OESR 2024

Electrical Safety Authority

Ontario Electrical Safety Report

Contents

A Message from the Electrical Safety Authority's President & CEO

Since its inception in 2000, the Ontario Electrical Safety Report (OESR) is the only publication in Canada to consistently track and publish detailed electrical safety data. Now in its 24th edition, it continues to be a cornerstone of ESA's work and a clear reflection on the value we place on a data-driven approach to tracking electrical harms and mitigating those areas of greatest risk.

As a safety regulator, we are committed to being data-driven in all of our activities. Data doesn't just help us understand where harm has occurred — it helps us act before it happens. It informs how we identify risks, direct our resources, engage the public and foster compliance. The OESR is one of the most important tools we use to deliver on that commitment.

The focus on data is especially critical as Ontario prepares for an expected 75% increase in electricity demand by 2050 — driven by the rapid expansion of data centres, growth in manufacturing and the electrification of transportation. The pace and scale of this transformation brings new challenges for how we manage risk, deliver services and protect workers and the public. The OESR helps ensure we respond with precision, guided by data, informed by trends and strengthened through collaboration with key safety partners.

The OESR also plays a critical role in advancing the priorities outlined in our new five-year strategic plan, Empowering Safety, Energizing Tomorrow. The strategic plan is a roadmap built around four pillars that define how ESA will adapt and lead as a regulator during this period of unprecedented change. The data and analysis captured in the OESR play a direct role in translating our long-term goals into focused actions across all four pillars:

- Increasing electrical safety awareness by identifying the most at-risk Ontarians for electrical harm so that we can execute education and training programming where it's needed most.
- Fostering compliance through evidence-based strategies, including proactive safety blitzes and outreach to sectors where trends point to recurring hazards or gaps in understanding.
- Enhancing collaboration by building the report on a foundation of shared data from key safety partners, including the Office of the Chief Coroner, the Ontario Ministry of Labour, Immigration, Training and Skills Development, the Office of the Fire Marshal, the Canadian Institute of Health Information, and the Workplace Safety and Insurance Board of Ontario.
- Evolving service delivery by identifying trends tied to emerging technologies or new installation practices — insights that allow us to modernize the Ontario Electrical Safety Code, inspection processes and the way our customers interact with us.

The energy transformation won't be successful unless it's done safely. That's why we're taking an integrated, evidence-based approach to keep Ontarians safe in an increasingly complex energy environment. I am grateful to all of the staff whose hard work has resulted in this exceptional Report, as well as all of the safety partners who have contributed their data to the OESR. To all of you, thank you for your contributions to electrical safety in Ontario.

Josie Erzetic
President and CEO, Electrical Safety Authority

A Message from the Electrical Safety Authority's Public Safety Officer

I am pleased to share the Ontario Electrical Safety Report (OESR) 2024, ESA's annual, data-driven overview of electrical safety trends across the province. The OESR transforms complex data into clear and digestible insights — ultimately, providing information for us to take into consideration when we are prioritizing, responding to and reducing the risk of harm to help keep Ontarians safe.

This year's data confirms several persistent trends. Electrical-related fatalities remain consistent with previous years, but younger individuals continue to be disproportionately affected by electrical contact incidents — especially those involving high-voltage sources. These findings highlight the importance of tailoring awareness and prevention strategies to those most at-risk for harm in the province.

We also observed an increase in the number of reported electrical incidents. At first glance, this may seem like a step in the wrong direction. In fact, it reflects meaningful progress. Thanks to enhanced internal processes, increased outreach and improved internal and external education, ESA has been able to capture safety data with greater accuracy and speed. Importantly, this strengthens our ability to respond proactively and allocate resources where they are needed the most.

Another notable trend is the increase in powerline contact incidents, particularly those involving trees falling on overhead lines. As climate-related events grow more frequent and severe, these incidents reinforce the importance of continuing to work with our safety partners to address infrastructure vulnerabilities and public safety risks.

This report is made possible through the contributions of our valued partners. On behalf of everyone at ESA, I want to extend my sincere thanks to the Ontario Office of the Chief Coroner, the Ontario Ministry of Labour, Immigration, Training and Skills Development, the Office of the Fire Marshal, the Canadian Institute for Health Information and the Workplace Safety and Insurance Board of Ontario. Their data, insights and ongoing collaboration are critical to understanding risk and advancing safety across the province.

The insights in this report directly support ESA's strategic plan, Empowering Safety, Energizing Tomorrow. They do so by helping us focus our efforts on high-risk areas, foster compliance and build partnerships that extend our reach and impact. As Public Safety Officer, I see the OESR as a critical tool for understanding risk, tracking progress and guiding our next steps toward a safer Ontario.

Together, we can continue to drive meaningful progress — grounded in evidence and purpose.

Patience Cathcart
Public Safety Officer, Electrical Safety Authority

Electrical-related Fatalities and Incidents Over the Past Ten Years (2015–2024)

143 ELECTRICAL-RELATED FATALITIES

50 Electrocution Fatalities

93 Electrical Fire Fatalities*

Electrocution Fatalities

2015–2019 vs. 2020–2024 → **6%** rate decrease

Utility-related Deaths

Accounted for **48%** of all electrical-related fatalities in the past ten years

Deaths from Powerline Contact

2015–2019: **10**

2020–2024: **11**

Occupational Deaths

2015–2019: **14**

2020–2024: **9**

Non-occupational

The five-year rolling average rate of fatalities has increased from **0.15** per million (2015–2019) to **0.21** per million (2020–2024)

40% increase

Fire Fatalities and Events

2015–2019 vs. 2020–2024 → **15%** rate increase

Cooking Fires

Most common type of fire with electricity as the ignition source

Number of Cooking Fires

2019: **583**

2023: **529**

9% decrease

Electrical Distribution Fires

Number of Electrical Distribution Fires

2019: **449**

2023: **367**

18% decrease

PRIORITY ISSUES

The ESA's focus areas to reduce electrical injuries and fatalities fall in the following harm categories:

1. Occupational settings
2. Non-occupational settings
3. Powerline contact
4. Product safety
5. Aging infrastructure

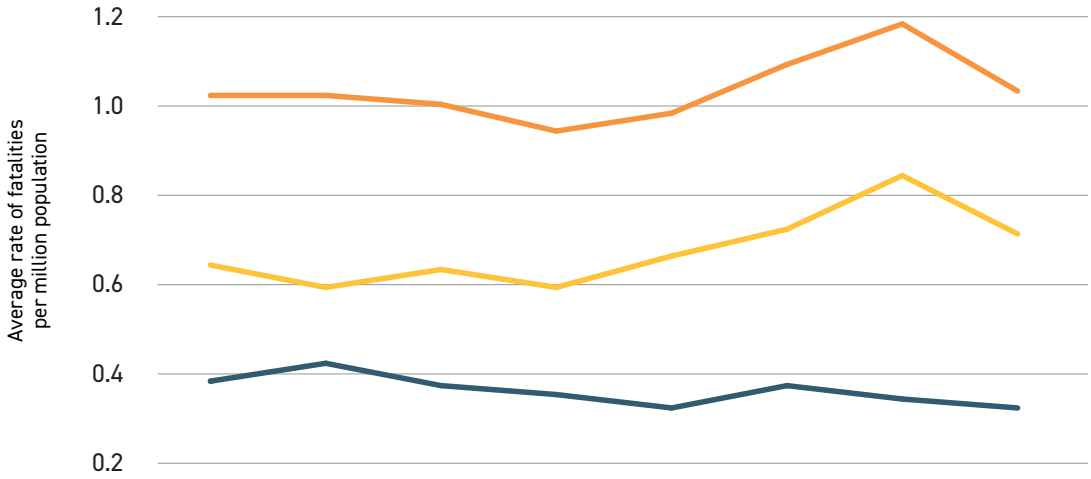
**Fire fatalities are those where the ignition source was reported as "electrical distribution equipment" or the fuel of the ignition source was reported as "electricity."*

Executive Summary

The Electrical Safety Authority's (ESA's) Ontario Electrical Safety Report (OESR) was created to provide a comprehensive perspective of electrical fatalities, injuries, and incidents in Ontario. Data presented in this report come from multiple sources, investigations, and root-cause analyses. Information is provided on potential electrical risks and high-risk sectors. This report is used by the ESA and others to better understand the dynamics of electrical safety and to encourage the development of initiatives to improve the status of electrical safety in the province.

Since 2017, the five-year average rate of electrocution, burn fatalities, and electrical fire deaths (where the ignition source was confirmed to be electrical) has remained at **one per million population**. While we have maintained this low incidence, the causes and contexts of these incidents have shifted, indicating the need for continued vigilance and targeted interventions.

FIVE-YEAR ROLLING AVERAGE OF ALL ELECTRICAL-RELATED FATALITIES IN ONTARIO, 2013–2024



Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Electrical fire fatalities	0.59	0.63	0.59	0.66	0.72	0.84	0.71	0.68*
Electrocution and burn fatalities	0.37	0.37	0.35	0.32	0.37	0.34	0.32	0.33*
Total electrical-related fatalities	1.02	1.00	0.94	0.98	1.09	1.18	1.03	1.01*

**Preliminary data subject to change*
Source: ESA, Coroner, and OFM records

Electrical-related Fatalities

In the past ten years, there were 143 electrical fatalities in Ontario. From 2015 to 2024, 50 people have died from electrocution (non-intentional death caused by contact with electricity) or by the effects of electrical burns, and 93 have died as a result of electrical fires (where the ignition fuel was identified as electricity and/or the ignition source was electrical distribution equipment). In comparison, the previous ten-year period from 2014 to 2023 reported 50 deaths from electrocutions and burns, and 97 fire deaths where the ignition source was identified as electrical. The trend rate of electrical-related fatalities continues to remain relatively consistent.

Electrocutions and Electrical Burn Fatalities

Below are the five-year rolling average rates of electrocutions and electrical burn fatalities, comparing the two most recent five-year periods:

Five-year period of electrical-related fatalities		
2015–2019	• 25 electrical-related fatalities • Five-year rolling average of 0.35 per million population	Rate decrease of 6%
2020–2024	• 25 electrical-related fatalities • Five-year rolling average of 0.33 per million population	

Utility-related electrocutions have accounted for 48% of all electrical-related fatalities in the past ten years:

Five-year period of powerline fatalities		
2015–2019	• 40% of all electrical-related fatalities (10/25) were from powerline contact • Five-year rolling average of 0.14 per million population	Rate is the same
2020–2024	• 44% of all electrical-related fatalities (11/25) were from powerline contact • Five-year rolling average of 0.14 per million population	

In the past ten years, the number of non-occupational electrical-related fatalities has been greater than the number of occupational fatalities. Historically, previous ten-year periods have shown that occupational electrical-related fatalities were greater or equal to non-occupational electrical-related fatalities.

Five-year period of occupational fatalities		
2015–2019	• 56% of electrical-related fatalities (14/25) were occupational • Five-year rolling average of 0.37 per million labour force	Rate decrease of 59%
2020–2024	• 36% of electrical-related fatalities (9/25) were occupational • Five-year rolling average of 0.15 per million labour force	

Electrical tradespeople (electricians and apprentice electricians) accounted for 26% of occupational electrical-related fatalities between 2015 and 2024 as they were fatally injured on the job when working energized.

Between 2020 and 2024, there were 16 non-occupational electrical fatalities.

Five-year period of non-occupational fatalities	
2015–2019	• 44% of electrical fatalities (11/25) were non-occupational • Five-year rolling average of 0.15 per million population
2020–2024	• 64% of electrical fatalities (16/25) were non-occupational • Five-year rolling average of 0.21 per million population

Fire Fatalities and Events

The rate of electrical fire fatalities (where the ignition fuel was identified as electricity and/or the ignition source was electrical distribution equipment) has increased by 15% when comparing the five-year rolling average in 2015–2019 and 2020–2024. Since the last report, the Ontario Fire Marshal (OFM) has advised that a number of electrical fire fatality investigations have closed, thus attributing an increase of electrical fatalities up until 2023.

The number of structure-loss fires where electricity was identified as the fuel of the ignition source has decreased by 10% between 2019 and 2023.

Cooking-related fires continue to be the most common type of fire where electricity was the fuel of the ignition source:

- In 2019, there were 583 cooking equipment fires;
- In 2023, there were 529 cooking equipment fires, a decrease of 9%.

Electrical distribution equipment fires are fires from electrical wiring, devices, or equipment in which its primary function is to carry current from one location to another (e.g., wiring, extension cords, terminations, electrical panels, and appliance cords) with electricity as the fuel of the ignition source. This type of fire has decreased over the most recent five years:

- In 2019, there were 449 electrical distribution equipment fires;
- In 2023, there were 367 electrical distribution equipment fires, a decrease of 18%.

Priority Issues

The ESA uses incident data from the OESR to identify areas that present the greatest risk to Ontarians, to monitor changes in incidence, and to identify emerging risks and trends.

Based on the data collected in the past ten years, the ESA has identified that the majority of electrical injuries and fatalities occur in the following specific areas. These areas have been identified as priorities for reducing electrical fatalities, serious injuries, damage, and loss in Ontario:

- **Occupational powerline contacts** — Powerline contact while working accounted for 43% of all occupational electrical fatalities between 2015 and 2024.
- **Non-occupational powerline contacts** — Powerline contact while at home or in recreational settings has increased; between 2015-2019 and 2020-2024, there has been a 29% increase in the rate of non-occupational fatalities due to powerline contact.
- **Electrical trade workers** — There was at least one critical injury to an electrical trade worker each year, in the past ten years. Safety incidents tend to be associated with unsafe work practices
- **Non-occupational electrical injuries** — From the most currently available data, these injuries, identified from emergency department visits in Ontario, have increased 7% from 2014 to 2023; however, the proportion of those with severe injuries has decreased by 13%.

- **Product safety compliance** — Misuse of electrical products and unapproved or counterfeit products account for a significant number of safety reports.
- **Electrical product fires** — The ESA defines electrical products as appliances, cooking equipment, lighting equipment, other electrical and mechanical equipment, and processing equipment. Data from the OFM show that the five-year average for electrical product structure-loss fires (where electricity was identified as the fuel source) between 2014–2018 and 2019–2023 has decreased by 20%.
- **Electrical fires where there was property loss, injury and/or fatality** — Between 2019–2023, an average of 1,372 electrical loss fires (where ignition sources were fueled by electricity) occurred in the past five years, with an average of 7.8 fatalities per year.

ESA Initiatives

Based on the information collected from the OESR, the ESA's strategic plan *(Empowering Safety. Energizing Tomorrow)* focuses on addressing those harms that represent the majority of incidents and fatalities. The ESA is working to reduce the electrical fatality and critical injury rate between 2025 and 2030.

Additional details on the ESA's efforts can be found at **www.esasafe.com**.

To ensure that the ESA is optimizing its efforts to act as an effective and efficient regulator, the ESA has undertaken a risk-based prioritization of electrical harms for safety, and manages harms from a life cycle perspective. The harm life cycle (HLC) uses data from internal and external sources (including those from this safety report) to manage harm reduction action.

The ESA cannot reach its goal without the significant work and support of its partners and stakeholders within the electrical safety system. We would like to acknowledge:

- those who generate and distribute electricity;
- electrical equipment manufacturers;
- standards organizations;
- safety organizations;
- installers of electrical equipment;
- educators;
- facility owners;
- injury response and treatment providers;
- government;
- researchers;
- injury prevention specialists;
- safety regulators and worker safety advocates; and
- those who are end users of electricity.

Working together, we seek to reduce the number of electrical fatalities, injuries, and fires with the ultimate vision of "An Ontario where people can live, work, and play safe from electrical harm, now and into the future."

1.0 Purpose of This Report

This 24th report on the state of electrical safety in Ontario summarizes electrical incidents, electrical-related fatalities identified by the Ontario Office of the Chief Coroner, and injuries of an electrical nature. It also provides information on deaths, injuries, and damage caused by fire incidents identified by the Ontario Office of the Fire Marshal (OFM), as well as fires and fire fatalities identified by local fire departments where electricity was identified as the ignition fuel and/or electrical distribution equipment was identified as the ignition source.

The purpose of this report is to provide stakeholders within the broad electrical safety system with an update and an overview of electrical safety in Ontario.

Those stakeholders include:

- electrical utilities and those organizations that generate, transmit, and distribute electricity;
- organizations that design, manufacture, distribute, and supply electrical products;
- electrical contractors who install, repair, and maintain electrical wiring installations and products in our homes, workplaces, and public spaces;
- regulators and various levels of government that write policies and regulations to protect public safety;
- Canadian and international organizations which develop standards for electrical installation and products;
- academic and commercial organizations that focus on safety research and development;
- organizations, such as insurance companies, that create policies that drive organization and consumer behaviour to reduce risk;
- health care providers, workplace and community-based safety organizations, and education and training organizations that provide public communication and increase hazard-mitigation skills and awareness;
- consumers who purchase electrical products and use and rely on electricity every day in their homes, workplaces, and public spaces;
- and more.

All of these stakeholders have an important role in contributing to and improving electrical safety in Ontario.

This report intends to educate and inform members of the electrical safety system by identifying key electrical safety risks. This information can be used to develop and improve standards, identify areas for continued safety research, influence the development of workplace and community-based safety programs, and lead to improved training, education, and communication programs.

1.1 Role of the Electrical Safety Authority

The Electrical Safety Authority (ESA) is an administrative authority acting on behalf of the Government of Ontario with specific responsibilities under Part VIII of the *Electricity Act, 1998*, and the *Safety and Consumer Statutes Administration Act, 1996*. As part of its mandate, the ESA is responsible for administering regulation in five key areas:

- Ontario Electrical Safety Code (Regulation 164/99);
- Licensing of Electrical Contractors and Master Electricians (Regulation 570/05);
- Distribution Safety (Regulation 22/04);
- Product Safety (Regulation 438/07); and
- Administrative Penalties (Regulation 12/23).

The ESA operates as a private, not-for-profit corporation. Funding derives from fees for electrical oversight, safety services, administering monetary penalties, and licensing of electrical contractors and master electricians. Activities include:

- overseeing compliance with regulations;
- investigating fatalities, injuries, and fire losses associated with electricity;
- identifying and targeting leading causes of electrical risk, using a harm life cycle approach;
- promoting awareness, education, and training on electrical safety;
- administering monetary penalties; and
- engaging with stakeholders to improve safety.

2.1 Electrocutions and Electrical Burn Fatalities

Electrocution occurs when a person is exposed to a lethal amount of electrical energy.

It takes very little electrical current to seriously injure or to kill a person. Direct contact with a circuit that can cause less than one amp of electricity (less than the current through a 100-Watt lightbulb) to pass through a human body can cause a person to stop breathing (fibrillation). Direct contact with a live 15-amp circuit, the equivalent to a standard household outlet, can result in death (Canadian Centre for Occupational Health and Safety, 2023).

Summary of Ontario data

There were 50 electrical-related fatalities reported in Ontario in the ten-year span between 2015 and 2024, which is the same as the previous time period between 2014 and 2023.

By age group, individuals aged 20 to 39 years accounted for the largest proportion of fatal injuries (48%), followed by individuals 40 to 59 years of age (28%). Many electrical fatalities occurred between the months of June and September (61%), with a peak of fatalities in August (19%).

