TORONTO ELECTRICAL REPAIR

Generators & Backup

Standby generators, automatic transfer switches, backup power systems, and ice storm preparedness for GTA homes

11 Expert Answers from Electric IQ

torontoelectricalrepair.com/construction-brain

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Q1

How much does annual generator maintenance cost and what does a typical service include?

Annual generator maintenance in the GTA typically costs $200-$400 for a whole-home standby generator, with portable generator servicing running $150-$250. This preventive maintenance is essential for ensuring your backup power system works when Toronto's next ice storm hits.

What's Included in Professional Generator Maintenance

A comprehensive annual service covers both the generator engine and electrical components. The engine portion includes changing the oil and filter, replacing the air filter, checking spark plugs, testing the battery and charging system, and inspecting belts and hoses. For natural gas units, the technician cleans and adjusts the gas regulator and checks all gas connections for leaks — this requires TSSA (Technical Standards and Safety Authority) certification in Ontario.

The electrical side involves testing the automatic transfer switch operation, verifying all control panel functions, checking wire connections for tightness and corrosion, testing the generator under load, and ensuring proper voltage and frequency output. The technician will also inspect the weatherproof enclosure for any damage from Toronto's freeze-thaw cycles and verify that the unit's cooling system is clear of debris.

GTA-Specific Maintenance Considerations

Toronto's climate creates unique maintenance needs for backup generators. Ice storms can damage air intakes and exhaust vents, while our freeze-thaw cycles can cause ground movement that affects gas line connections and electrical conduit. Many GTA homeowners discovered maintenance issues during the 2013 ice storm when generators that hadn't been serviced failed to start during the emergency.

Winter operation is particularly demanding — generators work harder in cold weather, batteries lose capacity in freezing temperatures, and condensation can form in fuel systems. Summer humidity accelerates corrosion on electrical connections and control panels. A good maintenance program addresses these seasonal challenges with appropriate battery testing, connection cleaning, and moisture protection.

Maintenance Timing and Frequency

Schedule generator maintenance in late fall before ice storm season, typically October or November. This timing ensures your system is ready for winter power outages while avoiding the spring rush when many homeowners discover problems after their generators sat unused all winter. Some manufacturers require annual maintenance to maintain warranty coverage.

For generators that see heavy use or are located in harsh environments (near Lake Ontario's salt spray, or in areas with frequent power outages), consider bi-annual service. Portable generators used regularly should be serviced every 100 hours of operation or annually, whichever comes first.

DIY vs Professional Service

Homeowners can handle basic maintenance like checking oil levels, cleaning air intakes, and running monthly tests, but comprehensive service requires professional expertise. Gas line work requires TSSA certification, electrical testing needs proper equipment, and transfer switch maintenance involves working with high-voltage systems. Most importantly, warranty coverage typically requires documented professional maintenance.

Cost Variables in the GTA Market

Maintenance costs vary based on generator size (8kW units cost less to service than 22kW systems), accessibility (generators in tight spaces or requiring ladder access cost more), and the service company's travel distance. Downtown Toronto and dense suburban areas often have higher service rates due to parking challenges and higher business operating costs.

Some companies offer maintenance contracts that include annual service, priority emergency response, and discounted repair rates for $300-$500 annually. These contracts can provide value for homeowners who want guaranteed service scheduling and faster response during widespread outages.

When Repairs Are Needed

Maintenance visits sometimes reveal issues requiring additional work — corroded connections, worn belts, failing batteries, or transfer switch problems. Budget an additional $200-$800 for common repairs discovered during routine maintenance. Major component failures (engine problems, transfer switch replacement) can run $1,500-$3,000 or more.

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Q2

How long can a whole-home standby generator run continuously during a Toronto ice storm?

A natural gas whole-home standby generator can run continuously for days or even weeks, as long as your gas supply remains active — which is exactly why natural gas units are the preferred choice for GTA ice storm preparedness. During Toronto's devastating 2013 ice storm, over 300,000 Toronto Hydro customers lost power for up to 10 days, and homeowners with natural gas standby generators were the only ones who maintained heat, refrigeration, and lighting throughout the entire event.

