GREEN MUNICIPAL FUND
FONDS MUNICIPAL VERT

The Village of Carmangay's 146 kW solar PV ground mount system at the Carmangay Lift Station. The project produces enough renewable electricity to offset the Village's municipal consumption, making its operations net zero when it comes to electricity use. The project was completed in 2020 and partially funded by the Government of Alberta through the **Alberta Municipal Solar Program**.

OPPORTUNITIES FOR MUNICIPAL CLEAN ENERGY GENERATION

Making the business case for renewables

As local governments act on climate change, the most effective approaches will vary based on local context. In provinces within high-carbon, fossil fuel–reliant grids, generating clean energy through renewable sources can be a significant opportunity to reduce both emissions and costs.

Renewable energy projects generate heat and electricity from sustainable sources such as sunlight, wind, water, biomass and geothermal heat. Unlike fossil fuel energy sources, which are finite and produce both pollution and greenhouse gas (GHG) emissions, renewable sources produce few to no direct emissions, making them a crucial component of a low-carbon future.

A program of/ Un programme de la FCM

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The Energy Hierarchy

Implementing a renewable energy project can significantly reduce emissions, but there are simpler and lower-cost options that municipalities should consider first.

When planning emissions reduction projects, local governments can apply the principles of the Energy Hierarchy to prioritize solutions with the highest impact and ensure that projects are designed as sustainably as possible. The Energy Hierarchy framework guides decision-makers through actions related to energy use and sustainability, focusing first on minimizing consumption and maximizing efficiency (in particular with no- and low-cost changes) before considering renewable energy opportunities.

Energy conservation

As a first step, energy conservation involves assessing and altering behaviours and practices in order to reduce energy use. Strategies such as turning off lights, setting thermostats to match occupancy and regular maintenance can be highly effective at reducing energy use and completed at little to no cost.

Energy efficiency

Energy management opportunities can boost the energy efficiency of municipal and community buildings and therefore help facilities save energy, reduce operating costs and maximize comfort for staff and users. These upgrades can also extend the life cycle of aging assets and sustain vibrancy and culture in areas where community members gather.

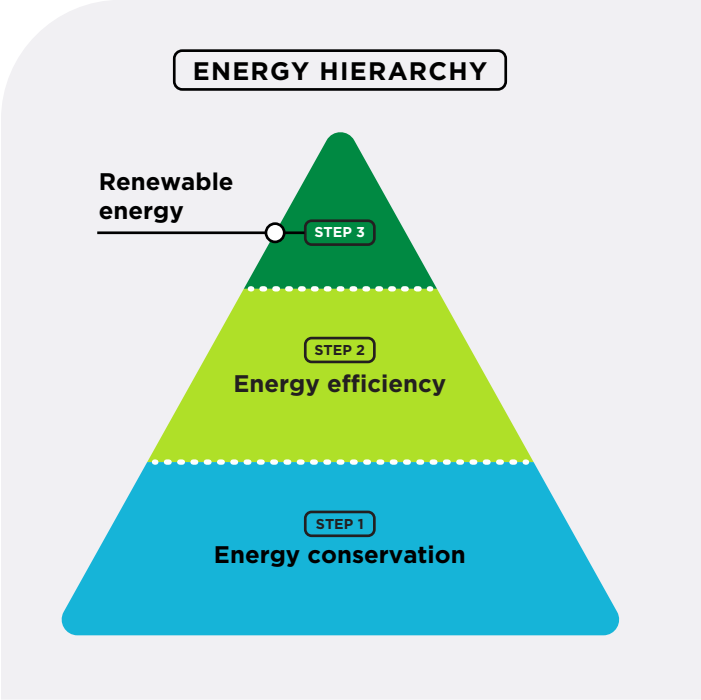
An energy audit will provide an overview of possible energy-saving opportunities within a facility. With this information in hand, a municipality can then prioritize retrofit projects—the purchase or installation of energy-saving measures—that will have the biggest impact.

Lower-cost retrofits include implementing low- or no-cost energy saving measures such as cleaning light fixtures regularly to maximize their efficiency or lowering the temperature of hot water heaters. More capital-intensive retrofits include upgrades to lighting and lighting controls, HVAC systems, hot water heaters, insulation and windows and doors. In many instances, these latter retrofits—in particular installing insulation and more-efficient windows—are too costly to be feasible. However, they should be considered.

Renewable energy

Once other measures within the Energy Hierarchy are implemented, it's time to consider renewable energy retrofits on municipal and community buildings as well as other pathways to clean energy generation.

By following the Energy Hierarchy approach and tackling energy conservation and efficiency projects first, municipalities benefit by reducing their need for energy. This means that they can meet their requirements for renewable energy with smaller systems.



What makes a good business case for renewable energy?

Successful renewable energy projects benefit from careful planning and scoping. This includes developing a business case, which is a necessary step to ensure that a project is shovel-ready and that a feasibility study can be performed. A business case for investment in renewable energy should include key considerations such as financial viability, risk management and stakeholder engagement.

