



Electricity Engineers'
Association

**HEALTH &
SAFETY**

2019

Electricity Supply Industry (ESI) Safety Performance Indicators Report

Reporting period: 1 July 2018 - 30 June 2019

EEA.CO.NZ



Industry snapshot



0 fatalities for six consecutive years



2020 25% ESI LTIFR reduction target from 2009 baseline already met



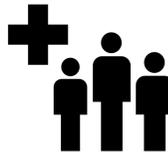
27% of all LTIs resulted in more than one week off work (35% last year)



The most common significant event type was Electricity. This was closely followed by Driving.



LTIFR Trends (per 200,000 hrs)
Compared to 2009 baselines



TRIFR Trends (per 200,000 hrs)
Over the last three years

Category	LTIFR Trends (per 200,000 hrs) Compared to 2009 baselines	TRIFR Trends (per 200,000 hrs) Over the last three years
 Generation	 From 0.8 to average of 0.6	 From 1.5 to 1.0
 Transmission	 From 0.5 to average of 0.3	 From 1.0 to 1.4
 Distribution	 From 2.8 to average of 1.6	 From 3.5 to 3.4
 Industry	 From 1.5 to average of 1.0	 From 2.2 to 2.2

Industry results for 2018/19

The below table summarises all safety performance results gathered over the reporting period 1 July 2018 to 30 June 2019, broken down by industry sectors.

Electricity Supply Industry - Summary of safety data and performance indicators															
Year ended 2019	FTEs	Fatalities	LTIs	RWIs	MTIs	TRIs	Days Lost to LTIs	Days of Restricted Work	LTIFR	RWIFR	MTIFR	TRIFR	LTISR	RWISR	ATLR to LTIs
Generation	4,911	0	28	8	15	51	284	75	0.6	0.2	0.3	1.0	6	2	10
Transmission	1,817	0	10	7	8	25	64	36	0.6	0.4	0.4	1.4	4	2	6
Distribution < 100 employees	618	0	12	2	12	26	198	58	1.9	0.3	1.9	4.2	32	9	16
Distribution >= 100 and < 250 empl	1,375	0	23	8	23	54	336	43	1.7	0.6	1.7	3.9	24	3	15
Distribution ≥ 250 employees	4,618	0	52	40	50	142	782	355	1.1	0.9	1.1	3.1	17	8	15
<i>Distribution Total</i>	6,611	0	87	50	85	222	1,316	456	1.3	0.8	1.3	3.4	20	7	15
Industry	13,338	0	125	65	108	298	2,031	914	0.9	0.5	0.8	2.2	15	7	16

Update on survey participants

Thirty eight companies participated in the 2018/19 survey return. This included two Distribution companies that did not participate in last years return.

In terms of personnel, an increase in FTE was observed for the transmission and distribution sectors compared to the 2017/18 return period. There were approximately 1,000 less FTE from the generation sector compared to last year. The 2017/18 return was the first to merge the safety performance data for the Retail and Generation segments. The 2018/19 return form was the first to collect data in this format.

This format change may have contributed to misunderstandings of and consequent misreporting of FTE for this sector.

LTI and RWI reporting as calendar days

Starting last year, the lost time and restricted injury rates are reported in calendar days as opposed to working days. Calendar day reporting is the standard way of reporting time lost as per OSHA standards and the Business Leaders' Forum reporting requirements.

For most respondents, the data for calendar days was available from 2014/15 to the current year.

