

Blackout Tracker

Canada Annual Report 2015

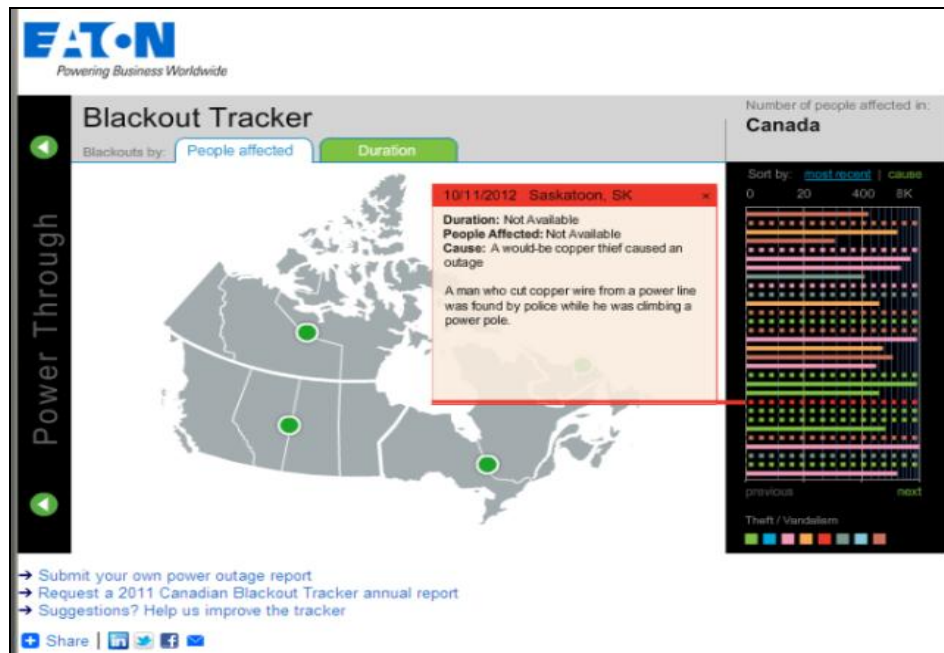
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A Canadian welcome

Thank you for your interest in Eaton's Blackout Tracker Annual Report for 2015. I am confident that you will discover that the information in this report substantiates ever-growing concerns over Canadian power outages, which are responsible for disrupting IT operations, damaging equipment and causing data losses.

We at Eaton are pleased to offer this report and trust that you will find it insightful and useful in helping to protect your business and IT investments against power outages in the future. While productivity and monetary loss to an organization can be extensive and far-reaching regardless of the size of the operation, with proper planning, you can avoid these potentially devastating consequences.

Numerous white papers and other valuable resources are available on the Eaton website, and I encourage you to download these for future reference. They can be a solid partner for helping you develop a strategy to prepare for power outages that could affect your organization.

Your comments and feedback are always appreciated and encouraged.

Sincerely,



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Introduction

Welcome to Eaton's Blackout Tracker Annual Report for 2015. From extensive power cuts resulting from severe storms to smaller, local disruptions that affected just a handful of residents, power outages caused problems for more than 2.4 million people and businesses across Canada over the past year.

This annual report is based on reported power outages in all the provinces and territories. Sources for the data included: news services, newspapers, websites (including those of newspapers, TV stations, etc.) and personal accounts. In all, 346 outages were tabulated and used as the basis for the report — representing a 35 percent increase from the 257 blackouts reported in 2014. This further compares to 137 in 2013, 106 in 2012, 177 in 2011, 194 in 2010, 142 in 2009 and 128 in 2008. (The 2008 data collection began on April 6, so 2008 results are not for a complete year). We at Eaton hope that you not only find the report interesting, but that it prompts you to take appropriate action to prepare for power outages that could affect you and your business.

It is important to note that an unknown number of power outages go unreported each year. The large power outages that impact tens of thousands or even millions of people are well reported, but not all events make headlines. Yet while many power outages last only a few seconds or minutes, they are long enough to significantly disrupt IT operations, damage equipment and cause data loss.

The main body of the report follows this introduction and is organized into two sections:

1. Overview of national power outage data
2. Power outage data by province

Downtime is disastrous

With the ability to cause irreparable damage and irretrievable loss of revenue in a matter of minutes, downtime is, in a word, disastrous. Electrical power outages, surges and spikes are estimated to cost more than \$150 billion in annual damages to the U.S. economy. The price tag varies not only by industry, but by the scale of business operations. For a medium-size business, the exact hourly cost may be lower, yet the impact on the business can be proportionally much larger. Nailing down the cost of each hour of downtime varies widely on a number of factors, such as the nature of the business, the size of the company, and the criticality of its IT systems related to revenue generating processes. For instance, a global financial services organization may lose millions of dollars for every hour of downtime, whereas a small firm might lose only a margin of productivity.

According to Dunn & Bradstreet, 59 percent of Fortune 500 companies experience a minimum of 1.6 hours of downtime per week. Assuming an average staff of 10,000 employees who are paid an average of \$56 per hour (including benefits), the downtime loss in labor alone for a Fortune 500 firm would ring up at \$896,000 per week — or more than \$46 million annually.

Despite the enormous price tag attached to downtime, there's still good news: by investing in power backup solutions to protect critical systems, you can significantly slash the risks and consequences.

Canada's 5 most significant reported outages

1. **Whipping winds**, August 29 – Vancouver, BC: Some 250 line technicians were working feverishly to restore power in the Lower Mainland after a massive windstorm left more than half a million customers in the dark.
2. **Troubled transmission**, Jan. 13 – Montreal, QB: Some 277,000 customers were left powerless after a transmission line failure caused a massive 90-minute blackout.
3. **Rain, rain, go away**, Jan. 4 – Montreal, QB: Freezing rain was blamed for knocking out power to 150,000 customers.
4. **Lingering loss**, Jan. 24 – York, ON: A building finally had its power restored after four days without reliable hydro. Residents — many senior or disabled — reported that service for basic utilities remained spotty after a small generator was brought in to (unsuccessfully) power the 500-unit building.
5. **Holiday havoc**, Dec. 24 – Montreal, QB: Some 148,000 customers spend Christmas Eve and part of Christmas Day in the dark, after powerful winds devastated the power supply.

Canada's 5 most unusual reported outages

1. **Swan song**, Jan. 13, 15, 16 — Meadowood, BC: Not one, not two, not three, but four dead trumpeter swans — responsible for causing three power outages in less than a week — prompted B.C. Hydro crews to start installing "bird diverters" in the city.
2. **Damn mist, I mean dam mist**, Nov. 25 – Yarmouth, NS: Heavy rain earlier in the week led to significant water spilling over a hydro dam, resulting in a blackout to 7,045 customers.
3. **All fired up**, April 18 – Burlington, ON: A 14-year-old boy faced numerous charges after a grass fire caused an outage and hundreds of thousands of dollars in damage. Police said the boy had been using a lighter to burn small items when the fire quickly spread and caused several wooden hydro poles to catch fire.
4. **Bumpy landing**, March 29 – Halifax, NS: An Air Canada plane made an abrupt landing in bad weather, leaving the runway at the Halifax airport and briefly knocking out power.
5. **Trash talk**, Oct. 27 – Regina, SK: A city garbage truck accidentally contacted and pulled down a guy wire in a back alley, causing a widespread outage.

Provinces and territories ranked by number of reported outages.

2015	2014	2013
1. Ontario — 135	1. Ontario – 86	1. Ontario – 47
2. British Columbia — 56	2. British Columbia – 54	2. British Columbia – 32
3. Manitoba — 33	3. Manitoba – 21	3. Alberta – 14
4. Nova Scotia — 32	4. Nova Scotia – 20	4. Nova Scotia – 12
5. Saskatchewan — 23	5. Alberta — 19	4. Quebec — 12
6. Alberta — 14	6. Saskatchewan – 13	5. Manitoba – 10
7. Newfoundland — 13	7. Quebec – 12	6. Saskatchewan – 5
8. New Brunswick — 12	7. Newfoundland — 12	7. New Brunswick — 3
9. Quebec — 10	8. New Brunswick — 11	8. Newfoundland — 1
10. Yukon — 7	9. Prince Edward Island — 5	8. Prince Edward Island — 1
11. Prince Edward Island — 5	10. Yukon — 2 Northwest Territories— 2	

Outages closely linked to business continuity losses

File this in the “unsurprising fact” folder: a recent [analysis](#) by Allianz Global Corporate & Specialty confirmed that power interruptions are among the leading global causes of business continuity insurance losses. Based on a study of nearly 2,000 business insurance claims from 68 countries between 2010 and 2014, the report estimated the average large business property claim at a staggering \$2.4 million, with blackouts ranked among the top 10 causes of such losses.

Allianz, a specialist insurer for business and industrial risks, revealed that the 10 sources — with fire and explosion topping the list — accounted for more than 90 percent of all business interruption losses globally, with the majority attributed to non-natural catastrophe events. In fact, the report excluded losses from claims related to “very large events,” such as Superstorm Sandy in 2012.

