

The background of the slide is a photograph of a large solar farm. The solar panels are arranged in neat rows and are tilted towards the sun. The sun is low on the horizon, creating a bright, golden glow and casting long shadows. The sky is a mix of blue and orange, with some clouds. The overall scene is peaceful and highlights the theme of renewable energy.

PLAN FOR A NET-ZERO UTILITY – GOLD BAR WWTP AND EDMONTON WTPS

NWWC22 Conference
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Today's Takeaways

- Vision for a net-zero emission utility
- Climate change activities at Gold Bar WWTP and Edmonton WTPs/Reservoirs
- Federal Grant Application Process



https://www.edmonton.ca/sites/default/files/public-files/assets/Climate_Resilient_Edmonton.pdf?cb=1658261401

Targets

- 2025
 - Reduce community-based net greenhouse gas emissions by 35%*
- 2030
 - Reduce community-based net greenhouse gas emissions by 50%*
 - Reduce energy consumption by 35% per person*
 - Generate 10% of Edmonton's electricity locally
- 2050
 - Achieving net-zero per person GHG emissions

EPCOR is committed to contributing to meet these targets

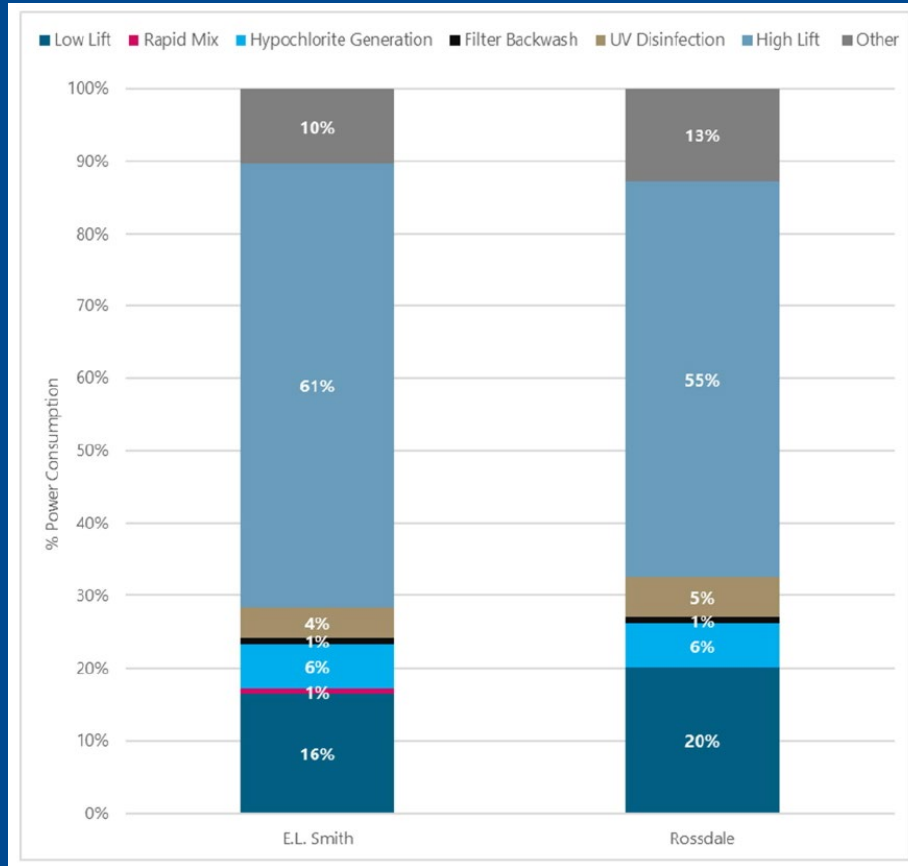
**(compared to 2005 levels)*

Edmonton WTPs & Reservoirs

Energy Audit – Scope of Work

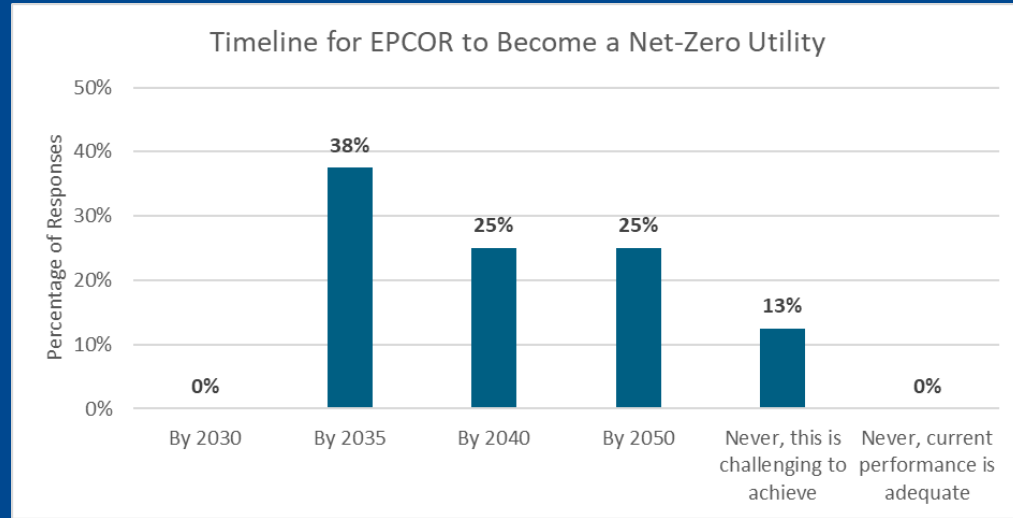
- The Plan
 - Prepare a baseline of GHG emission
 - Benchmark against other water utilities
 - Conduct stakeholder interviews/survey
 - Recommend process improvements
 - Create a roadmap to achieve net-zero utility
 - Prepare a capital plan and a campaign plan
- The Approach
 - Interactive, open minded, brainstorming
 - Innovative in technology and methodology