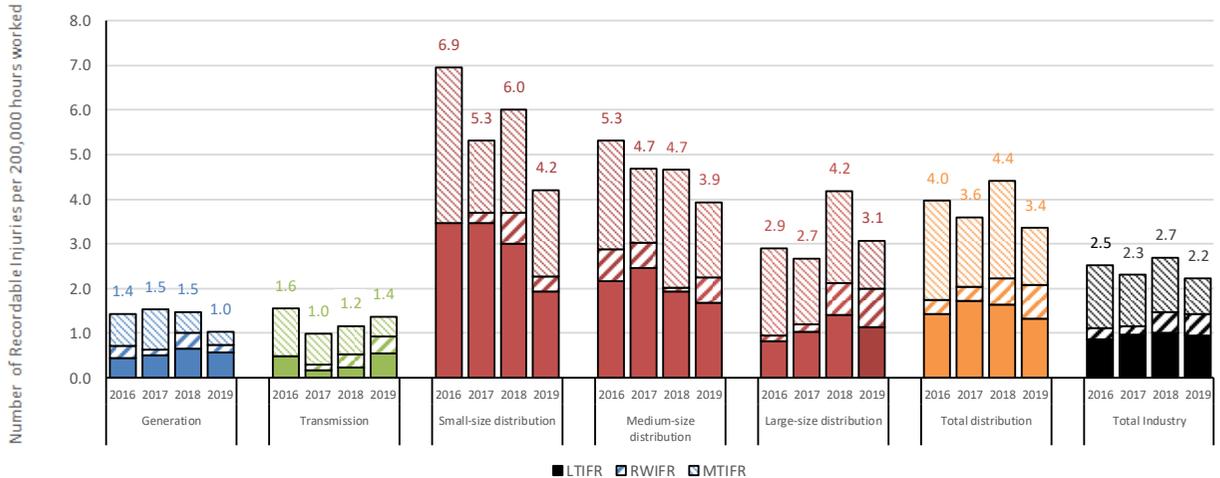
For those where calendar days were not available they were estimated based on work days. This mainly relates to generation companies that are part of the StayLive group.

Survey coverage

We estimate this year's report covers all FTEs in the combined generation, transmission and distribution sectors that were covered last year.

Total recordable injuries

Figure 1. Total Recordable Injury Frequency Rates (Actuals 2015/16 to 2018/19) per 200,000 hours worked, by Sectors



Notes:

- The below results are to be considered carefully as the rate variations may be influenced by improved RWI reporting over time.
- Time lost is expressed in calendar days.

Frequency rates - Total Recordable Injuries

The industry's TRIFR decreased by 19% in 2018/19, compared to 2017/18. All distribution and generation companies experienced a year to year decrease in TRIFR. A 17% increase in TRIFR was experienced across the transmission sector.

Severity rates - Days off and on restricted work

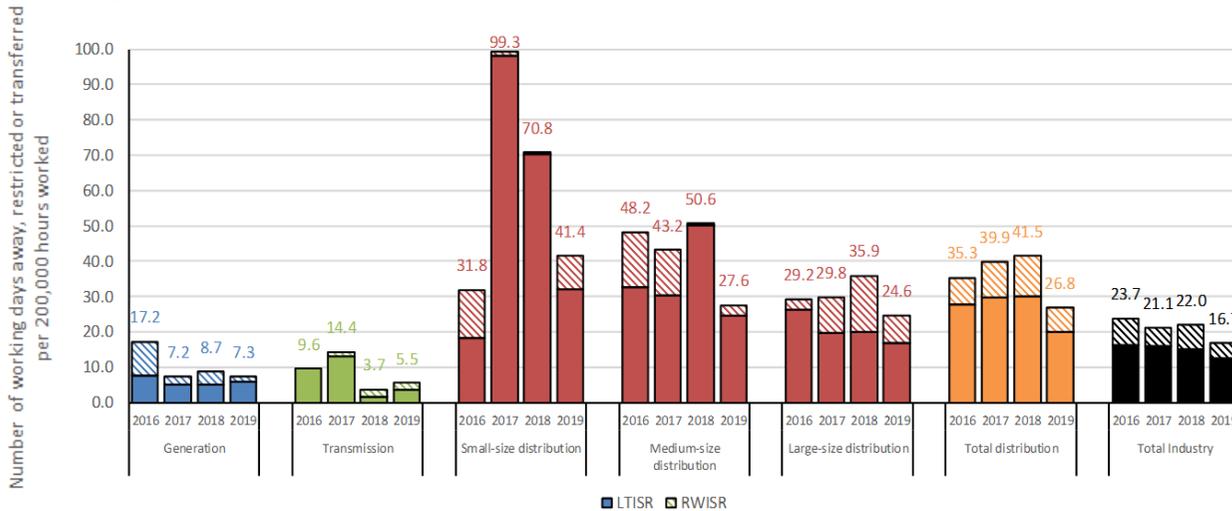
All distribution companies had a strong improvement in overall severity rate compared to last year, with medium and large sized distribution companies experiencing the lowest rate over the last four years.