The five-year rolling average rate of electrical fatalities has decreased by 6% when comparing 2015-2019 (0.35 per million population) and 2020-2024 (0.33 per million population). The rate of powerline fatalities has remained the same when comparing the same time period (0.14 per million population).

Residential (28%) and industrial (16%) settings were the most common places for electrical-related fatalities between 2020-2024.

The year rolling average of occupational electrical-related fatalities per labour force has decreased 60% when comparing 2015–2019 (0.37 fatalities per million) to 2020–2024 (0.15 fatalities per million). The five-year rolling average rate of non-occupational electrical-related fatalities per million population has increased by 40% between the same time periods (0.15 fatalities per million to 0.21 fatalities per million).

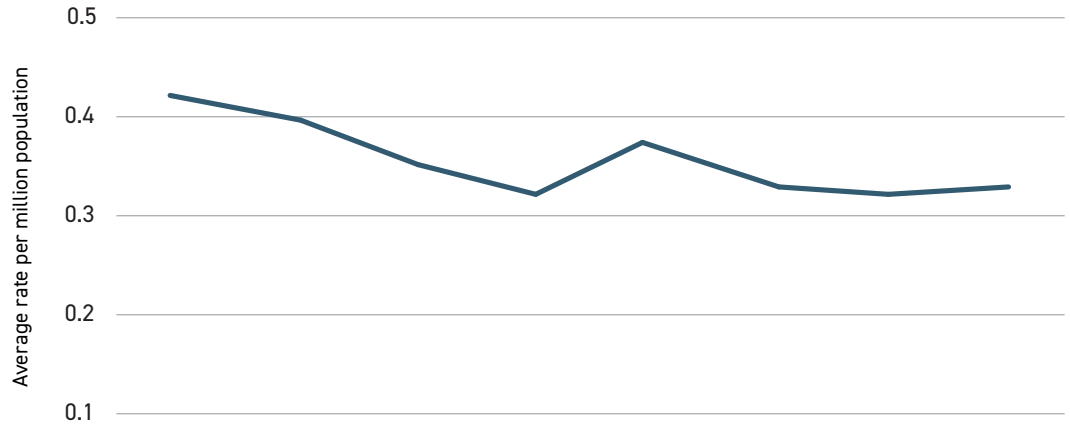
1 NUMBER OF ELECTRICAL-RELATED FATALITIES IN ONTARIO, 2015–2024

There were **six** electrical fatalities in Ontario in 2024.

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of electrical fatalities	6	3	5	6	5	4	7	3	5	6

Source: ESA and Coroner records

2 FIVE-YEAR ROLLING AVERAGE RATE OF ELECTRICAL FATALITIES IN ONTARIO, 2013–2024



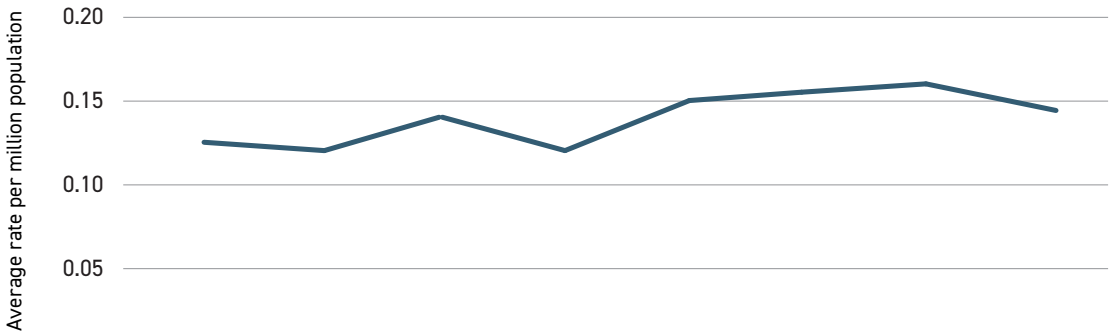
Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Electrocution and burn fatalities	0.42	0.37	0.35	0.32	0.37	0.34	0.32	0.33

Source: ESA and Coroner records

Conclusion

There has been a 6% decrease in the average rate of electrical fatalities when comparing 2015-2019 and 2020-2024.

3 FIVE-YEAR ROLLING AVERAGE RATE OF POWERLINE FATALITIES IN ONTARIO, 2013–2024



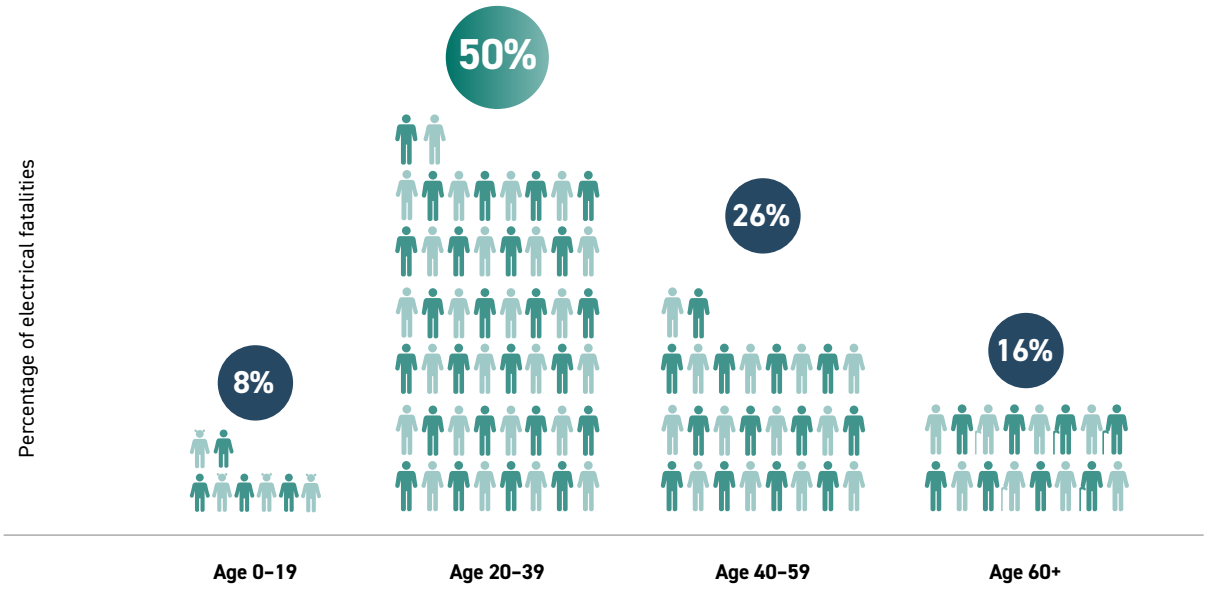
Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Rate of powerline fatalities	0.12	0.11	0.14	0.12	0.15	0.16	0.17	0.14

Source: ESA and Coroner records

Conclusion

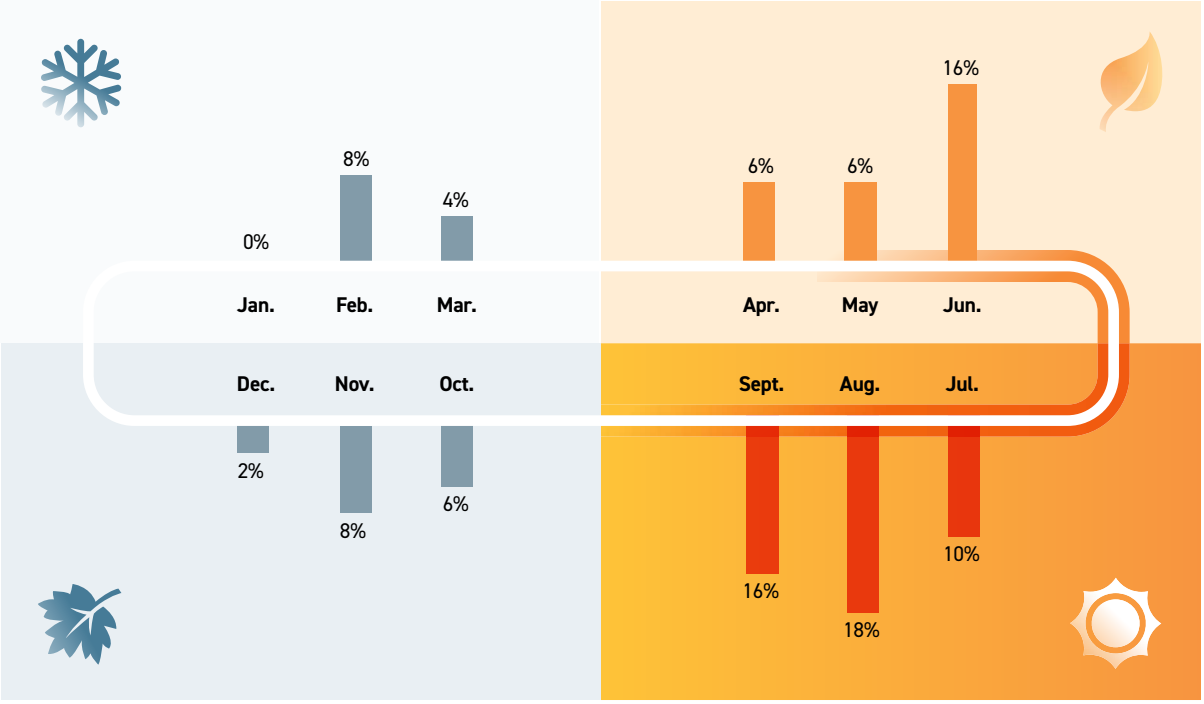
In 2024, there were two powerline fatalities. The rate has remained the same when comparing the rate at 2015–2019 and 2020–2024.

4 PERCENTAGE OF ELECTRICAL-RELATED FATALITIES BY AGE GROUP IN ONTARIO, 2015–2024



Source: ESA and Coroner records

5 PERCENTAGE OF ELECTRICAL-RELATED FATALITIES BY MONTH IN ONTARIO, 2015–2024



Source: ESA and Coroner records

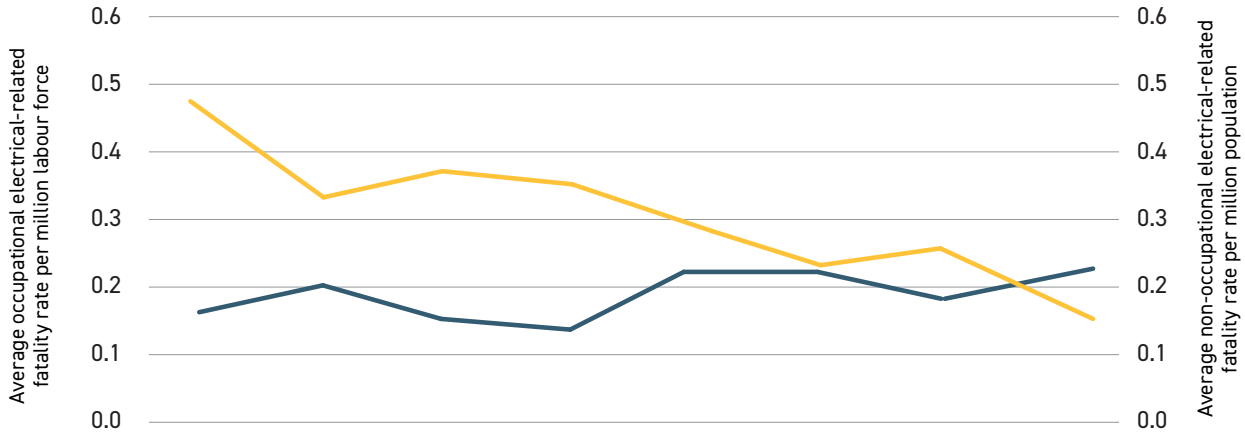
6 PERCENTAGE OF ELECTRICAL FATALITIES BY FACILITY TYPE IN ONTARIO, 2015–2019 AND 2020–2024

Residential, **commercial** and **industrial settings** were the most common settings where electrical fatalities occur.

Time period	Residential	Commercial	Industrial
2015–2019	40%	8%	20%
2020–2024	28%	8%	16%

Source: ESA and Coroner records

7 FIVE-YEAR ROLLING AVERAGE RATE OF OCCUPATIONAL AND NON-OCCUPATIONAL ELECTRICAL-RELATED FATALITIES IN ONTARIO, 2013–2024



Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Occupational	0.48	0.32	0.37	0.34	0.28	0.23	0.25	0.15
Non-occupational	0.16	0.20	0.15	0.14	0.22	0.22	0.19	0.21

Source: ESA and Coroner records

Conclusion

The five-year rolling average rate of occupational electrical-related fatalities per million labour force has decreased 59% when comparing 2015–2019 to 2020–2024. The five-year rolling average rate of non-occupational electrical-related fatalities per million population has increased by 40% between the same time periods.

2.2 Occupational Electrical-related Fatalities and Electrical Injuries

Occupational electrical-related fatalities are a particular hazard to those who routinely work near electrical sources. In the United States, contact with or exposure to electricity continues to be one of the leading causes of workplace fatalities and injuries. According to the U.S. Bureau of Labor Statistics, electrical fatality rates per 100,000 workers have remained consistent while overall fatality rates have increased. Seventy-four percent of workplace electrical fatalities occurred in non-electrical occupations. Construction and extraction occupations, installation, maintenance, and repair occupations, and building and grounds cleaning and maintenance occupations have the highest rate of electrical fatalities (ESFI, 2025).

In Ontario, Kim et al. (2016) studied occupational fatalities among construction workers between 1997 and 2007 and found that electrical contact was responsible for 15% of fatalities; risk factors associated with occupational fatalities included direct contact with electrical sources, lower voltage sources, and working outdoors. Most electrocution deaths occur among electricians and electrical helpers, utility workers, and those working in construction and manufacturing industries. Electrical-related fatalities are more common among workers who are younger than the average age of occupational deaths overall. Contact with overhead powerlines is reportedly by far the most frequent cause of fatal occupational electrocution injury (Campbell, 2022).

For those who survive electrical injury, the immediate consequences are usually obvious and often require extensive medical intervention. But symptoms may not appear until days or years later and they may present as pervasive, with less well-defined consequences. Long-term effects are particularly difficult to diagnose, as the link between the injury and the symptoms can often go unrecognized by patients and their physicians and worsen (Yiannopoulou et al., 2021). Substantial acute and long-term neuropsychological and social outcomes existed among patients after an electrical injury and were similar between patients exposed to low- and high-voltage injuries (Radulovic et al., 2019).

Education and proper protection are essential in preventing electrical injuries at work. A survey of 600 people in 2020 who worked directly with electricity asked questions about their experience with electrical shock hazards. Seventy-eight percent of respondents said they have been shocked while on the job, where 37% were shocked by less than 221 V. This is in contrast with 85% of respondents, who felt they were highly confident in recognizing electrical hazards (Littelfuse, 2020). This highlights the need for ongoing and refresher training for those who work with electricity in an occupational setting.

Summary of Ontario data

Between 2015 and 2024, there were 23 occupational electrical-related fatalities in Ontario. In the previous period (2014–2023), there were 22 occupational fatalities. In 2024, three occupational electrical-related fatalities were reported.

The five-year rolling average number of fatalities and critical injuries among workers (overall occupational safety) has remained the same when comparing 2015–2019 and 2020–2024. The five-year rolling average number of fatalities and critical injuries among electrical trade workers has increased slightly when comparing these two time periods.

When comparing the five-year rolling average rate, occupational electrical-related fatalities have decreased from 0.37 per million labour force population in 2015–2019 to 0.15 per million labour force population in 2020–2024. This is a decrease of 59%.

In the 2020–2024 time period, industrial settings (44%) were the most common places for occupational electrical-related fatalities. Repair and maintenance, landscaping, and construction were the most common types of work being done when these fatalities occurred. Between 2015 and 2024, the most commonly cited cause of death was improper procedure (14%) when excluding unknown causes.

Between 2015 and 2024, electrical tradespeople accounted for 26% of all occupational electrical-related fatalities. In the previous ten-year period (2014–2023), electrical tradespeople accounted for 23% of all occupational electrical-related fatalities.

A review of data provided by the WSIB from 2014 to 2023 shows that male workers continue to outnumber female workers with respect to occupational electrical injury. Workers in the construction and services sectors contribute to the highest number of WSIB lost time injury claims. Machine tools, electric parts, and other sources were the most common sources of injury. There was a 16% increase in the total number of electrical injury claims between 2014–2018 and 2019–2023; the number of claims for electrocution has increased by 20% between the time periods.

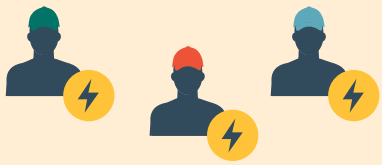
Statistics Directly Related to the ESA's Harm Reduction Priorities

WORKER SAFETY

Five-year Rolling Average Comparison
Number of worker-related electrical fatalities and critical injuries based on data reported by the Ministry of Labour, incidents investigated by the ESA and confirmed with the Office of the Chief Coroner.

The worker safety five-year rolling average remained the same when comparing 2015–2019 and 2020–2024.

1 NUMBER OF OCCUPATIONAL ELECTRICAL FATALITIES IN ONTARIO, 2015–2024

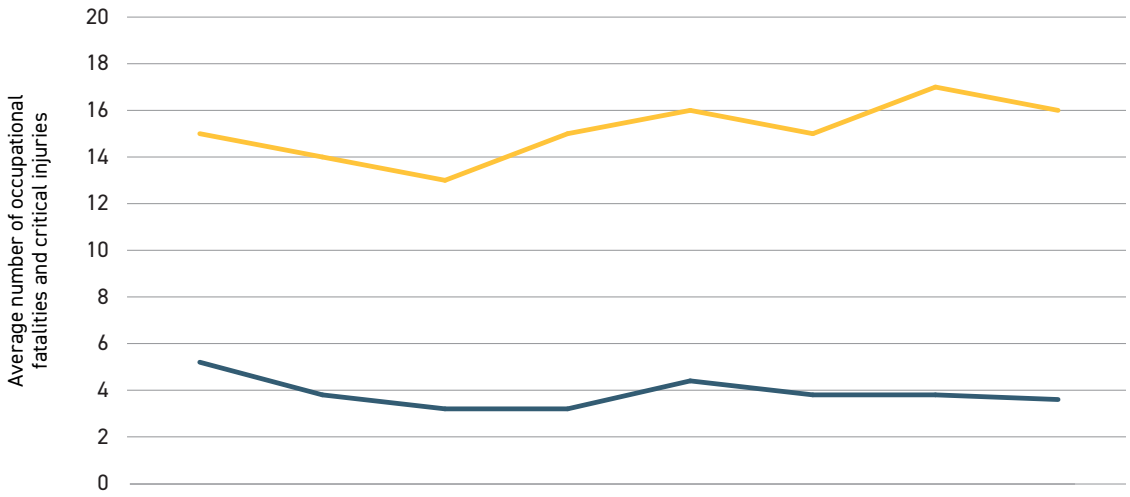


There were **three** occupational fatalities in Ontario in 2024.