Allianz attributed the recent rise in business-interruption insurance losses to increasingly interconnected and complex global supply chains. “Power infrastructure, for example, was once localized and isolated, but today, energy supply and distribution are far more integrated and span entire continents,” the report states. “As a result of increased interconnectivity, a solar storm or a cyber-attack on a power grid could result in countrywide blackouts lasting days, or potentially weeks, with a multitude of knock-on effects.”

Catastrophic weather leads to longer outages

If you feel like you’re being left in the dark longer than ever before, it’s not just your imagination. Now [a study](#) from the Lawrence Berkeley National Laboratory and Stanford University has confirmed that catastrophic weather is the culprit.

Researchers from both institutions, who deemed their report “the most comprehensive study of this topic to date,” examined 13 years worth of data on the annual duration and frequency of power interruptions for a large cross-section of U.S. electricity distribution utilities. While the number of blackouts per year hasn’t dramatically changed, the duration has, and researchers blame the weather.

“This finding suggests that increasingly severe weather events are linked to a 5 to 10 percent increase in the total number of minutes customers are without power each year,” according to the study’s lead author Peter Larsen, Berkeley Lab Research Scientist and Stanford PhD candidate.

Factoring data related to lightning strikes, precipitation levels, wind speed and temperatures, researchers discovered some interesting effects. For instance, a mere 5 percent increase in annual average wind speeds produced a 56 percent increase in the total amount of time that a utility’s customers were without power over the course of a year. Furthermore, a 10 percent increase in annual precipitation translated to a 10 percent increase in the duration of an outage.

The authors of the study suggest that as climate continues to change, so should adaptations to the electrical grid. “We hope the findings from the study will provide a more solid basis upon which to ground future private and public decisions on the long-term reliability of the U.S. electric power system,” said co-author and Berkeley Lab Staff Scientist Joseph Eto.

How prepared are you for a power outage?

Homeowners are learning from experience: a recent [Harris Poll found](#) that two-thirds of people who had experienced a prolonged power outage were motivated by their time in the dark to better prepare. The survey, conducted last spring and sponsored by Briggs & Stratton, also found that one out of every four homeowners had lost power for 12 hours or longer at least once in the last two years — with approximately 66 percent confirming that they would alter their approach prior to the next outage.

At the very least, the Federal Emergency Management Agency recommends that families compile an emergency preparedness kit and implement a communication plan. Furthermore, another tip is to consider purchasing a portable generator or a home standby generator. During natural disasters such as hurricanes, it can take a long time for utility power to return to neighborhoods, as winds often damage

trees and block roads, making it difficult to repair power lines. In these instances, generators can keep homes from enduring lengthy power interruptions.

Board axes utility's plans to clear trees

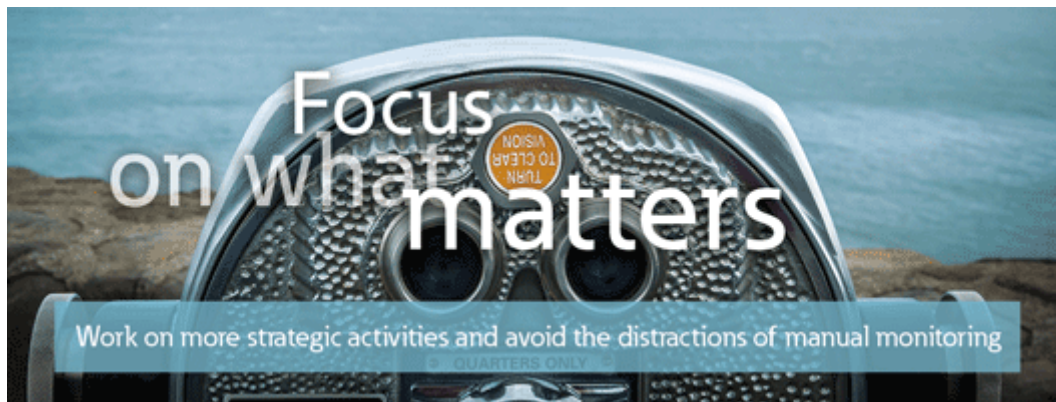
In an effort to prevent significant power outages caused by fallen trees and branches, Nova Scotia Power (NSP) sought the authority to clear the area around 1,400 km of its power lines this year. However, the organization's motion was denied by the Nova Scotia Utility and Review Board, which ruled that the utility can't cut down trees and branches to power lines without permission from municipalities. The decision came after the city of Halifax argued that the utility company shouldn't have the authority.

"It creates a situation where, again, we have to work with municipalities individually and make sure that we can balance what they want to happen with the reliability of the system," explained David Rodenhiser, communications manager for NS.

NSP's request was driven in part by the devastation left by post-tropical storm Arthur, which hit the province in 2014 and caused widespread outages.

Rodenhiser added that the City of Halifax and NSP are currently negotiating a new agreement.

What you can do to protect your business



In today's climate, 100% uptime is expected no matter what, making your [#1 concern business continuity](#). When an unplanned outage happens, your focus shifts to resolving the issue and reducing data loss. What if you were able to monitor and control power so you can spot potential issues and resolve them before they escalate?

Eaton's [PredictPulse™](#) remote monitoring service and [Intelligent Power Manager](#) (IPM) software help you do that, plus so much more. When used together, they give you the support of Eaton's technical alarm experts who keep tabs on your power devices 24x7 and alert you to any anomalies, along with the ability to monitor, manage and control your power devices even when you're away from the office. If there's an extended power event, IPM also helps maximize the runtime of critical equipment and ensure data integrity. This all keeps downtime to a minimum—and makes your life a little easier.

Are you looking to protect your home? Check out [Eaton's home generator sizing tool](#). We offer a complete line of backup power generators that will provide you with reliability and worry-free systems to protect your home during power outages.

Overview of national power outage data

This section provides aggregate data for Canada and includes all the data found in the subsequent province section.

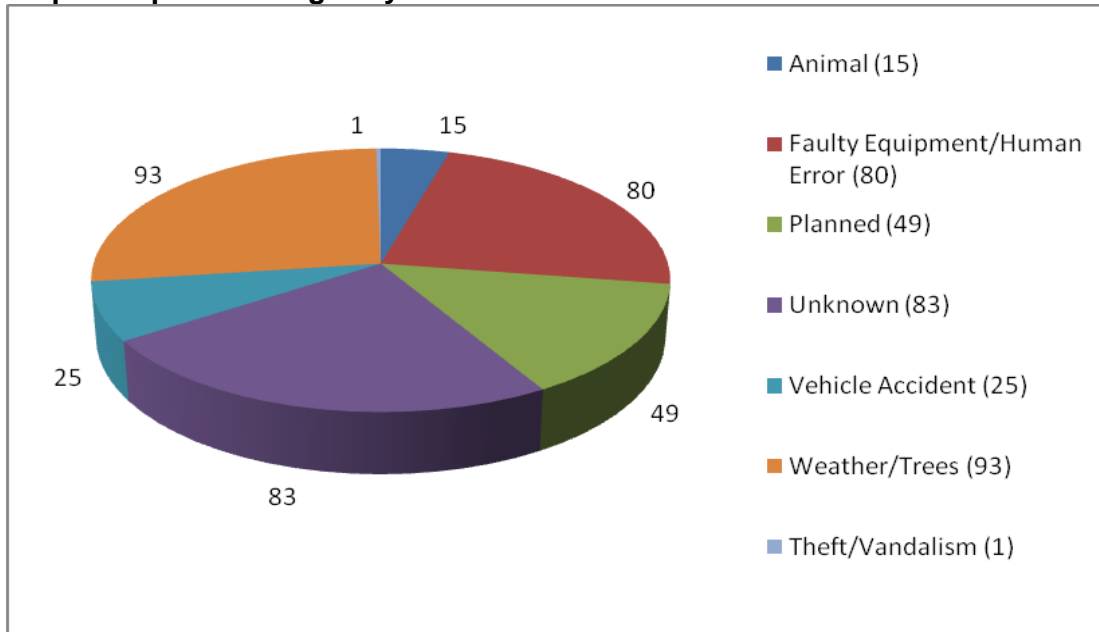
Outage summary

Total number of people affected by outages <i>(This is the sum of the number of people affected by reported power outages in Canada starting January 1, 2013.)</i>	2,484,744
Total duration of outages <i>(This is the sum of the durations of the reported power outages.)</i>	28,188 minutes (more than 19 1/2 days)
Total number of outages <i>(The sum of the number of reported power outages.)</i>	346
Average number of people affected per outage <i>(This number is determined by dividing the "Total number of people affected by outages" by the number of outages that reported the number of people affected. Not all reports of outages included number of people affected. The number of outages used for this calculation can be found in the note following this table.)</i>	7,308
Average duration of outage <i>(This number is determined by dividing the "Total duration of outages" by the number of outages that reported durations. Not all reports of outages included the duration. The number of outages used for this calculation can be found in the note following this table.)</i>	83 minutes

Notes:

