Municipality of Tweed: Corporate Energy Plan, 2024-2029

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2 Our Commitment

Effective energy management begins with the specific, visible expression of commitment by the senior authorities in the Municipality to making the reduction of energy consumption an organizational priority. At a minimum, this commitment includes a resolution by Municipal Council articulating the staff mandate to plan and implement measures for energy efficiency improvement. Furthermore, successful energy management depends on the integration of energy efficient practices into the business-as-usual conduct of the organization, is based on a regular assessment of energy performance, and requires the implementation of procedures and measures to reduce energy waste and increase efficiency. Regardless of the size of the municipality, the common element of successful energy management is the allocation of staff and resources to continually improve energy performance. Staff and senior authorities have implemented several conservation initiatives that has allowed the municipality to manage their energy load and save on energy costs. As we move forward, we aim to build on past success and implement further strategies and enhancements to reduce energy consumption.

- Declaration of commitment – Council Resolution: We will continue to lobby for support for necessary resources to enhance our strategic energy management plan that will reduce our energy consumption and its related environmental impact.

- Vision: We exercise stewardship in our use of finite energy resources in order to demonstrate leadership, optimize our delivery of services, and enhance the overall quality of life in our community.

- Policy: We will incorporate energy efficiency into all areas of our activity including our organization and human resources management procedures, procurement practices, financial management and investment decisions, and facility operations and maintenance.

- Goals (long term): To continuously improve the energy efficiency of our facilities and processes in order to reduce our operating costs, our energy consumption and the concomitant greenhouse gas emissions.

- Overall target: To reduce consumption of fuels and electricity in municipal operations by 5% relative to a baseline year of 2023.

- Objectives (short to medium term):
    1. To complete the energy audits on municipal facilities during the next five years;
    2. To continue to reduce total energy consumption in municipal facilities, normalized to weather condition, over the next five years.

3 Understanding of the Current Situation

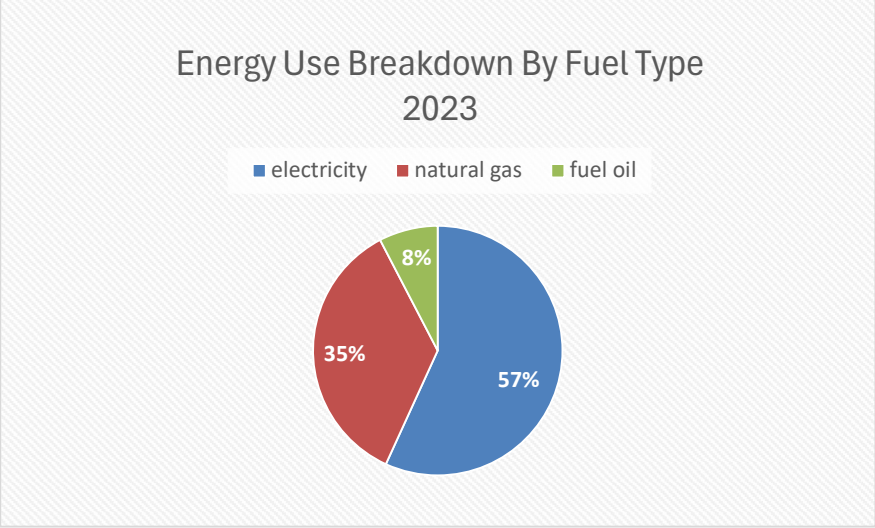
The Energy Management Program is built upon information that describes the current status of the organization on its business practices, and its energy use practices. The strategic energy management plan includes these information outputs.

Stakeholder Needs: Internal stakeholders (Council, CAO, staff) need to be able to clearly communicate the corporate commitment to energy efficiency, and to develop the skills and knowledge required to implement energy management practices and measures. External stakeholders (the Province, community citizens and groups) need the municipality to be accountable for energy performance and to minimize the energy component of the costs of municipal services.

- Municipal Energy Needs: We need reliable, low-cost, sustainable energy sources delivering energy to the most efficient facilities and energy-consuming technology feasible.

