

Strategic Energy Management Plan (SEMP) Update

Council Meeting
July 13, 2021

Agenda

1. Strategic Energy Management Plan (SEMP) Overview
 - Brief description
 - Department commitments
 - MEM program
 - Deliverables
2. SEMP Updates
 - Target
 - Implementation
 - Savings
3. Future Implementation
 - 2021 ECM's
 - 2022 ECM's
 - Future

Strategic Energy Management Plan (SEMP)

- Facility Services has developed a Strategic Energy Management Plan (SEMP) to reduce facility energy use, increase operational efficiency and adopt new technologies to help reduce our carbon footprint on the environment.
- Our mission is to improve the energy performance of facilities within Strathcona County through process, best practice and policy. We will work with stakeholders to exchange information and provide tools, strategies, and programs that build awareness and lead to action and positive results.
- The SEMP will identify and implement Energy Conservation Measures (ECM's) as well as develop procedures to achieve corporate approved target of reducing GHG levels 15% below 2018 levels by 2030

Department Commitment

Facility Lifecycle and Maintenance Program

- Upgrade equipment based on age and condition, using energy efficient equipment where and when appropriate.
- Identifying appropriate funding opportunities
- Increase employee training to identify energy savings
- Build on existing Building Automation Systems (BAS) to continuously monitor equipment to realize energy savings opportunities, identify issues, and communicate successes.

Strategic Energy Management Plan

- Creates greater focus on energy use improvements and associated GHG reductions
- Builds accountability through role assignments and objectives
- Creates continuous improvement through benchmarking and reporting
- Involves monitoring for communication of results
- Assists in business case development for energy savings
- Seek out funding opportunities for ECM implementation including the Municipal Energy Manager (MEM) Program through the MCCAC

MEM Program

Municipal Energy Manager (MEM) Program

- Co-sponsored with Utilities and Facility Services
- Received Municipal Climate Change Action Centre (MCCAC) grant funding for 80% of wage for a Municipal Energy Manager for second year ending May 2022.
- Extend the current SEMP to include RPC, Utilities, and Fleet
- Compile information to build a corporate wide SEMP including direction and strategies for the next five years
- Tracking and monitoring energy performance for communicating results



SEMP and MEM programs

Working together to successfully update the Environmental Sustainability Framework (ESF), both programs fall in line through:

- Innovative process
 - Green House Gas emissions inventory
 - Energy efficiency audits
 - Using technology for understanding energy use/benchmarking
- Supportive plans
 - Help administer the Municipal Sustainable Building policy
 - Develop corporate wide SEMP; setting the course
 - Assist in department plans for energy reduction
- Strategic initiatives
 - Encourage, undertake and support alternative energy sourcing
 - Determine corporate energy use (vehicle fuel, natural gas, electricity)
 - Investigate Electric Vehicles (EV) technology, assist in planning

Benchmarking

- Completed for 2019
- Normalizes building size to compare by type
- Compares our facilities to similar building types in Edmonton as well as other buildings in similar regions
- Assist in decision making placing focus on poor performers
- Monitors building performance
- Identify improvements

Building/Facility Type	Median – Energy Use Intensity (GJ/Sq.m)	2019 SC Average Energy Use Intensity (GJ/Sq.m)
Recreation Centre	1.85	3.34
Ice Rink / Curling Rink	1.52	2
Multi sports Complex	1.9	3.2
Perfomring Arts	1.85	2.18
Fire Hall / Police Station	1.57	1.88
Fleet / Maintenance Shop	1.6	3.67
Administration Building	1.51	1.82
Transit Facility Transit Terminal	1.6	3.53

Opportunities

Facility	# of Opportunities
SOC	6
GARC	8
SHPK	6
ARC	19
BPGC	15
EHLC	10
EHSP	5
MRC	14
RPC/SALTO	8
SAP	6
CC/CH	4
SPSY	6
MP	48
KLC	4

- Created from 14 building Audits and 1 Energy Scan
- Over 180 opportunities identified
- Represents roughly 54% of County's total consumption
- Range from no cost to capital projects
- A living list with buildings and opportunities added as necessary
- Does not include life cycle projects

