



Énergie NB Power

Office Building

Energy consumption generates greenhouse gases (GHG) and accounts for a significant business expense. By implementing energy efficiency measures and practices, businesses get more value from the energy they purchase while lessening their impact on the environment. Many opportunities exist for office buildings to decrease energy consumption and realize cost savings. The energy efficiency measures listed below include recommendations for upgrades that can improve aesthetics, enhance customer experience and lower maintenance costs. All of these measures should be evaluated for each individual building first by a professional, and a comprehensive energy audit may be beneficial.

Typical energy efficiency measures

HVAC

- Downsize to a new high-efficiency chiller in conjunction with lighting and other retrofits.
- Choose high-efficiency packaged A/C units listed by the Consortium for Energy Efficiency in their Tier 2 guidelines (<http://www.cee1.org/com/hecac/hecac-tiers.pdf>).
- Use condensing boilers with large turn-down ratios whose efficiencies improve with turn-down.
- Switch over to direct digital controls.
- Install variable air volume air handling systems with variable speed drives.
- Install premium-efficiency motors.
- Install demand-controlled ventilation.
- Ventilate garages in response to environmental conditions.
- Upgrade the energy management system; optimize settings to reflect usage, respond to changing weather patterns and control peak electric loads.
- Continuously commission the building.
- **Install an outdoor air economizer** with air-handling units. If the building already has an economizer, verify function and control.
- Consider using cool air from the cooling tower with water-cooled chillers.
- **Smart thermostats** provide preset limits for heating and cooling – overriding unnecessarily high or low settings by staff. These thermostats also feature digital controls and readouts that ensure greater accuracy than the sliding levers on traditional units.
- **Night temperature setbacks** involve the installation of an automatic thermostat that controls the temperature when the office is closed.
- **Scheduling** or **cycling** is the practice of shutting down your HVAC equipment for short periods throughout the day. For example, shutting down fans and other systems for three minutes an hour represents 5 % of your consumption, but may not be noticed by customers or tenants. The trick is to reduce consumption without a perceptible change in temperature. If the temperature changes, your system will have to work harder to return to desirable temperature and humidity levels.
- **Heat recovery ventilators (HRVs)** and **energy recovery ventilators (ERVs)** have balanced exhaust and supply fans that meet all ventilation needs without creating drafts and air pressure imbalances. HRVs can feature efficiencies as high as 85 to 95 %, with payback in roughly 3.5 years. Consider these units whenever air is continuously exhausted and make-up or ventilation air is required.
- **Zone isolation** and **demand control ventilation (DCV)** reduce airflow when low carbon-dioxide levels indicate a room is not in use. Implementing these measures may involve the use of variable-frequency drives (see the “Motors and Drives” section) and shut-off dampers, as well as reductions in the amount of outside air used by your HVAC system. Energy is saved not only because air distribution is reduced, but also because less air must be heated or cooled.



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- **Heat pumps** transfer heat from a lower-temperature source to a higher-temperature area. In the winter they extract heat from the outside and transfer it to the interior. In the summer they cool inside spaces by extracting heat from the inside and transferring it to the outside. High-efficiency units can operate 10 to 30 % more efficiently. Depending on the heat source, a heat pump can produce two to three times the energy consumed. **Geothermal or ground-source heat pumps** (GSHPs) are particularly efficient in areas with cold winters, since ground temperature is usually warmer than outside air in winter and cooler than outside air in summer. This allows GSHPs to perform 45 to 70 % more efficiently than conventional systems.

Building Envelope

- Install interior or exterior shading devices.
- Increase insulation R-value
- Undertake air sealing, including duct work.

Plug Loads

- Use low-energy sleep functions on computers, printers, and copiers.
- Use the duplex copying mode to save energy and paper.
- Choose ENERGY STAR office equipment and appliances.
- Install Vending Miser on vending machines.

Lighting

- Compact fluorescent lights (CFLs)
 - Use 75% less energy than standard incandescent bulbs to produce the same amount of light and last up to 10 times longer
 - Ideal to use in hard-to-reach places, in guest rooms and where lights are left on for long periods of time
- High Performance T8 fluorescent lamps
 - Use 15% less energy than standard T8 systems
 - Better colour rendering up to 25 years
 - Maintain light output for longer periods of time
 - Longer lamp lifespan
- Holiday LED strings
 - Use 90% less energy than conventional incandescent light strings and last at least 10 times longer
 - More durable and produce very little heat
- LED or photoluminescent exit signs
 - Extremely long product life: LEDs last 10 to 15 years
- Lighting occupancy sensors
 - Depending on the room, savings can be up to 70%
 - Extends the life of lighting products and reduce maintenance costs

Employee

- Ensure building maintenance and cleaning staff are enthusiastic about savings and adopt work habits that support energy efficiency.
- Involve all employees in energy savings efforts, provide efficiency education for work and home, and encourage employee suggestions on energy savings opportunities.



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Financial incentives available

NB Power's **Energy Smart Commercial Buildings Retrofit Program** provides financial incentives of up to \$3,000 towards an evaluation to determine the potential for energy efficiency upgrades and a maximum of \$75,000 towards the energy retrofitting project costs. For more information about making your office more energy efficient, visit www.nbpower or by phone at 1-800-663-6272 and press 5 for Energy Efficiency Services (after choosing your preferred language).

Sources: NB Power commercial team reviewed existing documents from NRCan, BC Hydro and Southwest Energy Efficiency Project.