Natural gas generators connect directly to your existing Enbridge gas line, which runs underground and is virtually immune to ice storm damage. This means there is no fuel tank to refill, no trips to the gas station in dangerous conditions, and no risk of running out during a prolonged outage. Propane-fuelled standby generators are the alternative for homes without natural gas service — common in parts of Pickering, Ajax, and rural areas north of the GTA — but propane tanks are finite. A standard 500-gallon propane tank will power a 22kW generator for roughly 4 to 5 days under moderate load, so you need to plan for refill logistics during a major storm.

The real limiting factor for continuous operation is not fuel but maintenance intervals. Most standby generators from Generac, Kohler, and Briggs & Stratton recommend an oil check every 100 to 200 hours of continuous operation, which translates to roughly 4 to 8 days of nonstop running. During the 2013 ice storm, many GTA homeowners ran their generators for the full 7 to 10 days without issues, though manufacturers recommend monitoring oil levels if you exceed 200 hours. Modern units have low-oil shutoff protection that will automatically stop the generator before engine damage occurs.

Load management matters significantly for longevity. A 22kW generator running your entire home — furnace, fridge, lights, sump pump, and a few convenience circuits — typically operates at 40 to 60 percent capacity during normal winter usage. Running at partial load is ideal for engine life. However, if you are simultaneously powering electric baseboard heaters, a hot tub, and an electric dryer, you could push the unit to full capacity, increasing fuel consumption and engine wear. Your electrician will perform a load calculation during installation to ensure proper sizing.

Installation of a whole-home standby generator in the GTA typically costs **$8,000 to $15,000** for a 16 to 22kW natural gas unit, including the automatic transfer switch, concrete pad, gas line extension (TSSA permit required), and ESA electrical permit. The automatic transfer switch is the critical component — it detects the power outage within seconds, signals the generator to start, and transfers your home's electrical load from the grid to the generator automatically. When Toronto Hydro restores power, the transfer switch reverses the process and the generator shuts down on its own. You do not need to be home for any of this to happen.

After the 2013 ice storm, demand for standby generators surged across the GTA, and installation wait times stretched to 3 to 6 months. The best time to install is late spring or early summer, well before ice storm season. If you are considering a standby generator for your Toronto home, Toronto Electrical Repair can match you with licensed electricians experienced in generator installations through the Toronto Construction Network.

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Q3

What is the difference between a manual and automatic transfer switch for backup power?

A manual transfer switch requires you to physically flip a lever or series of breakers to transfer your home from grid power to generator power, while an automatic transfer switch (ATS) detects the outage and switches over on its own within 10 to 30 seconds — no human intervention needed. Both types are legally required in Ontario before you can connect any generator to your home's electrical panel, and both require an ESA permit and installation by a licensed electrician.

A **manual transfer switch** is the more affordable option, typically costing **$1,500 to $2,500 installed** in the GTA market. It is a dedicated sub-panel mounted beside your main electrical panel, usually wired to 6 to 10 pre-selected

circuits — your furnace, refrigerator, sump pump, a few lighting circuits, and maybe a bathroom outlet. When the power goes out, you go outside, start your portable generator, run the heavy-duty power cord from the generator to the transfer switch inlet box on your exterior wall, then go back inside and flip each circuit switch from "line" to "generator" position. When power returns, you reverse the process. The entire switchover takes about 5 to 10 minutes. This is perfectly adequate for homeowners who are usually home during storms and comfortable with the manual process.

An **automatic transfer switch** is paired with a permanently installed standby generator and costs significantly more — the ATS itself runs **$800 to $2,000** for the equipment, but it is almost always quoted as part of a complete standby generator installation package ranging from **$8,000 to $15,000**. The ATS continuously monitors your utility power. When it detects an outage, it sends a start signal to the generator, waits for the engine to stabilize (usually 10 to 30 seconds), then transfers your entire home's electrical load to the generator. When Toronto Hydro restores power, the ATS detects stable utility voltage, transfers the load back to the grid, and signals the generator to cool down and shut off. This entire process happens whether you are home, asleep, or away on vacation — which is a major advantage for GTA homeowners who travel during winter.