There was an increase in overall severity rate for transmission from 3.7 calendar days in 2017/18 to 5.5 calendar days in 2018/19. Note that the severity rate for the transmission sector remains the lowest across the industry.

Year-to-year improvements in lost and restricted work time severity rates across the generation and distribution sectors led to an overall decrease of 24% for the industry.

This results in an ESI rate of 17 calendar days away from work or on light duties per 200,000 hours in 2018/19, decreased from 22 in 2017/18.

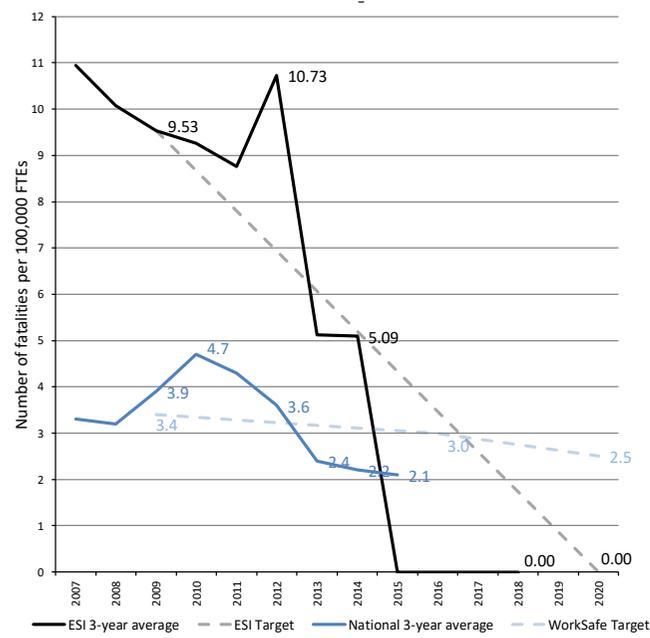
Figure 2. Days Away, Restricted or Transferred Rates (Actuals 2015/16 to 2018/19) per 200,000 hours worked



Fatalities

The electricity supply industry has experienced no fatalities for six consecutive years.

Figure 3. ESI Fatality Trends - Three-year moving averages per 100,000 FTEs, compared with WorkSafe targets



Outline of ESI fatal accidents since 2004

- 2004 *EEA Safety Alert 07-2004*: One fatality through contact with live jumper during twin-circuit pole replacement. Test not carried out to check isolation prior to applying temporary earths.

EEA Safety Alert 09-2004: One fatality from lifting gear accidentally contacting an in-service line adjacent to the out-of-service line being worked on.
- 2005 *EEA Safety Alert 01-2005*: One fatality from inadvertent livening of out-of-service conductor through contact with adjacent live circuit.
- 2006 *EEA Safety Alert 09-2006*: One fatality from hand-to-hand contact with live 400 V overhead lines during the lowering of a work platform. (Coroner unable to establish what caused the victim's heart attack - case excluded from ESI statistics.)
- 2007 *EEA Safety Alert 05-2007*: One fatality from hand-to-hand contact with inadvertently livened cable that was being connected to overhead line. Cable connector at ground-mounted substation had bent under hauling pressure and contacted adjacent live cable connector. PPE not worn.

EEA Safety Alert 06-2007: Electrocution during live work on 11 kV when the employee brushed against uncovered live conductor in the live work zone.
- 2008 *EEA Safety Alert 01-2008*: One fatality and one injury from pole collapse. Collapse occurred after load change when conductors were being unfixed from pole fittings.
- 2010 *EEA Safety Alert 07-2010*: One fatality from pole collapse. Pole fall attributed to inadequate ground support. Hazard information had not been communicated.

No Alert available: One fatality from motor vehicle accident.
- 2011 *EEA Safety Alert 05-2011*: One fatality and one injury from all-terrain mobile platform overturn in hill terrain. Platform was being repositioned with employees aloft.
- 2012 *EEA Safety Alert 12-2012*: One fatality from electric shock and fall from height while working on ladder repairing broken 11 kV conductor that was live.
- 2013 *Safety Alert 01-2013*: One fatality from vehicle rollover in farm hill country.

