Energy Optimization Project

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Recommended by:	General Manager of Corporate Services

Report Summary

This report provides a recommendation regarding a potential energy optimization project at two Greater Sudbury Housing Corporation properties.

Resolution

THAT the City of Greater Sudbury direct staff to enter into a single source agreement with Nerva Energy for the provision of energy optimization services at 1920 and 1960 Paris Street as outline in the report entitled “Energy Optimization Project” from the General Manager of Corporate Services, presented at the City Council meeting of July 15, 2025;

AND THAT the project be funded from the Social Housing Capital Reserve Fund in the amount of $242,844 with annual energy savings contributed back to the Social Housing Capital Reserve Fund up to the initial project amount. Energy savings above the project amount will be budgeted for in future operational budgets.

Relationship to the Strategic Plan, Health Impact Assessment and Climate Action Plans

This report pertains to objective 3.2 (Develop and Strengthen Strategies and Policies to Mitigate Impact of Climate Change) under the “Climate Change” strategic priority by outlining a way to improve climate resilience.

Financial Implications

The total capital cost for the project is $508,850 and will be funded $266,006 from energy incentives provided by Enbridge Gas and $242,844 from the Social Housing Capital Reserve Fund. Annual energy cost savings of $39,680 will pay back the reserve over approximately 6 years with savings after the payback period reducing Greater Sudbury Housing Corporation’s operating budget.

Background

The Community Energy and Emissions Plan (CEEP) is the long-term plan to reduce carbon emissions and pollution in Greater Sudbury. It responds to City Council's Climate Emergency declaration in May 2019, which included a commitment to achieve net-zero emissions by 2050. That means reducing greenhouse gas emissions (GHG) caused by human activity to as close to zero as possible and removing remaining emissions from the atmosphere. Similarly, the Government of Canada's 2030 Emissions Reductions Plan outlines a target to cut greenhouse gas (GHG) emissions by 40 percent below 2005 levels by 2030 and achieve net-zero emissions by 2050.

Sudbury Housing Operations acts as the landlord for Greater Sudbury Housing Corporation (GSHC) properties.

The GSHC provides rent-geared-to-income housing to all household types including families, seniors, singles, and people with special needs including persons with mental illness. Their housing portfolio consists of 1,848 units, which makes it the single largest landlord in the City of Greater Sudbury. The portfolio accounts for 39% of the purpose-built social housing stock.

In the housing portfolio, the demand for energy is primarily for space and water heating, with lighting, and appliances comprising the remainder of the energy consumption. This is evidenced in the proportionate share of energy type with natural gas (used in space and water heating) being approximately 79% and 78% respectively in 2022 and 2023. Figure 1 describes the consumption of natural gas and electricity across the housing portfolio.

Figure 1: Housing Operations- Energy Consumption (equivalent kWh)

Energy Source	2022	2023	Change	Percentage Change
Natural Gas	33,059,029	28,745,417	-4,313,612	-13%
Electricity	8,306,249	7,873,017	-433,232	-5%
Totals	**41,365,278**	**36,618,434**	**-4,746,844**	**-11%**

Properties in the housing portfolio can be segregated into apartments, townhouses, semi-detached and detached units. The apartment portfolio is the subject of this report and particularly the 1920 and 1960 Paris Street facilities. These facilities account for 14.2% of the total equivalent kWh used in the housing portfolio. The top five energy consuming properties in the Sudbury Housing apartment portfolio are as follows:

Figure 2: Energy Use at top 5 Housing Apartments

Rank	Address	Energy Use (equivalent kWh)	% of Total Housing Energy Use
1	159 Louis Street	3,553,292	9.7%
2	1960 B Paris Street	2,422,937	6.6%
3	720 Bruce Ave	2,053,183	5.6%
4	1960 A Paris Street	1,655,772	4.5%
5	1920 Paris Street	1,142,077	3.1%

Current Opportunity

The City of Greater Sudbury is part of the Ontario Education Collaborative Marketplace (OECM). The OECM is a not-for-profit collaborative sourcing partner for Ontario's education, municipal and Broader Public Sector (BPS) customers. Nerva Energy is an awarded supplier via the OECM that is based in Hamilton, Ontario. They provide multi-discipline services aimed at reducing the carbon footprint of facilities complete with a financial performance guarantee on the outcome of the project. Nerva Energy has performed energy engineering and project management for public and private sector clients that include school boards, universities and municipalities.