The safety purpose of both types is identical: they prevent **backfeed**, which occurs when generator power flows backward through your panel and out onto Toronto Hydro's distribution lines. Backfeed is lethal — it can electrocute utility workers repairing downed lines, and it is a serious criminal liability issue. The transfer switch mechanically isolates your home from the grid before connecting the generator, making backfeed physically impossible. This is why connecting a generator directly to an outlet with a "suicide cord" (a double-male extension cord) is illegal in Ontario, extremely dangerous, and will void your insurance.

For most GTA homeowners with portable generators, a manual transfer switch is the practical choice. If you are investing in a permanently installed standby generator — particularly after experiencing the 2013 ice storm's week-long outages — the automatic transfer switch is the standard pairing. Either way, ESA permits are required and a licensed electrician must perform the installation. Toronto Electrical Repair can connect you with experienced electricians who handle both types of transfer switch installations across the Greater Toronto Area.

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Q4

How much does it cost to get my home wired for a portable generator in the GTA?

Getting your home properly wired for a portable generator — meaning a manual transfer switch, power inlet box, and dedicated circuits — typically costs $1,500 to $2,500 in the Greater Toronto Area, including the ESA permit and inspection. This is the safe, legal, code-compliant way to connect a portable generator to your home's electrical system, and it is a one-time investment that protects your family every ice storm season.

The installation involves three main components. First, your electrician installs a **power inlet box** on the exterior wall of your home, usually near where you plan to position the generator. This is a weather-rated receptacle — typically a NEMA L14-30 (30-amp) or L14-50 (50-amp) twist-lock connector — that accepts a heavy-duty cord from your generator. Second, a **manual transfer switch** is mounted beside your main electrical panel inside the house. This switch is pre-wired to the circuits you choose to power during an outage, usually 6 to 10 essential circuits including your furnace, refrigerator, sump pump, a lighting circuit or two, and a general-purpose outlet circuit. Third, all the wiring connecting these components is run through walls, usually 10-gauge or 8-gauge NMD90 copper wire depending on the amperage rating.

The breakdown of costs in the current GTA market looks roughly like this: the manual transfer switch panel runs **$300 to $600** for equipment (Reliance, Generac, and Square D are the common brands), the power inlet box and cord are **$150 to $300**, wire and miscellaneous materials add **$100 to $200**, labour runs **$800 to $1,200** for a typical half-day installation, and the ESA permit is **$100 to $200**. The total lands between $1,500 and $2,500 for most Toronto homes, though costs can run higher if your panel is in the basement and the inlet box is on the opposite side of the house, requiring longer wire runs.

Choosing the right circuits for your transfer switch is critical. Your electrician will help you prioritize, but the essentials for GTA ice storm preparedness are your gas furnace (the blower motor and igniter are electric even though the fuel is gas), your refrigerator, your sump pump (absolutely critical in spring thaw or heavy rain), one or two lighting circuits, and a general-purpose outlet for charging phones and running a radio. A 30-amp transfer switch can comfortably handle these loads from a 5,000 to 7,500 watt portable generator. If you want to add your well pump, electric water heater, or window AC units, you will need a 50-amp setup and a larger generator.

One important consideration for older GTA homes — particularly those in Scarborough, North York, and Etobicoke with original 100-amp or 60-amp panels — is that the transfer switch installation may reveal the need for a panel upgrade. If your existing panel has no available breaker slots for the transfer switch circuits, or if the panel is a Federal Pioneer Stab-Lok or Zinsco model with known safety issues, your electrician may recommend upgrading the panel at the same time. This adds $2,000 to $4,000 to the project but addresses two safety concerns

simultaneously.

The ESA permit and inspection are mandatory for this work in Ontario — no exceptions. Your electrician pulls the permit before starting, and an ESA inspector verifies the installation within a few weeks of completion. Keep the certificate of inspection with your home records permanently. If you are ready to get your home generator-ready before the next ice storm season, Toronto Electrical Repair can match you with licensed electricians in your area at no cost through the Toronto Construction Network.

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Q5

Is it worth getting a standby generator if I already have a natural gas furnace?

Absolutely — in fact, having a natural gas furnace makes a standby generator even more important, because your furnace cannot run without electricity regardless of its fuel source. This is one of the most dangerous misconceptions among GTA homeowners. Your gas furnace relies on an electric blower motor, an electronic igniter, a circuit board, and often a combustion air fan. When Toronto Hydro power goes out, your furnace is completely dead, and your home begins losing heat within hours during a January cold snap.