Power Usage of Major WTP Processes

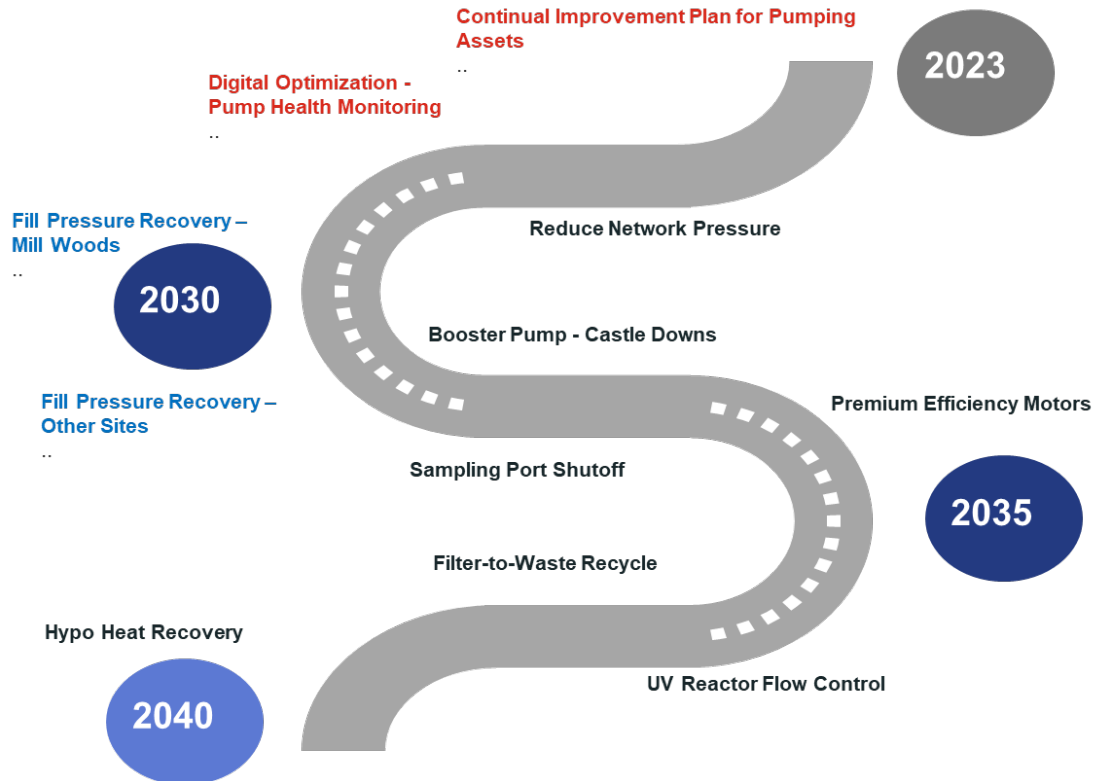


Staff Survey

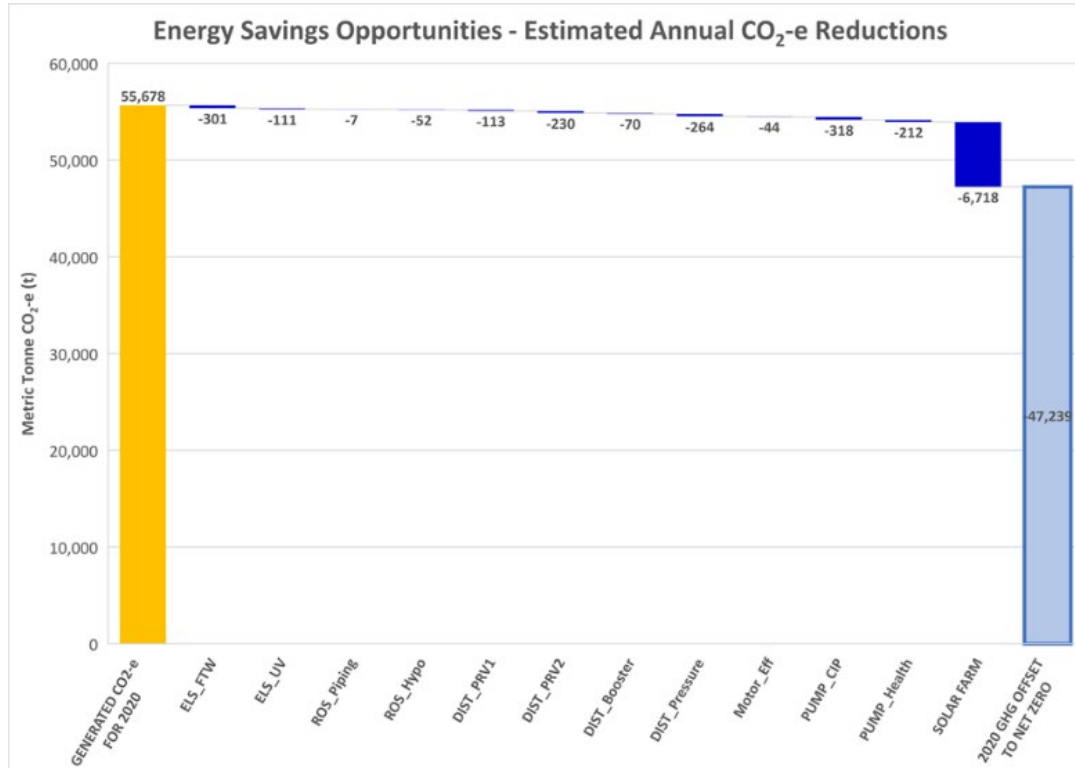
- Four survey sections:
 - Environmental Strategy
 - Current Performance
 - Efficiency Improvements
 - Final Thoughts



First Road Map to Net Zero



First Road Map to Net-Zero



Gold Bar WWTP

1. Energy Audit

- Energy profile
 - Electricity
 - Natural Gas
 - Biogas
- Energy Conservation Measures

Figure E-1
Current and Potential Gas Energy Profile

