

Emissions Reduction Alberta (“ERA”) Expanded Technology Pilot (ETP) Final Project Report | April 9, 2024

Project Information	
ETP Project ID:	ETP#0162095
Project Title:	Cornerstone Co-op OLPP-S Retrofit
Recipient Organization:	Cornerstone Co-op
ERA Project Start Date:	June 21, 2023
ERA Project Completion Date:	September 30, 2023
Total Eligible Project Budget:	\$499,782 (actual)
Total ERA Funding:	\$92,000 (actual)

ABOUT ETP

The Expanded Technology Pilot (ETP) offered a new pathway for Alberta businesses to propose effective, commercially viable technologies that could offer high return on investment but were not supported through the Energy Savings for Business (ESB) program. Successful proposals received funding to support project implementation and will help expand ERA’s understanding of the technology’s performance, market potential, and how it could be best supported in future initiatives.

ETP was open to applications between December 2021 to May 2023.

PROJECT SCOPE

The Cornerstone Co-op is a 6,035 ft² grocery store located in the village of Mannville, Alberta. It has fresh meat and fresh produce departments, bakery section, dry groceries, and some hardware and seasonal items. The store operates 6 days per week, 9 hours per day. A refrigeration system serving food cooling units runs 8,760 hours per year.

Their innovative project is the replacement of an outdated refrigeration system with a low-pressure refrigeration system retrofit that serves a set of newly updated store coolers. The outdated system used high pressure, which resulted in mechanical stress on the compressor and thus it required an estimated \$24,000 in excess maintenance costs annually.

The new system improves system efficiency and helps reduce utility bill costs.

PART 1: Commercialization & Technology Benefits

1. List and briefly describe any knowledge-sharing activities since the completion of your ERA funded project. E.g., attendance and presentations at conferences or workshops, news articles, social media promotions, etc.
 - *Project highlighted in [March/April 2024 - Mechanical Business](#) newsletter (page 48)*
 - *Project updates shared on social media (Facebook, X, and LinkedIn)*

2. What is the plan for further commercialization of the technology? i.e. what does the next 3-5 years look like, will the technology be used/exported outside of Alberta/Canada etc.
 - *We are working with a number of small independent grocers in Newfoundland to install the Oxford Low-Pressure Platform with Solar (OLPP-S) and a small group of curling clubs in in Southwest Ontario.*
 - *Identifying best uses with the Arctic Research Foundation.*
 - *Introducing this technology across all First Nations bands in Canada.*
 - *Export of this technology for use globally is available now.*
 - *Solar powered cooling in remote parts of the world will eliminate the need for generators and food scarcity.*

3. List any additional benefits from the technology system (e.g. water use, land use, social benefits, etc.). Were there any other learnings from installing the technology? (e.g. any new insights into technology capability, difficulties or setbacks, what other markets the technology could be utilized in etc.)

Cornerstone Co-op is the main food business and anchor within Mannville and the updated refrigeration system will benefit the community in multiple ways:

Better Food Quality- the legacy refrigeration system used mechanical controllers with static set points that pay no mind to any other system data. Refrigeration systems are complex energy loops that require constant M&V to ensure operations. The Sensori ems of the OLPP-S provides this high level of operations as the complimentary controller to the low-pressure compression rack. The measured and smooth operation of the OLPP-S architecture means a tight control not just of temperature values but also of cooling capacity, which is a better metric for refrigeration. This means that all display cases and fixtures are always at the most effective and efficient operating parameters in delivering the stable refrigeration effect.

Increase in Owner Experience- in dealing with many local, independently owned business owners, one of the most challenging irritations about the legacy refrigeration was in the need to worry about it when off site. Meaning they expected it to fail and for them to rush back to deal with it. Installing an

OLPP-S based system has now allowed them to know that their systems are robust and accessible at all times and from anywhere with an internet signal. We can even let them know how much their refrigeration is costing them at that moment as the OLPP-S includes a power meter as standard for instant consumption data- interestingly enough, most other legacy manufacturers choose not to.