During Toronto's 2013 ice storm, temperatures hovered around -15 degrees Celsius for several days while over 300,000 households had no power. Homeowners with natural gas furnaces assumed they would be fine — until they realized their furnaces would not start without electricity. Water pipes froze and burst in thousands of GTA homes, causing tens of thousands of dollars in water damage per household. Some homeowners lost their entire basements to flooding when sump pumps also lost power during the subsequent thaw. A standby generator eliminates all of these risks by keeping your furnace, sump pump, and critical systems running automatically the moment power drops.

The practical case for a standby generator in a GTA home with natural gas is compelling on multiple levels. Since you already have an Enbridge gas line running to your furnace, extending that gas line to a standby generator is straightforward and relatively inexpensive — typically **$500 to $1,500** for the gas line extension, plus a TSSA permit for the gas work. The generator connects to the same unlimited fuel supply as your furnace, meaning it can run continuously for days or weeks without refuelling. A **16 to 22kW natural gas standby generator** installed with an automatic transfer switch costs **$8,000 to $15,000** in the GTA, which includes the generator unit, concrete pad, ATS, gas line, ESA electrical permit, and TSSA gas permit.

Beyond the furnace, a standby generator protects several other systems that GTA homeowners depend on during winter. Your **sump pump** is critical — a power outage during a warm spell or spring thaw means no sump pump, and basement flooding can cause $10,000 to $50,000 in damage. Your **refrigerator and freezer** contents can represent $500 to $1,000 in food. If you work from home — as many GTA residents now do — lost productivity during a multi-day outage has real financial consequences. And for families with young children, elderly parents, or anyone with medical equipment that requires power, a standby generator is not a luxury but a necessity.

The return on investment becomes clearer when you consider insurance. Some Ontario insurance providers offer modest premium reductions for homes with permanently installed standby generators and whole-home surge protection, recognizing the reduced risk of freeze-related water damage claims. Additionally, a properly installed standby generator with ESA and TSSA permits adds real resale value to a GTA home — buyers who lived through the 2013 ice storm actively look for this feature.

Installation requires both an ESA electrical permit for the transfer switch and generator connection, and a TSSA permit for the natural gas line extension. Your licensed electrician coordinates the electrical side while a licensed gas fitter handles the gas connection — many GTA electrical contractors have both credentials or work with gas fitters regularly. If you want to explore standby generator options for your home, Toronto Electrical Repair can match you with experienced local electricians through the Toronto Construction Network directory.

Q6

What happens to my electrical panel during a power surge when the grid comes back on after an outage?

When Toronto Hydro restores power after an outage, the initial surge can spike to 20 to 40 percent above normal voltage for a fraction of a second — enough to damage sensitive electronics, trip AFCI breakers, and in rare cases, cause premature failure of appliances with electronic controls. This post-outage surge is one of the most overlooked risks of power restoration in the GTA, and it is why whole-home surge protection is an important companion to any backup power strategy.

The spike happens because the utility grid does not always restore power smoothly. When Toronto Hydro re-energizes a feeder line, the sudden load change on transformers can produce transient voltage spikes. In the aftermath of the 2013 ice storm, insurance claims for surge-damaged electronics and appliances were widespread as power was restored neighbourhood by neighbourhood over 10 days. Refrigerators with electronic control boards, furnaces with sensitive igniters, computers, televisions, and garage door openers were among the most commonly damaged items.

A **whole-home surge protection device (SPD)** installed at your main electrical panel is the primary defence against these restoration surges. The device mounts directly in your panel (or on the exterior beside it) and clamps voltage spikes before they reach your branch circuits. A quality whole-home SPD — Siemens, Eaton, and Square D all make residential models — costs **$150 to $400** for the device and **$300 to $600 installed** by a licensed electrician including the ESA permit. It protects every circuit in your home simultaneously, which is far more effective than plugging individual power bars into each outlet.

If you have a **standby generator with an automatic transfer switch**, the ATS provides an additional layer of protection during power restoration. When Toronto Hydro restores power, the ATS does not immediately switch your home back to grid power. Instead, it monitors the incoming utility voltage for a set period — typically 5 to 10 minutes — to verify that the grid supply is stable and within acceptable voltage range before transferring the load. This delay allows the initial transient surges and voltage fluctuations to settle before your home reconnects. It is one of the underappreciated benefits of an ATS-equipped standby generator system.