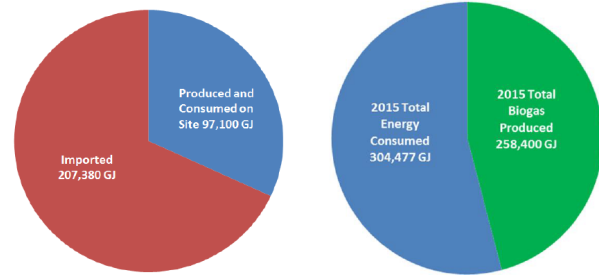
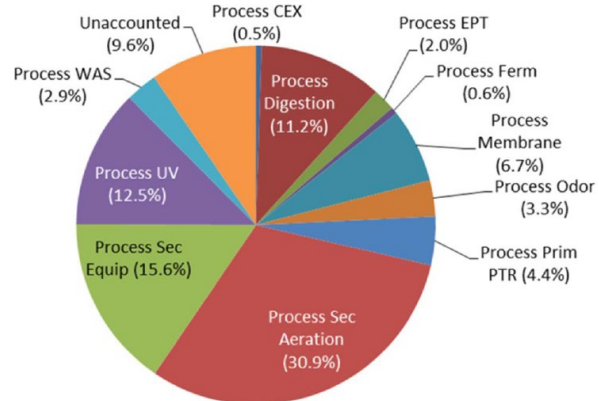


Figure E-2
Electricity Breakdown



2. Climate Change Strategic Plan

2021 - 2024

EWSI EDMONTON WASTEWATER TREATMENT

Climate Change
STRATEGIC PLAN

INTENT

Direction and information generated by the Climate Change Strategic Plan (CCSP) will be included in the Integrated Resource Plan (IRP) and Asset Management Plans (AMPs) to allow for planning and execution of activities related to climate change.