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of occupational electrical-related fatalities	3	3	2	2	4	2	1	0	3	3

Source: ESA and Coroner records

2 FIVE-YEAR ROLLING AVERAGE OF OCCUPATIONAL ELECTRICAL FATALITIES AND CRITICAL INJURIES IN ONTARIO, 2013–2024



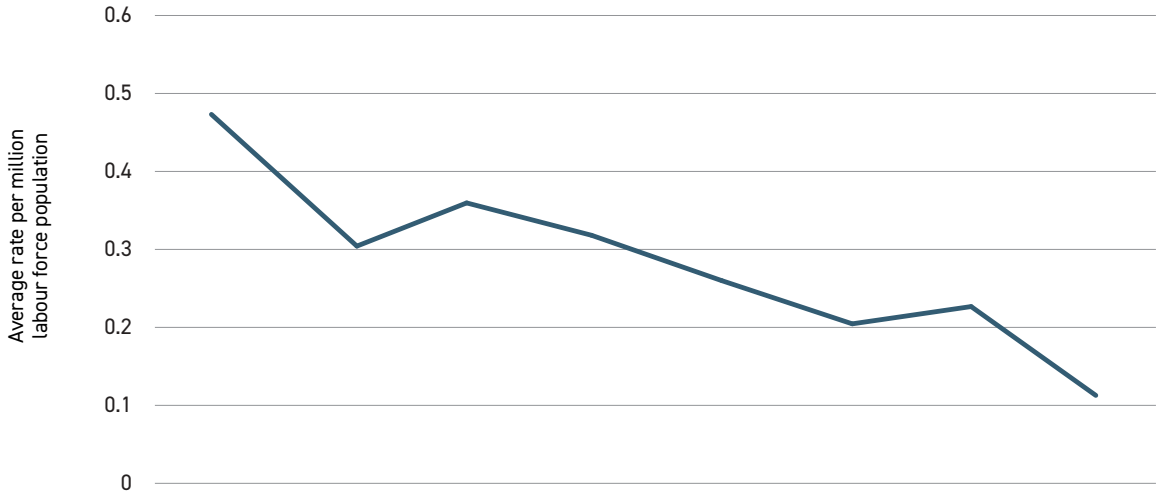
Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Occupational safety overall	14	13	15	16	15	17	16	15
Electrical trade	3.8	3.2	3.2	4.4	3.8	3.8	3.6	3.4

Source: ESA, Coroner, and MOLTSD records

Conclusion

The five-year rolling average number of occupational fatalities and critical injuries has remained the same when comparing 2015–2019 and 2020–2024. Among electrical trade workers, this number has increased slightly when comparing the same time period.

3 FIVE-YEAR ROLLING AVERAGE RATE OF OCCUPATIONAL ELECTRICAL FATALITIES IN ONTARIO, 2013–2024



Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Occupational electrical-related fatality rate	0.48	0.32	0.37	0.34	0.28	0.23	0.25	0.15

Source: ESA and Coroner records

Conclusion

The rate of occupational electrical-related fatalities has decreased by 59% when comparing 2015–2019 and 2020–2024.

4 PERCENTAGE OF OCCUPATIONAL ELECTRICAL FATALITIES BY FACILITY TYPE IN ONTARIO, 2015–2019 AND 2020–2024

Percentage of occupational electrical-related fatalities

Facility Type	2015–2019	2020–2024
Commercial	14%	0%
Farm	7%	11%
Industrial	**36%**	**44%**
Public place	7%	0%
Residential	14%	22%
Unknown	14%	11%
Utility	7%	11%

The industrial setting is the most common facility type for occupational electrical fatalities.

Source: ESA and Coroner records

5 PERCENTAGE OF OCCUPATIONAL ELECTRICAL FATALITIES BY TYPE OF WORK IN ONTARIO, 2015–2019 AND 2020–2024

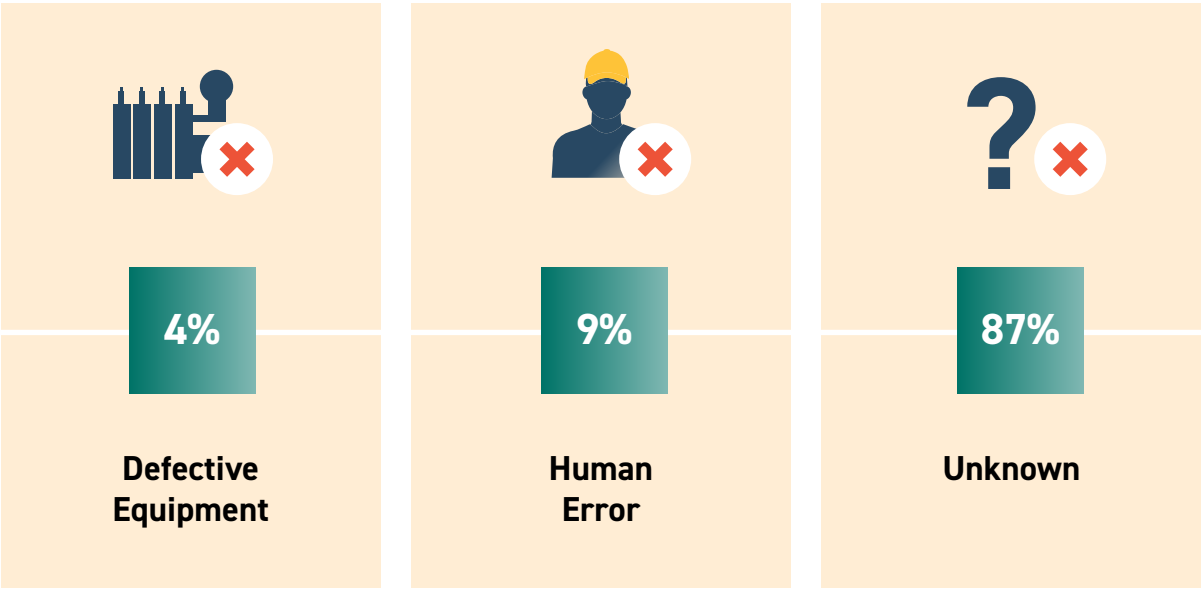
From 2015–2024, **repair/maintenance activities** were the most common types of work for occupational electrical fatalities.

	Work type	Construction	Excavation	Inspection	Installation	Landscaping	Other	Repair/ maintenance	Cleaning	Unknown
Percentage of occupational electrical-related fatalities	2015–2019	7%	14%	7%	0%	7%	7%	57%	0%	0%
	2020–2024	11%	0%	0%	22%	11%	0%	11%	11%	33%

Source: ESA and Coroner records

Within the more recent five-year period (2020–2024), fatalities associated with **landscaping and installation work** have been on the rise.

6 PERCENTAGE OF OCCUPATIONAL ELECTRICAL FATALITIES BY PROBABLE CAUSE IN ONTARIO, 2015–2024



Probable cause	Defective equipment	Human error	Unknown
Percentage of occupational electrical-related fatalities	4%	9%	87%

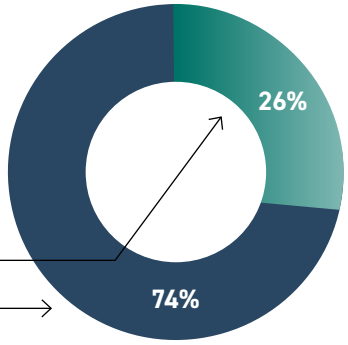
Source: ESA and Coroner records

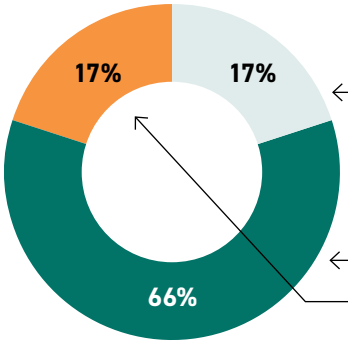
Conclusion

In years past, improper procedure and lack of training were cited as probable causes for occupational fatalities.

7 NUMBER OF OCCUPATIONAL ELECTRICAL FATALITIES BY OCCUPATION IN ONTARIO, 2015–2024

Electrical trades make up 26% of occupational fatalities





Electrician fatalities account for the majority of fatalities amongst electrical tradespersons

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Apprentice electrician	0	0	0	0	1	0	0	0	0	0
Electrician	0	1	0	0	0	0	1	0	1	1
Power linesperson	0	0	0	0	0	0	0	0	0	0
Linesperson apprentice	0	0	0	0	0	1	0	0	0	0
Total electrical	0	1	0	0	1	1	1	0	1	1
Other trades	3	2	2	2	3	1	0	0	2	2
All occupational fatalities	3	3	2	2	4	2	1	0	3	3

Source: ESA and Coroner records

8 NUMBER OF ALLOWED WSIB LOST TIME ELECTRICAL INJURY CLAIMS BY SEX IN ONTARIO, 2015–2024

3X

Between 2015–2024, the number of WSIB claims related to electrical injury among **males** was almost **three times greater** than that among females.

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Male	49	43	46	52	64	44	56	61	70	63
Female	17	21	24	13	22	16	11	21	22	23

Source: Workplace Safety and Insurance Board

9 NUMBER OF ALLOWED WSIB LOST TIME ELECTRICAL INJURY CLAIMS BY SECTOR IN ONTARIO, 2015–2024

Construction
181

Services
163

Manufacturing
121

Schedule 2*
103

Health care
52

Electrical
39

Transportation
19

Food
21

Education
5

Automotive
8

Other industry sectors
27

** Schedule 2 workers are those that work in firms funded by public funds (federal, provincial, and/or municipal governments), firms that are legislated by the province but are self-funded, or firms that are privately owned but involved in federally regulated industries such as telephone, airline, shipping, and railway.*

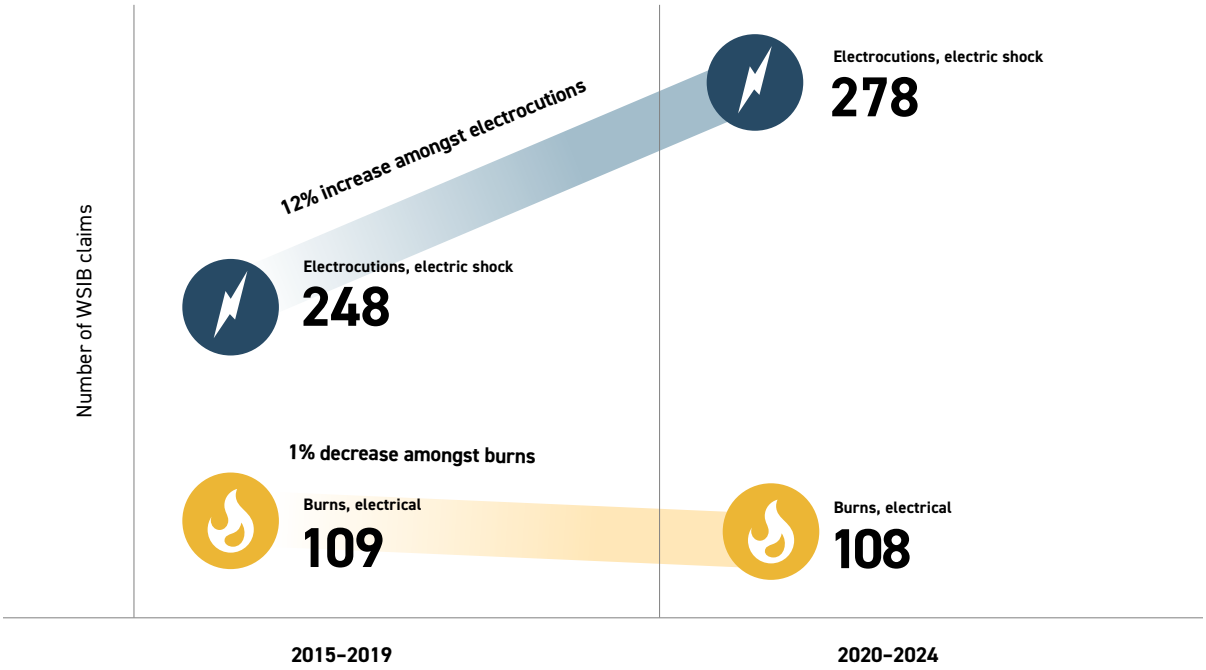
Source: Workplace Safety and Insurance Board

10 NUMBER OF ALLOWED WSIB LOST TIME ELECTRICAL INJURY CLAIMS BY THE TOP TEN SOURCES IN ONTARIO, 2015–2024

Source	Number of WSIB lost time claims	
Machine tools and electric parts	**406**	
Heating, cooling and cleaning machinery	**85**	
Metal woodworking and plastic, rubber concrete, and other processing	**23**	
Miscellaneous machinery (e.g., audio, video, televisions, telephones, snowblowers)	**29**	
Hand tools, powered	**24**	
Other tools, instruments, equipment, unspecified not elsewhere classified	**26**	
Special process machinery (e.g., food slicers, paper printing, wrapping, sewing, pumps)	**22**	
Furniture and fixtures	**13**	
Office and business machines	**20**	
Other sources	**79**	
Vehicle and mobile equipment parts	**11**	

Source: Workplace Safety and Insurance Board

11 NUMBER OF ALLOWED WSIB LOST TIME ELECTRICAL INJURY CLAIMS BY NATURE OF INJURY IN ONTARIO, 2015–2019 AND 2020–2024



Note: Electrocutions and electric shock, as provided by the WSIB, include injuries only.

Source: Workplace Safety and Insurance Board

2.3 Non-occupational Electrical-related Fatalities and Injuries

Injuries are a leading cause of death for the young and contribute substantially to the burden on the health care system. Many injuries are predictable and preventable.

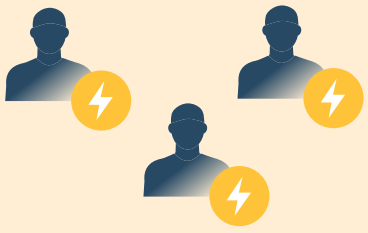
Summary of Ontario data

In 2024, there were three non-occupational electrical-related fatalities. In the previous year, there were two non-occupational electrical-related fatalities. The five-year rolling average rate between 2015–2010 and 2020–2024 has increased by 40% from 0.15 per million population to 0.21 per million population.

In the past ten years, the residential setting was the most common place for non-occupational electrical-related fatalities. Human error and improper use/misuse were the most common activities associated with fatalities.

Examples of non-occupational electrical related fatalities include working on Lichtenberg generators, copper theft or coming into contact with powerlines while fishing or camping.

1 NUMBER OF NON-OCCUPATIONAL ELECTRICAL-RELATED FATALITIES IN ONTARIO, 2015–2024

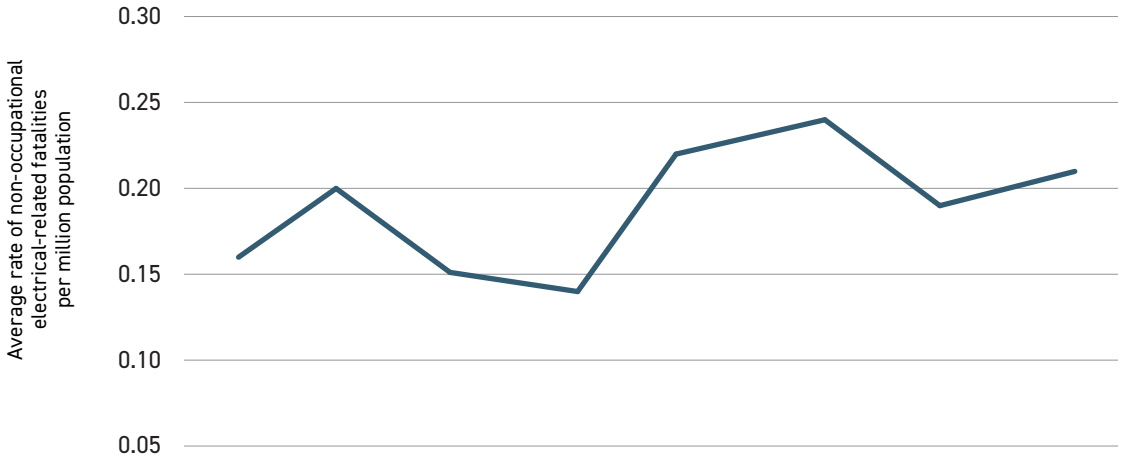


There were **three** non-occupational electrical-related fatalities in Ontario in 2024.

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of non-occupational electrical-related fatalities	3	0	3	4	1	2	6	3	2	3

Source: ESA and Coroner records

2 FIVE-YEAR ROLLING AVERAGE RATE OF NON-OCCUPATIONAL ELECTRICAL FATALITIES IN ONTARIO, 2013–2024



Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Rate of non-occupational electrical-related fatalities per million population	0.16	0.20	0.15	0.14	0.22	0.24	0.19	0.21

Source: ESA and Coroner records

Conclusion

The five-year rolling average rate of non-occupational electrical-related fatalities has increased by 40% when comparing 2015–2019 and 2020–2024.

3 PERCENTAGE OF NON-OCCUPATIONAL ELECTRICAL FATALITIES BY SETTING IN ONTARIO, 2015–2024

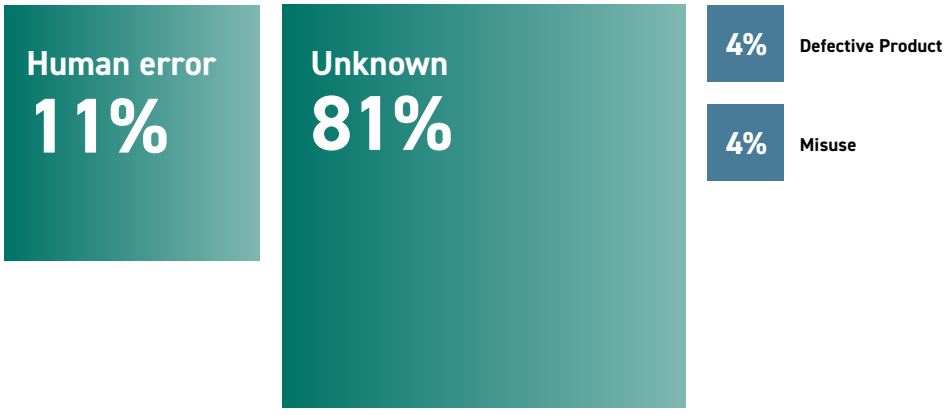
In both 2015–2019 and 2020–2024, the **residential setting** is the most common place for non-occupational electrical-related fatalities.

Percentage of non-occupational electrical-related fatalities

Facility type	Commercial	Public right of way	Residential	Unknown	Utility
2015–2019	0%	9%	73%	0%	18%
2020–2024	13%	6%	31%	44%	6%

Source: ESA and Coroner records

4 PERCENTAGE OF NON-OCCUPATIONAL ELECTRICAL FATALITIES BY POTENTIAL CAUSE IN ONTARIO, 2015–2024



Source: ESA and Coroner records

2.4 Electrical Injury and Emergency Department Visits in Ontario, 2014–2023

Note: This section is a reprint of last year's information as the data for 2015–2024 is yet to be available from the Canadian Institute of Health Information (CIHI).

Electrical injuries can occur as a result of lightning, or low-voltage or high-voltage contact, and are often associated with high morbidity and mortality. Almost all electrical injuries are accidental and preventable (Zemaitis et al., 2023).

Exposure to electricity can result in four main types of injuries: flash, flame, lightning, and true injuries. Flash injuries are caused by an arc flash and are typically associated with superficial burns. Flame injuries occur when an arc flash ignites an individual's clothing, and electrical current may or may not pass the skin. Lightning injuries are associated with an electrical current flowing through the individual's entire body. True electrical injuries involve an individual becoming part of an electrical circuit, where an entrance and exit site can be found (Zemaitis et al, 2023).