Collaboration

- Work with RPC on Facility and behavioural opportunities
- Assisting Fleet in compiling and assessing fuel use summary to calculate GHG as well as participate in the Hydrogen Bus project and an EV feasibility study
- Set up energy scan with Utilities to asses 17th st Reservoir
- Provide data and information to the Sustainability Framework Team to ensure synergy



Communication

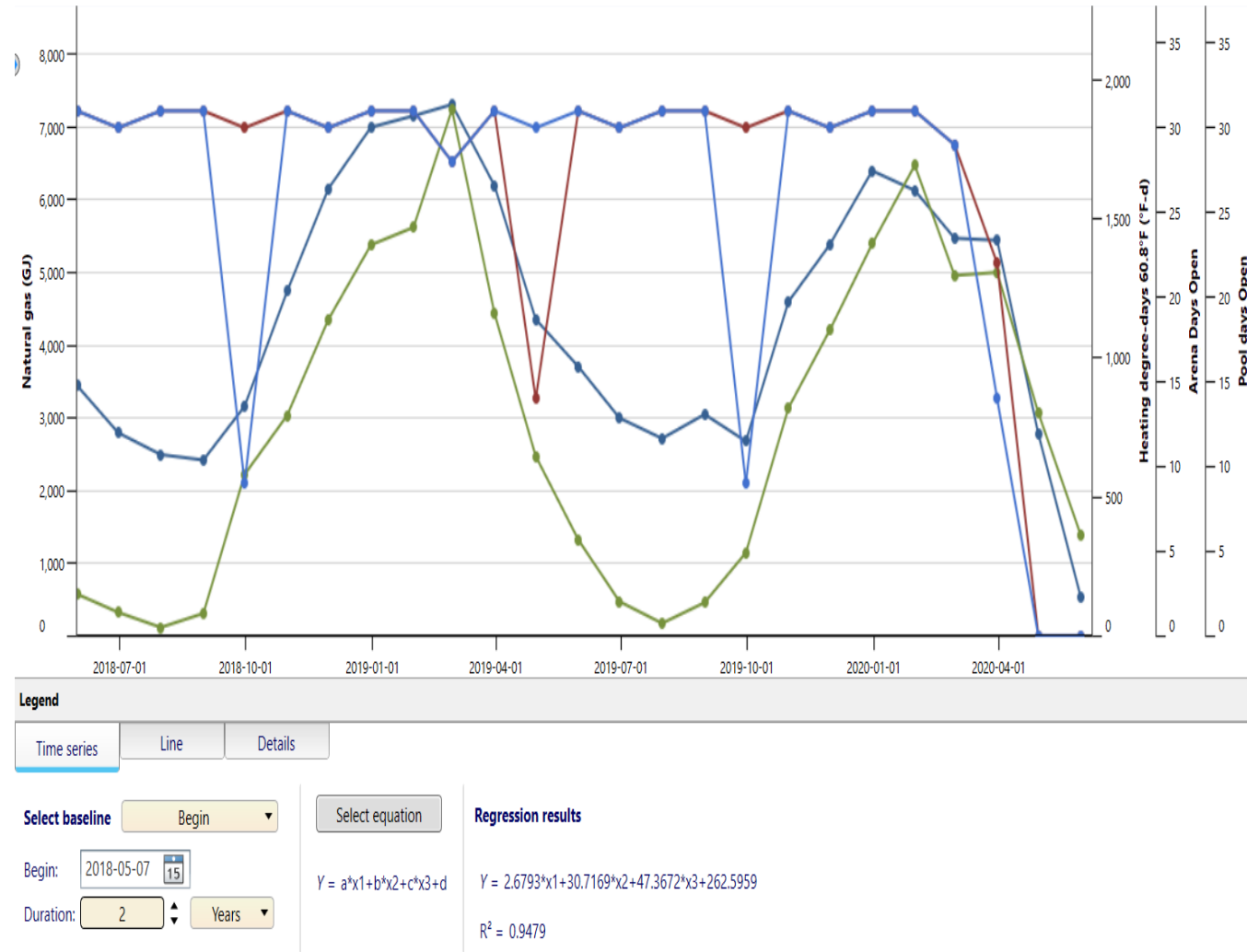
Roll out internally Energy Management webpage where information will be shared around;