For homeowners without a standby generator, there are practical steps to protect your panel and appliances during power restoration. Before an anticipated outage — or as soon as power goes out — **turn off or unplug sensitive electronics** including computers, televisions, gaming consoles, and any appliance with a digital control board. Leave one light switched on so you know when power returns. When the lights come on, wait 10 to 15 minutes for the grid to stabilize before turning your appliances back on one at a time. This staggered approach also prevents the inrush current spike that occurs when every motor and compressor in the house tries to start simultaneously,

which can trip breakers in a 100-amp panel.

If you notice that breakers have tripped after power restoration, reset them one at a time. If a breaker trips again immediately, do not keep resetting it — this indicates a potential problem on that circuit that needs professional diagnosis. AFCI breakers in particular are sensitive to the electrical noise that accompanies grid restoration and may trip as a protective measure. This is the breaker doing its job, not a malfunction.

A whole-home surge protector paired with proper backup power planning is the complete approach to grid instability protection. If you want to add surge protection to your panel or discuss backup power options, Toronto Electrical Repair can connect you with licensed electricians across the GTA.

Q7

Can I install a standby generator beside my Toronto townhouse or is there a setback rule?

Yes, there are strict setback and clearance requirements for standby generators in Toronto and across the GTA — and for townhouses specifically, the constraints are tighter than for detached homes because of shared walls, property line proximity, and municipal noise bylaws. Before purchasing a generator, you need to confirm that your property can physically accommodate one within all applicable codes.

The **Ontario Building Code** and **TSSA (Technical Standards and Safety Authority)** regulations require minimum clearances for natural gas and propane standby generators. The general requirements include a minimum of **1.5 metres (5 feet) from any operable window, door, or fresh air intake**, a minimum of **1.5 metres from the property line** in most GTA municipalities, and clearance from any gas meter, propane tank, or other fuel source as specified by the manufacturer. The generator must sit on a level concrete pad or approved composite pad, and the exhaust must be directed away from the home and neighbouring properties.

For **townhouses and semi-detached homes**, the challenge is usually the narrow side yard. Many GTA townhouses have side yards of only 1.2 to 1.8 metres, which may not accommodate a generator plus the required clearances. Your electrician and gas fitter will assess whether the unit can be placed in the rear yard instead, which often provides more space. Some townhouse complexes — particularly freehold townhomes — may also have restrictive covenants or homeowner association rules that limit or prohibit outdoor mechanical equipment. Check your property documents before proceeding.

Condominium townhouses (where you own the interior but the condo corporation owns the exterior and common elements) present an additional hurdle. You will almost certainly need written approval from the condo board before installing a standby generator, as it involves modifications to the building exterior, gas line work, and electrical connections that affect common elements. Some condo corporations prohibit generators entirely due to noise concerns and insurance liability.

The **City of Toronto's noise bylaw (Chapter 591)** limits noise from stationary mechanical equipment. Most modern standby generators from Generac, Kohler, and Briggs & Stratton produce 60 to 70 decibels at 7 metres — roughly equivalent to a normal conversation. However, during a power outage when ambient neighbourhood noise drops significantly, even 65 decibels can draw complaints from neighbours. Some GTA municipalities, including Mississauga and Markham, have their own specific noise bylaws that may be stricter. Higher-end generator models with sound-attenuated enclosures run as low as 55 to 60 decibels and are worth the premium in dense townhouse developments.

The permitting process for a townhouse generator installation involves two permits: an **ESA electrical permit** for the automatic transfer switch and generator electrical connection, and a **TSSA permit** for the natural gas line extension from your existing gas service to the generator. In some cases, a municipal building permit may also be required depending on the size of the concrete pad and any structural considerations. Your installation contractor coordinates these permits as part of the project.

Installation costs for townhouse generator setups in the GTA run **$9,000 to $16,000** depending on the unit size, gas line routing complexity, and any site preparation needed. The tighter working conditions and more complex gas line routing in townhouse configurations can add $1,000 to $2,000 compared to a straightforward detached home installation. If you want to explore whether a standby generator is feasible for your townhouse, Toronto Electrical Repair can match you with licensed electricians who specialize in generator installations and understand the specific requirements for your municipality.