Small or minor burns may be managed in an emergency department, but patients with severe burns may be transferred to regional burn centres for additional management (Koyfman and Long, 2020).

In the United States, approximately 10,000 patients present in emergency departments with electrical burns or electric shock per year. An estimated 4% of burn centre admissions are due to electrical burns. Most electrical injuries are due to household or occupational exposures. Young children are affected most by household current, adolescent males by high-risk behaviour, and adult males by occupational exposure (Gentges and Schleche, 2018).

From 2014 to 2023, 9,672 visits to Ontario hospitals' emergency departments (ED) were due to electrical injury. The total number of ED visits for electrical injury has increased by 7% when comparing 2014 and 2023. The trend of males outnumbering females in electrical injuries is also observed in ED visits with 71% of ED visits from males. The age group with the largest number of ED visits was 25-30 years for males and for females.

Using the Canadian Triage and Acuity Scale (CTAS), the severity of electrical injury was assessed upon each ED visit. Between 2014 and 2023, 88% of ED visits were classified as the most severe — that is, requiring resuscitation, conditions that are a potential threat to life, limb, or function requiring medical intervention or delegated acts, or conditions that could potentially progress to a serious problem requiring emergency intervention (Canadian Triage and Acuity Scale between 1 and 3).

In 66% of all ED visits, the principal diagnosis was identified as electrical current, while burns were the principal diagnosis in 17% of cases.

When excluding unspecified place of occurrence, the most common locations for electrical injury were the home, followed by trade and service areas, and industrial and construction locations.

Statistics Directly Related to the ESA's Harm Reduction Priorities

NON-OCCUPATIONAL ELECTRICAL SAFETY

Five-year Rolling Average Comparison

Number of emergency department visits due to critical electrical injuries (Canadian Triage and Acuity Scale levels 1-3) reported to the Canadian Institute of Health Information.

The number of emergency department visits that were classified as critical visits has increased by 1% in the five-year rolling average between 2014–2018 and 2019–2023.

1 NUMBER OF EMERGENCY DEPARTMENT (ED) VISITS FOR ELECTRICAL INJURY BY SEX IN ONTARIO, 2014–2023

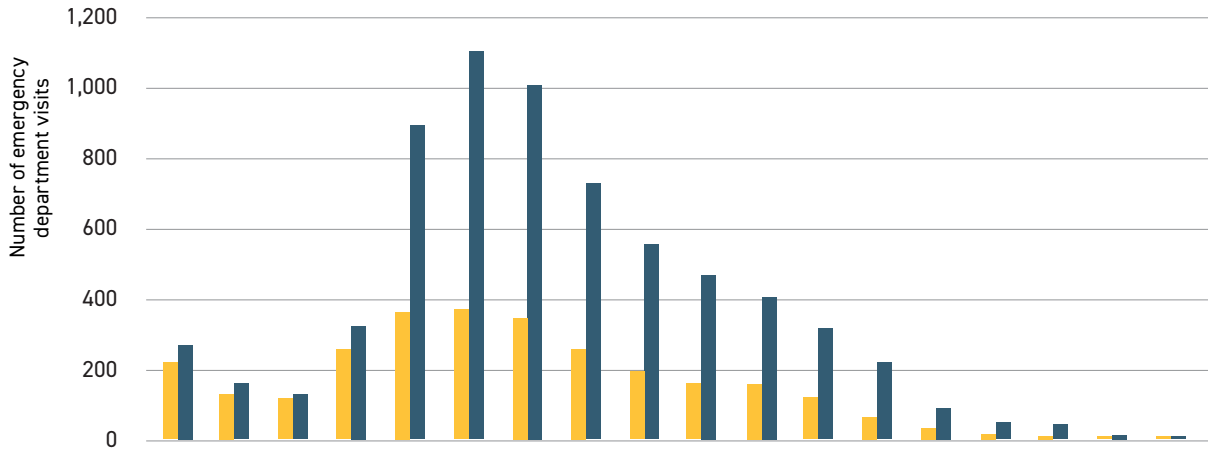
In the past ten years, on average, there were **967 ED** visits per year related to electrical injury.

The number of visits from **males** was more than **twice** the number of visits from females.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Female	325	265	305	304	279	295	196	276	280	321
Male	680	673	716	690	722	644	509	720	719	753
Total	1,005	938	1,021	994	1,001	939	705	996	999	1,074

Source: ED All Visit Main Table (CIHI), IntelliHEALTH, Ministry of Health and Long-Term Care (MOHLTC)

2 NUMBER OF EMERGENCY DEPARTMENT (ED) VISITS FOR ELECTRICAL INJURY BY AGE AND SEX IN ONTARIO, 2014–2023



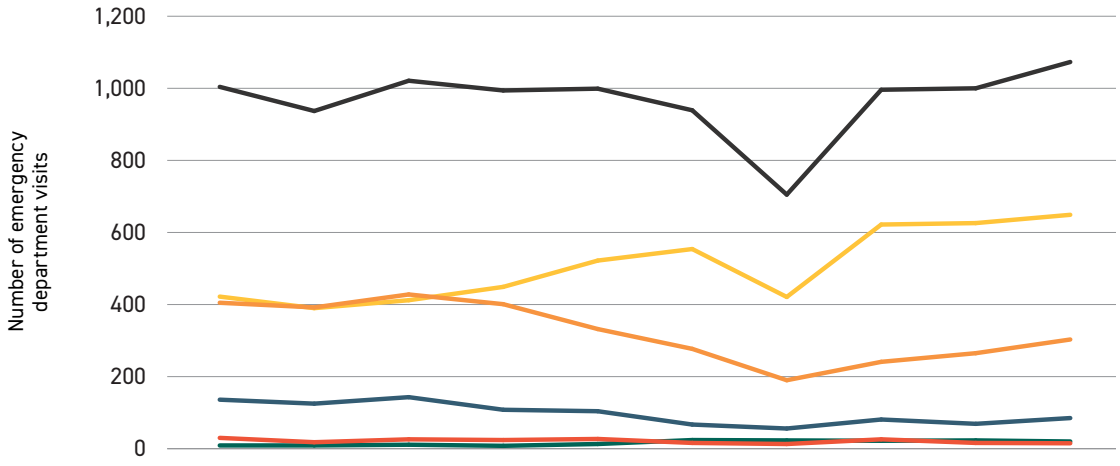
Age	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Female	221	131	118	258	365	372	347	260	195	160	159	120	64	33	16	10	8	9
Male	271	160	129	325	900	1,112	1,016	734	558	471	408	318	220	90	49	43	13	9

Source: ED All Visit Main Table (CIHI), IntelliHEALTH, MOHLTC

Conclusion

The number of males seen at the ED for electrical injury is greater than the number of females in all age groups in the past ten years. The age group with the largest number of ED visits was 25–30 years for males and 20–24 years for females.

3 NUMBER OF ED VISITS FOR ELECTRICAL INJURY BY CTAS IN ONTARIO, 2014–2023



Year	2014	201	2016	2017	2018	2019	2020	2021	2022	2023
Resuscitation/ life threatening (level 1)	30	18	26	24	27	16	13	26	16	15
Emergent/potentially life threatening (level 2)	405	392	428	401	332	277	190	241	265	303
Urgent/potentially serious (level 3)	422	390	412	449	522	554	421	622	626	649
Less-urgent/ semi-urgent (level 4)	136	125	143	108	104	67	56	81	69	85
Non-urgent (level 5)	9	9	11	8	13	24	23	22	23	20
Total	1,004	937	1,021	994	999	939	705	996	1,000	1,073

Source: ED All Visit Main Table (CIHI), IntelliHEALTH, MOHLTC

Conclusion

Eighty-eight percent of ED visits for electrical injury were classified on the Canadian Triage and Acuity Scale (CTAS) at levels 1–3 (Resuscitation, Emergent, Urgent) between 2014 and 2023.

4 LOCATION OF BURNS ASSOCIATED WITH ELECTRICAL INJURY IN ONTARIO, 2014–2023

The majority of burns associated with electrical injury were found on the **wrist and hand.**

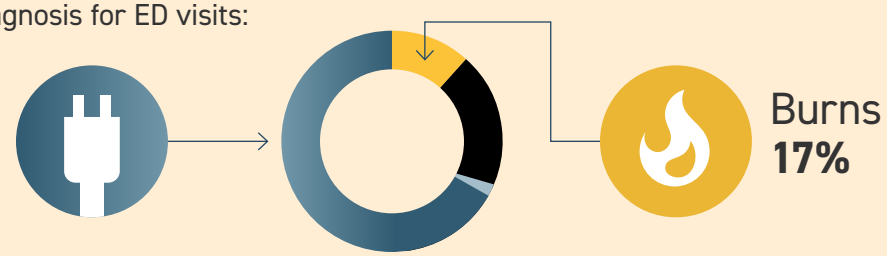
Location of burns	Head and neck	Trunk	Shoulder and upper limb, except wrist and hand	Wrist and hand	Hip and lower limb, except ankle and foot	Ankle and foot	Eye and adnexa	Respiratory tract	Other internal organs	Multiple body regions	Unspecified body areas	Unknown
Total	158	83	162	1,328	61	48	31	1	16	68	13	996

Source: ED All Visit Main Table (CIHI), IntelliHEALTH, MOHLTC

5 PRIMARY DIAGNOSIS OF EMERGENCY DEPARTMENT (ED) VISITS FOR ELECTRICAL INJURY IN ONTARIO, 2014–2023

Primary diagnosis for ED visits:

Electric Current **66%**



Burns **17%**

Primary diagnosis	Effects of electric current (T75.4)	Effects of lightning (T75.0)	Burns (T20–T31)	Other diagnoses
Number of ED visits	6,428	169	1,627	1,448

Source: ED All Visit Main Table (CIHI), IntelliHEALTH, MOHLTC

6 PLACES WHERE ELECTRICAL INJURY OCCURRED IN ONTARIO, 2014–2023

The most commonly reported places of injury were the **home, trade and service areas**, and **industrial and construction areas.**

Place	Farm	Home	Industrial and construction area	Residential institution	School, other institution, and public area	Sports and athletics area	Street and highway	Trade and service area	Other specified place of occurrence	Unspecified place of occurrence
	56	1,890	909	85	337	24	48	970	726	4,582

Source: ED All Visit Main Table (CIHI), IntelliHEALTH, MOHLTC

3.0 Utility-related Equipment

Utility-related equipment includes electrical equipment and devices used by Local Distribution Companies (LDCs), privately owned companies, or property owners that distribute electricity to customers' facilities or buildings. Examples of such equipment include overhead and underground powerlines (including most equipment on utility poles), substations, electrical chambers (vaults), high-voltage switchgear, and transformers. Utility-related equipment carries dangerous amounts of energy or power, and if barriers are breached, can be fatal. Overhead and underground equipment barriers are typically clearances above and below the ground, while substation barriers typically include fences and walls. Each barrier is designed to prevent public access and exposure to electric shock hazards.

In 2025, BC Hydro published the results of a survey of workers and their work practices near powerlines and electrical infrastructure. Their data showed that one-third of respondents have been injured or shocked by electricity or knew someone who was injured or shocked on the job. More than 20 percent stated that these incidents involved workers who were new to the job or had received insufficient training. Seasonal workers in construction, tree trimming, painting, and window washing are at higher risk of electrical injuries, particularly in the spring and summer months (BC Hydro, 2025). This trend is consistent with Ontario data, where we have seen incidents involved with extended-reach apparatus in maintenance and construction.

Summary of Ontario data

From 2015 to 2024, there were 24 electrical-related fatalities associated with utility-related equipment, which accounted for 48% of the total electrical fatalities in Ontario. This number is similar when compared to the previous ten-year period of 2014–2023 at 50%.

Contact specifically with powerlines accounted for 21 of the electrical-related fatalities in the most recent ten-year period, which contributed to 88% of utility-related equipment fatalities. The five-year rolling average rate for powerline electrocutions has remained the same when comparing 2015–2019 and 2020–2024.

The five-year average number of utility-related electrical fatalities has increased by 50% when comparing 2014–2018 and 2019–2023. Overhead powerline contact remains the leading cause of utility-related electrical incidents every year. In 2024, there were fewer than five reported incidents related to overhead powerlines among LDC workers (as a subset of the utility sector).

Reported injuries because of utility-related equipment have decreased over the past ten years, although property damage has been increasingly reported in the most recent five years.

Statistics Directly Related to the ESA's Harm Reduction Priorities

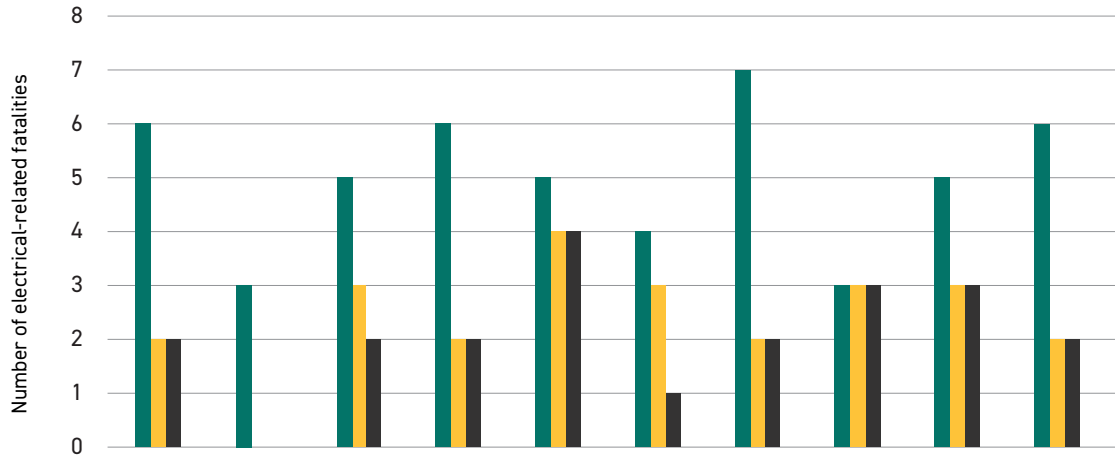
POWERLINE CONTACT

Five-year Rolling Average Comparison

The statistics below represent the number of worker and non-worker powerline-related contact incidents, based on data reported to the ESA.

The overhead powerline safety five-year rolling average has increased by 30% between 2015–2019 and 2020–2024.

1 NUMBER OF ELECTRICAL-RELATED FATALITIES FROM UTILITY EQUIPMENT IN ONTARIO, 2015–2024



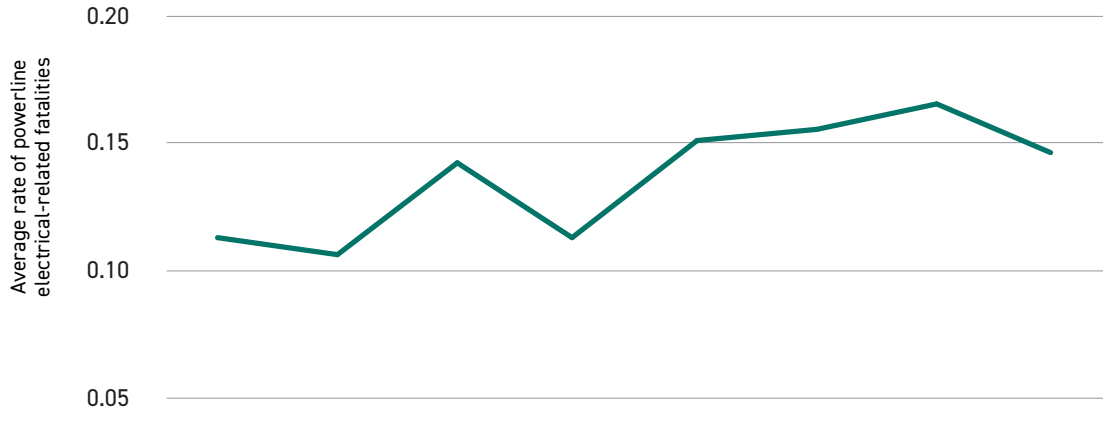
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Electrical-related fatalities	6	3	5	6	5	4	7	3	5	6
Utility equipment electrical fatalities	2	0	3	2	4	3	2	3	3	2
Powerline electrical-related fatalities	2	0	2	2	4	1	2	3	3	2

Source: ESA and Coroner records

Conclusion

The number of utility-related equipment fatalities has been within a range of zero to four fatalities reported per year. In 2024, there were two utility equipment fatalities reported, both of which were from powerline contact.

2 FIVE-YEAR ROLLING AVERAGE OF POWERLINE ELECTRICAL-RELATED FATALITIES IN ONTARIO, 2013–2024



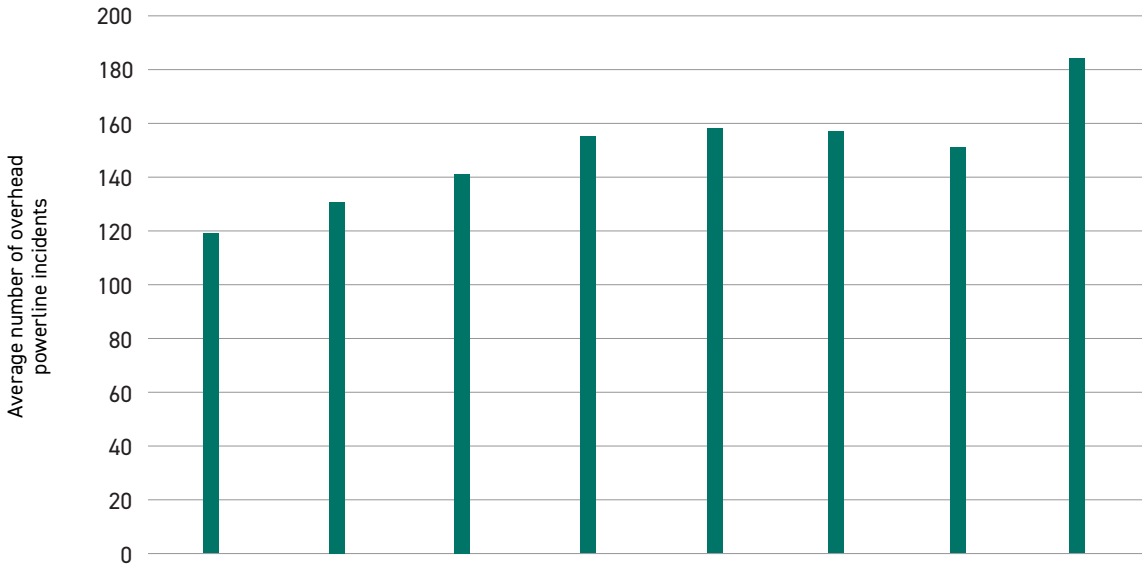
Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Rate of powerline electrical-related fatalities	0.12	0.11	0.14	0.12	0.15	0.16	0.17	0.14

Source: ESA and Coroner records

Conclusion

The rate of powerline electrical-related fatalities has remained the same when comparing 2015–2019 and 2020–2024.

