

OTTAWA ELECTRICAL

Generators & Backup

Whole home generators, transfer switches, and
backup power

7 Expert Answers from Construction Brain

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Q1

Do I need a permit for a standby generator in Ottawa?

Yes, you absolutely need an ESA permit for standby generator installation in Ottawa. Installing a standby generator involves new electrical circuits, transfer switches, and connections to your home's electrical system - all of which require permits and professional installation under the Ontario Electrical Safety Code.

What requires the permit isn't just the generator itself, but the complete electrical installation. This includes running a new dedicated circuit from your electrical panel to the generator location, installing an automatic transfer switch that connects to your main panel, and establishing proper grounding and bonding. The transfer switch is particularly critical because it prevents dangerous backfeeding into Hydro Ottawa's electrical grid, which could electrocute utility workers during power outages.

ESA permit and inspection process begins when your licensed electrical contractor pulls the permit before starting work. The electrician must complete the installation according to OESC requirements, including proper clearances from your home (typically 5 feet minimum), adequate ventilation for exhaust, and compliance with noise bylaws. ESA will then inspect the electrical connections, transfer switch operation, and safety systems within 3-5 business days of the work completion.

Generator sizing and costs in Ottawa typically range from \$8,000-\$15,000 for whole-home systems, including the generator, transfer switch, electrical work, and permits. Popular sizes are 20kW for essential circuits (furnace, fridge, some lights) or 24kW+ for whole-home backup. The permit fee is usually around \$100-150, but this is included in your contractor's quote.

Important safety considerations make professional installation non-negotiable. Improper generator connections have caused house fires, carbon monoxide poisoning, and electrocution of utility workers. The automatic transfer switch must be installed correctly to prevent your generator from energizing Hydro Ottawa's lines during outages.

For a free consultation on generator sizing and installation requirements for your Ottawa home, contact Electrical Ottawa. Our ESA-licensed electricians handle all permits and ensure your backup power system meets code requirements safely.

Q2

Do I need a transfer switch for a generator?

Yes, you absolutely need a transfer switch for a generator in Ontario. It's not just recommended - it's required by the Ontario Electrical Safety Code and ESA regulations for any generator connected to your home's electrical system.

A transfer switch is a critical safety device that prevents your generator from back-feeding electricity into Hydro Ottawa's power lines, which could electrocute utility workers or damage equipment. When the power goes out, the transfer switch safely disconnects your home from the grid before allowing generator power to flow to your circuits. When utility power returns, it automatically switches back and shuts down the generator connection.

There are two main types of transfer switches for Ottawa homes. Manual transfer switches require you to physically flip switches to select which circuits get generator power - typically 6-10 essential circuits like furnace, refrigerator, and some lights. These cost \$800-1,500 installed and work well with portable generators. Automatic transfer switches detect power outages and switch over without any action from you, powering your entire home or pre-selected circuits. These range from \$2,500-5,000 installed and are designed for standby generators.

ESA permits and inspections are mandatory for all transfer switch installations in Ontario. Only licensed electricians can legally install transfer switches, and the work must be inspected before it can be energized. The installation involves connecting to your main electrical panel and often requires upgrading your service if you're adding a whole-home generator system.

Never attempt to power your home without a proper transfer switch - using extension cords or "backfeeding" through a dryer outlet is extremely dangerous and illegal. This creates deadly risks for utility workers and can cause fires or electrocution in your home. Insurance companies also deny claims for damage caused by improperly connected generators.

For Ottawa homeowners considering backup power, we typically recommend manual transfer switches for portable generators (5,000-10,000 watts) or automatic switches for permanent standby units (14-22kW). The right choice depends on your budget, which circuits you want to power, and whether you want the convenience of automatic operation during outages.

For a free consultation on generator and transfer switch options for your Ottawa home, Electrical Ottawa can assess your electrical panel and power needs to recommend the best solution.

Q3

Can a generator damage my electronics?