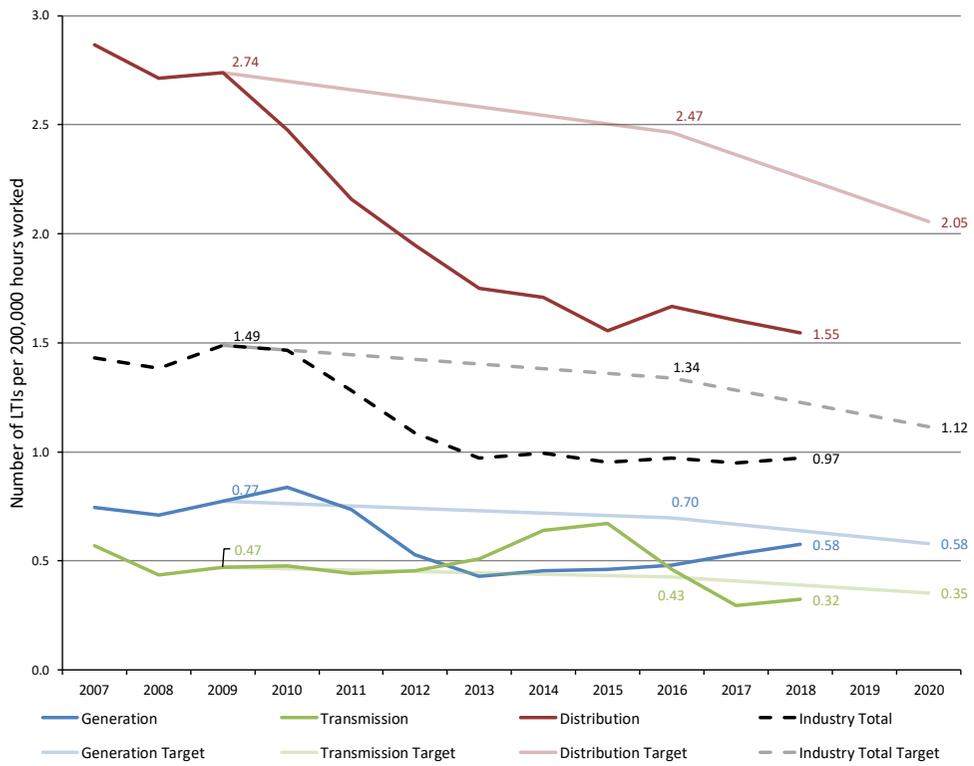
11 fatalities were reported by the industry since EEA started analysing ESI safety performance indicators in 2004.

Of these, three resulted from direct contact with live equipment, two from inadvertent livening of electrical equipment, one from incorrect isolation of broken line, two from pole collapses, two from driving accidents and one from a mobile plant overturn accident.

Lost time injuries

WorkSafe LTIFR targets as applied to EDI sectors 2009 three-year average Baseline, 2016 and 2020 targets				
Year End	Generation	Transmission	Distribution	Industry Total
2009 baseline	0.77	0.47	2.80	1.50
2016 target -10%	0.70	0.43	2.52	1.35
2020 target - 25%	0.58	0.35	2.10	1.12
2019 Actual	0.57	0.55	1.32	0.94

Figure 4. LTIFR Trends (three-year moving averages) per 200,000 hours worked
Compared with 10% and 25% reduction target by 2016 and 2020



WorkSafe Injury Rate Reduction Targets

The harm reduction targets set by WorkSafe of at least 10% by 2016 and 25% by 2020 from a 2009 baseline concern both work-related fatalities and serious injuries. In line with WorkSafe’s targets, EEA has applied a similar methodology to baseline calculations and target settings specific to the industry.

LTIFR trends compared with WorkSafe’s reduction targets

LTIFR results are presented in Figure 4 in **three-year moving averages** to smooth variations across consecutive years and facilitate long-term trend analysis.