3 FIVE-YEAR ROLLING AVERAGE NUMBER OF OVERHEAD POWERLINE INCIDENTS IN ONTARIO, 2013–2024



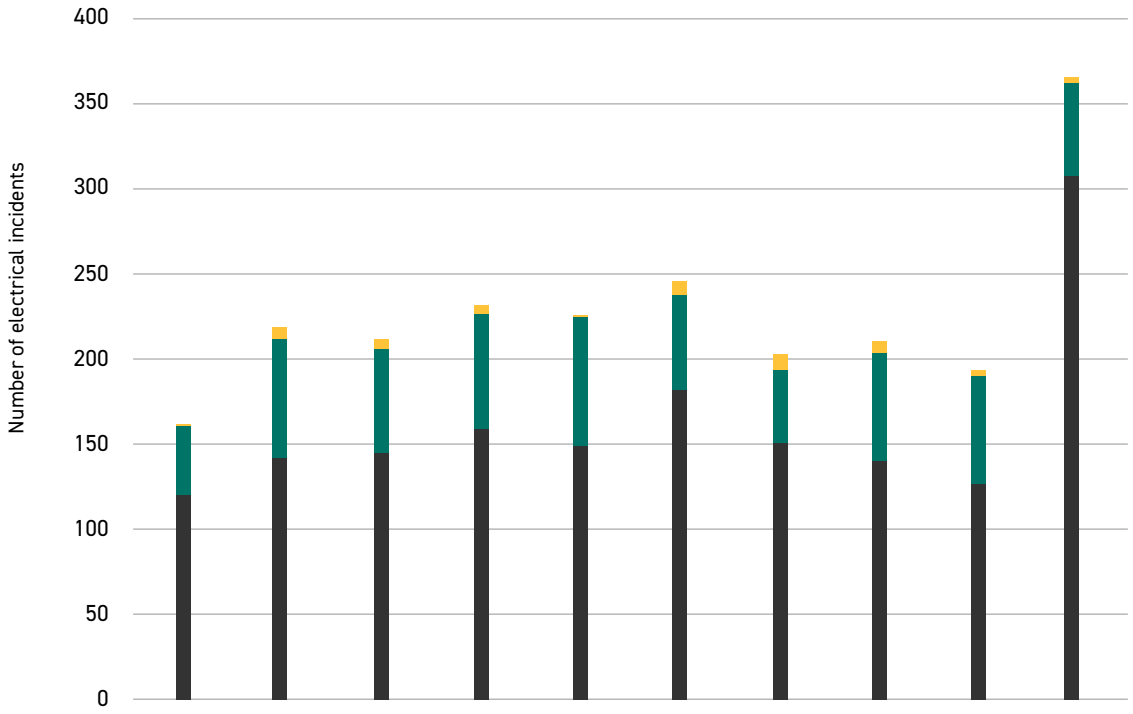
Five-year period	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023	2020–2024
Number of overhead powerline incidents	119	129	141	155	158	157	151	183

Source: ESA records

Conclusion

The five-year rolling average number of overhead powerline incidents has increased by 30% when comparing 2015–2019 and 2020–2024.

4 NUMBER OF UTILITY-RELATED ELECTRICAL INCIDENTS BY CONTACT TYPE IN ONTARIO, 2015–2024



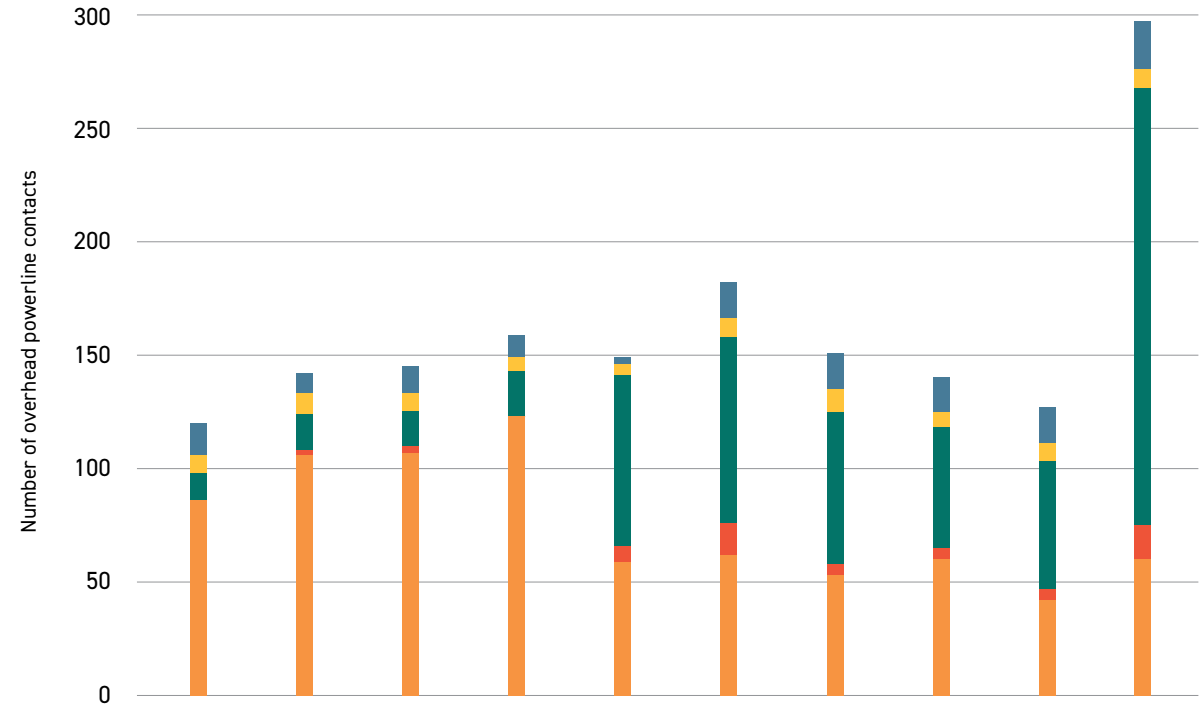
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Vaults, substations, and padmounts	1	7	6	5	1	8	9	7	4	3
Underground powerline contact	41	70	61	68	76	56	43	64	63	56
Overhead powerline contact	120	142	145	159	149	182	151	140	127	307

Source: ESA records

Conclusion

Overhead powerline contact remains the leading cause in utility-related electrical incidents between 2015 and 2024.

5 NUMBER OF OVERHEAD POWERLINE CONTACTS BY SECTOR IN ONTARIO, 2015–2024



Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Utility	14	9	12	10	3	16	16	15	16	22
Transport	8	9	8	6	5	8	10	7	8	11
Public	12	16	15	20	75	82	67	53	56	197
Farm	0	2	3	0	7	14	5	5	5	18
Construction	86	106	107	123	59	62	53	60	42	62

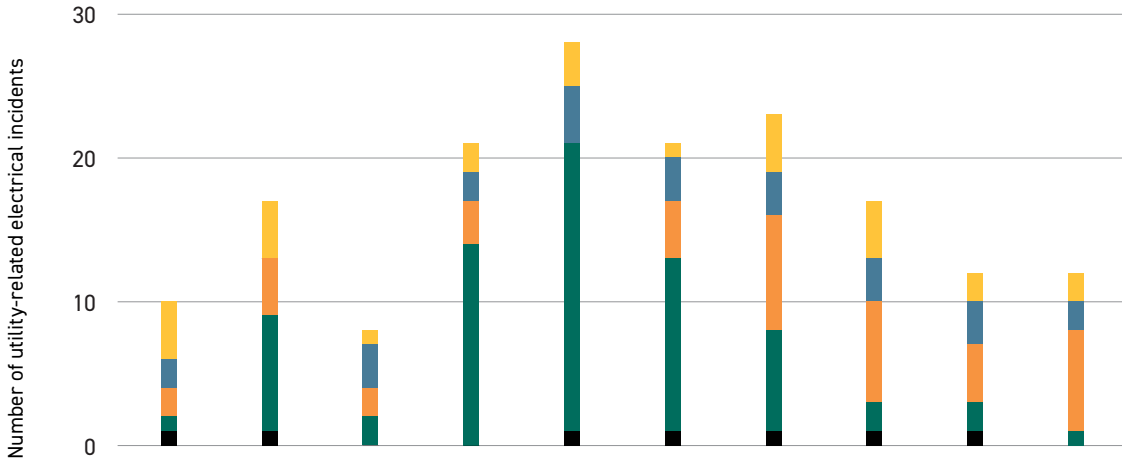
Source: ESA records

Conclusion

Historically, construction has been the leading sector in overhead powerline contacts; however, in the past five years, incidents reported in public settings have increased. In 2024, public settings have seen a notable number of tree-related incidents reported to the ESA, often with limited contextual information. The underlying causes behind this surge are currently undetermined.

In 2024, there have been fewer than five reported incidents involving LDC workers and overhead powerline contact.

6 NUMBER OF UTILITY-RELATED ELECTRICAL INCIDENTS BY OUTCOME IN ONTARIO, 2015–2024



Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Critical injury	4	4	1	2	3	1	4	4	2	2
Fatality	2	0	3	2	4	3	3	3	3	2
Non-critical injury	2	4	2	3	0	4	8	7	4	7
Property damage	1	8	2	14	20	12	7	2	2	1
Unknown	1	1	0	0	1	1	1	1	1	0

Source: ESA records

Conclusion

The number of critical injuries and the number of fatalities reported from utility-related incidents have remained under four, between 2015 and 2024.

4.0 Overview of Fires in Ontario

Fire remains a significant threat to life and property in urban and rural areas. Structural fires, particularly residential fires, remain a critical concern. The high number of electrical incidents and the associated dollar loss, as well as the number of "deliberate" fires and their associated dollar loss, are the two other areas of major concern (Asgary et al., 2010).

Summary of Ontario data

Ontario reported 35,303 structure-loss fires (fires resulting in an injury, fatality, or dollars lost) between 2019 and 2023. Residential-loss fires (25,895) account for 74% of structure-loss fires in the same period. Stove-top fires (with electricity fuel only) account for 5% of structure-loss fires and 7% of residential-loss fires. Since 2019, there has been a 6% increase in total-loss fires, a 7% increase in structure-loss fires, and a 5% increase in residential-loss fires.

For the period between 2014 and 2023, the OFM identified the following as the most common ignition sources for structure-loss fires:

- cooking (16%);
- electrical distribution equipment — wiring (9%);
- miscellaneous (includes fires — natural causes and chemical reactions) (8%);
- cigarettes (8%);
- heating and cooling equipment (7%);
- other electrical, mechanical (5%); and
- appliances (4%).

When comparing 2014–2018 and 2019–2023, the average number of structure-loss fires per year by ignition source decreased 15% for cooking, 10% for electrical wiring, 12% for heating/cooling equipment, and 9% for appliances.

Between 2019 and 2023, among structures that follow the Ontario Building Code (OBC), when structure-loss fires were limited to those where electricity was identified as the fuel of the ignition source (but not necessarily the primary fuel energy source), the most common electrical-related products involved were:

- cooking equipment (37%);
- electrical distribution equipment (28%); and
- appliances (12%).

Electrical Products

In the OESR, the ESA defines electrical products from OFM data as appliances, cooking equipment, lighting equipment, other electrical and mechanical equipment, and processing equipment. Data from the OFM shows that the five-year average for electrical product loss fires (where electricity was identified as the fuel of the ignition source) between 2014–2018 and 2019–2023 has decreased by 20%.

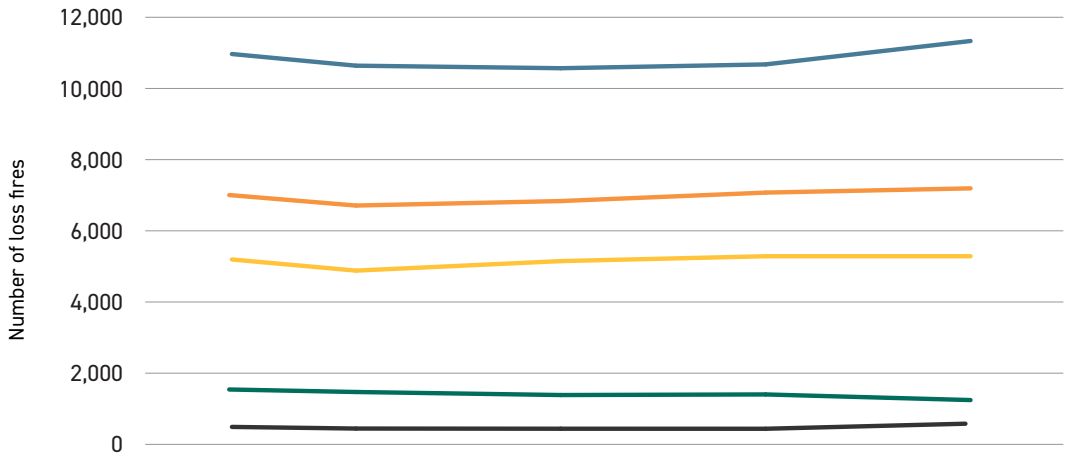
Statistics Directly Related to the ESA's Harm Reduction Priorities

PRODUCT SAFETY

Number of electrical product-related loss fires: a product loss fire is defined as one involving appliances, cooking equipment, lighting equipment, and other electrical, mechanical, or processing equipment as classified by the Office of the Fire Marshal.

The five-year rolling average of product safety fires has decreased by 20% between 2014–2018 and 2019–2023.

1 NUMBER OF LOSS FIRES IN ONTARIO, 2019–2023



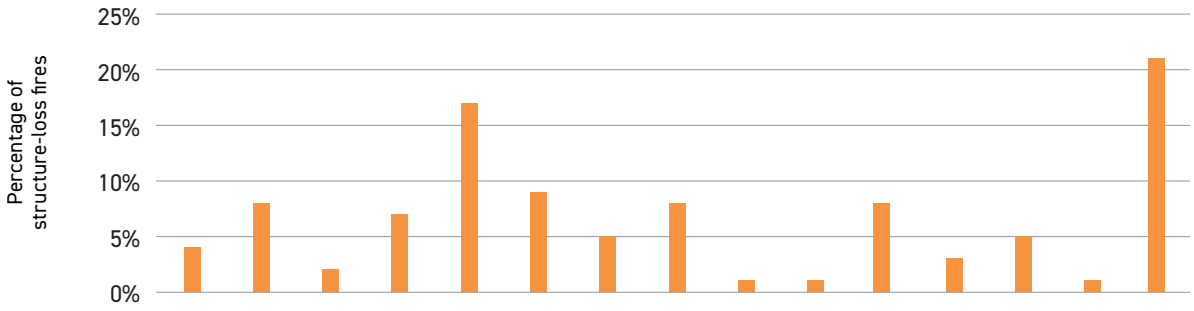
Year	2019	2020	2021	2022	2023
Total number of loss fires	10,672	10,600	10,708	11,598	11,315
Structure-loss fires	6,715	6,842	7,081	7,482	7,183
Residential-loss fires	4,874	5,143	5,281	5,461	5,136
OBC structure-loss fires where electricity fuelled the ignition source	1,440	1,354	1,371	1,398	1,293
Stove-top structure-loss fires	406	401	400	346	382

Source: OFM records

Conclusion

The number of total-loss, structure-loss, and residential-loss fires has increased between 2019 and 2023. However, the number of Ontario Building Code structure-loss fires where electricity fuelled the ignition source has decreased by 10% when comparing 2019 and 2023.

2 PERCENTAGE OF STRUCTURE-LOSS FIRES BY IGNITION SOURCE IN ONTARIO, 2014–2023



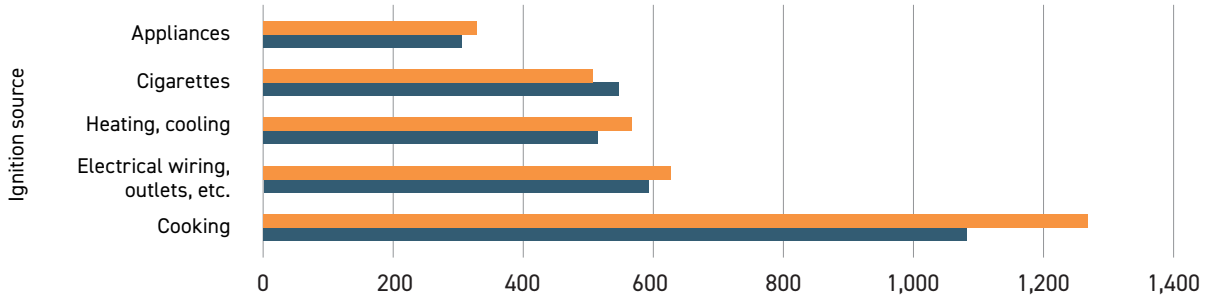
Ignition source	Appliances	Arson	Candles	Cigarettes	Cooking	Electrical wiring	Exposure	Heating, cooling	Lighting	Matches, lighters	Miscellaneous	Other open flame tools	Other electrical, mechanical	Processing equipment	Undetermined
2014–2023	4%	8%	2%	8%	16%	9%	5%	7%	1%	1%	8%	3%	5%	1%	22%

Source: OFM records

Conclusion

When excluding undetermined and miscellaneous sources, cooking (16%) and electrical wiring (9%) were the most common ignition sources for structure-loss fires between 2014 and 2023.

3 FIVE-YEAR AVERAGE NUMBER OF STRUCTURE-LOSS FIRES BY IGNITION SOURCE IN ONTARIO, 2014–2018 AND 2019–2023



Ignition source		Cooking	Electrical wiring, outlets, etc.	Heating, cooling	Cigarettes	Appliances
Average number of structure-loss fires	2014–2018	1,239	626	516	619	326
	2019–2023	1,054	565	483	533	296

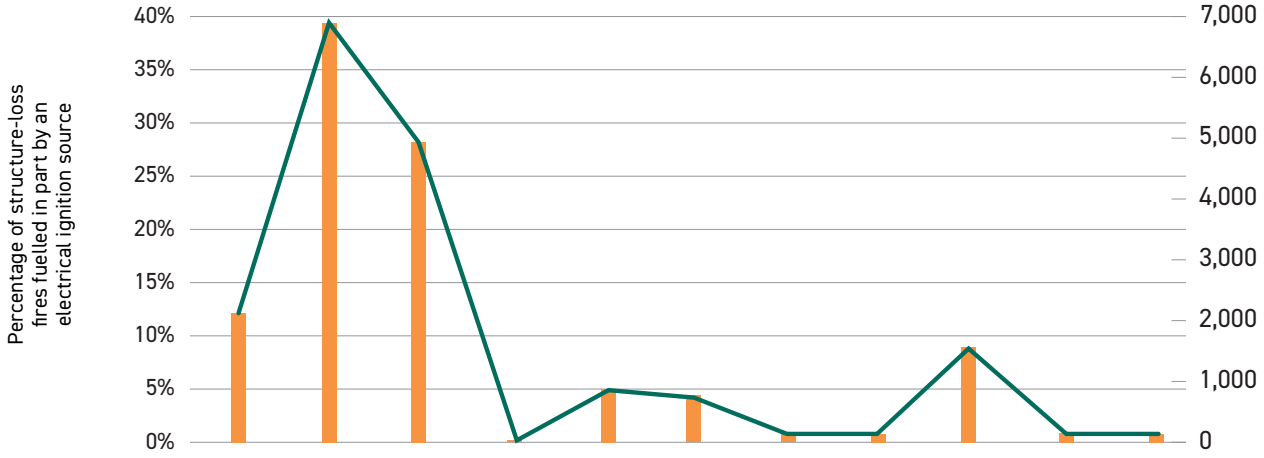
Source: OFM records

Conclusion

Cooking equipment remained the most common ignition source in 2014–2018 and 2019–2023, although the average number of structure-loss fires among cooking equipment, heating/cooling, electrical wiring, and appliances has decreased in the most recent period.