- Completed ECM's,
- Upcoming projects,
- Energy Management principles and tips
- Building Performance

A email will be set up as well to field ideas, questions, and comments

Webpage is in development to be rolled out by end of 2021

Measurement and Verification



- Using Building energy modeling software
- Model buildings energy consumption to normalize building data
- Performs energy calculations
- Measures effectiveness of ECM implementation
- Creates feasibility analysis for potential ECM's
- Verifies savings according to appropriate associations

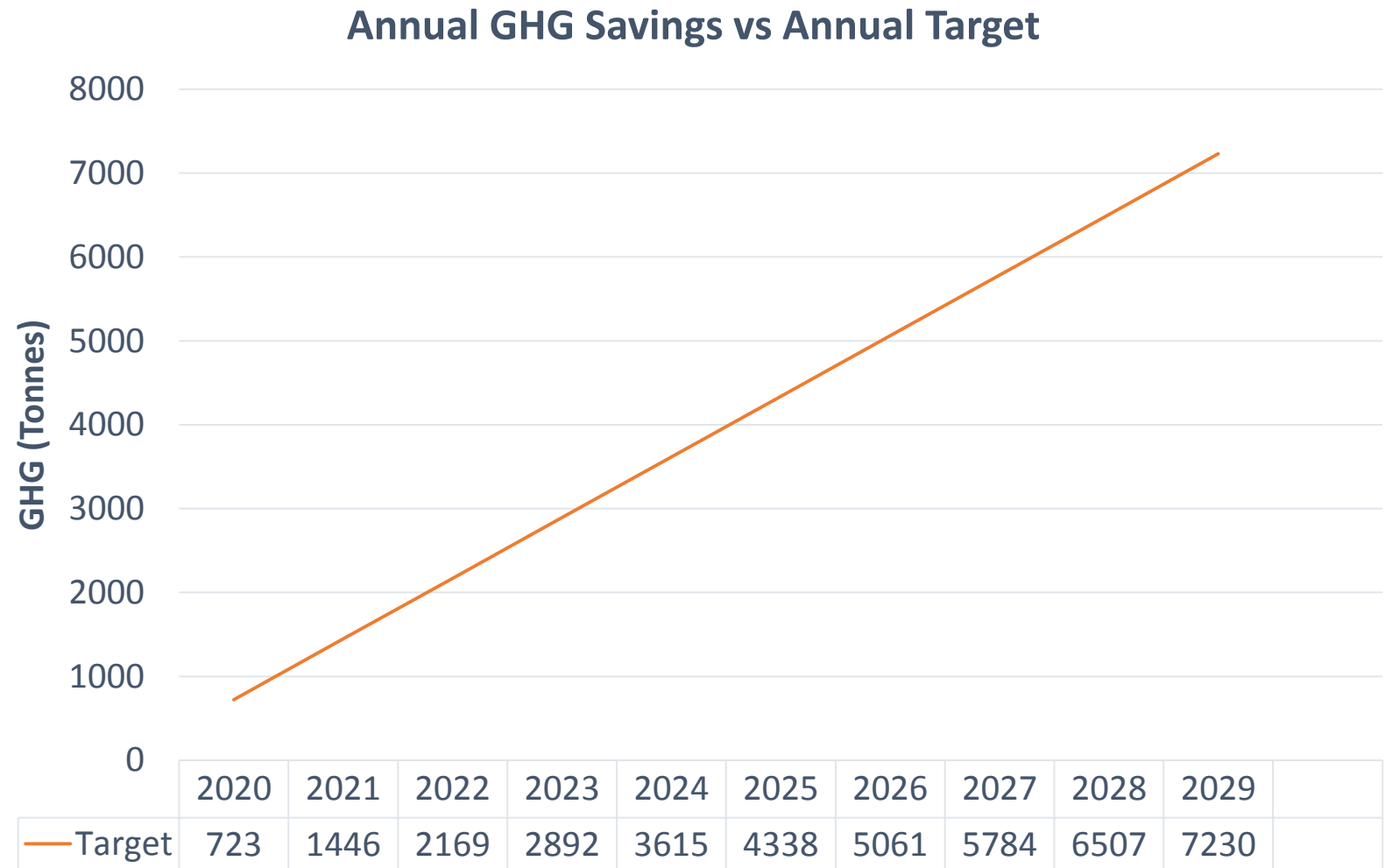
Corporate GHG Inventory

- Using Building energy modeling software
- Model buildings energy consumption to normalize building data
- Performs energy calculations
- Measures effectiveness of ECM implementation
- Creates feasibility analysis for potential ECM's
- Verifies savings according to appropriate associations