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Q8

How often does a whole-home standby generator need maintenance and what does it cost?

A whole-home standby generator needs professional maintenance once or twice per year, with annual service costs typically running $200 to $500 in the GTA depending on the unit size and service scope. The generator also runs a brief automated self-test weekly — usually for 10 to 15 minutes — to keep the engine lubricated, charge the starter battery, and confirm the system is ready for an actual outage.

The **annual maintenance service** is the most important item and should be performed by a qualified technician, ideally in the fall before ice storm season. The service includes an oil and filter change (generators use standard

small-engine oil, similar to a lawnmower), air filter replacement or cleaning, spark plug inspection and replacement if needed, battery load test and terminal cleaning, coolant level check (on liquid-cooled models), inspection of the fuel system and gas connections, transfer switch inspection and testing, and a full operational test under load. For a typical 16 to 22kW Generac or Kohler residential unit, this annual service runs **$250 to $400** in the GTA market. Some installation companies offer annual maintenance plans at a slight discount if you prepay.

The **weekly self-test cycle** is programmed during installation — most homeowners set it for a midday weekday to minimize noise impact on neighbours. The generator starts automatically, runs at low speed for 10 to 15 minutes, then shuts down. This exercise cycle is critical because standby generators can sit idle for months between outages, and without regular exercise, oil settles, seals dry out, and batteries lose charge. If you notice your generator skipping its weekly test or displaying an error light on the control panel, schedule a service call promptly — you do not want to discover a problem during an actual ice storm.

Battery replacement is needed every 2 to 4 years. The starter battery is a standard 12-volt sealed lead-acid battery similar to what you would find in a riding mower. Replacement cost is **$100 to $200 installed**. Cold GTA winters are particularly hard on starter batteries, so err on the side of replacing every 2 to 3 years rather than waiting for a failure.

Beyond routine maintenance, the major service milestones are based on run hours. At **200 hours** of cumulative runtime, most manufacturers recommend a more thorough inspection including valve adjustment and compression testing. At **500 hours**, the coolant should be flushed and replaced on liquid-cooled models. Most residential standby generators accumulate 20 to 50 run hours per year during normal GTA outage frequency, so these milestones may take a decade or more to reach — unless you experience a prolonged event like the 2013 ice storm, which could add 100 to 200 hours in a single event.

The TSSA gas connection and ESA electrical connection should also be visually inspected during annual maintenance. Look for corrosion on the gas connector, verify the gas shutoff valve operates smoothly, and check that the transfer switch is clean and free of insect nests (wasps occasionally build inside outdoor electrical enclosures in GTA summers). Your service technician covers these items as part of a comprehensive annual visit.

Neglecting maintenance is the primary reason standby generators fail when homeowners need them most. A generator that has not been serviced in three years and has a dead battery will not start during a February ice storm. The $300 to $500 annual service cost is modest insurance for a system that protects a $500,000 to $2,000,000 GTA home from frozen pipes, basement flooding, and days without heat. Toronto Electrical Repair can connect you with generator service technicians through the Toronto Construction Network directory.

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Q9

Should I get a 16kW or 22kW generator for my Toronto home?

The right size depends entirely on your home's electrical load, and for most GTA homes, the answer comes down to whether you want to power essential circuits or your entire house — a 16kW unit handles essentials plus comfort loads in a typical 1,500 to 2,000 square foot home, while a 22kW unit can power virtually everything in homes up to 3,000 square feet. Your electrician will perform a detailed load calculation to determine the exact requirement, but here is how to think about sizing.

A **16kW standby generator** produces roughly 66 amps at 240 volts. This is enough to simultaneously power your gas furnace blower (5 to 10 amps), refrigerator (3 to 5 amps), sump pump (8 to 12 amps starting surge), 20 to 30 LED light fixtures (negligible draw), a well pump if applicable, garage door opener, security system, internet router, and several convenience outlets for charging devices. For a typical GTA home with a gas furnace, gas water heater, and gas stove, a 16kW unit comfortably covers all your actual needs during an outage. The unit costs approximately **$4,000 to $6,000** for the generator alone, or **$8,000 to $12,000** fully installed with ATS, concrete pad, gas line, and permits.