Yes, generators can absolutely damage your electronics if not properly installed or if you're using the wrong type of generator. The biggest risks come from power quality issues like voltage fluctuations, frequency instability, and "dirty" power that can fry sensitive devices like computers, TVs, and smart home systems.

Portable generators are the biggest culprits for electronics damage. These units often produce unstable power with voltage spikes and drops that can destroy anything with microprocessors or sensitive circuits. Even expensive "inverter generators" marketed as "clean power" can still have issues, especially as they age or when overloaded. The power quality from a portable unit running extension cords into your home is rarely consistent enough for modern electronics.

Standby generators with proper transfer switches are much safer for your electronics. These whole-home units are designed to provide stable, utility-grade power and include automatic voltage regulation. However, even these need proper installation by a licensed electrician to ensure clean power delivery. The transfer switch must be correctly sized and wired to prevent backfeed and maintain proper grounding.

In Ottawa, ESA permits are required for any permanent generator installation, including the transfer switch wiring. This isn't just red tape - improper installation can create power quality issues that damage electronics or, worse, create safety hazards. A licensed electrician will ensure proper grounding, sizing, and connection to prevent damage to your valuable electronics.

The most dangerous scenario is backfeeding - plugging a portable generator directly into an outlet without a transfer switch. This can send power back through your electrical system, potentially damaging electronics throughout your home and creating a deadly hazard for Hydro Ottawa workers. It's also illegal and will void your insurance.

For maximum electronics protection, consider a standby generator with built-in surge protection and voltage regulation. Units from manufacturers like Generac, Kohler, and Cummins include these features in their higher-end models. Your electrician should also install whole-home surge protection at your panel to guard against power surges when utility power is restored.

If you must use a portable generator during an outage, only plug essential items directly into the generator using heavy-duty outdoor extension cords. Avoid daisy-chaining power strips or running sensitive electronics like computers, gaming systems, or smart TVs. The risk of damage simply isn't worth it.

For a properly installed standby generator that protects your electronics and provides seamless backup power, request a free consultation from Electrical Ottawa. We'll assess your home's needs and ensure ESA-compliant installation that keeps your valuable electronics safe.

Can I run my furnace on a portable generator?

Yes, you can run most furnaces on a portable generator, but it requires careful planning and proper setup to do it safely. The key is having the right generator size and a safe connection method.

Most residential gas furnaces need between 600-1500 watts to start up and 300-800 watts to run continuously. The blower motor creates the biggest power demand, especially during startup when it can draw 2-3 times its running wattage. Electric furnaces, however, require much larger generators (10,000+ watts) and aren't practical for most portable units.

Generator sizing is critical - you'll need at least a 3,000-4,000 watt portable generator to handle the furnace startup surge plus a few essential items like lights and your refrigerator. Popular models like the Honda EU3000iS or Generac GP3500iO work well for this application. Remember that generators produce less power at altitude and in cold weather, so size up accordingly for Ottawa's winter conditions.

The connection method matters for both safety and legality. Never plug a generator directly into a wall outlet - this creates deadly backfeed that can electrocute utility workers. In Ontario, you have two safe options: use heavy-duty extension cords to power individual items, or install a manual transfer switch. The transfer switch option requires an ESA permit and licensed electrician installation, but it's much more convenient and safer for regular use.

For furnace-specific connection, you'll typically need to run a heavy-duty extension cord from the generator to the furnace area, then plug the furnace into the cord using the appropriate adapter. Make sure your extension cord is rated for the furnace's amperage - usually 12 AWG minimum for most residential furnaces. The furnace should be the first thing you connect to avoid voltage drops from other loads.

Safety considerations are paramount when running generators during power outages. Always operate the generator outdoors, at least 20 feet from windows and doors to prevent carbon monoxide poisoning. In Ottawa's winter weather, you may need a generator cover or shelter, but ensure adequate ventilation. Never run a generator in your garage, basement, or any enclosed space - carbon monoxide is odorless and deadly.

