Design, Construction and Retrofit Strategies

			2018-2019		2019-2020		2020-2021		2021-2022		2022-2023	2018/2019-2022/2023			
Lighting	Quantity of Time that Measure will be in	Estimated Cost of	Estimated Annual Energy Savings from all	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Saving (ekWh)	Estimated Total Accumulated Energy Savin (ekWh)	igs Energy Payback	% related to Electricity	% related to Natural
High Efficiency Lighting Systems	place (years)	Implementation \$ 255,350	projects (ekWh)	\$ 350,000	(ekWh) 285.714	\$ 1,100,000	(ekWh) 897,959	\$ 439,000	(ekwn) 358.367 \$	450,000	367	347 (EKWII) 5,963,0	Period 7	100	Gas
Outdoor Lighting	15	\$ 17,200	14,041	\$ -	-	\$ -	-	\$ 41,000	33,469 \$	-		- 137,1	7	100	0
Occupancy Sensors Other (Describe)	10	\$ 59,400 ©	67,886	\$ - ©	-	\$ -	-	\$ 41,000 ©	46,857 \$	-		- 433,1	5	100	100
Other (Describe)		Φ -		Φ -		-		Φ -	- Φ				U		100
			2018-2019		2019-2020		2020-2021		2021-2022		2022-2023	2018/2019-2022/2023		T	Ī
H.V.A.C.	Quantity of Time that Measure will be in place	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all proj (ekWh)	ects Estimated Total Accumulated Energy Savin (ekWh)	igs Energy Payback Period	% related to Electricity	% related to Natural Gas
Efficient Boilers (near condensing)	30	\$ -	-	\$ -		\$ -	-	\$ -	- \$	-			- 15	5	95
High-efficiency Boilers (condensing)	15	\$ 60,000	166,817	\$ -	-	\$ 200,000	556,058	\$ 200,000	556,058 \$	150,000	417	043 4,031,4	10	5	95
High-efficiency Boiler Burners Geothermal	20	\$ - \$ -	<u>- </u>	\$ - \$ -	<u>-</u>	\$ - \$ -	<u>-</u>	\$ - \$ -	- \$ - \$	-		<u>-</u>	- 5 - 35	100	95 0
Heat Recovery/Enthalpy Wheels	30	\$ -	<u>-</u>	\$ -	-	\$ -	-	\$ -	- \$	-			- 8	20	80
Economizers	15	\$ -	-	\$ -	-	\$ -	-	\$ -	- \$	-		-	- 7.5	50	50
Energy Efficient HVAC systems	30	\$ 30,000	3,928	\$ 275,000	36,009	\$ 1,000,000	130,944	\$ -	- \$	-		- 556,5	75	50	50
Energy Efficient Rooftop Units High Efficiency Domestic Hot Water	15 15	\$ - \$ -		\$ - \$ 16.000	31 619	\$ -		\$ - \$ 31,000	- \$ 61.262 \$	-		- 249 C	000 10	15	85
Efficient Chillers and Controls	25	\$ -	-	\$ -	-	\$ -	<u>-</u>	\$ -	- \$	-		-	- 100	100	0
High-efficiency Motors	20	\$ -	-	\$ -	-	\$ -	-	\$ -	- \$	-		-	- 10	100	0
VFD Demand Ventilation	15	\$ - \$		\$ - \$	-	\$ - \$	- -	\$ - \$	- \$	-		-	- 5 - 5	75 50	25 50
Entrance Heater Controls	20	\$ -	<u>-</u>	\$ -	-	\$ -		\$ -	- \$	-		<u>- </u>	- 5	50	50
Destratification Fans	10	\$ -	-	\$ -	-	\$ -	-	\$ -	- \$	-		-	- 7	100	0
Other (Describe)		-	- -	-	- · · · · · · · · · · · · · · · · · · ·	-	- -	\$ -	- \$	-		<u>-</u>	- 0		100
			2018-2019		2019-2020		2020-2021		2021-2022		2022-2023	2018/2019-2022/2023			
Controls	Quantity of Time that Measure will be in place	Estimated Cost of Implementation	Estimated Annual Energy Savings from all	Estimated Cost of Implementation	2019-2020 Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	2020-2021 Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	2021-2022 Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation		ects Estimated Total Accumulated Energy Savin (ekWh)	igs Energy Payback Period	% related to Electricity	% related to Natural Gas
	place	Estimated Cost of Implementation \$ 25,000	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation		Estimated Cost of Implementation		Estimated Cost of Implementation		Estimated Cost of Implementation		ects Estimated Total Accumulated Energy Savin	Pariod	% related to Electricity	% related to Natural Gas
Controls Building Automation Systems - New Building Automation Systems - Upgrad	place 10	Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation \$ -		Estimated Cost of Implementation \$ -		Estimated Cost of Implementation -		Estimated Cost of Implementation -		ects Estimated Total Accumulated Energy Savin	Pariod	% related to Electricity 50	% related to Natural Gas 50
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to	place 10 ade 10	Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation \$ - \$ - \$ 15,000	Estimated Annual Energy Savings from all projects (ekWh) -	Estimated Cost of Implementation \$ - \$ 7,500		Estimated Cost of Implementation		Estimated Cost of Implementation -		ects Estimated Total Accumulated Energy Savin	Pariod	% related to Electricity 50 50	% related to Natural Gas 50 50
Building Automation Systems - New Building Automation Systems - Upgrad	place 10 ade 10	Implementation	Estimated Annual Energy Savings from all projects (ekWh)	\$ - \$	Estimated Annual Energy Savings from all projects (ekWh) -	Estimated Cost of Implementation \$ - \$ 7,500		Estimated Cost of Implementation		Estimated Cost of Implementation		ects Estimated Total Accumulated Energy Savin	Pariod	% related to Electricity 50 50 100	% related to Natural Gas 50 50 50
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues	place 10 ade 10	Implementation	Estimated Annual Energy Savings from all projects (ekWh)	\$ - \$	Estimated Annual Energy Savings from all projects (ekWh) -	Estimated Cost of Implementation \$ - \$ 7,500 \$ -		Estimated Cost of Implementation \$ - \$ - \$ - \$ -		Estimated Cost of Implementation		ects Estimated Total Accumulated Energy Savin	Pariod	% related to Electricity 50 50 100	% related to Natural Gas 50 50 0 100