Please note that this chart excludes arson and ignition source undetermined.

4 PERCENTAGE OF STRUCTURE-LOSS FIRES FUELLED IN PART BY AN ELECTRICAL IGNITION SOURCE IN ONTARIO, 2014–2023 (OBC STRUCTURES ONLY)



Electrical ignition source	Appliances	Cooking	Electrical distribution equipment	Exposure	Heating, chimney	Lighting	Miscellaneous	Open flame	Other electrical, mechanical	Processing equipment	Undetermined
Percentage of structure-loss fires	12%	39%	27%	<1%	5%	4%	1%	1%	8%	1%	1%
Counts	1,748	5,889	4,013	9	801	573	215	123	1,264	136	206

Source: OFM records

Conclusion

When the fire is from ignition sources that use electricity, cooking equipment (39%), electrical distribution equipment (27%), and appliances (12%) were the most common ignition sources between 2019 and 2023.

5 PERCENTAGE OF ELECTRICAL STRUCTURE-LOSS FIRES IN ONTARIO BY TIME OF DAY, 2014–2023 (OBC STRUCTURES ONLY)

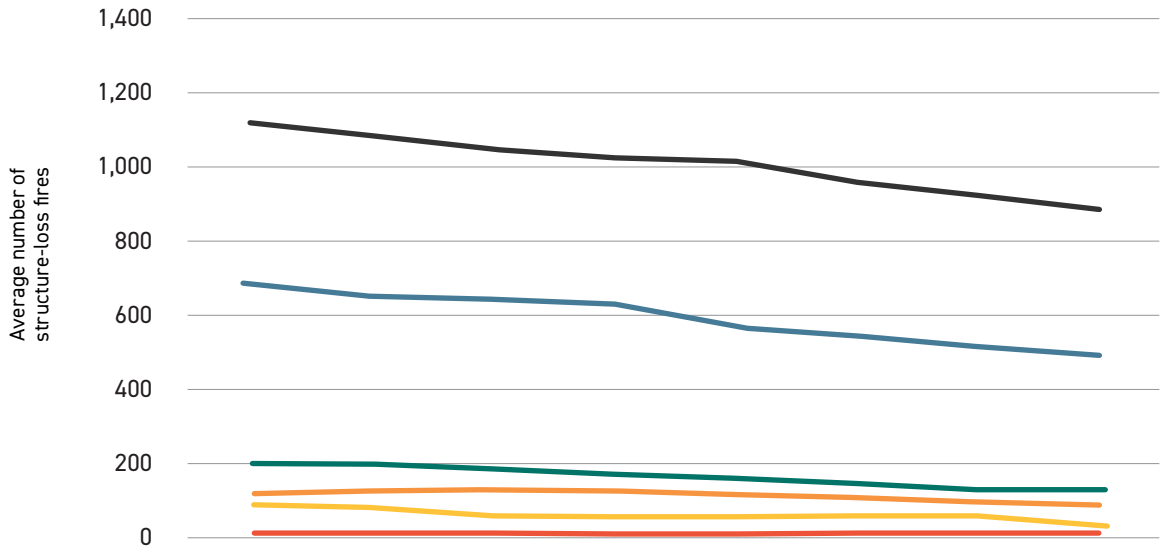
Time	Midnight – 8 a.m.	8 a.m. – 4 p.m.	4 p.m. – Midnight
Percentage	19%	39%	43%

Source: OFM records

Conclusion

Between 2014 and 2023, most of the electrical-related structure-loss fires occurred in the period from 4 p.m. to midnight.

6 FIVE-YEAR ROLLING AVERAGE NUMBER OF ELECTRICAL STRUCTURE-LOSS FIRES BY PRODUCTS IN ONTARIO, 2012–2023 (OBC STRUCTURES ONLY)



Five-year period	2012–2016	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023
Appliances	196	196	190	182	172	168	166	160
Cooking equipment	713	695	670	624	584	556	524	507
Lighting	73	70	68	66	60	55	50	47
Other electrical, mechanical	115	124	125	127	127	128	127	127
Processing equipment	15	14	13	13	14	14	16	14
Product safety overall	1,142	1,113	1,099	1,066	1,012	956	921	856

Source: OFM records

Conclusion

Between 2014–2018 and 2019–2023, the five-year rolling average number of fires related to product safety has decreased by 20%.

4.1 Fires Resulting in Fatalities

Beaulieu et al. (2020) examined the geographic and demographic distribution of residential fires and related casualties in Canadian provinces. Between 2005 and 2015, 145,252 residential fires were reported from the provinces of British Columbia, Alberta, Manitoba, and Ontario, in which 5.5% resulted in casualties. Death rates per population decreased significantly between 2005 and 2015, while casualties per 1,000 house fires did not change. Death rates per house fire incidents were generally higher in urban areas than in remote areas but tended to increase as distance from city centres increased and moved closer to suburban areas. Fire-related deaths were more likely to involve males, and older residents were disproportionately affected (Clare et al., 2017). The vast majority of fire-related deaths are classified as unintentional (accidents) (Statistics Canada, 2022).

Summary of Ontario data

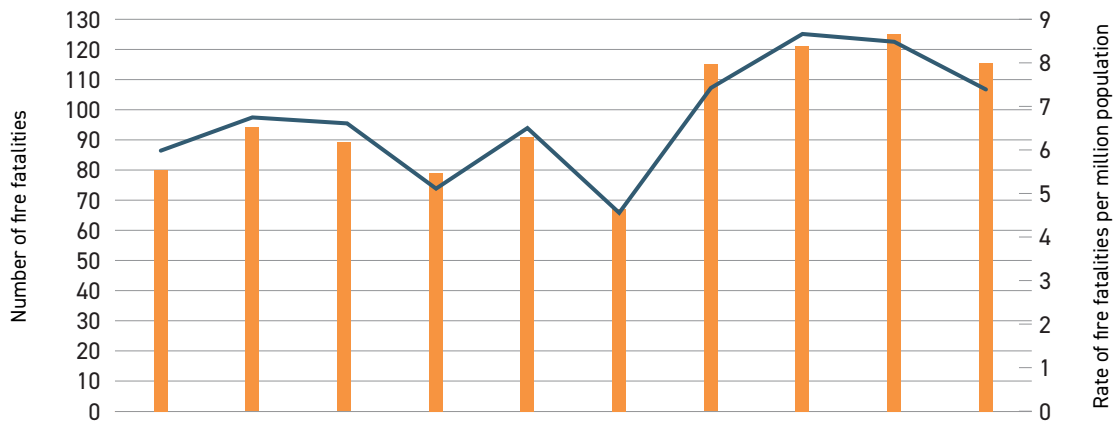
Ontario reported 975 deaths due to fires between 2014 and 2023. This number excludes fire deaths in vehicle collisions, fire fatalities among emergency response, or any fire deaths on federal or First Nations property. This number is more than what was reported between 2013 and 2022, where 940 deaths were reported, excluding those on First Nations property. The OFM reported that in 2023, the fire death rate was 7.3 deaths per million population, which is a 24% increase when compared to the fire death rate in 2014, which was 5.9 deaths per million population.

Structure-loss fires are fires that result in an injury, fatality, and/or financial loss that occur in structures (as opposed to vehicles or the outdoors). In Ontario, there were 883 fire fatalities from structure-loss fires from 2014 to 2023. The OFM reported that in 2023, the structure-loss fire death rate was 6.5 per million population, which is a 27% increase when compared to the structure-loss fire death rate in 2014, which was 5.1 deaths per million population.

The OFM data identified 97 structure fire deaths between 2014 and 2023 (excluding those on First Nations property) where electricity was the fuel of the ignition source or were from electrical distribution equipment. Since 2014, the death rate from this type of fire has decreased by 61% from 0.66 deaths per million population to 0.26 deaths per million population.

In these types of fires in which the investigations were considered closed, 97% were considered accidental between 2014 and 2023. Stove or range-top burners accounted for 40% of fire fatalities fuelled by electricity in the last ten years.

1 NUMBER AND RATE OF ALL FIRE FATALITIES IN ONTARIO, 2014–2023



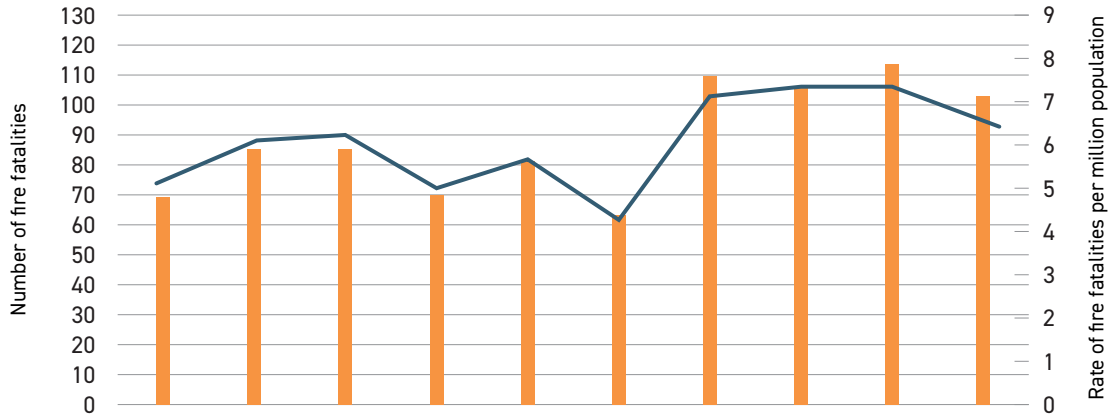
Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
All fire fatalities in Ontario	80	94	89	79	91	67	115	121	125	114
Ontario population in millions	13.6	13.7	13.4	14.1	14.3	14.5	14.7	14.2	15.1	15.6
Fire death rate in Ontario	5.9	6.9	6.6	5.6	6.4	4.6	7.8	8.5	8.3	7.3

Source: OFM records

Conclusion

The number and rate of fire fatalities have increased when comparing 2014 and 2023.

2 NUMBER AND RATE OF FIRE FATALITIES IN STRUCTURE FIRES IN ONTARIO, 2014-2023



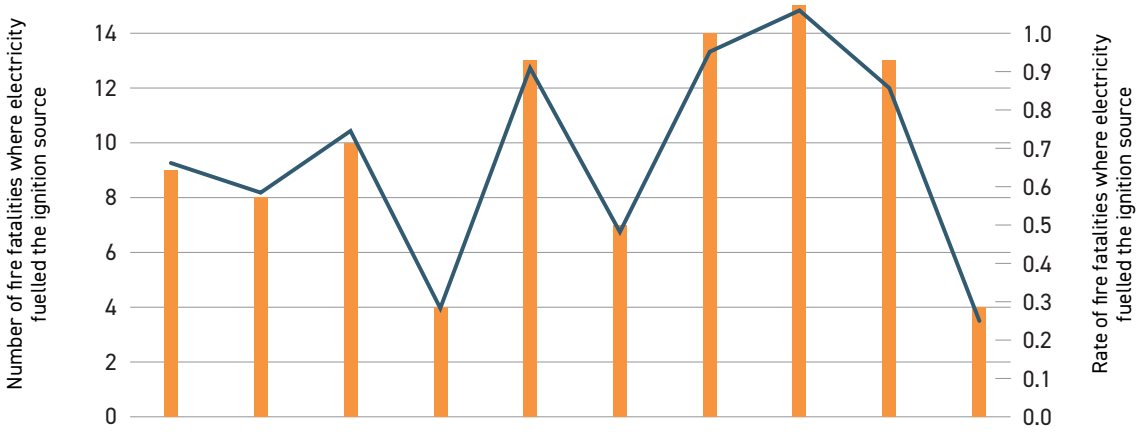
Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of fire fatalities from structure fires	69	85	86	70	81	63	109	106	113	101
Ontario population in millions	13.6	13.7	13.4	14.1	14.3	14.5	14.7	14.2	15.1	15.6
Rate of fire fatalities from structure fires	5.1	6.2	6.4	5	5.7	4.3	7.4	7.5	7.5	6.5

Source: OFM records

Conclusion

The number and rate of fire fatalities in structure fires have increased when comparing 2014 to 2023.

3 NUMBER AND RATE OF STRUCTURE FIRE FATALITIES WHERE ELECTRICITY WAS THE FUEL OF THE IGNITION SOURCE OR FROM ELECTRICAL DISTRIBUTION EQUIPMENT IN ONTARIO, 2014–2023



Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of fatalities where electricity fuelled the ignition source	9	8	10	4	13	7	14	15	13	4
Ontario population in millions	13.6	13.7	13.4	14.1	14.3	14.5	14.7	14.2	15.1	15.6
Rate of fatalities where electricity fuelled the ignition source	0.66	0.58	0.75	0.28	0.91	0.48	0.95	1.06	0.86	0.26

Source: OFM records

Conclusion

Electrical fire fatalities (where electricity fuelled the ignition source or was from electrical distribution equipment in Ontario) have decreased 56% when comparing 2014 to 2023.

4 PERCENTAGE OF STRUCTURE FIRE FATALITIES WHERE ELECTRICITY IS THE FUEL OF THE IGNITION SOURCE OR BY ELECTRICAL DISTRIBUTION EQUIPMENT CAUSE CLASSIFICATION IN ONTARIO, 2014–2023 (CLOSED FIRE INVESTIGATIONS ONLY)

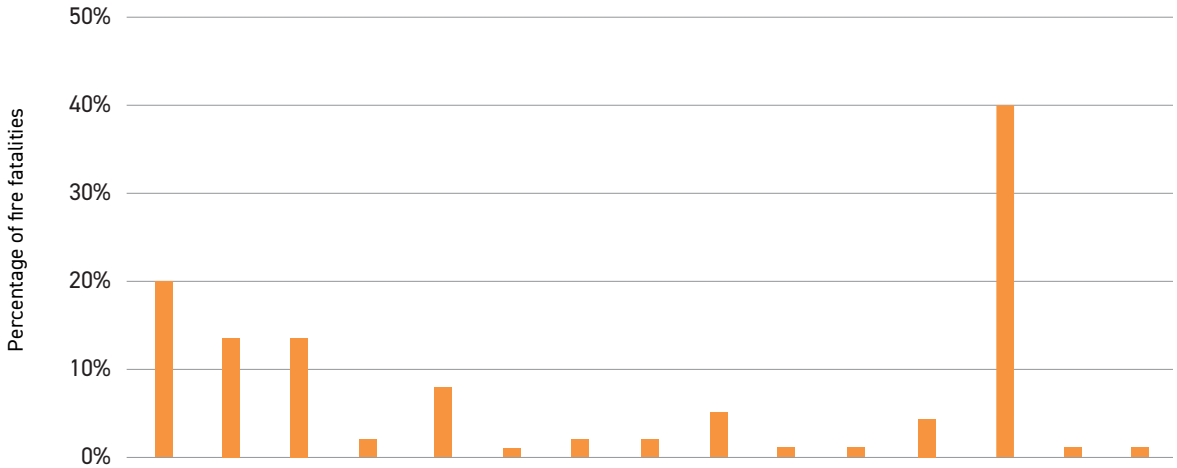
Cause classification	Accidental	Undetermined	Intentional
2013–2022	97%	2%	1%

Source: OFM records

Conclusion

Almost all structure fire fatalities (97%) where electricity fuelled the ignition source or where the fires were from electrical distribution equipment were accidental.

5 PERCENTAGE OF STRUCTURE FIRE FATALITIES WHERE ELECTRICITY WAS THE FUEL OF THE IGNITION SOURCE BY IGNITION SOURCE IN ONTARIO, 2014–2023 (CLOSED FIRE INVESTIGATIONS ONLY)



Ignition source	Circuit wiring – copper	Clothes dryer	Cord, cable for appliance, electrical articles	Electric blanket, heating pad	Extension cord, temporary wiring	Incandescent lamp	Multiple competent ignition sources	Other cooking items (e.g., toaster, kettle)	Other electrical	Other electrical distribution items	Oven	Space heater – portable	Stove, range-top burner	Christmas lights, decorative lighting	Undetermined
Percentage	20%	13%	13%	2%	7%	1%	2%	2%	5%	1%	1%	4%	40%	1%	1%

Source: OFM records

Conclusion

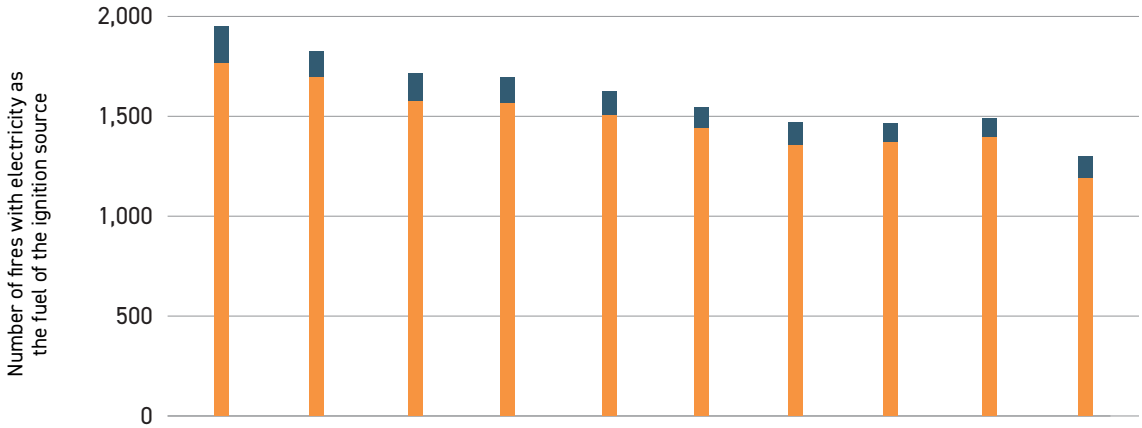
The stove (40%) remains the most common ignition source when examining structure fire fatalities, where electricity fuelled the ignition source or where the fires were from electrical distribution equipment, in the most recent ten-year period.

4.2 Fire Incidents with Electricity as the Fuel of the Ignition Source of the Fire

Among OBC structures, where electricity was the fuel of the ignition source of the fires, there were 14,977 loss fires and 1,198 no-loss fires for a total of 16,175 structure fires from 2014 to 2023. Over the same time period, there was a 27% decrease in structure-loss fires and a 29% decrease in total structure fires.

Between 2014 and 2023, 82% of structure fires occurred in the residential setting. Cooking equipment (44%), electrical distribution equipment (26%), and appliances (12%) remained the most common ignition sources in these fires. Since 2018, temperature limiting controls on Canadian stoves have been introduced to prevent stove top fires by preventing heating elements from reaching temperatures high enough to ignite cooking oil. Some devices may work by having a sensor to prevent overheating by automatically shutting off the burner if a pan gets too hot, or a fire prevention device to monitor unattended cooking and shuts off the stove after a set period of inactivity.