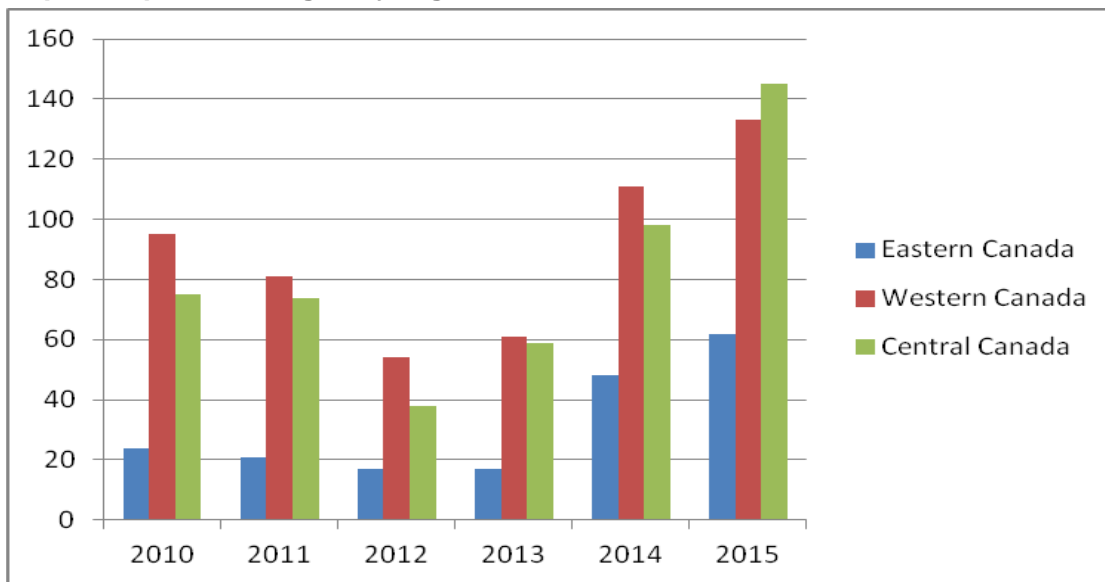
- a. Total number of people affected (and average) based on 218 (63%) of the total reported outages. Total duration of outages (and average) based on 100 (29%) of the total reported outages.
- b. Reports from news services, newspapers, websites, etc. that are used as sources sometimes give statistics using different terms. For example, some reports may be based on "people" while others may be based on "addresses," "homes and businesses" or "utility customers." For purposes of this report all of these are assumed to be, and are counted, as people.

Reported power outages by cause



Note: Each power outage was grouped into one of seven possible causes. The outages by cause were totaled. The number adjacent to the pie piece represents the percentage of outages attributable to that cause.

Reported power outages by region



Regions:

East: Newfoundland, New Brunswick, Nova Scotia, Prince Edward Island

West: Alberta, British Columbia, Manitoba, Northwest Territories, Saskatchewan, Yukon

Central: Ontario, Quebec

Power outage data by province

Introduction

This section of the report provides an analysis of the power outages by province. There are four parts to each analysis.

1. The first part is an outage summary. The results are computed in the same manner as those in the outage summary found in the overview of national power outage data in the previous section of this report. Only data pertaining to the particular province is used.
2. The second part of the analysis on each province is the outage fact. This is simply an interesting fact concerning a particular outage (or outages) in a province.
3. The third part of the analysis is a chart of the reported power outages by cause, which is the same type of chart that can be found in the overview of national power outage data. Only data pertaining to the particular province is used.
4. The last part of each provincial section is the number of reported power outages by month, which is the same type of chart that can be found in the overview of national power outage data. Only data pertaining to the particular province is used. From this chart it may be possible to determine particular times of the year when power outages are more common.
5. Data collection began April 6, 2008.

Note: Only two outages each were tallied for Yukon and Northwest Territories in 2014. As a result, individual outage information was not broken down for these territories.

Alberta

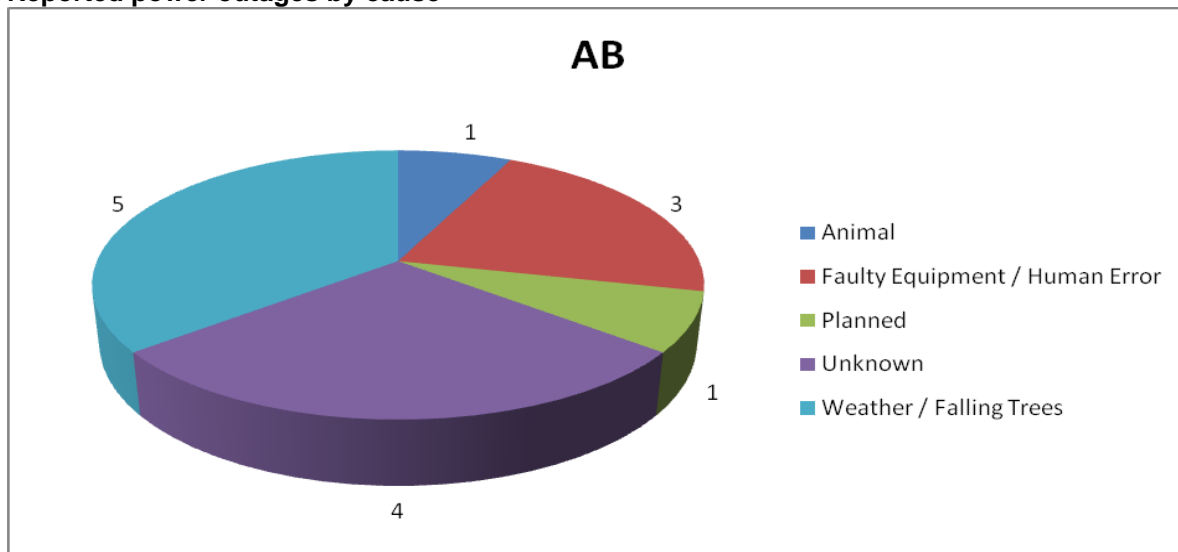
Outage summary

Total number of people affected by outages	9,910
Total duration of outages	480 minutes (8 hours)
Total number of outages	14
Province/territory ranking (number of outages)	6
Average number of people affected per outage	708
Average duration of outage	34 minutes

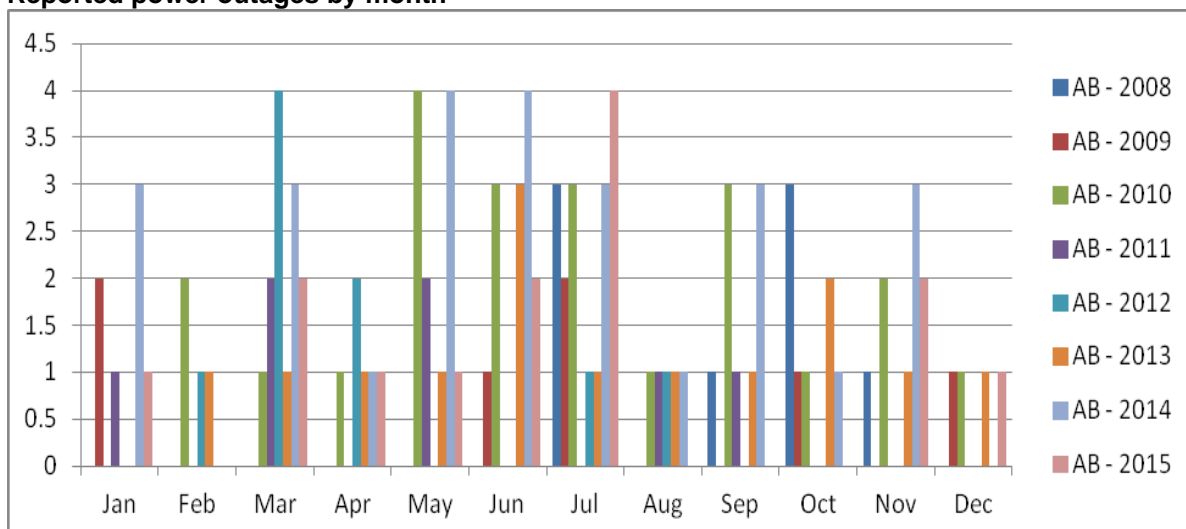
*Note: Total number of people affected (and average) based on 3 (21%) of the total reported outages.
Total duration of outages (and average) based on 1 (7%) of the total reported outages.*

Outage fact: On March 9, an unlucky raven caused a power cut that affect 2,800 in Lac La Biche County. The errant bird landed in the wrong place at a substation, with rolling blackouts necessitated because the power load was too heavy.