- Municipal Energy Today: The management of energy consumption and the energy performance of our facilities and equipment are the responsibilities of Finance (cost management), Works Department (maintenance), and department managers (operations).

An overview of the energy consumption by fuel type for 2023 is provided below:



The energy consumption and emissions are listed in Appendix A - Energy Consumption and Emissions for each facility that falls under the reporting requirements of Regulation 25/23.

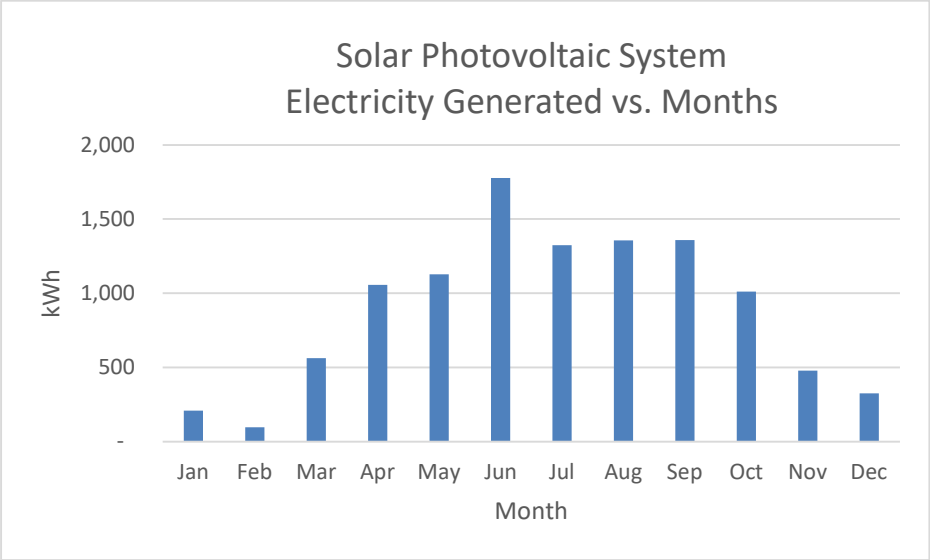
Associated with energy consumption and performance is the potential to reduce GHG emissions with improved energy performance. While Regulation 25/23 does not explicitly require these emissions to be reduced, there is a requirement to report them. Thus, minimizing the

GHG emissions produced by the energy delivered or supplied to the facilities could be a consideration along with the emissions produced by higher efficiency or renewable energy technology used in these facilities.

4 Renewable Energy Generation

While provincial electricity generation is primarily nuclear and hydro which are low emission, it is not emission less especially during peak hours that occur during cooling season. One way to mitigate these peak emissions is generating electricity from solar PV. In 2013, a 10kW solar PV system was installed on the rooftop of the Countrymen Roads Garage, 29 Countryman Road. See photo below.

The electricity generated from this system in 2023 as indicated in generator payment statements issued by the local distribution company (Hydro One) is 10,683 kWh and is charted by month in the following graph; the net payment to the Town of Tweed is $5,803.51 after deductions for service charges and HST.



5 Planning Phases and An Improvement Cycle

A business management plan typically has the following four phases: Plan, Do, Check, and Act which can also be applied to an energy management plan. In the planning phase goals and associated tasks are decided upon through consensus. The plan is implemented in the Do phase along with data collection to assess the effectiveness of plan. Check involves the evaluation of the implementation data to determine any differences between planned and actual performance. The Act phase reviews the findings from Check and actions any required course corrections or improvements. This fourth phase is key as it completes the cycle for continuous improvement and leads back to the Plan stage to start the cycle again.

6 Action Planning

The action planning phase of activity flows logically out of the Data Collection and Analysis phase in that:

- Knowledge of the situation leads to goals and objectives
- Goals and objectives need broad strategies, and
- Actions need to be designed to carry out the strategies.

Action planning means specifying the measures and activities that will be implemented, the personnel who will be accountable for the various tasks, the resources required, the time-line or schedule for implementation, and the means of evaluation.

- Long-term strategic issues: Strategic level issues addressed in this plan are energy policy development, organizing for energy management, developing required skills and knowledge, managing energy information, communicating with our stakeholders, and investing in energy management measures.