Nerva's process for project generation/approval takes the following steps:

1) Engage with potential client to ascertain the likelihood of facility HVAC (plant and distribution) improvements that would result in a positive financial return based on energy savings.
2) Conduct feasibility study at no cost to the client. This feasibility study results in a project that outlines the project scope, energy and financial savings associated with the project.
3) Conduct any further detailed Engineering and enter into a formal agreement for the project complete with energy conservation and financial guarantees. The financial guarantees are approximately 80% of the expected energy savings or Return on Investment (ROI) to account for any unforeseen circumstances. If the project fails to meet this threshold, Nerva Energy will compensate the City for the difference.
4) Post implementation support and monitoring of project improvements to confirm energy savings and financial guarantee.

City staff have engaged with Nerva on several facilities in the City portfolio to help establish a viable energy conservation project. Nerva has conducted a series of visits to the identified City facilities and have examined the energy use at these facilities. The result is an initial proposed project for 1920 and 1960 Paris Street housing facilities.

Project Details

Nerva Energy Proposed Energy Conservation Measures – 1920 & 1960 Paris

1. Install Comprehensive Metering for Plant Equipment

This will provide the ability to track how much energy each system uses in real-time. This data can be used to identify inefficiencies and make informed decisions to reduce energy waste.

2. Separate the Heating and Domestic Hot Water (DHW) Systems

Presently, one heating plant consisting of 4 boilers handles both, which reduces optimization potential. By splitting them, each system can run more efficiently, especially during times when heating is needed but not hot water, or vice versa.

3. Implement a Building Optimization System (BOS)

A BOS uses real-time data and automation to make all systems work together as efficiently as possible. This leads to consistent comfort levels in the building while consuming less energy overall.

4. Match Boiler Operation to Actual Heating Needs

Currently, boilers have longer run times than required due to non-existent feedback from in-suite heating demand. Load-matching with in-suite requirements will ensure boilers only operate when needed and at the appropriate output, reducing energy consumption, improving efficiency, and extending equipment life.

5. Add In-Suite Controls with Setpoint Limits

Existing in-suite thermostats are non-programmable and have no set point limitations, allowing residents to set very high temperatures, driving up energy use. By setting reasonable limits, the building maintains comfort while reducing heating energy waste.

6. Window and Door Sensors to Mitigate Energy Abuse
Installing sensors on windows and doors can help detect when they are left open while heating systems are in operation. The system will then shut down heating to reduce unnecessary energy waste and help enforce responsible energy use within the building.

7. Make-Up Air (MUA) Optimization
By optimizing and scheduling the MUA system to operate at higher fan speeds during peak occupancy periods (e.g., early mornings, evenings), the building can maintain adequate indoor air quality when most vital, while avoiding unnecessary energy use during off-peak hours.

Financial Analysis

Total Cost	$508,850
Total Utility Incentive	$266,006
Combined Net Cost	$242,844
Projected Gas Savings	$41,019 (117,810 m^3)
Projected Electricity Savings	$7,954 (55,216 kWh)
Projected Annual Savings	$48,973
Guaranteed Gas Savings	$33,270 (95,555 m^3)
Guaranteed Electricity Savings	$6,410 (44,489 kWh)
Guaranteed Annual Savings	$39,680
Total GHG Reduction	225 Tonnes (20%)
Projected Combined ROI	20.2%
Guaranteed Combined ROI	16.3%

The project at 1920 and 1960 Paris Street has a gross cost of $508,850 and a net cost of $242,844 as a result of energy incentives provided by Enbridge Gas. The incentive from Enbridge Gas is contingent on the project being completed by October 31, 2025. Nerva Energy is confident they will meet this deadline. Upon completion of this project and the project hitting the projected Return on Investment (ROI), energy consumption will be reduced by approximately 20.2% at these two facilities. This will mainly be a result of reductions in natural gas consumption.

Conclusion

Council resolution 2025-130 called for staff to explore additional funding opportunities that align with our community's portfolio of buildings and facilities for energy efficiency initiatives; AND that staff provide updates on opportunities upon regular reporting on the CEEP. Nerva Energy can undertake an energy optimization project at two of Housing operations largest apartment complexes located at 1920 and 1960 Paris Street. Various improvements have been identified and energy savings calculated. These savings result in an approximate 20% reduction in energy costs and a projected ROI of 20.2% for the project. This return includes a grant available to the City from Enbridge gas that results in a net cost to the City of approximately $243,000. Nerva Energy offers a guaranteed ROI of 16.3% and will compensate the City should the project not meet that threshold. Staff are recommending to single source this project to Nerva Energy and fund the initial capital cost from the Social Housing Capital Reserve Fund that is to be repaid with the proceeds from the incentive and the attributable energy savings. Once the Social Housing Capital Reserve Fund has been repaid, all subsequent energy savings will be incorporated into the Housing operating budget for the respective location.