GUIDING PRINCIPLES*	maintain alignment with City of Edmonton, EPCOR Utilities and other EPCOR operating companies	adhere to IRP shared outcomes and design principles	increase knowledge and awareness	foster innovation	apply sustainable / reliable / resilient lens
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	adaptation	mitigation
GOALS	improve Edmonton Wastewater Treatment climate resilience	reduce Edmonton Wastewater Treatment greenhouse gas emissions
OBJECTIVES	i. achieve desired Edmonton Wastewater Treatment level-of-service by to-be-established date	i. achieve to-be-assessed near-term carbon footprint reduction relative to 2012 baseline by 2025 ii. achieve companion mid-term reduction target for 2035 date iii. achieve carbon-neutrality by to-be-established date
ACTIONS	i. consolidate and summarize status and findings of the original EPCOR Water Canada Climate Change Adaptation Strategy Edmonton Wastewater Treatment-related initiatives by Q4 2021 ii. participate in the update of the EPCOR Water Canada Climate Change Adaptation Strategy, completed by Q4 2021 iii. develop and execute comprehensive, Edmonton Wastewater Treatment vulnerability response assessment to inform next Performance Based Regulation (PBR) by Q4 2022 iv. select desired Edmonton Wastewater Treatment level-of-service and establish timeline to achieve by Q4 2023 v. implement Phase 1 temporary flood mitigation structures by Q4 2024	i. estimate 2020 and subsequent yearly carbon footprints annually ii. complete emissions reduction / energy efficiency study by Q4 2021 iii. develop and execute nitrous oxide (N2O) and methane (CH4) field study by Q4 2022 iv. investigate and implement carbon price strategy by Q4 2022 v. develop alternative carbon-neutral road maps and investigate potential timeline to achieve carbon-neutrality by Q4 2023 vi. assess Edmonton Wastewater Treatment contribution to EPCOR Year 2025 70% GHG reduction and Year 2035 85% GHG reduction targets relative to 2012 baseline and establish timeline to achieve carbon-neutrality by Q4 2024 vii. implement secondary aeration upgrade project by 2024 viii. implement Outfall 10 ultra violet disinfection upgrade project by 2026

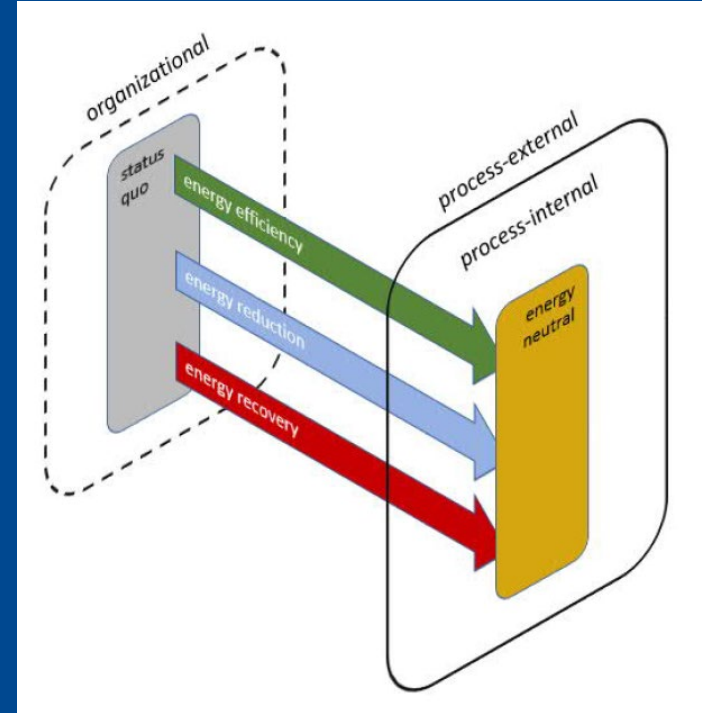
Energy Neutrality – Pathways & Technologies

Pathways

- Three (3) main methods to reach energy neutrality:
 - Energy Efficiency
 - Energy Reduction
 - Energy Recovery