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers	place 10 ade 10	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 -	\$ - \$	Estimated Annual Energy Savings from all projects (ekWh) 49,104	Estimated Cost of Implementation \$ - \$ 7,500 \$ -	Estimated Annual Energy Savings from all projects (ekWh) - 24,552	Estimated Cost of Implementation \$ - \$ - \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) - \$ \$ \$ \$	Estimated Cost of Implementation	Estimated Annual Energy Savings from all proj (ekWh)	Estimated Total Accumulated Energy Savin (ekWh) - 81,8 - 515,5	Pariod	% related to Electricity 50 50 100	% related to Natural Gas 50 50 0 100
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe)	10 ade 10 10 15	S 25,000 \$ -	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019	S	Estimated Annual Energy Savings from all projects (ekWh) 49,104 - 2019-2020	S	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021	Implementation	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ - \$	Implementation -	Estimated Annual Energy Savings from all proj (ekWh)	Estimated Total Accumulated Energy Savin (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023	Period 340	50 50 50 100	50 50 50 0 100
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers	place 10 ade 10	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all	Implementation \$ - \$ - \$ 15,000 \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 49,104	Implementation \$ - \$ - \$ 7,500 \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) - 24,552	Implementation	Estimated Annual Energy Savings from all projects (ekWh) - \$ \$ \$ \$	Implementation -	Estimated Annual Energy Savings from all proj (ekWh)	Estimated Total Accumulated Energy Savin (ekWh) - 81,8 - 515,5	Period 340	50 50 50 100	% related to Natural Gas 50 50 0 100 % related to Natural Gas
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe)	place 10 10 10 10 15 Quantity of Time that Measure will be in	S	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019	S	Estimated Annual Energy Savings from all projects (ekWh) 49,104 - 2019-2020 Estimated Annual Energy Savings from all projects (ekWh)	S	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021 Estimated Annual Energy Savings from all projects	Implementation \$ - \$ - \$ - \$ - \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects	Implementation Estimated Cost of	Estimated Annual Energy Savings from all projection (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj	Estimated Total Accumulated Energy Saving (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Saving	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	50 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe)	place 10 10 10 10 15 Quantity of Time that Measure will be in	S	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all	Implementation \$ - \$ - \$ 15,000 \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 49,104 - 2019-2020 Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 7,500 \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021 Estimated Annual Energy Savings from all projects	Implementation \$ - \$ - \$ - \$ - \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects	Implementation Estimated Cost of	Estimated Annual Energy Savings from all projection (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj	Estimated Total Accumulated Energy Saving (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Saving	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	Gas 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof	place 10 10 10 10 15 Quantity of Time that Measure will be in	S	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 15,000 \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 7,500 \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021 Estimated Annual Energy Savings from all projects (ekWh)	Implementation S	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects	Implementation Estimated Cost of	Estimated Annual Energy Savings from all projection (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj	Estimated Total Accumulated Energy Saving (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Saving	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	50 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof New Windows	place 10 10 10 10 15 Quantity of Time that Measure will be in	Implementation \$ 25,000 \$ - \$ 15,000 \$ - \$ - \$ Estimated Cost of Implementation \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 15,000 \$ - \$ - \$ - \$ 25,000 \$ -	Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 7,500 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021 Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ - \$ - \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects	Implementation Estimated Cost of	Estimated Annual Energy Savings from all projection (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj	Estimated Total Accumulated Energy Saving (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Saving	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	Gas 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof New Windows Treatments	place 10 10 10 10 15 Quantity of Time that Measure will be in	Implementation \$ 25,000 \$ - \$ 15,000 \$ - \$ - \$ Estimated Cost of Implementation \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 15,000 \$ - \$ - \$ - \$ 25,000 \$ -	Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 