Department	2018 GHG (tonnes)	2019 GHG (tonnes)	2020 GHG (tonnes)
Recreation, Parks, and Culture	18854	18567	13674
Facility Services	12158	12326	10852
Transportation and Agriculture services	3120	2483	2546
Utilities	4319	3970	4021
Fleet	9766	9873	7632
Total	48216	47220	38726
Annual GHG Reduction	N/A	<996>	<8,494>

2030 Target

- 15% Reduction in GHG from 2018 levels by 2030
- Reduce annual GHG emissions by 7232
- Require an annual reduction of 723 per year
- Low hanging fruit
- No Cost/Low Cost
- Capital investment



Implementation

No Cost

- Behavioural
- Equipment and Program Scheduling
- Operational set points
- Optimizing Set Points

Low Cost

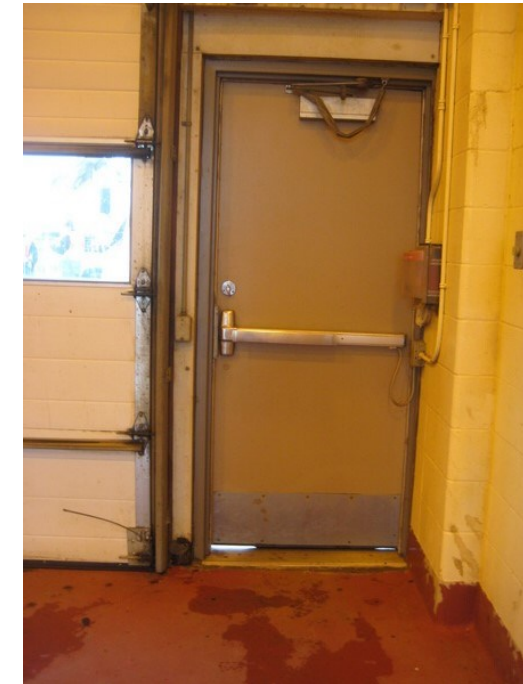
- Envelope Repairs
- Pipe insulation repair
- LED Lighting bulb replacements
- Motor/fan replacement and repair

Capital

- Budgetary Asks
- Life Cycle Projects
- Grant Funding
- Equipment replacement
- New technologies