Comprehensive business cases should:

- Present the intended pathway for renewable energy generation as well as the relevant jurisdictional policies and how they might impact the project.
- Outline environmental benefits including an estimate of GHG emissions reduction and an end-of-life plan for decommissioning, removal and potential disposal.
- Demonstrate financial viability. Key financial metrics should include:
  - Payback period: The length of time required for the project to generate enough savings or revenue to recover its initial investment. Shorter payback periods typically indicate lower financial risk.
  - Internal rate of return (IRR): The annualized rate of return the project is expected to achieve, expressed as a percentage. IRR helps assess the project's competitiveness relative to other investments.
  - Net present value (NPV): The difference between the present value of the project's expected cash inflows and outflows. Financially feasible projects will have a positive NPV, indicating that their benefits outweigh their costs over time.

The Town of Westlock's 625 kW solar PV system at the Rotary Spirit Centre. The project will reduce facility electricity costs by producing renewable electricity onsite thus lowering the amount of electricity used from the grid. The project was completed in 2020 and partially funded by the Government of Alberta, through the **Alberta Municipal Solar Program**.

- Present any available grant opportunities, which can improve financial viability.
- Consider the social aspects of the project, including:
  - A strategy for diverse stakeholder engagement.
  - Equity-deserving groups who may be impacted by the project.
  - Opportunities for awareness-building and education in the community.
- Anticipate barriers or risks associated with the project and outline strategies to mitigate them.
- Detail next steps and the need for an implementation plan.

Pathways to renewable energy generation

There are several pathways for municipal participation in renewable energy generation, including the following.

On-site renewable energy systems

For most municipalities, provincial regulations allow for on-site renewable energy production on municipal and community buildings and property to offset energy consumption. In grids with high emissions intensity, renewable energy projects can reduce emissions and costs associated with the use of grid electricity generated from fossil fuels.

On-site systems can be installed on municipally owned buildings such as town halls or fire stations as well as on community buildings such as recreation centres or libraries.

The RenuWell Workforce Training Program. The MD of Taber's RenuWell project installed 1.45 MW of distributed solar on inactive oil & gas sites in the region. This project serves as a pilot to demonstrate how legacy oil and gas infrastructure can be repurposed for community solar development, cutting down on the cost of reclamation and saving valuable farmland for agricultural use. The project was partially funded by the Government of Alberta, through the **Municipal Community Generation Challenge**.

Alberta has a deregulated electricity market in which private energy producers can compete to sell electricity to the grid. This market structure has allowed a diverse range of renewable energy generators to enter the market—particularly private investors—and to capitalize on the province's growing demand for cleaner energy. As Alberta pursues a target of deriving 30 percent of electricity generated in the province from renewable sources by 2030, municipalities are looking to participate in both on-site projects and larger-scale, direct-to-grid generation.

On-site renewables are most commonly solar photovoltaic systems due to their scalability and ease of installation. In some contexts, wind turbines and other technologies such as geothermal systems or combined heat and power (CHP) can also be viable options.

Direct-to-grid renewable energy systems

Provincial regulations such as the Government of Alberta's Small Scale Generation Regulation may allow municipalities to act as electricity generators, providing power directly to the grid. These projects are a potential revenue source for municipalities while also creating social, environmental and economic benefits at the local scale.

Renewable energy procurement

Another option is to secure renewable energy generated elsewhere to meet electricity needs. In such a situation, the municipality uses electricity as normal, but renewable energy is added to the grid to offset this consumption. In Alberta, a municipality can also obtain renewable power for its operations by signing a power purchase agreement (PPA), a contract between an electricity generator and a municipality that defines terms for the sale and purchase of renewable electricity. Renewable energy procurement provides municipalities with a opportunity to reduce emissions and demonstrate corporate responsibility.

Grant opportunities

Municipalities should include in their business case any grant opportunities available to support their projects. Sources include FCM's Green Municipal Fund (GMF) and, for communities in Alberta, the Municipal Climate Change Action Centre (MCCAC).

Sustainable Municipal Buildings (GMF)

GMF's Sustainable Municipal Buildings offer provides funding for energy retrofits of existing buildings and high-efficiency new construction of municipal and community buildings as well as feasibility or new construction studies to support project planning. **Installing solar PV is an eligible measure; however, projects must also include other energy-efficiency measures. Contact GMF for more details.**

Municipal Electricity Generation program (MCCAC)

The MCCAC is currently accepting applications to the Municipal Electricity Generation (MEG) program, which is funded by the Government of Alberta. Municipalities in Alberta can access rebates to install grid-connected alternative-electricity generation systems on municipally owned facilities or land for the purpose of offsetting municipal electricity consumption.

Community Energy Conservation program (MCCAC)

The Community Energy Conservation (CEC) program provides rebates to Alberta municipalities to fund energy audits and retrofit projects in municipally owned facilities. This program is funded by the Government of Alberta and administered by the MCCAC.

This document was produced by the Municipal Climate Change Action Centre for FCM's Green Municipal Fund. The Municipal Climate Change Action Centre is a partnership of Alberta Municipalities, the Rural Municipalities of Alberta and the Government of Alberta.