1 NUMBER OF STRUCTURE FIRES WITH ELECTRICITY AS THE FUEL OF THE IGNITION SOURCE IN ONTARIO, 2014–2023 (OBC STRUCTURES ONLY)



Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of fires with no loss	182	129	137	124	120	108	118	96	93	91
Number of fires with loss	1,768	1,696	1,578	1,571	1,508	1,440	1,354	1,371	1,398	1,293
Total fires with electricity as the fuel of the ignition source	1,950	1,825	1,715	1,695	1,628	1,548	1,472	1,467	1,491	1,384

Source: OFM records

Conclusion

In 2023, the total number of structure fires where electricity was the fuel of the ignition source decreased by 29% when compared to 2014.

2 NUMBER OF FIRES WITH ELECTRICITY AS THE FUEL OF THE IGNITION SOURCE BY STRUCTURE CLASSIFICATION IN ONTARIO, 2019–2023 (OBC STRUCTURES ONLY)

Structure Classification	Number of Fires
Assembly	**241**
Business and personal services	**169**
Care and detention	**140**
Industrial	**513**
Mercantile	**237**
Residential	**6,062**

Source: OFM records

Conclusion

Residential structures were the most common structures (82%) for fires where electricity was the fuel of the ignition source between 2019 and 2023.

3 PERCENTAGE OF RESIDENTIAL FIRES WITH ELECTRICITY AS THE FUEL OF THE IGNITION SOURCE BY IGNITION SOURCE IN ONTARIO, 2019–2023

The leading sources in residential fires when electricity fuelled the ignition source included:

Cooking equipment
43%

Electrical distribution equipment
26%

Appliances
12%

Ignition source	Appliances	Cooking equipment	Electrical distribution equipment	Exposure	Heating equipment, chimney, etc.	Lighting	Miscellaneous	Open flame tools, smokers' articles	Other electrical, mechanical	Processing equipment	Undetermined
Percentage	12%	43%	26%	<1%	5%	3%	2%	<1%	8%	<1%	1%

Source: OFM records

Conclusion

Cooking equipment (43%) and electrical distribution equipment (26%) were the leading sources in residential fires when electricity fuelled the ignition source.

4.3 Cooking Fires with Electricity as the Fuel of the Ignition Source of the Fire

The National Fire Protection Association found that households that used electric ranges had a higher risk of cooking fires and associated losses than those using gas ranges. Their research also showed that a disproportionate share of home cooking fires were reported in apartments or other multi-family homes (Ahrens, 2017).

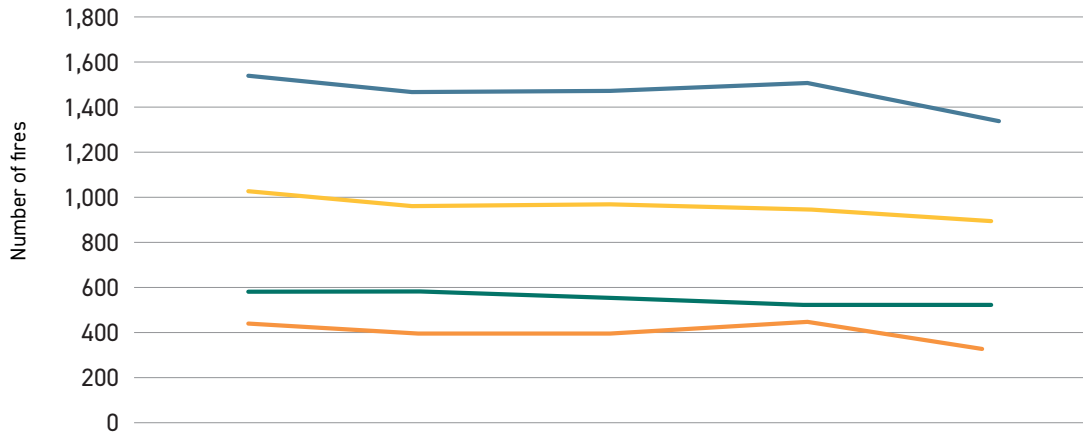
The most common cause of residential fires is cooking fires. Cooking fires have led to major injuries and fatalities, as well as significant financial losses. In most cooking fires, the ignition occurred due to the presence of cooking oil, which is highly ignitable and can contribute to spreading the fire (Hamida et al., 2019). Electricity is frequently used to ignite these stoves.

Summary of Ontario data

From 2019 to 2023, there were 2,770 structure fires in Ontario, where the ignition source was cooking equipment fuelled by electricity. Of those, 95% occurred in homes, and there has been a 10% decrease in this type of residential fire since 2019. Stoves and range-top burners were the leading ignition source, followed by the oven and other cooking items. The overwhelmingly cited possible cause to these cooking fires was leaving the stove or range-top burner unattended.

The OFM fire-loss reporting system identified cooking equipment as one of the leading ignition sources associated with preventable home injuries. Structure fires that were ignited from cooking equipment that used electricity accounted for an annual average of 69 injuries among civilians and an average of 2.8 fatalities between 2019 and 2023. In this time period, stoves and range-top burners were the leading ignition source in fires where electricity fuelled the ignition source.

1 NUMBER OF COOKING EQUIPMENT AND ELECTRICAL DISTRIBUTION EQUIPMENT FIRES IN ONTARIO, 2019–2023 (OBC STRUCTURES ONLY)



Year	2019	2020	2021	2022	2023
Cooking equipment	583	572	563	523	529
Electrical distribution equipment	449	397	397	423	367
Total cooking equipment and electrical distribution equipment fires	1,032	969	960	946	896
Total fires with electricity as the fuel of the ignition source	1,548	1,472	1,467	1,491	1,384

Source: OFM records

Conclusion

The number of structure fires from cooking equipment (where electricity fuelled the ignition source) and electrical distribution equipment (where electricity fuelled the ignition source) in 2023 has decreased by 13% when compared to 2019.

2 NUMBER OF COOKING EQUIPMENT FIRES WITH ELECTRICITY AS THE FUEL OF THE IGNITION SOURCE BY SOURCE IN ONTARIO, 2019–2023 (OBC STRUCTURES ONLY)

Stoves and **range-top burners** were the leading sources (73%) of cooking equipment fires between 2019 and 2023.

Year	2019	2020	2021	2022	2023
Stove, range-top burner	441	428	428	379	407
Range hood	8	9	5	7	7
Oven	69	78	76	70	72
Other cooking items	38	26	34	46	28
Open fired barbeque — fixed or portable	0	1	0	1	1
Microwave	18	20	12	10	12
Deep fat fryer	9	10	8	10	2

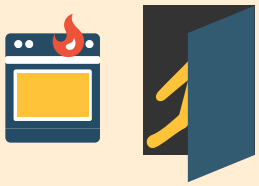
Source: OFM records

Conclusion

Stoves and range-top burners were the leading sources (73%) of cooking equipment fires between 2019 and 2023.

Other cooking items include toasters, kettles, and electric frying pans.

3 NUMBER OF STOVE-TOP FIRES VS. COOKING EQUIPMENT FIRES BY POSSIBLE CAUSE IN ONTARIO, 2019–2023 (OBC STRUCTURES ONLY)



Leaving equipment unattended was the most common possible cause of electrical fires for both cooking equipment and stove-top fires between 2019 and 2023.

Possible cause	Children playing (ages 11 and under)	Design/construction/installation/ maintenance deficiency	Electrical failure	Improper handling of ignition source or ignited material	Improper storage	Improperly discarded	Mechanical failure	Natural cause	Other misuse of ignition source/ materials ignited	Other unintentional cause, not classified	Rekindle	Routine maintenance deficiency (e.g., creosote, lint, grease buildup)	Suspected arson	Suspected vandalism	Suspected youth and vandalism (ages 12–17)	Unattended	Undetermined	Unintentional, cause undetermined	Unknown, not reported	Used for purpose not intended	Used or placed too close to combustibles
Stove-top fires	3	9	39	210	29	10	0	2	65	261	0	30	16	2	1	1,111	49	101	3	8	121
Cooking equipment fires	7	24	153	244	59	12	22	2	103	344	1	85	22	3	1	1,282	83	135	5	27	153

Source: OFM records

4.4 Electrical Distribution Equipment Fires with Electricity as the Fuel of the Ignition Source of the Fire

The OFM defines electrical distribution equipment as electrical wiring, devices, or equipment where the primary function is to carry current from one location to another. Thus, wiring, extension cords, terminations, electrical panels, and cords on appliances are considered electrical distribution equipment. This is not to be confused with utility equipment from Local Distribution Companies.

Among OBC structures, in the five-year period between 2019 and 2023, the OFM identified 2,033 fires as electrical distribution equipment fires with electricity as the fuel of the ignition source, in which 94% were identified as loss fires. The five-year rolling average of electrical distribution equipment loss structure fires has decreased by 3% between 2014–2018 and 2019–2023.

The most common ignition source of electrical distribution equipment fires was circuit wiring (aluminum and copper), and the number of fires from this source has decreased by 24% when comparing 2014–2018 and 2019–2023. Electrical failure is the most common possible cause in these types of fires.

Between 2012 and 2016, there was an estimated average of 35,150 home fires involving electrical distribution and lighting equipment in the U.S. This caused an estimated average of 490 deaths, 1,200 injuries each year in 2012–2016, as well as an estimated $1.3 billion in direct property damage per year (Campbell, 2019).

Electrical distribution and lighting equipment remain one of the leading causes for home fires and fire casualties in the U.S. (Hall, 2023). It is also the leading cause of home fire property damage. Electrical wiring and cable insulation accounted for 5% of all home fires and 4% of all home fire deaths. Cords or plugs were involved in only 1% of fires, but 6% of deaths. Extension cords dominated the cord or plug category. Electrical failures or malfunctions can occur in any type of equipment powered by electricity. Between 2016 and 2020, Hall (2023) reported that half of these fires involved electrical distribution or lighting equipment.

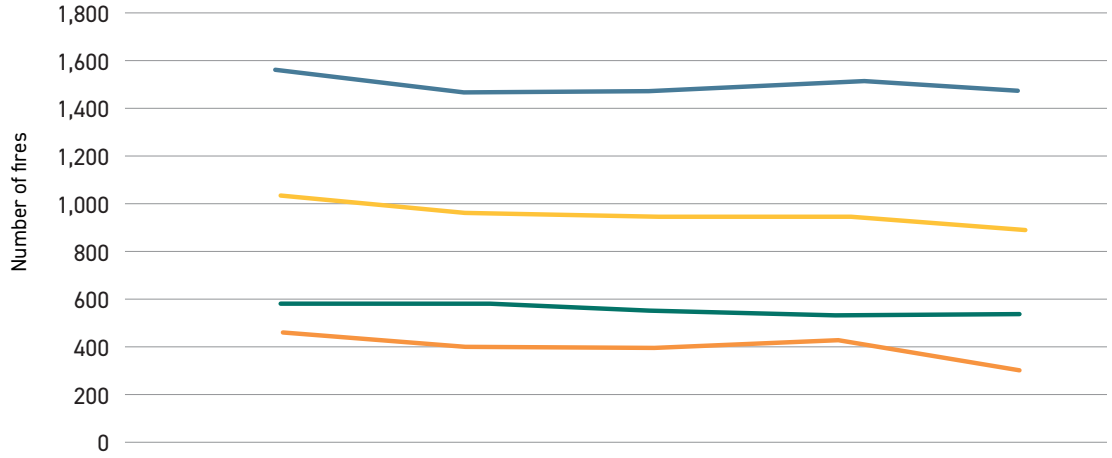
Statistics Directly Related to the ESA's Harm Reduction Priorities

AGING INFRASTRUCTURE AND DISTRIBUTION EQUIPMENT FIRES

Number of electrical wiring-related fires: this includes fires from copper and aluminum wiring, extension cords, appliance cords, terminations, and electrical panels — electrical devices categorized by the OFM as electrical distribution equipment.

The five-year rolling average for electrical distribution equipment structure loss fires related to aging infrastructure has decreased by 8% between 2014–2018 and 2019–2023.

1 NUMBER OF COOKING EQUIPMENT AND ELECTRICAL DISTRIBUTION EQUIPMENT FIRES IN ONTARIO, 2019–2023 (OBC STRUCTURES ONLY)



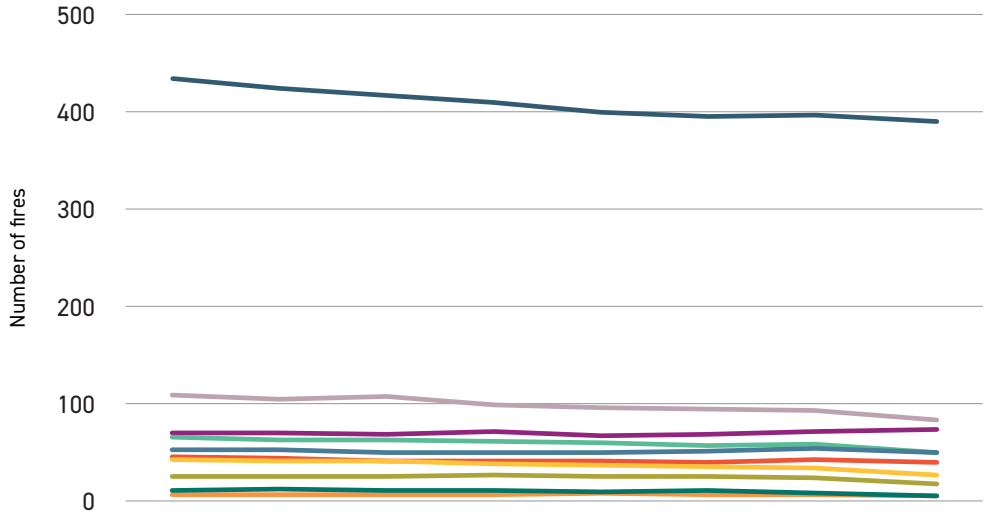
Year	2019	2020	2021	2022	2023
Cooking equipment	583	572	563	523	529
Electrical distribution equipment	449	397	396	423	367
Total cooking equipment and electrical distribution equipment fires	1,032	969	959	946	896
Total fires with electricity as the fuel of the ignition source	1,548	1,472	1,466	1,491	1,384

Source: OFM records

Conclusion

The number of electrical distribution equipment structure fires has decreased 18% since 2019.

2 FIVE-YEAR AVERAGE NUMBER OF ELECTRICAL DISTRIBUTION EQUIPMENT STRUCTURE-LOSS FIRES BY IGNITION SOURCE IN ONTARIO, 2012–2023 (OBC STRUCTURES ONLY)



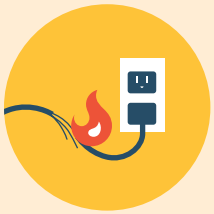
Five-year period	2012–2016	2013–2017	2014–2018	2015–2019	2016–2020	2017–2021	2018–2022	2019–2023
Circuit wiring — Al, Cu (includes conductors)	110	105	108	100	97	95	93	82
Cord, cable for appliance, electrical articles	71	71	69	73	68	69	72	77
Distribution equipment (includes panel boards, fuses, circuits)	66	63	64	62	60	58	59	53
Extension cord, temporary wiring	46	45	41	41	42	40	43	42
Meter	7	7	7	8	8	7	7	7
Other electrical distribution item	54	53	50	51	51	53	54	58
Service/utility lines (includes power/hydro transmission lines)	26	26	26	28	26	26	25	24
Terminations — Al, Cu (includes receptacles, switches, lights)	44	42	41	39	38	36	35	33
Transformer	12	13	12	11	11	12	9	7
Total	435	426	419	412	401	396	398	384

Source: OFM records

Conclusion

Circuit wiring — aluminum and copper remained the leading ignition source in electrical distribution equipment fires between 2012 and 2023. The five-year rolling average of electrical distribution equipment loss structure fires shows an 8% decrease between 2014–2018 and 2019–2023.

3 NUMBER OF ELECTRICAL DISTRIBUTION EQUIPMENT FIRES BY POSSIBLE CAUSE IN ONTARIO, 2019–2023



The leading possible causes in electrical distribution equipment fires between 2019 and 2023:

Electrical failure and **design/construction/installation/maintenance deficiency.**

Possible cause	Accidental	Children playing (ages 11 and under)	Design/construction/installation/maintenance deficiency	Electrical failure	Improper handling of ignition source or ignited material	Improper storage	Mechanical failure	Natural cause	Other misuse of ignition source/material ignited	Other unintentional cause, not classified	Rekindled	Routine maintenance deficiency (e.g., creosote, lint, grease buildup)	Suspected arson	Suspected vandalism	Unattended	Undetermined	Unintentional, cause undetermined	Unknown, not reported	Used for purpose not intended	Used or placed too close to combustibles	Vehicle collision
Number of electrical distribution fires	9	2	104	1,458	12	8	20	7	19	76	1	10	1	2	8	83	60	1	11	23	4

Source: OFM records

Conclusion

Electrical failure was the leading cause of electrical distribution structure fires between 2019 and 2023.

5.0 Product Safety

Ontario Regulation 438/07 *Product Safety* enables the ESA to address the safety of electrical products and equipment. The ESA has oversight for product safety related to the approval of electrical products, including consumer electrical products, before they are sold, used, offered, advertised, or displayed in Ontario. The ESA also responds to unsafe industrial and commercial products and publicizes product safety notices (including recalls) to protect end users.

O. Reg 438/07 authorizes the ESA to protect the public against potentially unsafe electrical products. ESA utilizes a risk-based oversight model to:

- Respond to product safety reports;
- Remove reported potentially unsafe, counterfeit, and unapproved electrical products from sale; and
- Provide education to the public and retailers on their obligation to uphold electrical safety.

The *Canada Consumer Product Act* was enacted in 2011 and provides product safety oversight for consumer electrical products, including mandatory reporting obligations to Health Canada. On an ongoing basis, the ESA routinely works with Health Canada to remove the sale of unapproved consumer electrical products, including removing listings by online retailers. All incidents involving consumer electrical products are required to be reported to Health Canada.

In 2024, Health Canada received 2,028 product reports from across the country, of which 349 reports were about electric ranges or ovens. Products that were most commonly associated with electrical hazards were battery chargers/adapters, electric ranges or ovens, and telephone or telephone accessories. No fatalities were reported, but minor injuries, including electrical shocks and burns, were reported (Health Canada, 2024).

Since 2015, there has been a 75% increase in the number of product incidents reported to the ESA. In 2024, there were 572 reports. Compared to the previous year of 2023, this is a 5% increase.

