Gas Consumption History

Past actual consumption is illustrated in the following graphs. The three most recent complete years are shown below (all accounts).





The following tables further summarize natural gas consumption at Waypoint from year to year.

KPI	2019	Change from Previous (%)	2020	Change from Previous (%)	2021	Change from Previous (%)
Total Consumption (m^3)	1,034,490	- 1.8	957,982	- 7.4	919,866	- 4.0
Total Cost ($)	127,722	NA	143,697	12.5	160,130	11.4
Cost /Unit ($/m^3$)	0.123	NA	0.150	22.0	0.174	16
Electrical Intensity (m^3/ft^2)	1.58	- 1.8	1.47	- 7.4	1.41	- 4.0

Notable Completed Projects

Envelope	2	**Window Replacement** House 1 (Pineview)	2019	The current renovations to House 1 (Pineview) include a replacement of existing single pane windows with double pane wood frame windows. It is anticipated the replacements will reduce heat loss and improve occupant comfort.
	3	**Roof Upgrade** Bayfield Building	2021	There was an upgrade performed on the Bayfield Building's roof which has improved the insulating properties by approximately R12. It is anticipated the replacements will reduce heat loss and improve occupant comfort.

Lighting	1	**Lighting Replacement** Bayfield Building	2019	There were ceiling fixtures in the Bayfield Building containing predominantly 13 W CFL lamps. Over time these lamps became inconsistent in colour when replacements took place. The fixtures have been replaced with 11 W LED fixtures. In addition to a limited amount of electricity savings, the occupants will benefit from better and consistent output colour in their living space and maintenance should see a decrease in the costs associated with individual lamp replacements after failures.
	4	**Exit Sign Replacement** Administration Building Bayfield Building ESB Building	2021	The current signs used in the buildings identified are older technology of various vintages and are no longer considered efficient. Most existing exit signs are either 7 W or 14 W incandescent lamps. In addition to being dated, these lamps fail on a regular basis, causing staff to require changing the lamps. The existing models will be replaced with LED units with battery backups using approximately 4 W. This change will improve reliability, reduce energy and maintenance costs, and give a more professional appearance to the buildings.

Other	5	**Load shedding Project** Hospital Campus	2021	Waypoint has embarked on a project with the utility company consisting of installing a battery bank connected to the main incoming power line. The goal is to be able to go “OFFLINE” approximately 20 days per year, including the 5 highest days of electrical demand to reduce the stress on utility infrastructure. The additional benefit to Waypoint would be that the global adjustment on future electricity invoices will be eliminated as long as the requirements are met.
	6	**Pipe Insulation** ESB Building Toanche Building Administration Building	2022	Waypoint has engaged an insulation company to apply a PVC jacketing to several runs of piping in numerous mechanical rooms to reduce the impact of the surrounding environment on the pipe contents.

HVAC	7	**Building Automation Tuning** All Buildings Controlled By BAS (Including Atrium)	2022	The BAS fine tuning involves adjusting set-points, reprogramming algorithms, modifying schedules and controls and ensuring proper operation resulting in more efficient operations.

A more detailed summary of all completed projects affecting energy use can be found in **Appendix A**.

Notable Ongoing and Future Projects

Envelope	1	**Window Replacement** Administration Building	This is a continuation of the Administration Building window project replacing the remaining single pane windows with more efficient alternatives.
HVAC	2	**Toanche Air System/Radiant Panel Integration** Toanche Building	The current heating system is a mixture of radiant and air systems which often do not work together. This measure involves a modification to building controls to better regulate two different heating systems to improve operations.
	3	**Optimize Unit and Zone Schedules** Atrium Building	Optimize schedules based on facility occupancy.
	4	**Improve Heat Pump COP** Atrium Building	Tune heating and cooling plant control setpoints to improve efficiency.
Lighting	5	**Fluorescent Lighting Retrofit** Toanche Buildings Administration Buildings Bayfield Buildings	Replace existing linear fluorescents lamps (various T8) with LED replacements. Most retrofits will reduce each lamp from approximately 25W to 15W. In addition to electricity savings, replacements will also result in less maintenance since the new lamps should have a greater lifespan.
	6 6	**Exit Sign Replacement** Toanche Building	The current signs used in the buildings identified are older technology of various vintages and are no longer considered efficient. Most existing exit signs are either 7 W or 14 W incandescent lamps. In addition to being dated, these lamps fail on a regular basis, causing staff to require changing the lamps. The existing models will be replaced with LED units with battery backups using approximately 4 W. This change will improve reliability, reduce energy and maintenance costs, and give a more professional appearance to the buildings.
	7	**CFL Lighting Retrofit** Atrium Building	Install LED bulbs in areas where CFL were provided during construction

Other	8	**Sub-Metering Project** Hospital Campus	The hospital currently only receives one monthly electricity invoice for the entire campus making it difficult to determine where energy is being used. There are currently a limited number of sub-meters installed whose intention was to better understand where energy is being sent; however, the electrical systems underwent a significant change during site redevelopment including the Atrium Building construction and the meters no longer measure as intended. A redesign and installation of additional meters would help Waypoint in informed decision making moving forward.

A more detailed summary of all completed projects affecting energy use can be found in **Appendix B**.

Load Shedding Project Details

Waypoint is always looking for ways to reduce energy costs and implement green initiatives.

Waypoint has entered an agreement to undertake a battery storage project that will reduce the hospital's electricity demand at times when provincial demand is highest. During forecasted peak demand periods, Alectra will signal the newly installed battery storage system to provide electricity in place of the normal supply from the electricity grid. This process will help relieve strain on the utility grid at times of peak demand.

As a result of this load shedding initiative, Waypoint's global adjustment charge on electricity invoices is expected to be reduced by approximately $200,000 annually.

The batteries arrived on site in April of 2021.

Endorsement

Waypoint Centre for Mental Health Care's senior management has reviewed and approved this Energy Conservation and Demand Management Plan.

2022 / 06 / 02

David Griffin
Director, Hospital Services

Date

Contact Information

For additional information regarding Waypoint's Energy Conservation and Demand Management Plan, please contact:

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Appendix A – Completed Project Details

#	Project Name	Annual Energy Savings	Annual Cost Savings ($) Energy + Operations	Implementation Cost ($)	Incentive ($)	Simple Payback (Years)	Status
1	Lighting Replacement						Completed 2019
2	Window Replacement						Completed 2019
3	Roof Upgrade						Completed 2021
4	Exit Sign Replacement						Completed 2021
5	Load Shedding Project						Completed 2021
6	Pipe Insulation						Completed 2022
7	Building Automation Tuning						Completed 2022

Appendix B – Ongoing and Future Project Details

#	Project Name	Annual Energy Savings	Annual Cost Savings ($) Energy + Operations	Implementation Cost ($)	Incentive ($)	Simple Payback (Years)	Status
1	Window Replacement						On Hold
2	Toanche VAV/Radiant Panel Integration						On Hold
3	Optimize Unit and Zone Schedules						In Progress
4	Improve Heat Pump COP						In Progress
5	Fluorescent Lighting Retrofit						In Progress
6	Exit Sign Replacement						Partially Complete
7	CFL Lighting Retrofit						In Progress
8	Sub-Metering Project						On Hold