



GREENHOUSE ENERGY EFFICIENCY CHECKLIST

Across the province, Ontarians rely on greenhouse growers for vegetables, flowers and more. Greenhouse operations are only growing – in fact, the amount of vegetables and fruit produced in Ontario has climbed 30 per cent over the last five years alone. Plus, with cannabis legalization, even more greenhouses may soon be cropping up. So, how can greenhouse operators maintain a competitive advantage? Through energy efficiency. Use this checklist to get on your way.

| BEST PRACTICES | DOES THE OPPORTUNITY EXIST? | PROJECT LEAD | ESTIMATED PROJECT COMPLETION DATE | BUDGET FOR IMPROVEMENTS | AVAILABLE INCENTIVES AND REBATES | ESTIMATED PAYBACK PERIOD |
|--|-----------------------------|--------------|-----------------------------------|-------------------------|----------------------------------|--------------------------|
| STRUCTURAL & OPERATIONAL | | | | | | |
| Look for and repair any holes or broken glass to reduce air leaks and reduce the chance of pests entering the space. Create a schedule to do this regularly. | | | | | | |
| Check around the perimeter where the structure meets the ground to look for leaks. | | | | | | |
| Install insulated board into the soil around the perimeter foundation of the greenhouse to prevent air leakage. | | | | | | |
| Keep doors closed fully. | | | | | | |
| Use multi-level racks for plants that don't require high lighting levels, so you can take advantage of space without wasting energy. | | | | | | |
| Use roll-out tray systems to take plants outside when weather and lighting permits. | | | | | | |
| Use docking seals (fabric-covered foam pads) around loading areas to reduce heat loss. | | | | | | |
| Aim to keep growing areas full, to maximize the benefit of the energy you're using. | | | | | | |
| DESIGN CHOICES | | | | | | |
| Place new greenhouses in areas sheltered from the wind (assuming it doesn't block light), to reduce heat loss. | | | | | | |
| Design your greenhouse using zones, so the conditions needed for certain plants can be isolated from others. That way, you can prevent overusing heating, cooling and lighting. | | | | | | |
| Use a system that incorporates more natural ventilation, instead of forced air ventilation only. | | | | | | |
| LIGHTING & CLIMATE CONTROL | | | | | | |
| Replace traditional incandescent, high pressure sodium or compact fluorescent lighting with energy-efficient LED grow lights, which uses up to 50 per cent less energy. | | | | | | |
| Install weather-stripping around doors and windows to prevent unnecessary air leakage. | | | | | | |
| Ensure vents are properly sealed when closed and exhaust fans are properly insulated. | | | | | | |
| Ensure fan shutters (louvers) are closing properly. If not, lubricate them. | | | | | | |
| Use light-coloured materials for ground covers, walls, posts and heating pipes to reflect heat. | | | | | | |
| Consider a chilled water system for cooling needs. | | | | | | |
| Use polycarbonate sheeting on walls to reduce heat loss. | | | | | | |
| Install retractable energy curtains to gain more control over natural light. Periodically inspect them for holes or tears. | | | | | | |
| Consider floor or under-bench heating, which may allow you to keep the overall air temperature lower. | | | | | | |
| Install electronic thermostats with sensors for more accurate temperature control. | | | | | | |
| Install variable frequency drives (VFDs) on exhaust fans, heat buffering systems, zone pumps and mixing valves, to use energy more efficiently. | | | | | | |
| Schedule regular maintenance on rooftop heating and cooling units. Consider proactively upgrading to more energy-efficient models, which may also help reduce operational and maintenance costs. | | | | | | |

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