ESA regulations require that any permanent generator installation or transfer switch be installed by a licensed electrician with proper permits. While using extension cords with a portable generator doesn't require permits, any modifications to your home's electrical system do.

For frequent power outages or whole-home backup power, consider a permanently installed standby generator. These automatically start during outages and can power your entire home, including electric furnaces. Installation typically costs \$4,000-8,000 in Ottawa including the generator, transfer switch, and professional installation.

If you're experiencing a heating emergency during a power outage and aren't comfortable with generator setup, Electrical Ottawa offers 24/7 emergency service to help Ottawa residents restore power safely.

Q5

How much does it cost to install a whole home generator in Ottawa?

Whole home generator installation in Ottawa typically costs between \$8,000 and \$25,000, depending on the generator size, fuel type, and electrical work required. The wide range reflects differences in generator capacity, installation complexity, and whether your electrical panel needs upgrading.

Generator costs break down into several components. The generator unit itself ranges from \$4,000 for a basic 14kW natural gas unit to \$12,000+ for larger 24kW models. Installation labor typically adds \$2,000 to \$4,000, covering electrical connections, gas line work, concrete pad preparation, and ESA permit fees. If your electrical panel needs upgrading to accommodate the generator's transfer switch, add another \$2,000 to \$3,500 for a 100A to 200A upgrade.

Natural gas generators are most popular in Ottawa due to reliable fuel supply and lower operating costs. A typical 20kW natural gas generator suitable for most homes costs \$6,000 to \$8,000 for the unit, plus \$3,000 to \$5,000 for complete installation. This size can power essential circuits including furnace, refrigerator, some lights, and a few outlets during Hydro Ottawa outages. Propane generators cost slightly less upfront but require tank refills and may have higher long-term operating costs.

ESA permits and inspections are mandatory for generator installations in Ontario. Your licensed electrician must pull permits before starting work, and ESA will inspect both the electrical connections and transfer switch installation. The transfer switch - which automatically switches your home between utility and generator power - must be installed by a licensed electrician and costs \$800 to \$1,500 depending on size and features.

Installation complexity affects final costs significantly. Straightforward installations with existing 200A service, close gas line access, and simple concrete pad placement stay toward the lower end. However, if you need panel upgrades, extensive gas line runs, or complex electrical work to separate essential from non-essential circuits, costs can reach \$20,000+. Enbridge gas connection fees may add \$500 to \$1,500 if new service is required.

Sizing your generator properly is crucial for both performance and cost. A 14kW unit (\$8,000-\$12,000 installed) handles essential circuits for most homes. A 20kW system (\$12,000-\$18,000 installed) can power most of your home including some air conditioning. Larger 24kW+ units (\$18,000-\$25,000+ installed) provide whole-home backup but may require significant electrical modifications.

Consider Ottawa's power outage patterns when deciding. Hydro Ottawa generally provides reliable service, but ice storms and severe weather can cause multi-day outages. A properly sized generator pays for itself in prevented food spoilage, heating costs, and peace of mind during extended outages.

For a free assessment of your home's generator requirements and accurate pricing based on your specific electrical setup, Electrical Ottawa's licensed electricians can evaluate your panel capacity, determine optimal generator sizing, and provide detailed installation quotes. All our generator installations include full ESA permitting and inspection coordination.

Q6

What size generator do I need to run my whole house?

The size generator you need depends on your home's electrical load, but most Ottawa homes require a 15-20kW generator for essential circuits or 20-30kW for whole-house backup. To determine the exact size, you'll need a licensed electrician to calculate your home's actual electrical demand.

Understanding Generator Sizing

Generator sizing isn't just about your panel's amperage - it's about calculating your actual electrical load. A 200-amp panel doesn't mean you need a 200-amp generator, since you rarely use all circuits simultaneously. Your electrician will perform a load calculation considering your home's square footage, heating system, air conditioning, major appliances, and lighting.