- Links with other municipal plans: As an integral component of the management structure, the energy management plan is coordinated with the municipality's budget planning process, its preventative maintenance plans, and the overall asset management plan.
- Energy leader: We will clearly designate leadership and overall responsibility for corporate energy management.
- Internal Staff Resources: An Energy Management Team will be managers from departments throughout the organization. This team will meet to discuss the plan and any outstanding energy issues within the organization. The Energy Management Team will also be a medium for communicating the energy conservation message to staff. Proposed energy saving plans will be brought forward for discussion at a regular budget meeting.
- External Staff Resources: Suppliers will be utilized based on the energy goals and objectives for the selection of external consultants and energy suppliers.

7 Initiatives Execution

The Energy Action Plan provides a priority list of activities, the initiatives—that are categorized as programs, projects and process--that address the role of people and the impact of business practices on the energy performance of the organization. Project management will include technology and/or operational changes having a direct energy efficiency benefit for implementation. Execution is a project management function which matches implementation needs with the requisite human and financial resource.

- The Municipality will carry out the required development of business procedures and communication programs and implement them methodically according to the planned timelines within the resource constraints that apply.

- The Municipality will use department and facility energy team representatives to facilitate the implementation of facility level business procedures and communication initiatives, including energy performance reporting.

The projects are listed in Appendix B – Energy Conservation, Efficiency and Demand Management Initiatives and are further categorized as Proposed, Ongoing and Completed.

8 Review

As part of any energy management strategy, continuous monitoring, verification, and reporting is an essential tool to track consumption and dollar savings and/or avoidance as the result of implemented initiatives. The energy conservation initiative will identify a number of priority objectives that will serve as the key planning and guiding document for the Municipality of Tweed during the next few years. The Municipality will review and evaluate the energy plan, revise and update it as necessary on an annual basis.

9 Evaluation Progress and Next Steps

Based on the Town's progress to date and building on past projects its Arena, Municipal Administration Building, Actinolite Hall, Firehall, and Library, its suggested the following initiatives be undertaken for the Plan term of 2025-2030. As previously stated, these initiatives are categorized by programs, projects and processes and are also shown in Appendix B.

9.1 Programs

- Send key people to energy savings training.
- To begin an education program for all Municipal staff on methods to reduce energy.

9.2 Projects

- Identify unnecessary plug loads.
- Increase the utilization of technology (control system for ice plant).
- Reduce expenses through improved building operations.
- Install motion sensors on lighting in municipal buildings.
- Investigate options for equipment efficiencies.
- Fine tune heating and cooling system.
- Improvements to facilities – caulking, weather-stripping, and insulating to improve heating and cooling loss.
- Review and upgrade or remove baseboard heaters.

9.3 Processes

- Make the most of day lighting and shading – open window covers to fully let the sunshine in cool seasons to reduce reliance on heating system and close window covers in summer season to reduce reliance on air conditioning.
- Soft drink machine controls: timers and unplug off season.
- Make use of free cooling in summer by bringing in 100% outdoor air at night.
- Turn off printers at night and on weekends.
- Unplug coffee maker at night.
- Shut off lighting in offices and washrooms when not in use.
- Observe the energy activity in other municipalities.
- Provide autonomy to workers and managers to develop new solutions to energy challengers.