Reported power outages by cause



Reported power outages by month



British Columbia

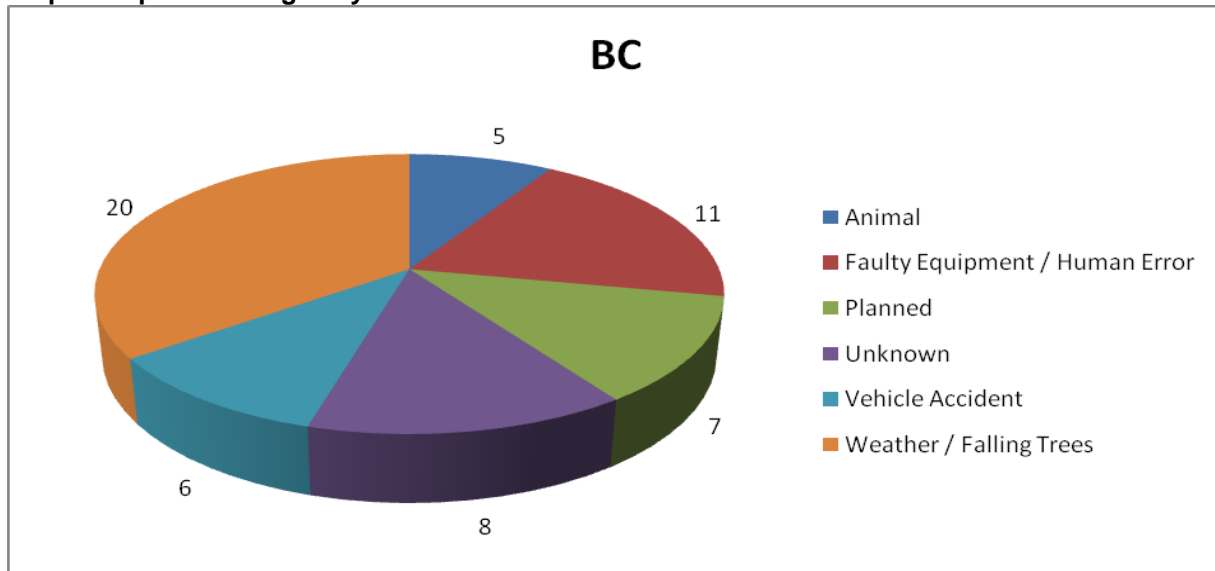
Outage summary

Total number of people affected by outages	821,475
Total duration of outages	2,682 minutes (1.8 days)
Total number of outages	56
Province/territory ranking (number of outages)	2
Average number of people affected per outage	14,669
Average duration of outage	48 minutes

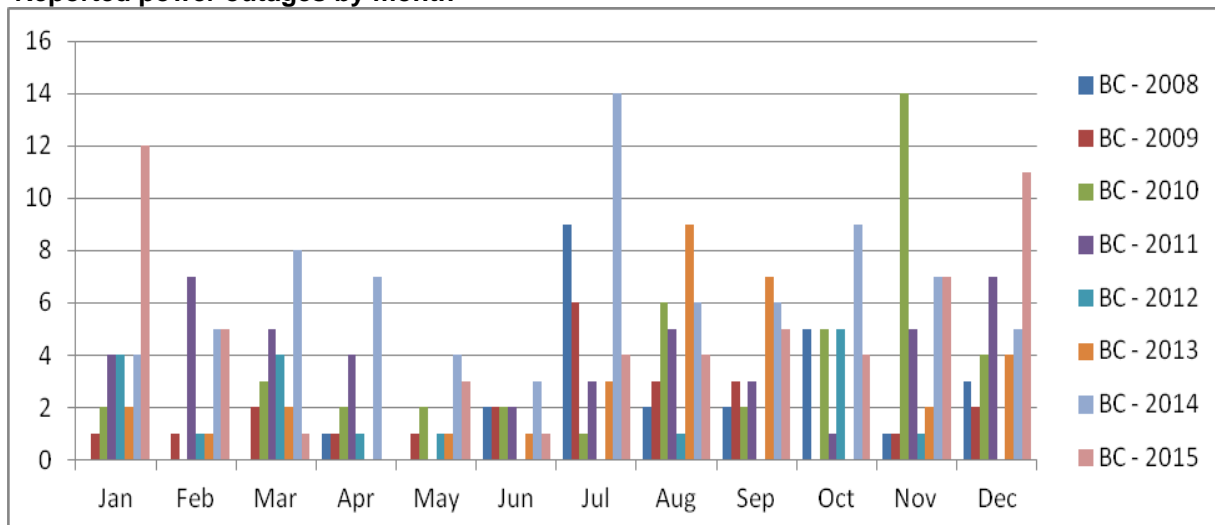
Note: Total number of people affected (and average) based on 39 (70%) of the total reported outages. Total duration of outages (and average) based on 11 (20%) of the total reported outages.

Outage fact: On May 11, some 12,000 Salmon Arm customers were left in the dark following a loud boom, which the utility reported was caused by a malfunctioning circuit breaker.

Reported power outages by cause



Reported power outages by month



Manitoba

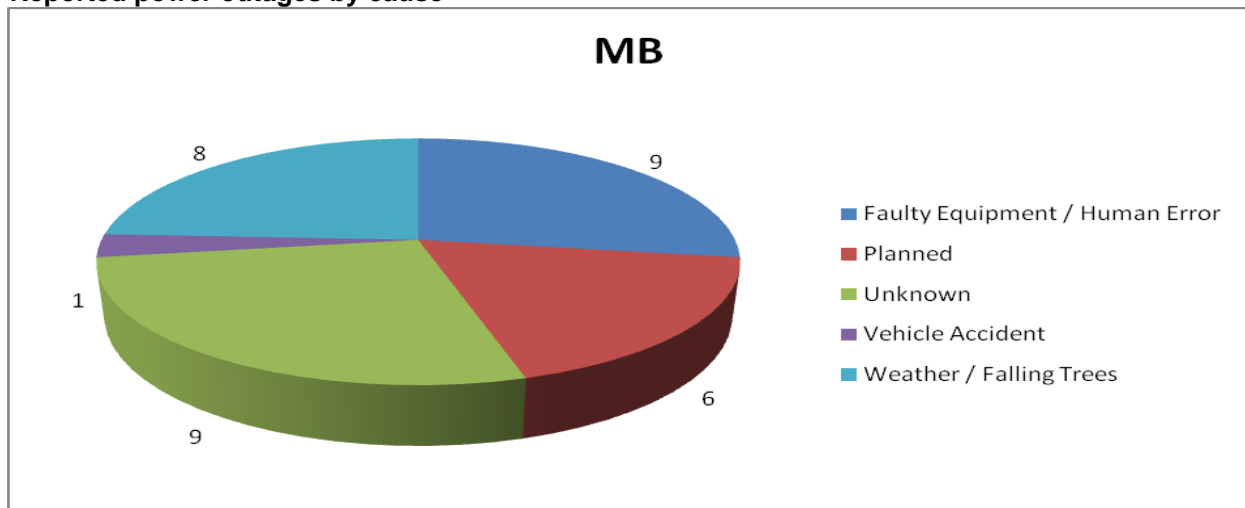
Outage summary

Total number of people affected by outages	92,029
Total duration of outages	2,610 minutes (1.8 days)
Total number of outages	33
Province/territory ranking (number of outages)	3
Average number of people affected per outage	2,789
Average duration of outage	79 minutes

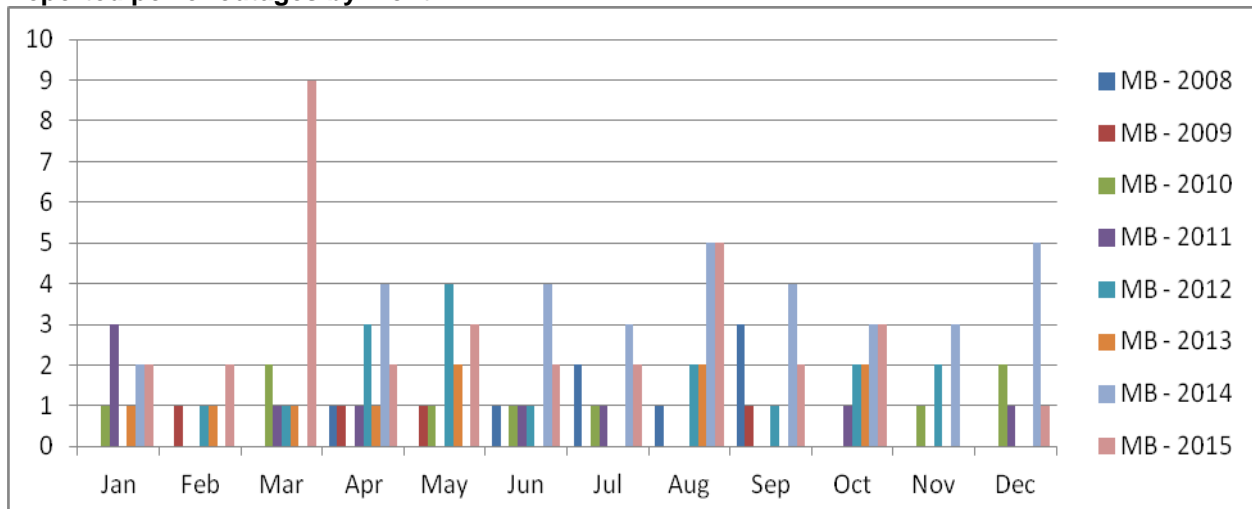
*Note: Total number of people affected (and average) based on 23 (70%) of the total reported outages.
Total duration of outages (and average) based on 11 (33%) of the total reported outages.*

Outage fact: On May 18, instead of wearing shorts and slapping on sunscreen, Manitobans celebrated the first long weekend of the summer with whiteout snow conditions on highways, strong winds and wind warnings on lakes. At least 5,000 in Virden were left without power.