A **22kW standby generator** produces roughly 91 amps at 240 volts. You need this larger unit if your home has **electric-heavy loads** such as an electric water heater (18 to 25 amps), electric range or oven (40 to 50 amps), central air conditioning (20 to 40 amps), a Level 2 EV charger (32 to 50 amps), electric baseboard heaters in multiple rooms, or a hot tub (40 to 50 amps). If you have several of these loads and want to maintain full normal operation during an outage — not just essentials — the 22kW is the appropriate choice. Installed cost runs **$10,000 to $15,000** in the GTA market.

The critical factor your electrician will assess is your **panel's total connected load versus the generator's continuous output**. A 200-amp panel does not mean your home draws 200 amps continuously — most GTA homes have a peak demand of 60 to 120 amps depending on what is running simultaneously. The load calculation considers the running wattage and starting surge of every circuit. Air conditioners and well pumps have starting surges 3 to 4 times their running draw, which must be within the generator's surge capacity.

For the GTA housing stock specifically, here are general guidelines. **Post-war bungalows and side-splits in Scarborough, Etobicoke, and North York** with gas heating and gas hot water typically do well with 16kW. **Larger two-storey homes in Vaughan, Richmond Hill, and Markham** built in the 1990s to 2010s with central AC, electric water heaters, and potentially EV chargers usually need 22kW. **Large custom homes exceeding 3,500 square feet** with multiple HVAC zones, pools, and high-demand electrical systems may need even larger units — 30kW to 48kW models are available but push installed costs to $15,000 to $25,000.

One sizing mistake to avoid: do not undersize to save $2,000 on the upfront cost. An undersized generator that overloads during peak demand will shut down on overload protection, leaving you without power until the load is reduced. Conversely, modest oversizing is acceptable — a 22kW unit running at 60 percent capacity is perfectly efficient and gives you headroom for future electrical additions like an EV charger. Your electrician's load calculation is the definitive answer for your specific home. Toronto Electrical Repair can match you with licensed electricians who perform load calculations and generator sizing as part of their installation service.

Q10

Do I need a permit from TSSA and ESA to install a natural gas generator in Ontario?

Yes, you need both — a TSSA permit for the natural gas line connection and an ESA permit for the electrical work, and neither is optional. Installing a natural gas standby generator in Ontario is a dual-permit project that involves two separate regulatory authorities, each responsible for a different aspect of the installation. Skipping either permit is illegal, voids your insurance coverage, and creates serious liability if anything goes wrong.

The **ESA (Electrical Safety Authority) permit** covers the automatic transfer switch installation, the electrical connection between the generator and your main panel, and any associated wiring. Your licensed electrician applies for this permit before beginning work. The ESA permit fee for a residential generator installation typically runs **$100 to $250** depending on the scope. After the electrical work is complete, your electrician notifies the ESA and an inspector visits your property to verify that the transfer switch is properly installed, the generator electrical connection meets Ontario Electrical Safety Code requirements, the panel labelling is updated, and the installation prevents any possibility of backfeed to the utility grid. The inspection is typically scheduled within 3 to 7 business days of notification, though peak season (late fall) can extend this to 2 weeks.

The **TSSA (Technical Standards and Safety Authority) permit** covers the natural gas piping from your existing gas service to the generator. This work must be performed by a licensed gas fitter (G2 or G3 licence), not your electrician — though many GTA electrical contractors have gas fitting credentials or partner with gas fitters for generator installations. The TSSA permit covers the gas pipe sizing calculation (ensuring your existing gas service has adequate capacity for both your furnace and the generator), the pipe run from the gas meter or manifold to the generator location, the gas pressure regulator at the generator, and the leak testing of all new connections. The TSSA permit fee is typically **$80 to $200**. A TSSA inspector verifies the gas installation, conducts pressure testing, and issues approval.

Gas service capacity is an important consideration that the TSSA permit process addresses. Your existing Enbridge gas meter and service line were sized for your home's original gas loads — furnace, water heater, stove, dryer, and fireplace. Adding a 16 to 22kW generator creates a significant additional gas demand. If your existing gas service lacks capacity, Enbridge may need to upgrade your meter or service line, which can add several weeks to the project timeline and potentially $500 to $2,000 in additional costs. Your gas fitter coordinates with Enbridge during the permit process to confirm service adequacy.