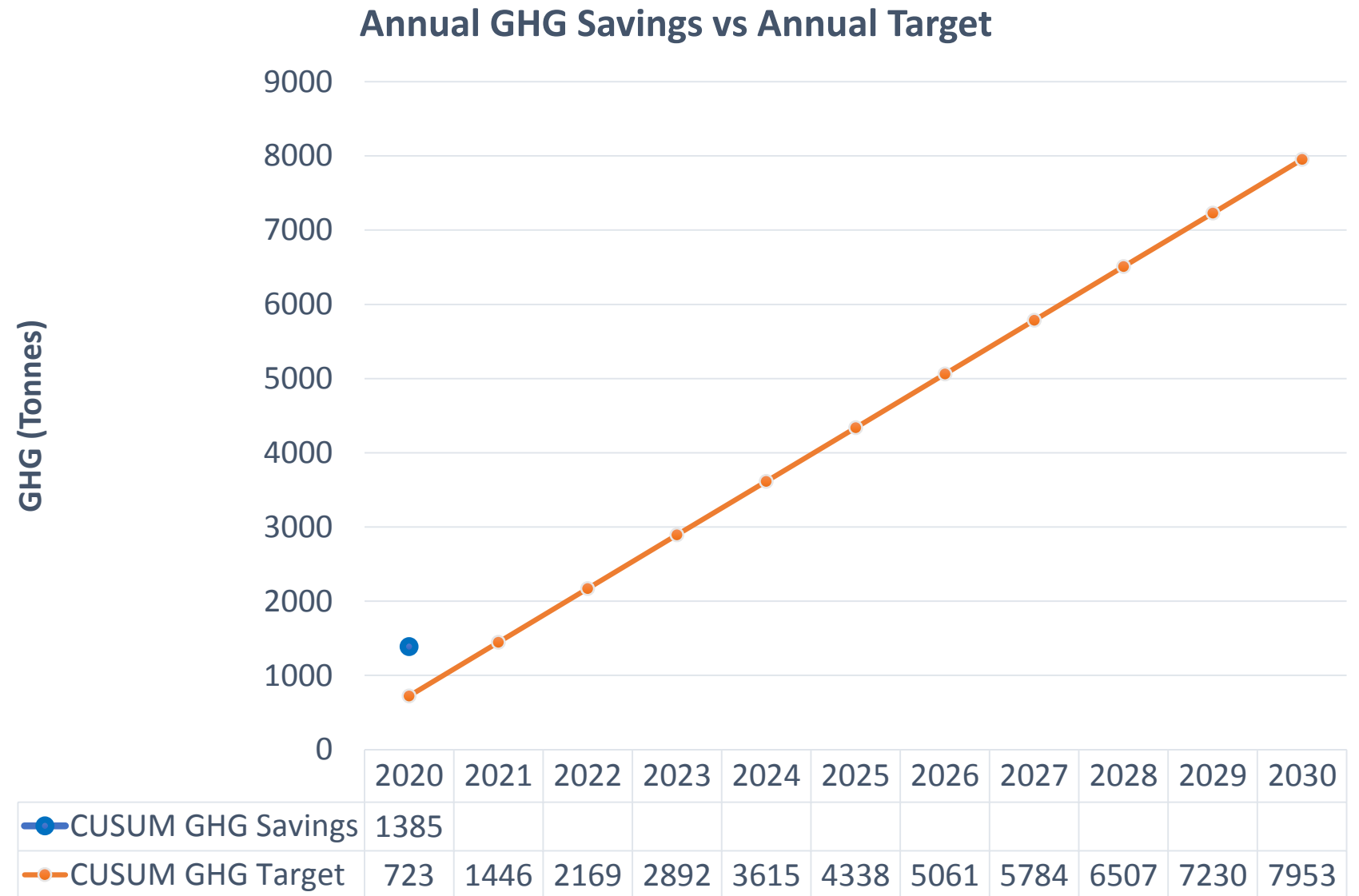
Implementation 2020

- Replacing bulbs with LED.
- Repair and replace weather stripping
- Repair and replace and missing or damaged pipe insulation
- Set DHW to 140 deg f
- Refine Building Automation systems
- Behavioural changes in operational staff through information sharing and using energy management principles

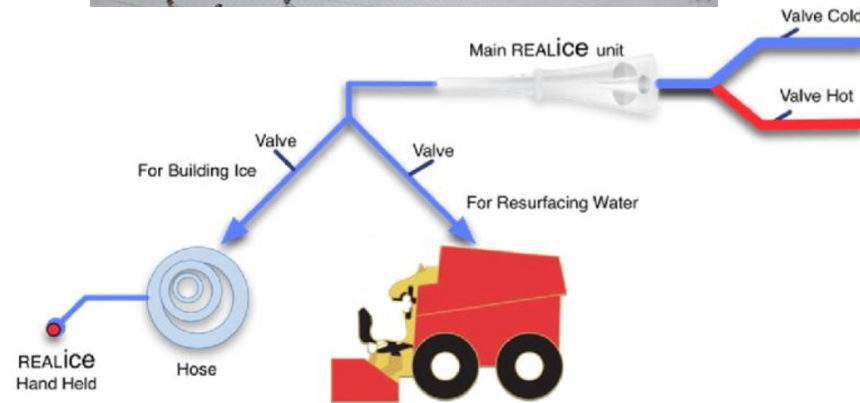


Implementation 2020

- Includes 2019
- Investment of roughly \$633k
- GHG reduction of 1382 tonnes/yr
- 1.9million kWh
5,500 GJ
- Cost savings of \$150k/yr
- Exceed target