Reported power outages by cause



Reported power outages by month



New Brunswick

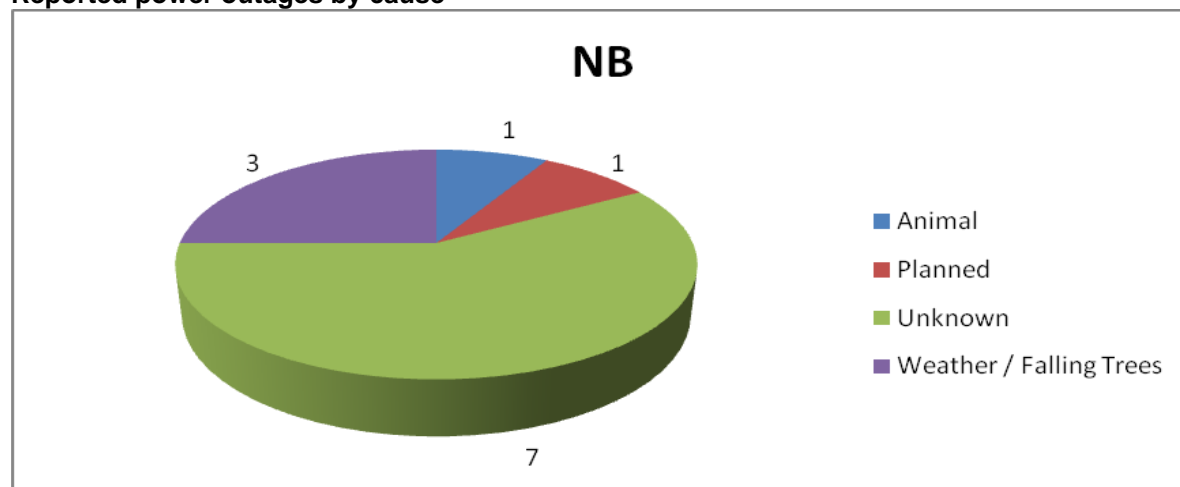
Outage summary

Total number of people affected by outages	78,620
Total duration of outages	420
Total number of outages	12
Province/territory ranking (number of outages)	8
Average number of people affected per outage	6,552
Average duration of outage	35

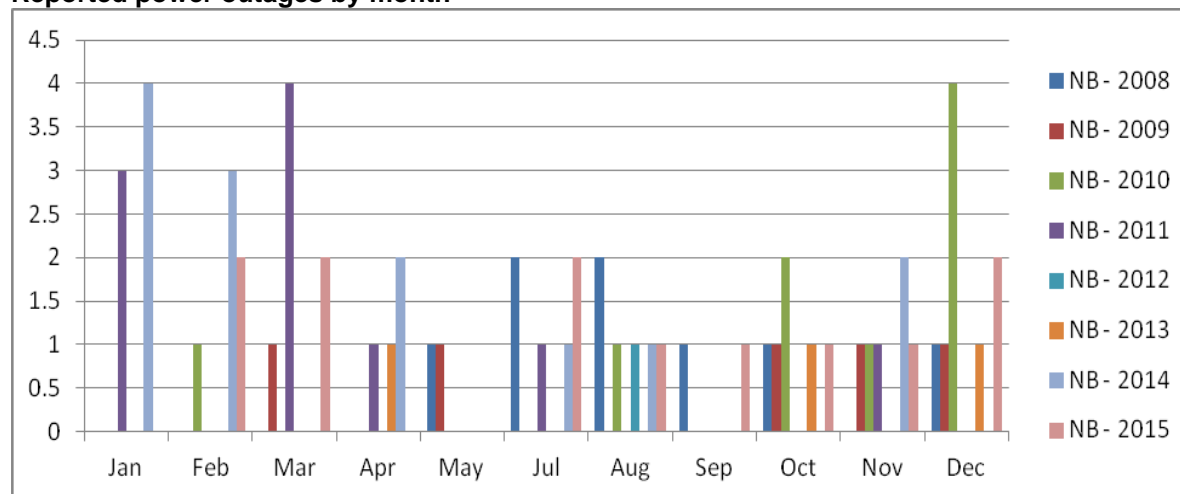
Note: Total number of people affected (and average) based on 10 (83%) of the total reported outages. Total duration of outages (and average) based on 2 (17%) of the total reported outages.

Outage fact: On March 30, 900 Fredericton customers were left in the dark after crows came into contact with switches on a main line and cut power.

Reported power outages by cause



Reported power outages by month



Newfoundland and Labrador

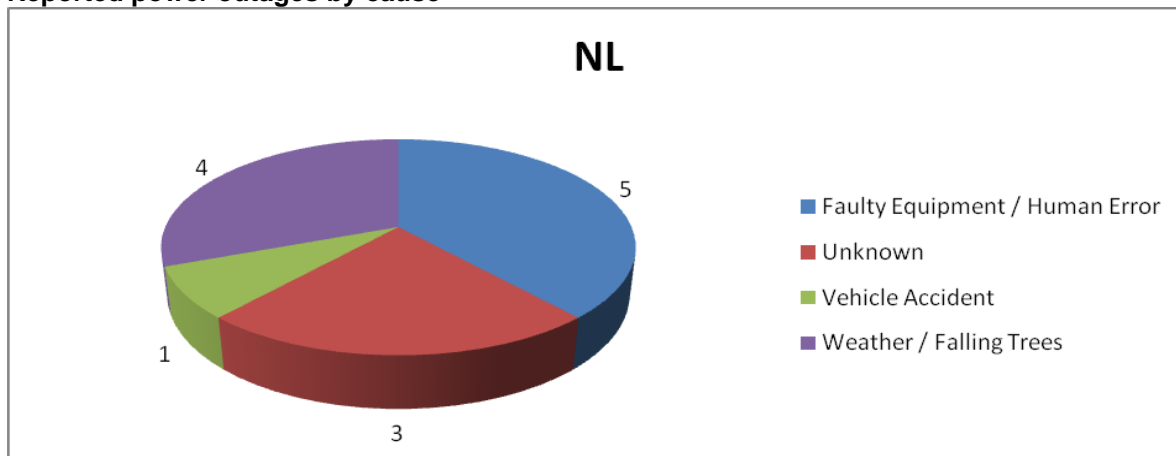
Outage summary

Total number of people affected by outages	141,440
Total duration of outages	440
Total number of outages	13
Province/territory ranking (number of outages)	7
Average number of people affected per outage	10,880
Average duration of outage	8

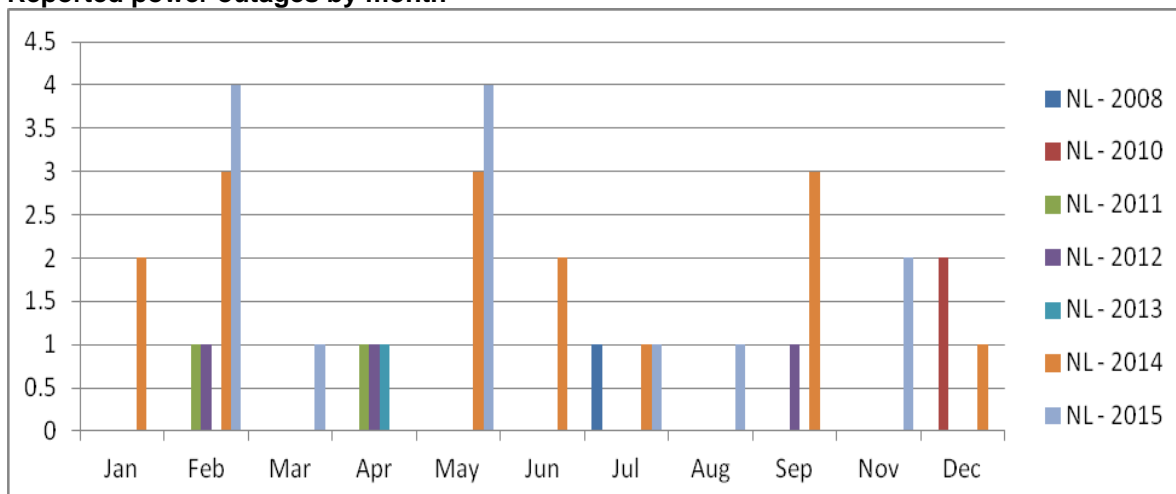
Note: Total number of people affected (and average) based on 3 (23%) of the total reported outages. Total duration of outages (and average) based on 2 (15%) of the total reported outages.

Outage fact: On March 4 in St. Johns, 80,000 customers lost power after electricity generator Hydro said it experienced "a system status power emergency" involving its Holyrood station. The disruption prompted Newfoundland Power to put rotating outages into effect as it tried to manage supply amid freezing temperatures.