The total permit and inspection costs for both ESA and TSSA combined typically run **$200 to $450**, which is included in most GTA generator installation quotes of $8,000 to $15,000. Reputable installers handle the entire permit process as part of their service — if a contractor suggests skipping permits to save money or speed up the

timeline, that is a major red flag and you should find a different contractor immediately.

One additional note: the City of Toronto and some GTA municipalities may also require a **building permit** if the generator installation involves a concrete pad exceeding certain dimensions or modifications to an exterior wall. Your installer will advise whether this applies to your specific property. After all inspections pass, keep the ESA certificate of inspection and TSSA approval documents permanently with your home records — you will need them for insurance purposes and at resale. Find licensed electricians experienced with generator permitting through the Toronto Construction Network directory at torontoconstructionnetwork.com.

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- Kayland Construction Concepts
- Leveloff.LTD
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Q11

What are the dangers of using a portable generator inside my garage during a winter power outage?

Running a portable generator inside your garage — even with the door open — is life-threateningly dangerous and kills Canadians every single winter. Carbon monoxide (CO) from generator exhaust is colourless and odourless, and it can reach lethal concentrations inside an enclosed or semi-enclosed space within minutes. This is not a theoretical risk; it is the leading cause of non-fire death associated with portable generators in North America, and emergency rooms across the GTA see CO poisoning cases during every major power outage.

During Toronto's 2013 ice storm, Toronto Paramedic Services and GTA hospitals treated a surge of carbon monoxide poisoning cases, many from homeowners who ran generators in attached garages, open garages, carports, or even inside the house. CO is slightly lighter than air and migrates readily through door gaps, ventilation

systems, and any opening between your garage and your living space. An attached garage is essentially connected to your home's air space — the door seal between the garage and the house is not airtight, and your HVAC return air ducts may draw contaminated air directly from the garage into your living areas. Even a detached garage with the door wide open can accumulate dangerous CO levels if the generator is positioned where exhaust recirculates.

The only safe location for a portable generator is outdoors, at least 6 metres (20 feet) from any window, door, or ventilation intake, with the exhaust directed away from the home. Position it on a dry, level surface and protect it from rain and snow with a canopy or manufacturer-approved cover — never an enclosed structure. The heavy-duty extension cord or generator cord runs from the outdoor generator to your transfer switch inlet box on the exterior wall. If you do not have a transfer switch installed, you can run individual heavy-duty extension cords through a cracked window to power specific appliances — but you must never connect a generator directly to your electrical panel without a transfer switch.

The symptoms of carbon monoxide poisoning are deceptively subtle and easily mistaken for flu, fatigue, or the general malaise of being stuck at home during a power outage. Early symptoms include **headache, dizziness, nausea, confusion, and drowsiness**. Because CO displaces oxygen in your bloodstream, victims often become too disoriented to recognize the danger and escape. Sleeping occupants are at the highest risk — they may never wake up. Every GTA home should have **carbon monoxide detectors** on every level and near sleeping areas, and these detectors must have battery backup so they continue functioning during a power outage when the CO risk is greatest.

Beyond carbon monoxide, operating a generator in an enclosed space presents **fire risk** from fuel storage and hot exhaust surfaces. Gasoline vapours accumulating in a garage can ignite from the generator's hot exhaust manifold or a spark. Never refuel a generator while it is running or hot — shut it down, let it cool for 10 to 15 minutes, and refuel outdoors.

The safe, permanent solution is a properly installed **manual transfer switch with an exterior power inlet box**, allowing you to run your portable generator safely outdoors and connect it to your home's panel through a weatherproof cord. Installation costs **$1,500 to $2,500** in the GTA — a modest investment compared to the catastrophic consequences of indoor generator use. For homeowners who want to eliminate the portable generator risks entirely, a permanently installed natural gas standby generator with an automatic transfer switch runs **$8,000 to $15,000** and never requires manual operation, fuel handling, or outdoor setup during a storm. Toronto Electrical Repair can help you find a licensed electrician to set up safe generator connections for your home.

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