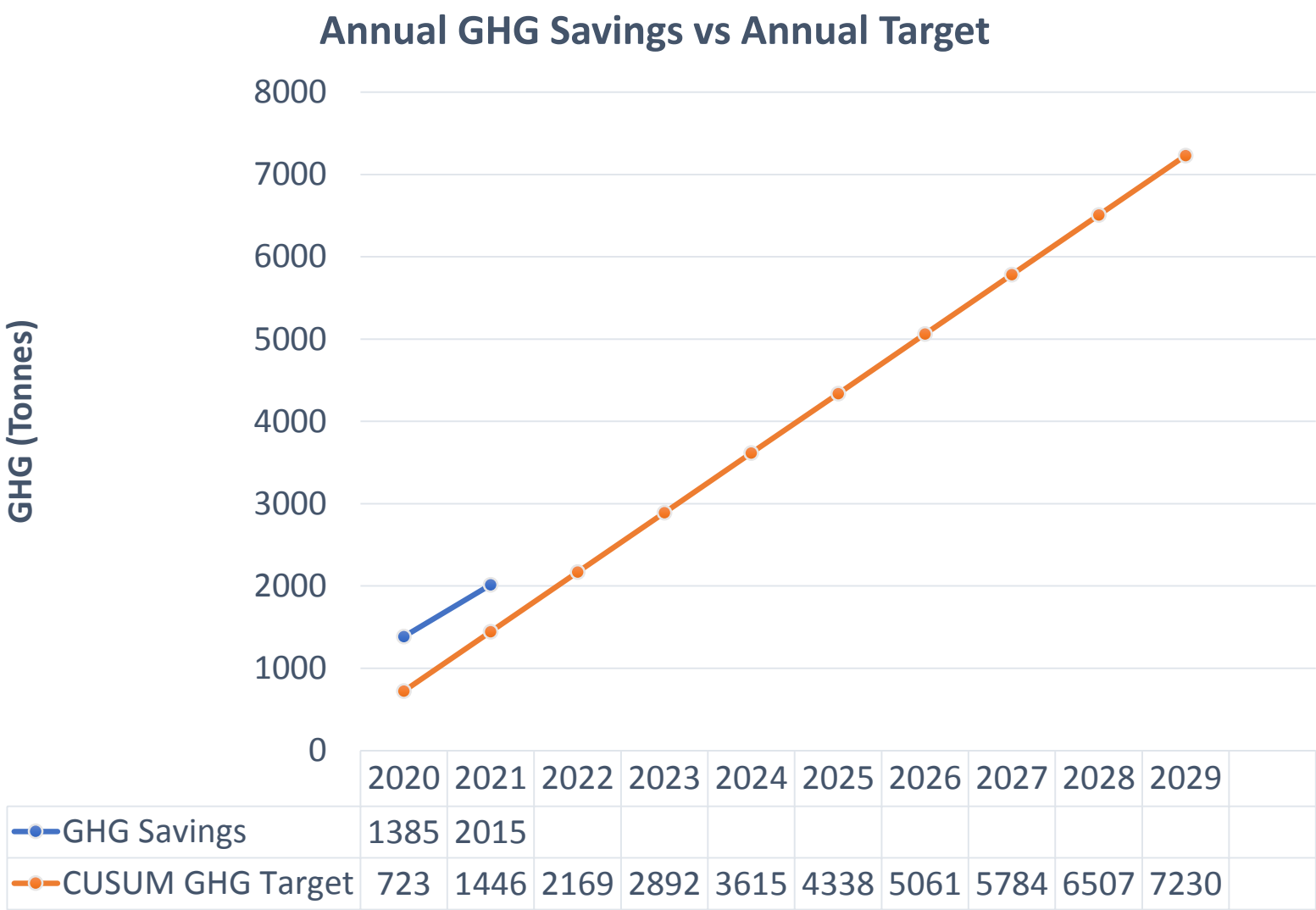
Implementation 2021



- LED Lighting Retrofits at MP and Salto
- -MCCAC funding of \$660k
- Installation of REALice cold water flooding at MP
- Festival Place Window upgrade
- Continued low Cost/No cost items across all facilities
- Fleet Electric Vehicle feasibility study

Implementation 2021

- Investment of roughly \$968k
- \$700k funded through MCCAC
- GHG reduction of 630 tonnes/yr
- 719 thousand kWh
- 573 GJ
- Cost savings of \$58k/yr