Reported power outages by cause



Reported power outages by month



Nova Scotia

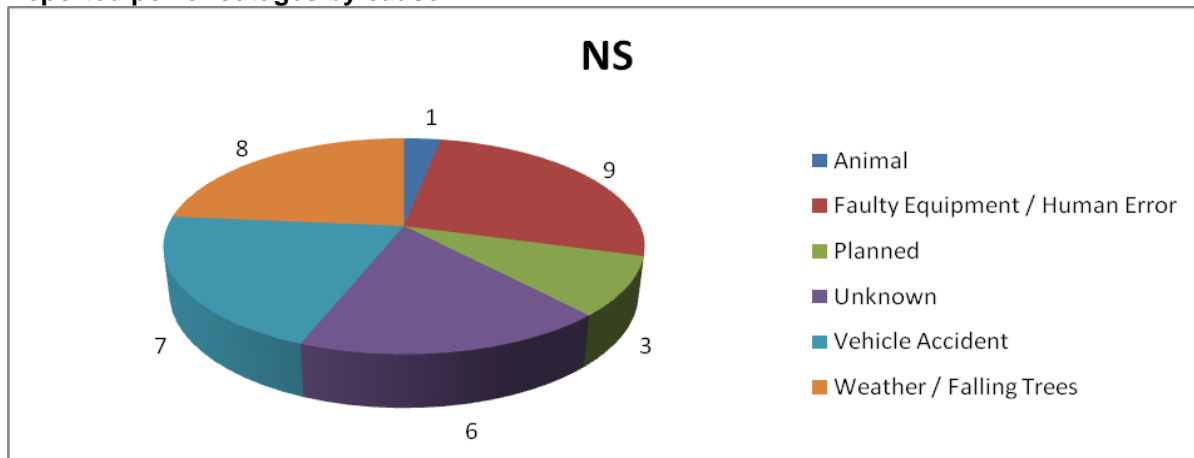
Outage summary

Total number of people affected by outages	189,113
Total duration of outages	2,846 minutes (nearly 2 days)
Total number of outages	32
Province/territory ranking (number of outages)	4
Average number of people affected per outage	5,910
Average duration of outage	89 minutes

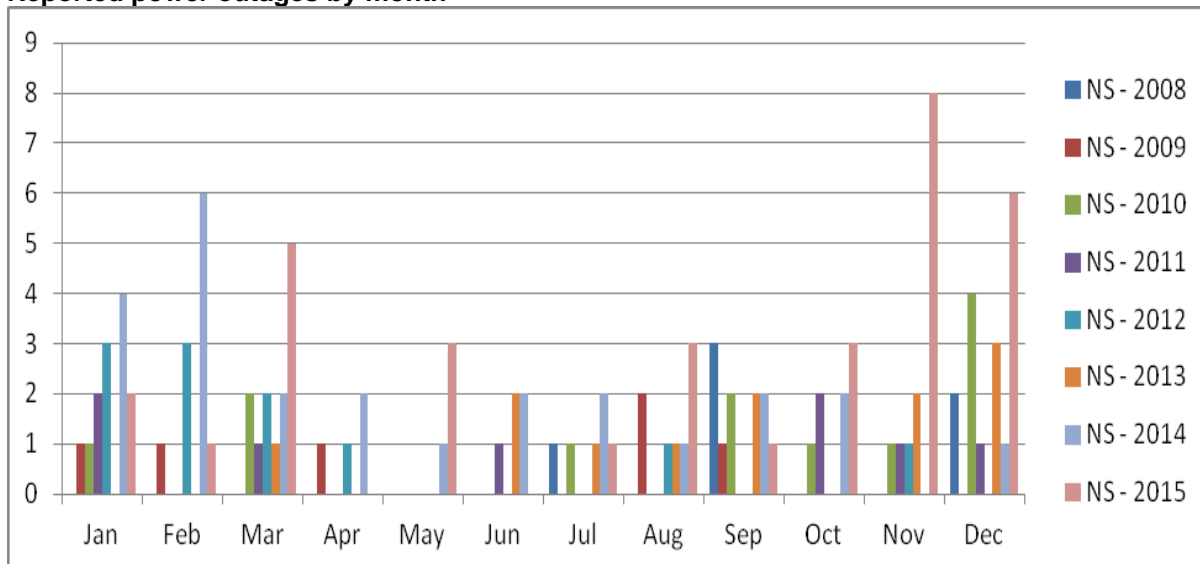
Note: Total number of people affected (and average) based on 26 (81%) of the total reported outages. Total duration of outages (and average) based on 10 (31%) of the total reported outages.

Outage fact: A lightning struck a major transmission line in Halifax August 22, knocking out power to 83,000 customers for more than an hour.

Reported power outages by cause



Reported power outages by month



Ontario

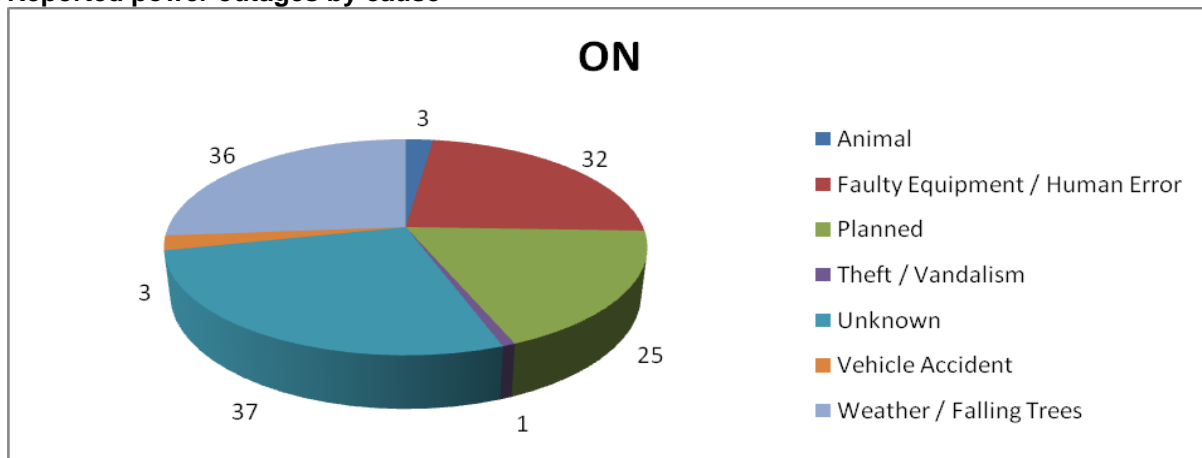
Outage summary

Total number of people affected by outages	623,710
Total duration of outages	16,620 minutes (11 1/2 days)
Total number of outages	135
Province/territory ranking (number of outages)	1
Average number of people affected per outage	4,620
Average duration of outage	123 minutes (more than 2 hours)

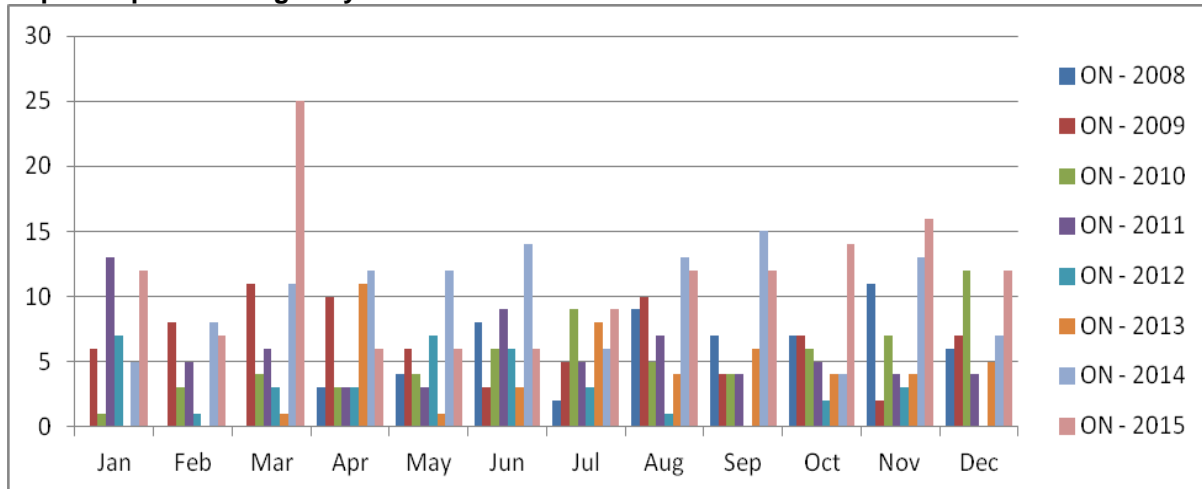
*Note: Total number of people affected (and average) based on 94 (70%) of the total reported outages.
Total duration of outages (and average) based on 48 (35%) of the total reported outages.*

Outage fact: On Dec. 3, an Ottawa utility lost its power supply from Hydro One, leaving 5,000 Orleans residents in the dark. Hydro Ottawa said crews performed emergency switching to restore service, with most reconnected within two hours.

