

ENERGY SAVING TIPS FOR THE COMMERCIAL & INSTITUTIONAL SECTORS

Energy
End
Use

Energy Saving Tip

Typical
Energy
Savings

Relative
Capital
Cost

Typical
Simple
Payback
Period

Water
Heating

Install **low-flow fixtures**. Replace standard showerheads with low-flow models, add low-flow faucet aerators and use ultra low-flow pre-rinse spray valves in food service applications.

25 - 75% of water heating energy use per fixture

Low

3 - 5 months

Lighting

Lighting is typically the second largest energy use in commercial buildings in Ontario, and is typically responsible for 30-50% of building electricity use. Replace the incandescent lamps with **compact fluorescent lamps** in "architectural" applications such as displays, task lighting, signage, lobbies, corridors, utility spaces, hotel rooms and retail spaces. Other efficient options for architectural lighting include white LEDs, ceramic metal halide lamps and halogen infrared lamps.¹

Up to 75% lighting energy use

Low

6 - 12 months

Space
Heating

Space heating is typically the largest energy use in commercial buildings in Ontario. **Air sealing** can help reduce heat loss from your building. Blocking air leaks brings many non-energy benefits such as increased comfort, protection of the building structure and reduction of noise and dust from outdoors. Air sealing typically involves the systematic effort of applying insulating foam, caulking and weather stripping to improve the integrity of the building envelope system, and involves identifying and sealing air leakage paths within the building envelope. In addition to easily identifiable leaks through and around doors and windows and mechanical penetrations, air may leak at the wall/roof interface, plumbing stacks and elevator shafts that can channel air directly from the ground floor to the penthouse.

Variable. 5% of space heating energy is typical.

Low

1 - 3 years

HVAC

Install **programmable thermostats** in place of standard thermostats to control packaged heating, ventilation and air conditioning (HVAC) equipment. Programmable thermostats provide improved control, scheduling and setpoint reset capability.

Up to 10% of HVAC energy use

Low

1 - 3 years

Lighting

Choose **high efficiency high bay lighting** in applications such as warehouses, "big box" retail stores and gymnasiums. Efficient options include high output T5 or pulse-start metal halide fixtures instead of standard metal halide fixtures.¹

Up to 20% of lighting energy use

Medium

1 - 4 years

Lighting

When replacing fluorescent lighting systems, choose **high-performance T8 lighting** instead of standard T8 lighting. High performance T8s operate with an efficacy of up to 100 lumens per Watt and have a longer lamp life than standard T8 systems. If your building still uses T12 fluorescent lighting, it is generally economically attractive to replace these fixtures with high-performance T8 fixtures immediately.¹

Up to 35% lighting energy over T12 fluorescent lighting, up to 15% over T8 fluorescent lighting.

Medium

2 - 5 years

Computers

If your organization runs several servers, consider **server virtualization**. Virtualization is a process of installing software which allows a server to run multiple operating systems or instances of the same operating system concurrently. This allows single machines to perform multiple concurrent operations, resulting in a reduced number of servers required for operations. If virtualization is not appropriate, consider purchasing ENERGY Star servers (and personal computers).

Up to 50% of server energy use

Low

Less than 1 year

Space
Heating

Institutional buildings which produce steam to satisfy space heating or process loads can typically realize significant energy savings through steam plant efficiency measures. **Steam plant efficiency measures** generally include combustion efficiency improvements, heat recovery, steam distribution and condensate return improvements, and equipment operations and maintenance improvements.

Up to 15% of space heating energy

Medium

1 - 3 years

All

Recommissioning is a process which applies building commissioning procedures to an existing building in operation. This process ensures that the previously commissioned systems are still maintained and operated in accordance with the original design intent. It is also an opportunity to optimize operations beyond the intent of the original designers using the experience of operating the building as a guide. The vast majority of commercial buildings can benefit from recommissioning.

Variable. 15% of building energy use is typical.

Medium

4 - 12 months

Space
Heating

Much of the energy used to provide space heating is used to heat up outdoor ventilation air. **Demand controlled ventilation** systems use CO₂ sensors to supply outdoor air (OA) based on the actual building occupancy, while preserving indoor air quality. Energy is saved because lower volumes of OA are introduced during periods of low occupancy. In practice, volumes of OA can often be reduced by as much as 50% in buildings with variable occupancy patterns.

Dependent on ventilation levels. Typical savings are 25% of ventilation energy, or 8 - 20% of total space heating energy.

Medium

2 - 4 years

Space
Heating

Install air-to-air **heat recovery equipment** to reduce the amount of heat being exhausted from your building. Energy recovery ventilators (ERVs) and heat recovery ventilators (HRVs) are air-to-air heat exchangers used to recover the energy contained in air exhausted from buildings. The co-benefits of air-to-air heat recovery include improved indoor air quality and reduced total HVAC equipment capacity.

Dependent on ventilation levels. Typical savings are 50% of ventilation energy, or 15 - 40% of total space heating energy.

Medium

4 - 6 years

HVAC

The fans and pumps that move heated or cooled air or water to condition spaces use a significant portion of a building's energy. In most commercial buildings, HVAC fans and pumps are the second largest users of electricity after lighting. **Adjustable speed drives** (ASDs) allow motor-driven loads such as fans and pumps to operate in response to varying load requirements, instead of simply operating in "on/off" mode. ASDs increase efficiency and provide precise control.

Up to 35% of energy used by HVAC fans and pumps

Medium

2 - 4 years

HVAC

Choose **high-efficiency gas rooftop units**. In heating mode, **high efficiency rooftop units** employ high-efficiency heat exchangers and modulating burners and maintain steady state efficiencies by avoiding "on-off" cycling. They operate their heating sections continuously and modulate the heating output to match heating requirements. In cooling mode, high efficiency rooftop units can achieve a cooling energy efficiency ratio (EER) of up to 12.8, compared with a standard EER of 10.2.

Up to 20% of space cooling and 10% of space heating energy

High

2 - 5 years

Space
Cooling

Space Cooling is a major energy use, and can contribute to summertime peak loads. **High-efficiency chillers** feature oil-free centrifugal compressors, magnetic bearings and variable speed drives to deliver cooling more efficiently than conventional chillers.

Up to 30% of space cooling energy

High

7 - 10 years

Space
Heating

When replacing boilers, choose condensing boilers. **Condensing gas boilers** feature additional advanced heat exchanger designs and materials that extract more heat from the flue gases before they are exhausted. The temperature of the flue gases is reduced to the point where the water vapour produced during combustion condenses back into liquid form, which releases its latent heat and improves energy efficiency and represents a significant energy-savings potential.

Up to 14% of space heating energy

High

3 - 6 years

¹ Note that waste heat from lighting fixtures has the "interactive effect" of supplementing space heating and adding to cooling load. Installing more efficient lighting fixtures will increase space heating requirements and reduce space cooling requirements. Low-end payback estimates do not take these interactive effects into account, while high-end estimates do take interactive effects into account.

Very Low Effort

Relative Implementation Effort

Significant Effort