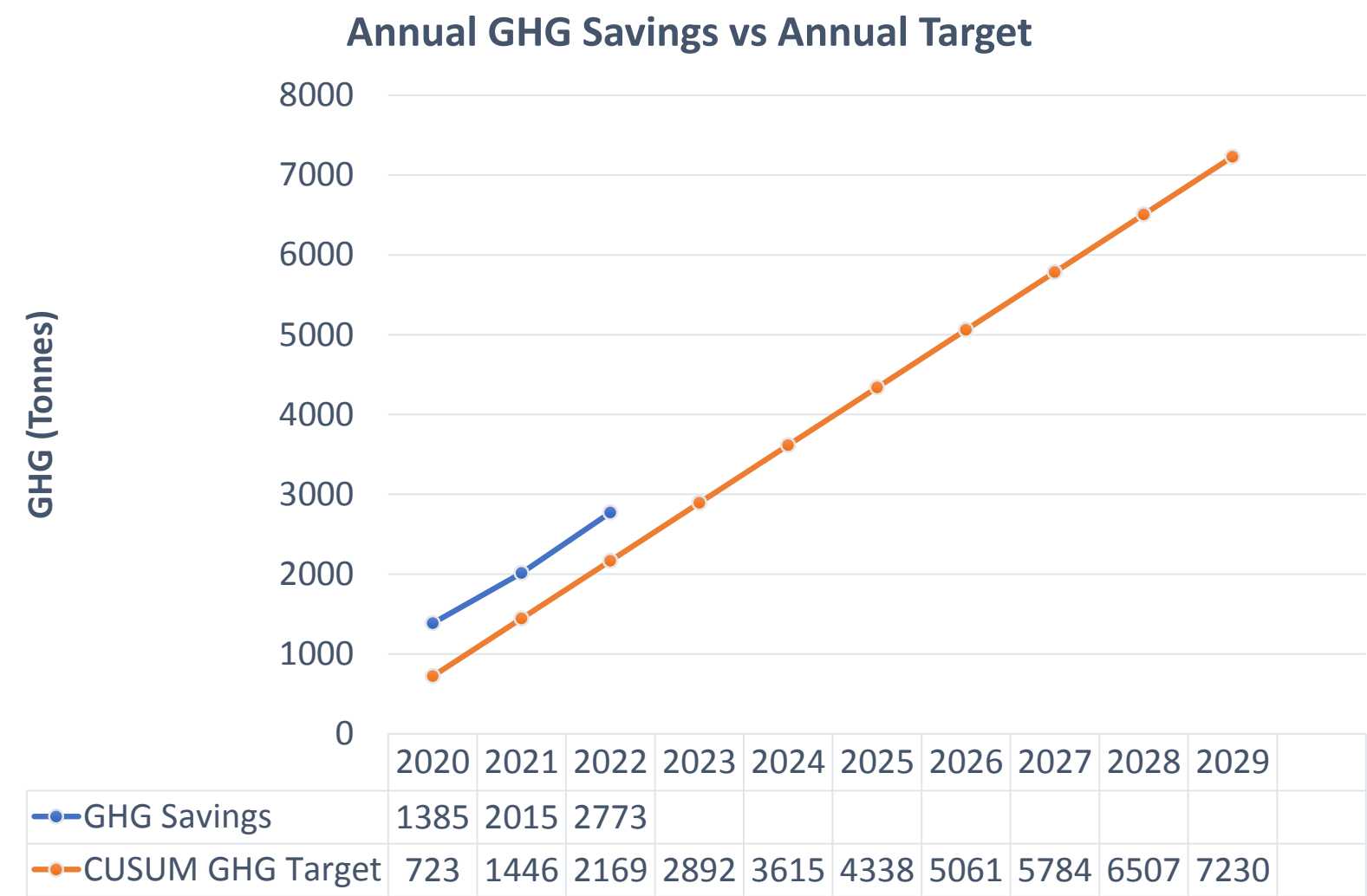
Implementation 2022

- Proposed 2022 ECM's
- LED Lighting Retrofits at SOC, ARC, MRC, SP arena
- MP Solar PV installation
- Retro commissioning at MP and Community Centre/County Hall
- No Cost/Low Cost items
- Life cycle projects
- Potential for EV