Reported power outages by cause



Reported power outages by month



Prince Edward Island

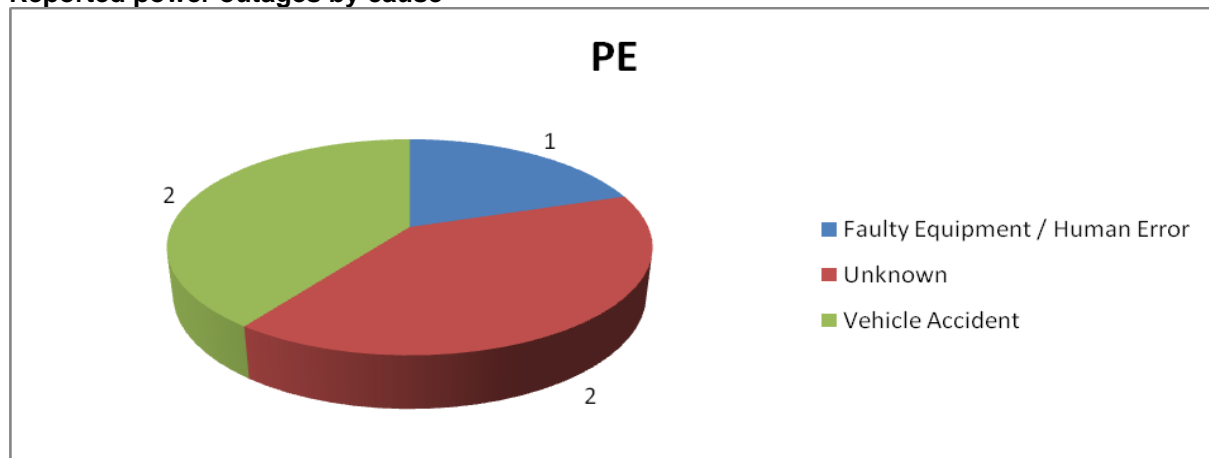
Outage summary

Total number of people affected by outages	21,400
Total duration of outages	180 minutes (3 hours)
Total number of outages	5
Province/territory ranking (number of outages)	9
Average number of people affected per outage	4,280
Average duration of outage	36 minutes

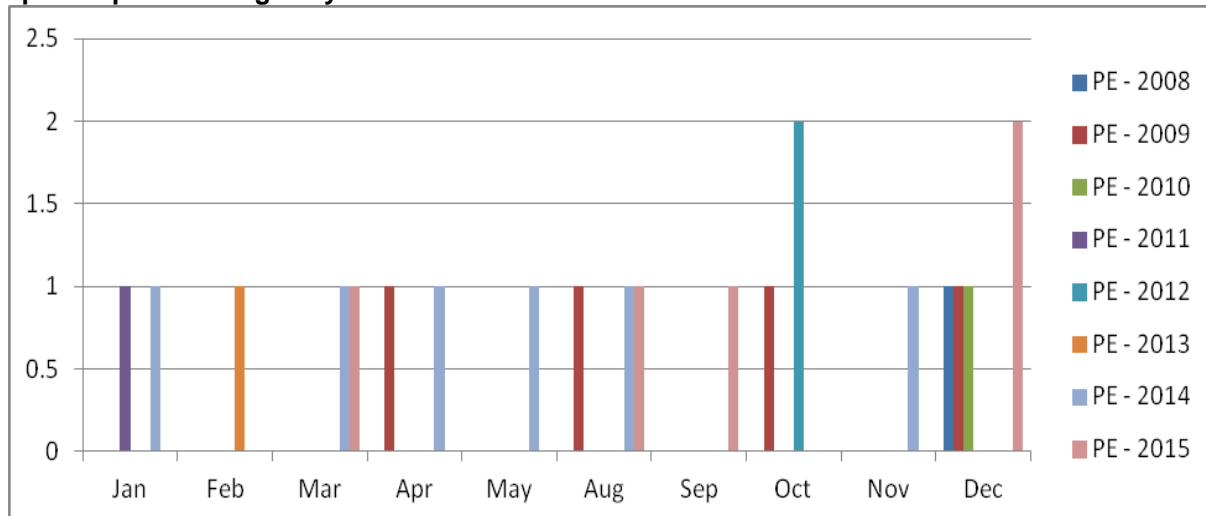
*Note: Total number of people affected (and average) based on 3 (60%) of the total reported outages.
Total duration of outages (and average) based on 1 (20%) of the total reported outages.*

Outage fact: On Dec. 3 in Stratford, a vehicle knocked down a pole, damaging a major transmission structure and cutting electricity to 19,000 customers.

Reported power outages by cause



Reported power outages by month



Quebec

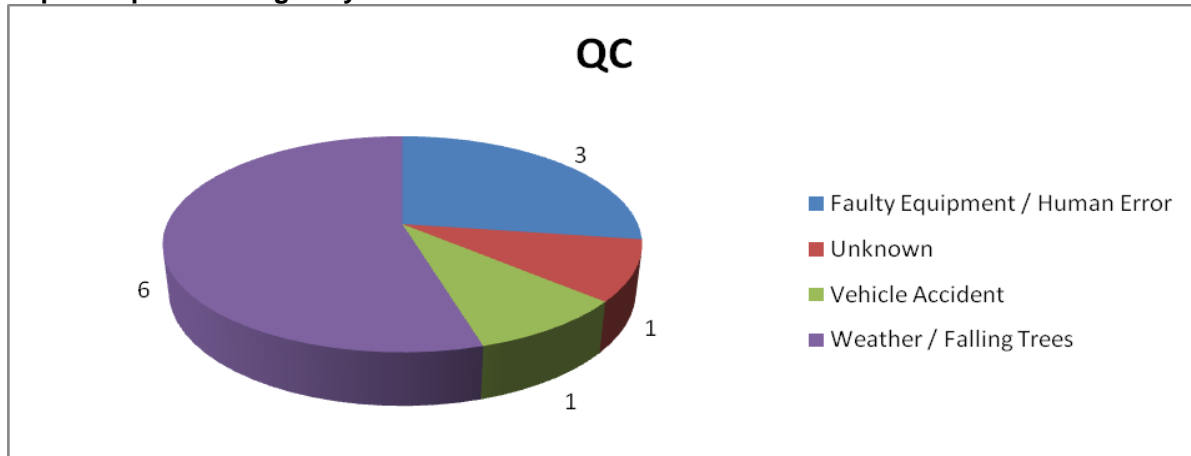
Outage summary

Total number of people affected by outages	469,747
Total duration of outages	390 minutes (6 1/2 hours)
Total number of outages	10
Province/territory ranking (number of outages)	9
Average number of people affected per outage	46,975
Average duration of outage	39 minutes

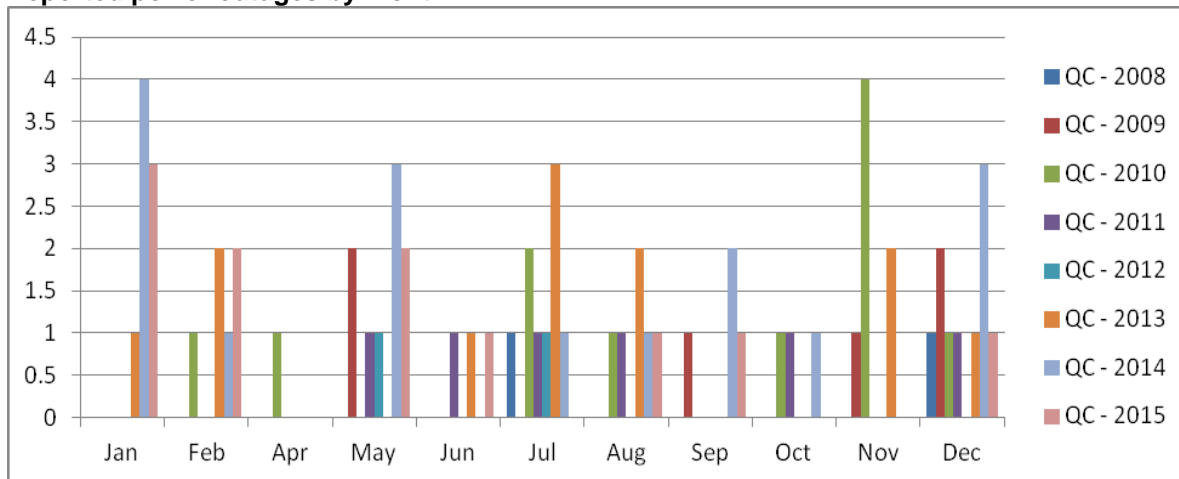
Note: Total number of people affected (and average) based on 8 (80%) of the total reported outages. Total duration of outages (and average) based on 2 (20%) of the total reported outages.

Outage fact: On June 14 in Gastineau, an impaired driver struck a Hydro pole, knocking out power for five hours. Tests later revealed that her blood-alcohol level was more than twice the legal maximum.

