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.

**GREENHOUSE ENERGY EFFICIENCY CHECKLIST**

**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.

**BEST PRACTICES**

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<th>DOES THE OPPORTUNITY EXIST?</th>
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<th>ESTIMATED PROJECT COMPLETION DATE</th>
<th>BUDGET FOR IMPROVEMENTS</th>
<th>AVAILABLE INCENTIVES AND REBATES</th>
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**DESIGN CHOICES**

- Place new greenhouses in a warm sheltered area to reduce heat loss.
- Design your greenhouse using sensors, so for optimal energy for energy plants can be adjusted from below. That way, you can prevent overcooling/overheating, 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 use up to 50 per cent less energy.
- Install wind-protecting around doors and windows to prevent unneeded air leakage.
- Ensure vents are properly sealed when closed and reduced fans are properly insulated.
- Ensure the fans (beta) are always properly sealed, if not, calculate blow.
- Use light-coloured materials for ground covers, walls, posts and heating pipes.
- Consider a chilled water system for cooling needs.
- Consider installing a system that includes solar or other renewable energy.
- Use a system that incorporates more natural ventilation, instead of forced air ventilation only.
- Ensure fans shut off when climate control is gained.
- Consider using a chilled water system for cooling needs.
- Use high-quality fans that can be adjusted from below. That way, you can prevent overcooling/overheating, cooling and lighting.
- Install electronic thermostats with sensors for more accurate temperature control.
- Install variable frequency drives (VFDs) or variable speed fans to improve energy efficiency.

**REVIEW AND INTEGRATE**

- Schedule regular maintenance or topsoil testing and composting, if necessary. Consider using a system that includes solar or other renewable energy.
- Ensure the fans (beta) are always properly sealed, if not, calculate blow.
- Use light-coloured materials for ground covers, walls, posts and heating pipes.
- Consider a chilled water system for cooling needs.
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