For a typical Ottawa home, here's what different generator sizes can handle:

15-20kW generators can power essential circuits including furnace, refrigerator, some lights, and a few outlets. This covers heating, food preservation, and basic lighting during outages - adequate for most families' emergency needs.

20-25kW generators add capacity for more circuits, potentially including your hot water heater, garage door opener, and additional outlets throughout the house. This size works well for homes with gas heating and moderate electrical demands.

25-30kW generators approach true whole-house backup, powering most circuits including electric heating (if applicable), multiple appliances, and maintaining normal electrical usage patterns during outages.

Ottawa-Specific Considerations

In Ontario, generator installation requires an ESA permit and inspection. The generator must be installed by a licensed electrician and connected through a proper transfer switch - never backfeed through a regular outlet, which is illegal and deadly. ESA requires generators be positioned at least 1.5 meters from windows, doors, and air intakes.

Natural gas generators are popular in Ottawa since they connect to your existing Enbridge gas line, providing unlimited runtime. Propane generators work well for homes without gas service but require tank refills. Standby generators automatically start during outages and typically restore power within 10-20 seconds.

Installation costs in Ottawa typically range from \$8,000-\$15,000 including the generator, transfer switch, electrical connections, gas line work, and permits. Higher-capacity units and complex installations cost more.

Next Steps

Contact a licensed electrician to perform a proper load calculation for your specific home. They'll assess your electrical panel, major appliances, and usage patterns to recommend the right generator size. This ensures you get adequate backup power without overpaying for unnecessary capacity.

For generator installation and sizing consultation, Electrical Ottawa's licensed electricians can evaluate your home's needs and handle the complete installation process, including ESA permits and inspections.

What is the cost of installing a transfer switch for a generator?

Installing a transfer switch for a generator in Ottawa typically costs between \$1,500 and \$4,000, depending on the size and type of switch needed. The total cost includes the transfer switch unit, installation labor, ESA permit, and inspection fees.

Manual transfer switches are the most affordable option, ranging from \$1,500 to \$2,500 installed. These require you to manually switch between utility power and generator power during an outage. They're suitable for smaller portable generators (5,000-10,000 watts) and work well for homeowners who want basic backup power for essential circuits like furnace, refrigerator, and a few lights.

Automatic transfer switches cost significantly more at \$2,500 to \$4,000 installed, but they provide seamless power switching without any manual intervention. When utility power fails, the automatic switch starts your generator and transfers the load within 10-15 seconds. These are typically paired with whole-home standby generators and can handle larger electrical loads.

The **size of your transfer switch** directly impacts cost. A 100-amp switch suitable for essential circuits costs less than a 200-amp switch designed to power your entire home. Most Ottawa homes need either a 100A or 200A transfer switch, with the choice depending on your generator capacity and how much of your home you want to backup.

ESA permit and inspection requirements add approximately \$200-400 to your project cost. In Ontario, transfer switch installation requires an ESA permit since you're modifying your electrical service. The work must be completed by a licensed electrician, and ESA will inspect the installation to ensure it meets Ontario Electrical Safety Code requirements, including proper grounding and disconnect procedures.

Additional costs to consider include upgrading your electrical panel if it lacks sufficient space for the transfer switch connections, running a dedicated circuit to your generator location, and installing a generator inlet box on your home's exterior. These extras can add \$500-1,000 to your total project cost.

Safety is critical with transfer switch installation - improper wiring can cause dangerous backfeed that could electrocute utility workers or damage your electrical system. The transfer switch must completely isolate your home from the utility grid when generator power is active.

For a free estimate on transfer switch installation for your Ottawa home, Electrical Ottawa's ESA-licensed electricians can assess your specific needs and provide accurate pricing based on your generator size and electrical panel configuration.

Disclaimer: This guide is provided for informational purposes only by Ottawa Electrical. It does not constitute professional advice. Always consult qualified, licensed contractors and your local building authority before starting any construction or renovation project. Information is current as of March 15, 2026 and may change. Visit electricalottawa.ca for the latest answers.