Reported power outages by cause



Reported power outages by month



Saskatchewan

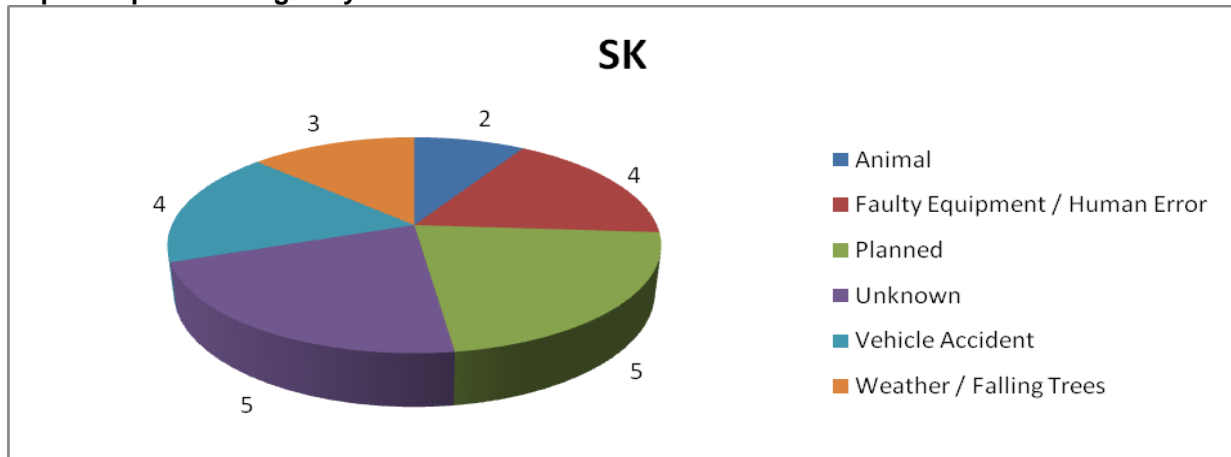
Outage summary

Total number of people affected by outages	26,830
Total duration of outages	1,320 minutes (22 hours)
Total number of outages	23
Province/territory ranking (number of outages)	5
Average number of people affected per outage	1,167
Average duration of outage	57 minutes

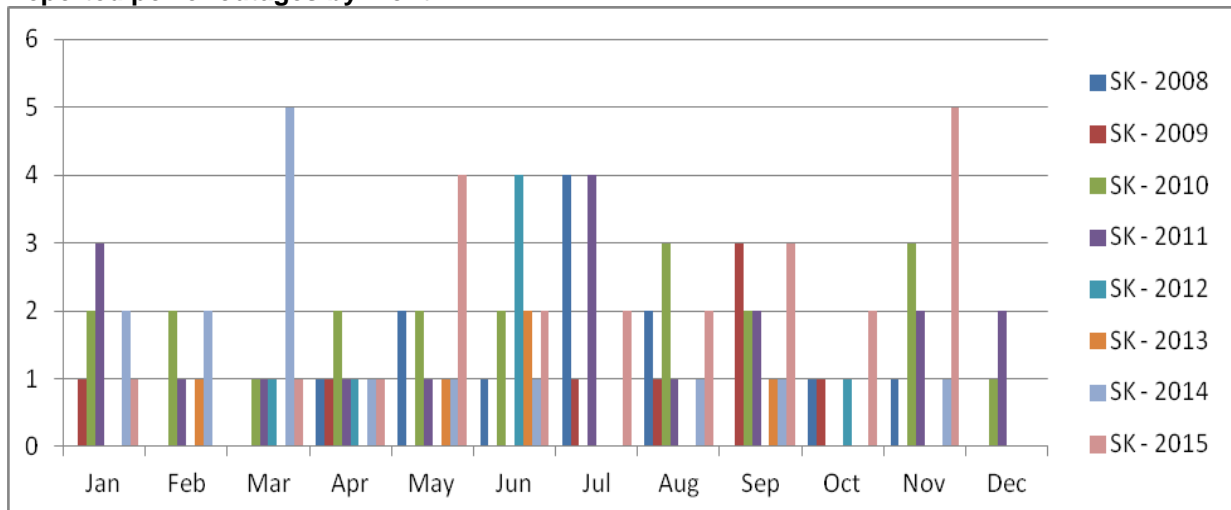
*Note: Total number of people affected (and average) based on 4 (17%) of the total reported outages.
Total duration of outages (and average) based on 7 (30%) of the total reported outages.*

Outage fact: Wind wreaked havoc on power lines in Moose Jaw Oct. 11, breaking power poles as 20,000 people lost electricity.

Reported power outages by cause



Reported power outages by month



Yukon

Outage summary

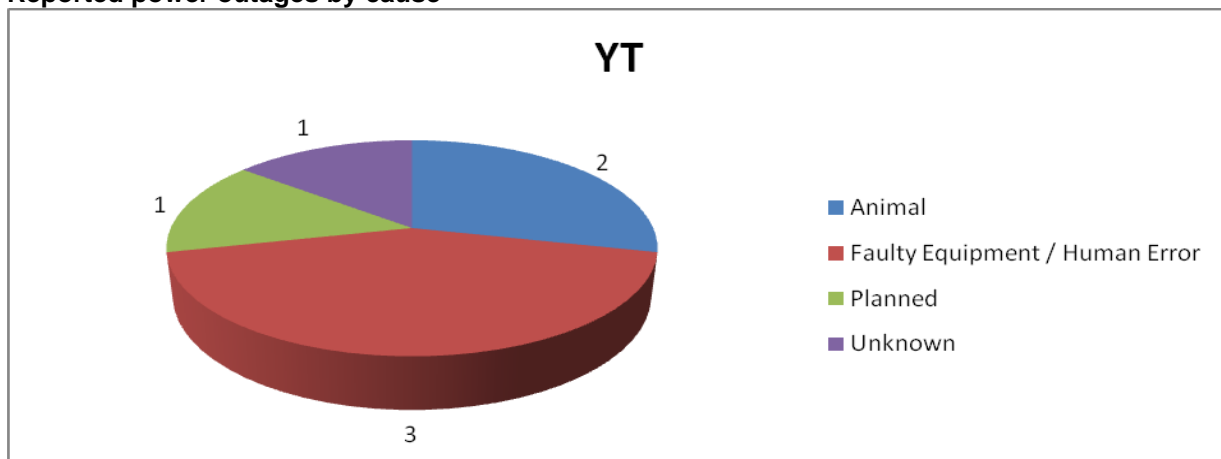
Total number of people affected by outages	10,470
Total duration of outages	535 minutes (nearly 9 hours)
Total number of outages	7
Province/territory ranking (number of outages)	10
Average number of people affected per outage	1,496
Average duration of outage	76 minutes

Note: Total number of people affected (and average) based on 4 (57%) of the total reported outages.

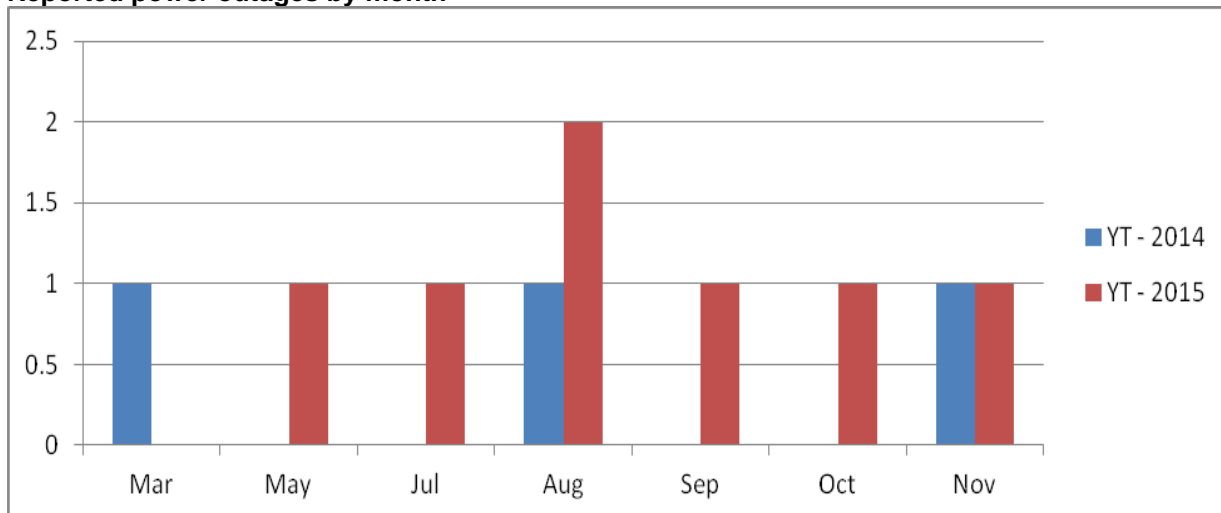
Total duration of outages (and average) based on 5 (71%) of the total reported outages.

Outage fact: A raven came in contact with power equipment in Whitehorse July 10, resulting in 100 customers losing power for more than four hours.

Reported power outages by cause



Reported power outages by month



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