7,500 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021 Estimated Annual Energy Savings from all projects (ekWh)	Implementation S	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects	Implementation Estimated Cost of	Estimated Annual Energy Savings from all projection (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj	Estimated Total Accumulated Energy Saving (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Saving	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	50 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof New Windows	place 10 10 10 10 15 Quantity of Time that Measure will be in	Implementation \$ 25,000 \$ - \$ 15,000 \$ - \$ - \$ Estimated Cost of Implementation \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 15,000 \$ - \$ - \$ - \$ 25,000 \$ -	Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ 7,500 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$	Estimated Annual Energy Savings from all projects (ekWh) 24,552 - 2020-2021 Estimated Annual Energy Savings from all projects (ekWh)	Implementation S	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects	Implementation Estimated Cost of	Estimated Annual Energy Savings from all projection (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj	Estimated Total Accumulated Energy Saving (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Saving	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	50 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof New Windows Treatments Shading Devices	place 10 10 10 10 15 Quantity of Time that Measure will be in	Implementation \$ 25,000 \$ - \$ 15,000 \$ - \$ - \$ Estimated Cost of Implementation \$ - \$ -	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh) 82,873	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 49,104 - 2019-2020 Estimated Annual Energy Savings from all projects (ekWh) 5,395 - 51,796 - 6,667	Implementation \$ - \$ - \$ 7,500 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$	Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$	Estimated Annual Energy Savings from all projects (ekWh) - \$ \$ \$ \$ 2021-2022 Estimated Annual Energy Savings from all projects (ekWh) - \$ \$ \$ \$ \$ \$ \$	Implementation Estimated Cost of	Estimated Annual Energy Savings from all proj (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj (ekWh)	Estimated Total Accumulated Energy Savin (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Ects Estimated Total Accumulated Energy Savin (ekWh) - 21,5 - 880,5 - 105,5	Period 340 15 - 15 - 7 - 0 ags Energy Payback	50 50 50 100 % related to	50 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof New Windows Treatments Shading Devices Other (Doors)	place 10 10 10 10 15 Quantity of Time that Measure will be in place 30 50 25 30 10 30 10 30	S 25,000	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh) 2018-2019 2018-2019	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 49,104 2019-2020 Estimated Annual Energy Savings from all projects (ekWh) 5,395 - 51,796 - 6,667	Implementation \$	Estimated Annual Energy Savings from all projects (ekWh)	Implementation	Estimated Annual Energy Savings from all projects (ekWh) - \$ - \$ 2021-2022 Estimated Annual Energy Savings from all projects (ekWh) - \$ 52,767 \$ 52,767 \$ - \$ 8,571 \$	Estimated Cost of Implementation	Estimated Annual Energy Savings from all proj (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj (ekWh) 2022-2023	Estimated Total Accumulated Energy Savin (ekWh) - 81,8 - 515,5 - 515,5 - 2018/2019-2022/2023 Estimated Total Accumulated Energy Savin (ekWh) - 21,5 - 880,5 - 105,5 - 43,8	Period 340	50 50 50 100 % related to	50 50 50 0 100 % related to Natural
Building Automation Systems - New Building Automation Systems - Upgrad Real-time energy data for operators to identify and diagnose building issues Voltage Harmonizers Other (Describe) Building Envelope Glazing Increased Wall Insulation New Roof New Windows Treatments Shading Devices	place 10 10 10 15 Quantity of Time that Measure will be in place 30 50 25 30 10 30 10 30	Implementation \$ 25,000 \$ -	Estimated Annual Energy Savings from all projects (ekWh) 16,368 - 49,104 - 2018-2019 Estimated Annual Energy Savings from all projects (ekWh) 82,873	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 49,104 - 2019-2020 Estimated Annual Energy Savings from all projects (ekWh) 5,395 - 51,796 - 6,667	Implementation \$ - \$ - \$ 7,500 \$ - \$ - \$ - \$ - \$ - \$ - \$ - \$	Estimated Annual Energy Savings from all projects (ekWh)	Implementation	Estimated Annual Energy Savings from all projects (ekWh) - \$ \$ \$ \$ 2021-2022 Estimated Annual Energy Savings from all projects (ekWh) - \$ \$ \$ \$ \$ \$ \$	Implementation Estimated Cost of	Estimated Annual Energy Savings from all proj (ekWh) 2022-2023 Estimated Annual Energy Savings from all proj (ekWh) 2022-2023	Estimated Total Accumulated Energy Savin (ekWh) - 81,8 - 515,5 - 2018/2019-2022/2023 Ects Estimated Total Accumulated Energy Savin (ekWh) - 21,5 - 880,5 - 105,5	Period 340	50 50 50 100 % related to	50 50 50 0 100 % related to Natural

Keys	
colour: yellow	= Default value
colour: blue	= Calculated Value
\$0.175	= cost of 1 ekWh electricity
\$ 0.0287	= cost of 1 ekWh natural gas
0.0955	m ³ = 1 ekWh (as per NRCan
0.0933	conversion table)
\$0.30	= cost of 1 m ³ of natural gas