Énergie NB Power

Grocery stores

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 grocery stores 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

Refrigeration

- It is usually worthwhile to upgrade refrigeration systems in grocery stores to include efficient, state-of-the-art technologies. Defrosting can be matched to actual need by including dew point controls for anti-condensate heaters on refrigerated cases. Incorporate efficient cooling system components such as high-efficiency compressors, water-cooled condensers, floating-head pressure controls, and multiple, unequally-sized compressors feeding the same manifold.
- Install floor insulation in coolers. The floors of walk-in refrigerators in many grocery stores are simply concrete slabs that are not insulated from the earth underneath nor around their edges. Retrofitting these with floor insulation improves efficiency in the cooler. Use efficient lighting in refrigerators and save even more: this retrofit lowers the electricity use for both lighting and cooling.
- **Doors** should be installed on open freezers and refrigerators. It can be cost effective to replace old refrigeration units with energy efficient new ones.
- **Night blinds** can be installed on all open cooling cabinets if none exist already. For displays with goods that are accessed less often, consider **day covers** or **plastic strip curtains**.
- **Heavy plastic curtains** outside your walk-in cooler or freezer keep the cold air in and the warm air out.
- **Energy efficient central compressors**, properly sized to match the load, can be one of your most important investments since compressors are one of the largest energy users.
- **Compressor and evaporator fan controllers** for walk-in coolers and freezers, such as variable speed drives, can cut the voltage to the motor and slow down the fan when full air flow is not needed. They are most useful in units that run between 22° to 4°C (28° to 40°F), with evaporator fans that run at full speed all the time. Different models include basic units that sense when the refrigerant has ceased flowing through the evaporator coil, mid-range units that monitor data over time and activate warning lights and top-end units that have a modem for remote or full-time monitoring. With investments as low as $100 per unit, savings can vary from 10 to 60 % of overall refrigeration energy consumption and have paybacks as low as one year.
- **Remote condensers** allow for the rejection of heat to the building's exterior instead of into the retail space when the air requires cooling.
- **Demand-defrost controls** initiate defrost cycles only when needed, instead of using automatic timers.
- **Dew point controls** on display cases prevent the buildup of fog on glass surfaces and the buildup of moisture on metal surfaces.
- **Larger heat exchangers** are more efficient than multiple, smaller units so, when renovating, try to group cabinets together to better facilitate heat removal or recovery.
- **Fibre optic lighting** piped into cabinets minimizes heat input from traditional lighting.
- **Lighting occupancy sensors** for walk-in coolers or freezers will ensure that lights are only on when needed and will make it easier for employees to carry food in and out.
- **Insulation** in coolers and freezers should be inspected and upgraded regularly.

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High-Efficiency HVAC

- Install a demand-controlled ventilation system. A demand-controlled ventilation (DCV) system senses the level of carbon dioxide in the return air stream and uses it as an indicator of occupancy. As a result, energy can be saved by varying the amount of ventilation required. Install variable air volume air handling systems with variable speed drives.
- Choose high-efficiency packaged A/C units.
- Downsize to a new high-efficiency chiller while retrofitting lighting and refrigerator cases. Sizing the HVAC equipment to take into account the cool air leaking from cases and cabinets can usually justify downsizing the chiller, offsetting the higher *first* cost of high-efficiency equipment.
- Use condensing boilers with large turn-down ratios whose efficiencies improve with turn-down.
- Switch over to direct digital controls.
- Install premium-efficiency motors.
- Upgrade the energy management system; optimize settings to reflect usage, respond to changing weather patterns, and control peak electric loads.
- Continuously commission the building.

Building Envelope

- Install high-efficiency glazing that is carefully chosen for each building in relation to the sun and other variables. When installing new glazing, choose a product that has high transmission in the visible spectrum (to enhance day lighting from within and the view from inside and out) but low transmission in the infrared (low solar heat gain coefficient, SHGC, and low emissivity in the far infrared)to enhance energy performance during the cooling season. Install overhangs to limit direct beam sunlight coming in store windows.
- Install insulation.
- Undertake air sealing, including duct work and door weather stripping.

Plug Loads

- Use low-energy sleep functions on computers, printers, and copiers.
- Choose ENERGY STAR® commercial refrigerators, water coolers, and other appliances.

Lighting

- Halogen infrared lamps
  - Approximately 30% more energy efficient than standard halogen and 40% to 50% more energy efficient than similar wattage incandescent lighting
  - Longer lamp life
  - Excellent light quality and colour rendering
  - Produces less heat than incandescent and standard halogen 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
- LED MR16 (multi-mirror reflector) lamps
  - Superior optical control
  - Reduced maintenance costs due to a very long life
- 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

- LED or photoluminescent exit signs
    - Extremely long product life: LEDs last 10 to 15 years
- LED signage
    - Reduce energy use by over 85% compared with standard neon signage
    - Last 50,000 to 100,000 hours

Employee Engagement

- Ensure that stockers, building maintenance people, 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 input on energy savings opportunities.
- Track energy use and utility bills and investigate anomalies. Document energy savings and report results to management and employees.

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 store more energy efficient visit www.nbpower.com or phone 1-800-663-6272 and press 5 for Energy Efficiency Services (after choosing your preferred language).

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