Appendix A – 2023 Energy Consumption and Emissions

Property Name	Year Ending	Address 1	Postal Code	Property GFA - Self-Reported (ft^2)	Weekly Operating Hours	Electricity Use - Grid Purchase (kWh)	Natural Gas Use (therms)	Fuel Oil #2 Use (kBtu)	Total GHG Emissions (Metric Tons CO_2e)
Elzevir Garage	2023-12-31	34 Bridgewater Rd	K0K 3J0	3,573	40	16,123	-	-	0.5
Stoco Garage	2023-12-31	869 Marlbank Road	K0K 3J0	6,867	40	47,760	-	323,839	25.7
Tweed Library	2023-12-31	Metcalf Street	K0K 3J0	4,746	28	28,154	2,258	-	12.8
Admin Bldg	2023-12-31	255 Metcalf Street	K0K 3J0	10,893	40	77,297	4,886	-	28.1
Arena Plant	2023-12-31	297 St Joseph Street	K0K 3J0	18,018	31	204,393	-	-	5.7
Hungerford St Well #2	2023-12-31	Hungerford Street	K0K 3J0	-	42	18,410	-	-	0.5
Fire Hall	2023-12-31	127 River St W	K0K 3J0	32,291	12	17,145	2,115	-	11.7
Pumping Station	2023-12-31	River Street	K0K 3J0	-	168	111,353	-	-	3.1
River St Well #3	2023-12-31	River Street	K0K 3J0	-	168	141,763	-	-	4.0
Arena	2023-12-31	297 St. Joseph	K0K 3J0	8,008	32	47,802	5,981	-	33.1

Appendix B – Energy Conservation, Efficiency and Demand Management Initiatives

Facility	Description	Annual Costs and Savings	Completed Year[1]
Tweed Arena	**Refrigeration Plant**: Replaced condenser section and installed infrared cameras for ice rink. The cameras monitor the ice temperature to reduce excessive cooling or melt risk; provide temperature readings to fine tune the plant and prevent overcooling; and target areas for cooling and resurfacing to use energy where it's needed.	An estimated $15,000 to $20,000 in electricity cost savings	2023
	Lighting: Replaced 40 lights over the ice surface with energy savings lights resulting in an energy saving of 28%	28% energy savings	2017
	Domestic Hot Water: Hot water tanks were replaced with efficient tankless water heaters	N/A	2017
	Lighting Control System: Manual control by operators and may move to automatic in a future retrofit	N/A	2024
Tweed Public Library	Replaced HVAC Units	10,166 kWh and 854 m3	2020
Fire Hall	**Lighting:** Completed LED lights conversion.	Electricity: 4,750 kWh Natural Gas: 411 m^3	2020
	Fuel Switch: Conversion from oil to natural gas	$1,018	2019

[1] Some projects are pre-date the past five-year reporting because they are being reported for the first time.

	Retrofit CO Controls: New CO system and replacement of old fan	N/A	2023
Thomasburg Community Centre	Conversion from oil to propane heating	N/A	2018
Country Roads Garage	Roof mounted solar PV system 5 kW capacity	For 2023, the energy savings (based on hydro bills) 10,822 kWh and costs savings were $5,879.00 (inclusive of services charges and HST)	2013
Facility	Description	Annual Costs and Savings	Planned Completion Year
Tweed Arena	Adjusting water system temperatures for Zamboni usage from 140 degrees down to 90 degrees for energy efficiency with compressors	The refrigeration plant savings per Zamboni use is estimated at 17 kWh[2]	2024-2026
Offices/Washrooms/Kitchens Across Municipal Buildings	Install motion sensor light switches to reduce unnecessary light usage when no one in an office	Occupancy sensors can save up to 35% in an open plan open office according to National Research Centre study.[3] Based on weekly operating hours[4], a list of percentage is savings is provided below according to their respective facilities and assuming a range of hourly off times depending on the facility type. Admin: 15% Library: 10%	2025-2028

[2] 17 kWh of savings assumes about 520 litres of water per use which is based on rink dimensions of 184 feet by 79 feet
[3] https://nrc-publications.canada.ca/eng/view/accepted/?id=b23dfd7d-3280-4740-b2fa-c57cd48806e9
[4] Admin - 42.5 hours per week, Library - 34 hours per week, Firehall - 86 hours per week, Arena - 56 hours per week (Sept to mid-April)

		Firehall: 20% Arena: 15% These savings are estimates since they also depend on the effectiveness of the sensors as well as occupancy and operating patterns.	
Administration Building	There have been reports of occupant comfort issues especially on the basement and second floor with space temperatures likely not meeting setpoint; temperatures not meeting setpoint may result in inefficient operation of the boilers Its recommended to Investigate the re-design of heating and cooling system so that they work as an integrated system to improve energy performance and occupant comfort.	N/A	2027-2029