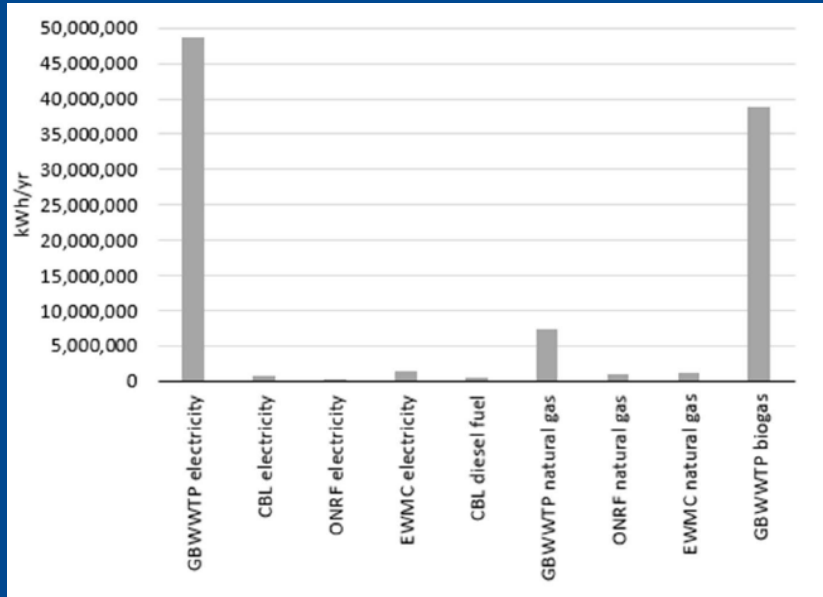
Technologies

- Varying degrees of implementation:
 - Established
 - Innovative
 - Embryonic

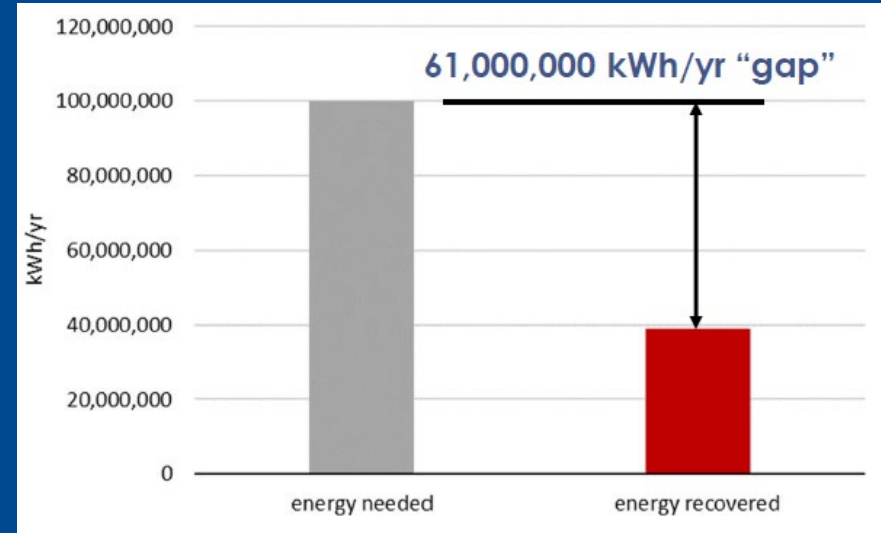


Gold Bar's Energy Gap

Current Energy Use



Operation Energy Gap



WTP Low Emission Grant Projects

Project #	Project Name	Project Cost	Grant	Our Funding	Priority	Lead
1	Reservoir Energy Management	\$7,766,000	\$3,130,743	\$4,635,257	1	Qing
2	Energy Recovery and Heat Pump	\$2,872,500	\$1,014,500	\$1,858,000	1	Qing
3	ELS WTP Filter to Waste	\$3,000,000	\$1,200,000	\$1,800,000	2	Kevin
4	Edmonton Pressure Zone Optimization	\$2,375,000	\$1,187,500	\$1,187,500	2	Kevin
	Total	\$16,013,500	\$6,532,743	\$9,480,757		

- This federal grant is:
 - Low Emission Economy Grant 2022 (Challenge stream).
 - Likely to have future grant streams in coming PBRs.
- The federal grant contributes to 50% of total cost.

Grant Application Challenges

Project Formal Submission Notice	May 10 2022
Project Formal Submission Deadline	July 15 2022 8PM Eastern
Grant Approval	Mid Nov 2022
Project Completion Date	Mar 31 2025

- Express of Interest (EOI) is the first stage (deadline Mar 2022).
- Project must be accepted to go into formal submission stage.
- Fed grant decision is Nov 2022
 - Within 45 day of approval, a matching funding agreement must be signed.
- Mar 31, 2025 is a hard project completion deadline.