Implementation 2022

- 2022 Submitted Business Case
- Investment of \$800k
- GHG reduction of 750 tonnes/yr
- 1.2 million kWh
- 2,300 GJ
- Cost savings of \$84k/yr



Implementation Future

Annual investment will be required to meet the target. The investment will funding comes from multiple sources:

- Available grants
- Current life cycle replacement and maintenance programs
- Capital projects (brought through budget process)

Investment levels are calculated from looking at project estimates with GHG savings, it is found;

- Roughly \$1200 of investment per tonne of GHG saved
- Roughly \$120 of annual savings per GHG saved

After Implementation Investment/savings may change, the following will assist in accurate reporting;

- Measurement and Verification for accuracy
- Reconciled and adjust accordingly annually towards target

Implementation Future

\$0 Annually

No cost/low cost ECM's
Operational replacements
Not meet target

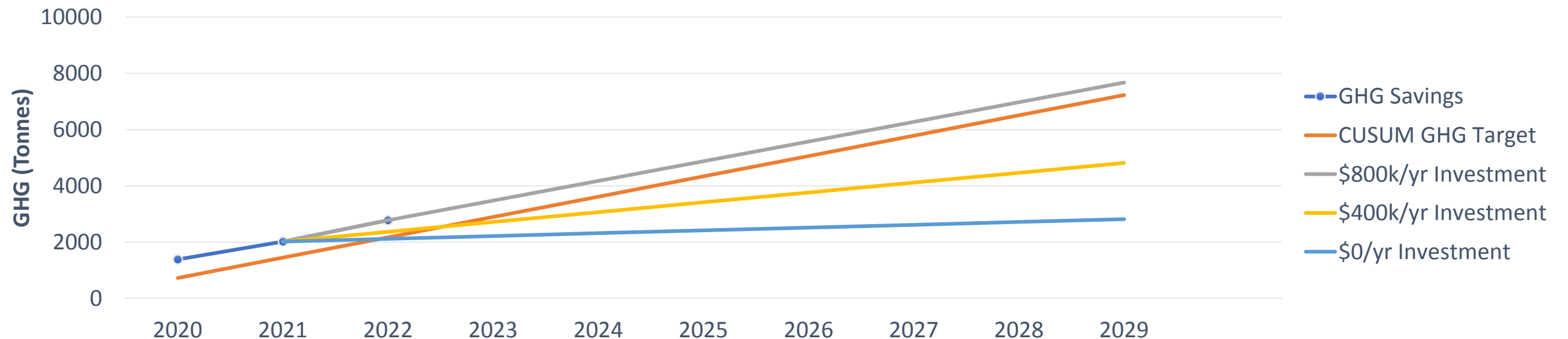
\$400k Annually

No Cost low Cost ECM's
Operational replacements
Small Capital Projects
Not meet target

\$800k annually

No Cost Low Cost ECM's
Operational Replacements
Small and Large Capital Projects
Meet target

Investment levels Vs GHG Savings



SEMP Future

- Continue audits on appropriate County facilities
- Build out opportunity lists to include behaviour programs as well as technical projects
- Increase corporate energy literacy through communication, engagement and training
- Following the energy hierarchy, the intent is to better use the purchased energy to realize cost savings and reduce GHG emissions

Use less energy

Minimising the demand for energy & cut unnecessary use, for example switching off the television when not watching or boiling the required amount of water in a kettle

Use efficiently

consume optimally such as using energy efficient lights, insulating the loft, double glazing the windows, draft proofing doors and windows

Use renewable energy

use energy from renewable resources such as solar photovoltaic, solar hot-water panels, ground source heat pumps etc. or alternatively buying electricity from renewable energy suppliers

SEMP Next Steps

- Use building modeling software to measure and verify savings
- Continue to Search for funding opportunities
- Develop annual ECM's to build out SEMP for up to 2025
- Align opportunities with current life cycle program or available grant programs
- Develop community awareness of opportunity and investment outcomes
- Benchmark facilities against like facilities in the region
- Continue facility audits and expand to other departments
- Create MEM position for long term

Q & A