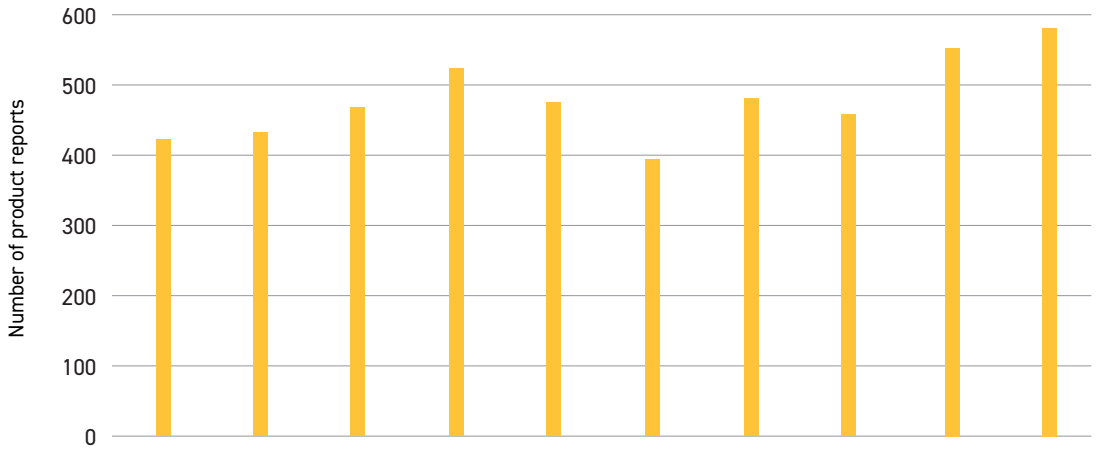
At the ESA, product safety reports are deemed high, medium or low risk by a risk assessment tool based on specific parameters. Some of these parameters include but are not limited to:

- Estimating the likelihood of the product being or becoming defective by evaluating factors such as product certification, use environment, history of compliance or previous product issues, ability to detect defect prior to product use, and pattern of incidents;
- Estimating the likelihood of serious negative effects by evaluating factors such as exposure characteristics, human/device interaction, undetected overheating, and impact of warnings; and
- Assessing severity of the potential impact by evaluating the loss severity as major, moderate, minor, or significant.

In 2024, majority of product safety reports initiated by the ESA were a result of identifying non-compliant products during ESA inspector site visits. Each report is assigned a priority based on its risk profile. Eighty-five percent (485 reports) were assigned as medium risk.

In 2024, 94% of product reports were concerned with unapproved products (products that have not been tested and evaluated to the applicable Canadian safety standards and may not be safe to use). A smaller percentage of reports dealt with certified products (products that were properly certified but reported to have a safety problem or a perceived safety problem).

1 NUMBER OF PRODUCT REPORTS SUBMITTED TO THE ESA IN ONTARIO, 2015–2024



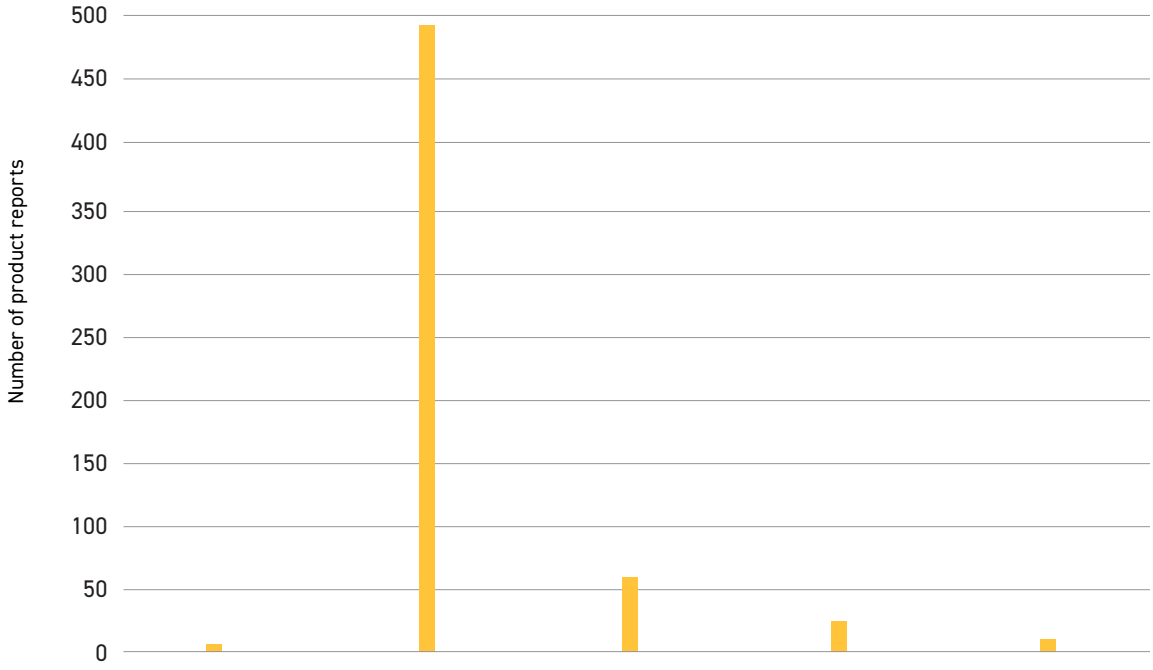
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of product reports	423	432	468	524	475	394	481	458	553	572

Source: ESA records

Conclusion

Between 2015 and 2024, there has been a 35% increase in product reports.

2 NUMBER OF PRODUCT REPORTS BY PRIORITY LEVEL IN ONTARIO, 2024



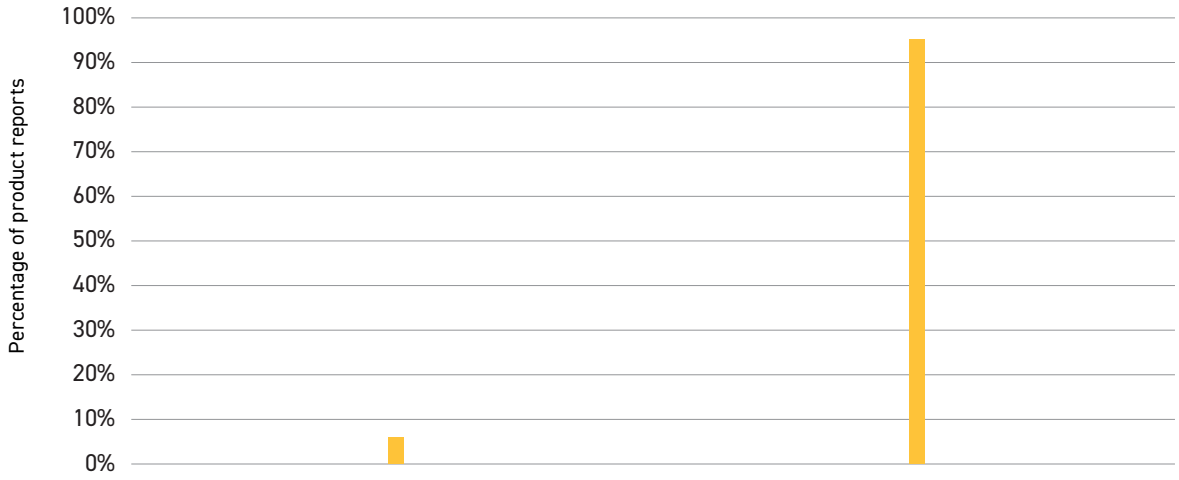
Priority level	Priority 1 (High risk — most important)	Priority 2 (Medium risk)	Priority 3 (Low risk)	Priority 4 (Lowest risk)	Triaged by Health Canada
Number of product reports	2	485	53	23	9

Source: ESA records

Conclusion

In 2024, 85% of product reports to the ESA were classified as Priority 2 (medium risk).

3 NUMBER OF PRODUCT REPORTS BY TYPE IN ONTARIO, 2024



Investigation type	Certified	Unapproved
Percentage of product reports	5%	94%

Source: ESA records

Conclusion

In 2024, 94% of product reports were related to unapproved electrical products.

6.0 Electrical Incident Review

The ESA collects information about reported electrical incidents so that a trend analysis can be made. This allows the ESA to understand the current and potential electrical risks, and to assess compliance with applicable legislative and regulatory requirements. An incident review may be conducted for reported incidents that are electrical in nature, or have the potential to be electrical in nature, which involve equipment/tools/devices that fall under the jurisdiction of the ESA, and meets one or more of the following criteria:

1. The incident review has the potential to provide ESA, or the Authority Having Jurisdiction requesting the review, the opportunity to gain a better understanding of the potential harm;
2. Conducting the incident investigation may potentially address key electrical safety concerns in a proactive manner; and/or
3. When the circumstances of the current electrical incident warrant greater surveillance including, but not limited to, situations where newer technology is involved or the electrical incident fits within the scope of a high-risk harm.

The following information is a summary of what is reported to the ESA's electrical incident database. This includes:

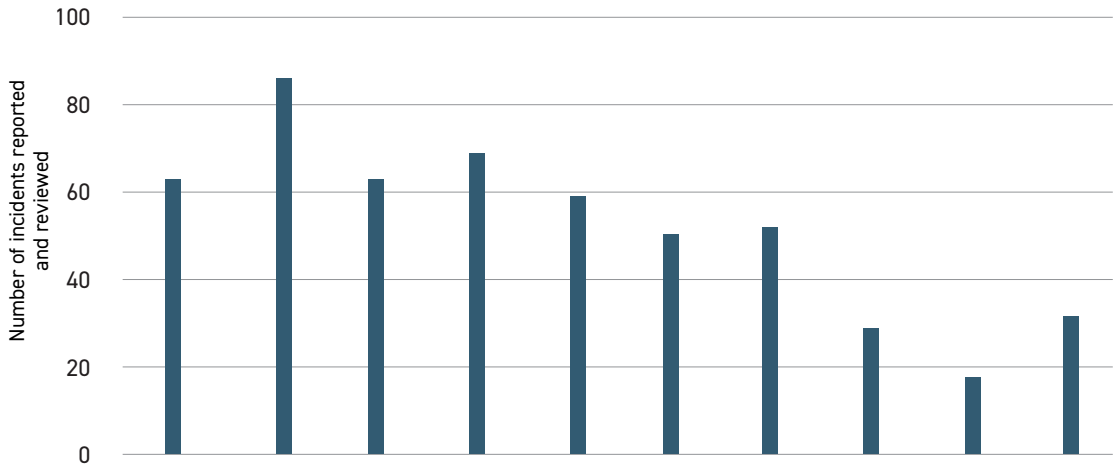
1. General incidents, which are serious or non-serious electrical incidents, where the cause and conditions leading to the incident are apparent and straightforward, and do not require an in-depth fact-finding inquiry; and
2. Root cause incidents, which are conducted for serious or non-serious electrical incidents, where the cause and conditions leading to the incident are complex in that there are multiple causes and/or many conditions present that could contribute to the incident, and it requires an in-depth fact-finding inquiry.

Between 2015 and 2024, 521 electrical incidents were reported and reviewed by the ESA. Six fatalities and five injuries related to unapproved consumer electrical products were reported during this time.

In 2024, 32 incidents were reported to and reviewed by the ESA. This is a 78% increase from 2023. Three percent of these incidents involved utility infrastructure, and thirteen percent of these incidents involved powerlines. Fifty-nine percent of reported incidents were occupational. The most common cause of these incidents is unknown.

A list of incidents reviewed from 2015 to 2024 can be viewed online at **esasafe.com/ontario-electrical-safety-report.**

1 NUMBER OF INCIDENTS REPORTED TO AND REVIEWED BY THE ESA, 2015-2024



Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of incidents reported and reviewed	63	86	63	69	59	50	52	29	18	32

Source: ESA records

Conclusion

In 2024, 32 incidents were reported to and reviewed by the ESA; this is a 78% increase from 2023.

Acknowledgements

The ESA acknowledges and thanks the Ministry of Labour, Immigration, Training and Skills Development of Ontario (MLITSD) for providing information, notifying the ESA of occupational electrical injuries, and co-operating with the ESA in the investigation of these incidents.

The ESA thanks the Office of the Fire Marshal and Emergency Management (OFM) for its continuing support in providing information on fire-related electrical incidents, partnering with the ESA on stove-top fire initiatives, and notifying the ESA of electrical fire incidents.

The ESA also thanks the following organizations for their support:

- The Office of the Chief Coroner for Ontario for sharing coroners' information on electrical-related fatalities and other deaths in Ontario;
- The Workplace Safety and Insurance Board of Ontario (WSIB) for providing occupational injury information; and
- The Canadian Institute of Health Information (CIHI) for providing information on emergency department visits for electrical injury.

Development of this report was led by a team from the ESA, including Freda Lam, Anna Turkalj, Patrick Falzon, Sean Burger, and Patience Cathcart with assistance from staff of the ESA's Utility Regulations, Product Safety, and Communications departments.

Methodology

The ESA receives data from various resources to compile this report. These include the Office of the Chief Coroner, the MLITSD, the OFM, and the WSIB. The ESA then cross-references these data with the coroners' reports, OFM's reports, and the ESA's incident review data to ensure accuracy and understanding of the incidents. Data on non-serious incidents are taken as provided.

The Electrical Safety Authority's Data

The ESA uses Ontario population estimates and projections from Ontario's Ministry of Finance (Population Projections Scenarios for Ontario by Age and Sex, 2022–2046) to determine electrocution and death by fire as rate per population, and Statistics Canada labour force characteristics (Table 14-10-0017-01) to determine occupational injury rates.

The 2015 to 2024 electrocution statistics are based on Ontario coroners' reports, ESA records, and MLITSD reports. At time of writing, OFM fire fatality information is only partially completed due to pending investigations and confirmations.

Data provided by the Office of the Chief Coroner takes precedence over other data in the event of discrepancies.

The electrocution and electrical burn fatality cases in the report are unintentional in nature. Suicide and deliberate attempts to injure are excluded, as well as deaths by lightning strikes. Electrocution from criminal activities such as theft of power, vandalism, pranks, or vehicles hitting a utility pole are counted as part of the statistics but are not included as part of preventable deaths. Death resulting from a fall but initiated by an electrical contact to a worker would not be recorded as an electrical-related fatality and therefore would not be accounted for in electrical injury data.

This report separates occupational and non-occupational (the general public) incidents for reasons of stakeholder interest and to aid in identifying strategies to reduce harm.

Workplace Safety Insurance Board Data

The WSIB defines lost time injuries (LTIs) as all allowed claims by workers who have lost wages as a result of a temporary or permanent impairment. LTI counts include fatalities. This data is provided by WSIB Enterprise Information Warehouse, as of July 2, 2024, for all injury years.

Allowed LTIs for electrical burns and electrical-related fatalities are based on the following CSA Z795-96 nature of injury codes:

- 05200 Electrical burns;
- 05201 First-degree electrical burns;
- 05202 Second-degree electrical burns;
- 05203 Third-degree electrical burns;
- 05290 Electrical burns, N.E.C.; and
- 09300 Electrocutions, electric shocks.

Emergency Department Visits

Separations data from the National Ambulatory Care Reporting System were provided by the Canadian Institute for Health Information (CIHI). Emergency department separation data used in this report are classified according to the Canadian Modification of the 10th revision of the International Classification of Diseases (ICD-10-CA). The inclusion criterion for the report was the presence of T75.4, T75.0, W85, W86, W87, or X33 codes indicating an electrical injury, including being a victim of lightning, among any of the diagnosis or external cause codes assigned to a record.

Reliability of Data

The numbers and figures in this report are based on current information provided to the ESA as of July 2024. Parts of this material are based on data and information provided by the Canadian Institute for Health Information, and are current as of July 5, 2024. However, the analyses, conclusions, opinions, and statements expressed herein are those of the author, and not necessarily those of the Canadian Institute for Health Information. These numbers may change in subsequent reports due to additional information received after the publication of the report. These changes and explanations will be noted in future reports.

While the information is considered to be true and correct at the time of publication, the author does not warrant that it is free from errors or omission. The ESA prepares this report and makes it available on the understanding that the ESA and its employees and agents shall bear no liability of any kind to users of this report for any loss, damage, costs of expense incurred or arising from the use or reliance on the report, whether caused by any error, negligence, omission, or misrepresentation in the report or otherwise.

Fire Source Data

The OFM reports its data by calendar year. Data collection and verification for the year has a one-year lag in reporting in the OESR. The OFM does not publish Ontario statistics until all fire departments have reported. The larger departments — Toronto and Hamilton — generally do not finish their filing until June of the following year. At the time of writing, some OFM data for 2024 is unavailable and data for 2023 is presented instead. The number of fire incidents and fire fatalities are current as of April 30, 2025, and are the most accurate at this point in time.

The following data issues were noted by OFM for 2023 data:

1. OFM Fire Investigations Services has introduced new CAUSE codes for 2021–2023 going forward.
2. A number of fire departments encountered cyber security issues and loss of data. Some municipalities have not been able to submit any data-specific time periods, which may lead to differences when compared to past years.
3. Some municipalities have used a different format for time stamps in reporting, so data may be affected when looking at "time of day" analysis.

The OFM provides information on all fire incidents except for those on federal or First Nations properties. Likewise, information on fire fatalities does not include those on federal or First Nations properties, nor fire deaths in vehicle accidents.

The ESA reports fire incidents based on data provided by the OFM to the ESA on:

- All fires where the ignition source was reported as "electrical distribution equipment" or the fuel of the ignition source was reported as "electricity"; and
- Fire incidents and fire fatalities investigated by the OFM where the ignition source was reported as "electrical distribution equipment" or the fuel of the ignition source was reported as "electricity".

In addition, the ESA conducts its own investigation of fires when called by the local fire department to assist or when jointly investigating fire incidents with the OFM. The ESA presents data that are consistent with the reporting convention of the OFM. Fires are reported by ignition source where the fuel of the ignition source was reported as electricity. It is worth noting that, with the exception of fires identified as having either electrical distribution equipment or electricity as the fuel of the ignition source by the fire departments or the OFM, electricity was not the primary fuel associated with the fire.

These situations are illustrated below.

In the OESR, these fires will be categorized into two types of fires. These are:

1. Fires caused by the ignition of combustibles (liquids and solids) around an electrical device, equipment, appliance, or installation, but which were not the direct result of a failure of electrical equipment, devices, electrical current, or arc flash coming into contact with the object. When the primary fuel associated with the fire is not electricity (such as leaving a stove unattended with the oil catching fire), the OFM labels these fires as cooking fires rather than electrical fires. In addition, the OFM does not recommend using numbers of fire deaths to identify trends and key issues.

   Typically, these types of fires were the direct result of misuse of the equipment, device, or appliance. Some examples of these types of fires are:

   - grease fires on an electrical stove-top as a result of cooking left unattended;
   - clothing catching fire while cooking;
   - clothes dryer catching fire caused by the appliance overheating due to improper cleaning of the lint cache; and
   - combustibles catching fire around heaters or electronics when they are placed too close to the heat source.

2. Fires caused by the ignition of combustibles around an electrical device, equipment, appliance, or installation and were the direct result of the failure of the device, equipment, or installation. In these cases, typical fires are caused by insulation surrounding electrical wiring failing and igniting a combustible in close proximity, or equipment or devices failing, causing them to overheat and later start a fire. Insulation failure could be caused by natural aging, premature aging resulting from overloading, or by mechanical breakdown of the insulation. Fires related to wiring and wiring devices are classified by the OFM as distribution equipment. Please note that the definition of distribution equipment in the fire section is quite different than the distribution equipment in the powerline section of the report.

   Examples of these fires are:

   - Carpet igniting caused by heat build-up of an extension cord placed under a carpet. Over time the insulation of the extension cord fails due to foot traffic on the cord, which leads to mechanical breakdown of the insulation.
   - Electrical wires poorly terminated and an installation performed without using any protective enclosure. Arcing occurs over time, resulting in a fire of combustibles around the wires.
   - Fire caused by a failure of a seized motor powered by electricity.

When fire fatality rates are calculated, the ESA displays data as it is calculated by the OFM, which uses Statistics Canada population estimates as the denominator. When fire fatality data is added to electrical-related death data, Ministry of Finance population estimates are used as the denominator.

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