Business Case For Low Emission Projects

- Industry leader as a sustainable water utility
 - Apply latest technology and achieve good benchmark towards becoming a net zero utility.
 - Real and substantially GHG emission reduction
 - Help to meet both corporate and City environmental goals.
 - The sooner the completion, the more GHG reduction.
 - 50% federal grant makes utility matching dollars go far.
 - Substantially reduce pay back time.
 - Operation savings from improved energy efficiency and using less power and gas.
 - Build an emission reduction program for future PBRs.

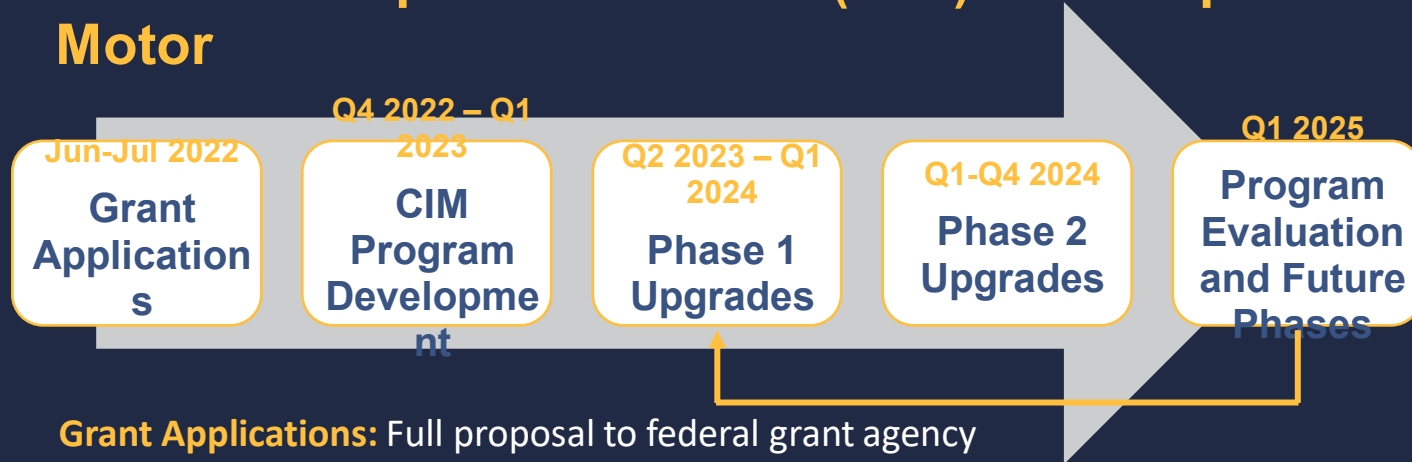
Reservoir Energy management Project

Part 1: Pump and Motor Upgrade

- Targeted pumps and motors for replacement
- Operational savings
 - Reduced power usage: ~\$300,000/year
 - Reduced operating costs:
 - New and efficient equipment, less failures, and less damage due to cavitation, etc.
 - Reduction of Scope 2 emissions
 - Reduce 740,000 kgCO₂e/y with a conservative 3% reduction.

Project Overview

Continual Improvement Plan (CIM) for Pump and Motor



Grant Applications: Full proposal to federal grant agency

CIM Development: Engage Exergy to assess existing assets, develop upgrade program, and operational changes

Phase 1 Upgrades: Highest priority or available asset upgrades

Phase 2 Upgrades: Second priority asset upgrades

Program Evaluation and Planning for Future Phases: Learning from Phases 1 & 2 to plan future phases



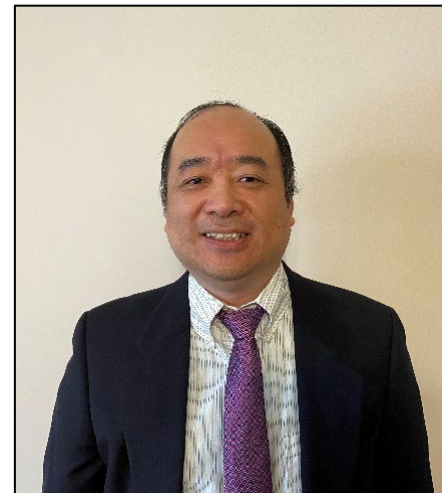
Questions?



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