Cornerstone Co-op Corporate Goals- due to the sustainability theme of the OLPP-S, in terms of the environmental and community benefits, Cornerstone Co-op selected the retrofit to suit their own corporate goals of sustainability, selecting the OLPP-S after engagement from Sercon Refrigeration.

Cornerstone Co-op was also granted a rate reduction from their utility company with a monetary saving of more than \$1,100.00 per year.

PART 2: Economic and GHG Impact

4. Provide your best estimate of the number of FTE’s supported because of the ERA funded project since project completion:

None

5. Provide updated estimated direct lifetime GHG emissions reductions in tCO₂e. Please provide any available evidence, calculations, or data to support this claim, e.g. relevant activity date, verification report, assumptions, or project plan.

	Total GHG reductions (tCO₂e)
Lifetime Savings	460*

*Values calculated by ERA prior to project completion.

Please specify the number of years the equipment is expected to remain operational: 20

6. Provide any operational data required in the Contribution Agreement.

- *Total store energy consumption: Post-installation utility bill data provided to ERA.*
- *Operating hours: Store hours are 9:00 am – 6:00 pm Monday – Saturday and the technology is in use 24/7.*
- *Volume of goods being refrigerated: 3,841 cubic feet.*
- *Any changes to facility during the retrofit: There was no increase in refrigeration space, nor were there any changes to doors or coverings.*
- *Energy consumption: The technology operates 8,760 hours per year. The average consumption of energy is 8 kW/h. At .16 per kWh that’s just over \$30 per day for electricity costs.*

7. Provide an update on the Technology Success Metrics identified in the Contribution Agreement:

Success Metric	Project Target	Target Achieved?
Energy consumption reduction at Cornerstone Co-op	≥145 GJ/year	<i>On track (based on three months of utility data)</i>
Reduced excess maintenance costs	≥\$24,000/year	<i>On track</i>

PART 3: Technology Transfer Plan

8. Provide a brief overview of what the problem the technology solves.

The low-pressure refrigeration system retrofit replaces an older refrigeration plant that serves a set of newly updated store coolers. The older refrigeration system used high pressure, which resulted in mechanical stress on the compressor and thus required an estimated \$24,000 in excess maintenance costs annually.

9. Describe where people can access the technology. Who is responsible for manufacturing, selling and servicing the technology?

The low-pressure refrigeration system was manufactured and sold by Oxford Energy Solution Inc. The Oxford Low Pressure Platform was installed by Sercon Refrigeration. The project was managed by Conservation First Solutions Inc. and Hill Valley Energy and Associates. For further information please contact Jordan Lai at Oxford Energy Solutions: jordan@oxfordenergy.ca or visit [Home | Oxford Energy Solutions](#)

10. Describe who will use the technology and what the target market is. i.e., industry, geography, size, quantity of customers etc.

This technology can be installed in any location using mechanical refrigeration and cooling systems, including grocery stores, cold storage facilities, recreational ice facilities, food production facilities, and others.

11. Identify specific competitors for similar technologies and substitutes. Include a brief comparison of the technologies and strengths/weaknesses of each. Identify any advantages that might exist with this technology system or that of your competitors.

This is a new technology. It was developed and patented by Oxford Energy Solutions Inc. There are no competitors providing the same technology at this time.

12. Describe the primary marketing mediums that either your company uses to market the technology or how you found out about the technology. i.e., advertising, industry contacts, word-of-mouth, public demonstrations etc.

Primarily marketing through LinkedIn, word-of-mouth, and industry contracts.

13. Describe what you are doing to promote the technology to others.

- *Working with the First Nations Incentive Coordinator for the Independent Electricity System Operator (IESO) to identify best use of this technology. Each First Nations has access to a \$300,000 grant to reduce energy use. There are 102 First Nations groups in Ontario.*
- *Active with the Arctic Research Foundation to offer this technology to remote locations as no maintenance is required with the OLPP-S.*
- *Working to create a standardized Custom incentive application for the IESO.*
- *Working with the Federal Government to find financial incentives and rebates through the Strategic Innovation Fund.*