In 2018/19, the industry’s LTIFR was below both its 2016 and 2020 targets, with the three-year moving average trending consistently just below 1.0.

All sectors apart from Transmission were below their LTIFR targets for 2016 and 2020.

	Generation		From 0.7 to average of 0.6
	Transmission		From 0.2 to average of 0.6
	Distribution		From 1.6 to average of 1.32
	Industry		From 1.0 to average of 0.94

Lost time injuries

Figure 5. ATR to LTIs Trends per 200,000 hours worked, by Sectors

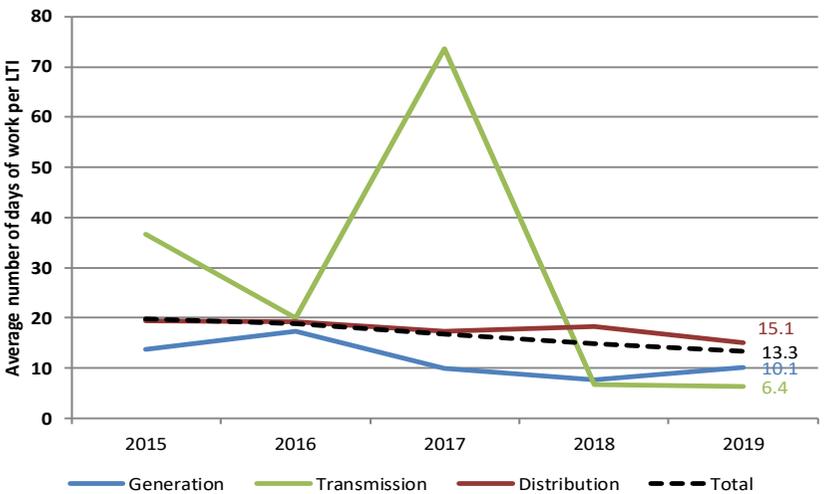
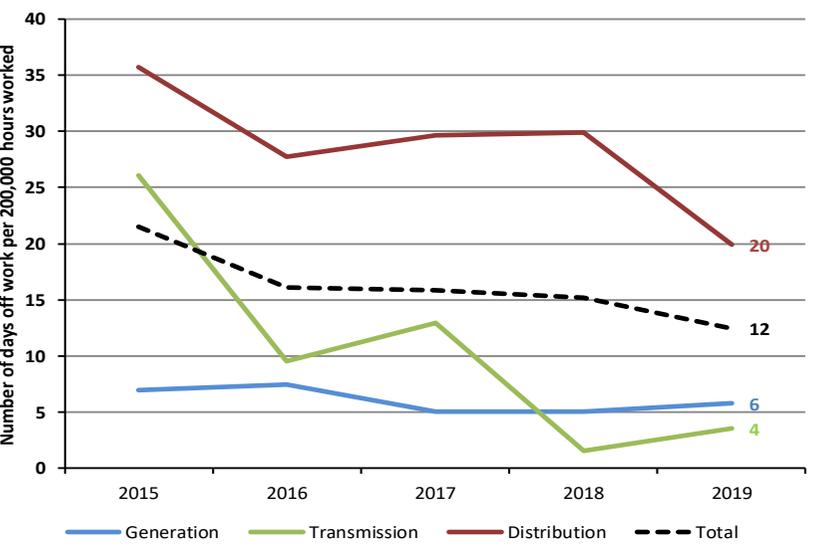


Figure 6. LTISR Trends per 200,000 hours worked, by Sectors



Average Time Lost (ATLR) to LTIs and LTISR trend results are presented in Figures 5 and 6.

Average Time Lost per LTI - Trends

The average time lost to LTIs is a simple severity calculation, representing the number of calendar days lost per LTI (it is not applied to days of restricted work and RWIs). The sharp increase in average time lost per LTI in the transmission sector in 2016/17 seemed to be an outlier and the results for the last two years have dropped to below industry average.

Lost Time Injury Severity Rate

The industry has continued its decrease from 19 calendar days lost per LTI in 2015 to 13 calendar days lost in 2019.

LTISR rates represent the number of calendar days off work per 200,000 hours worked, therefore the rate varies with the size of each industry sector.

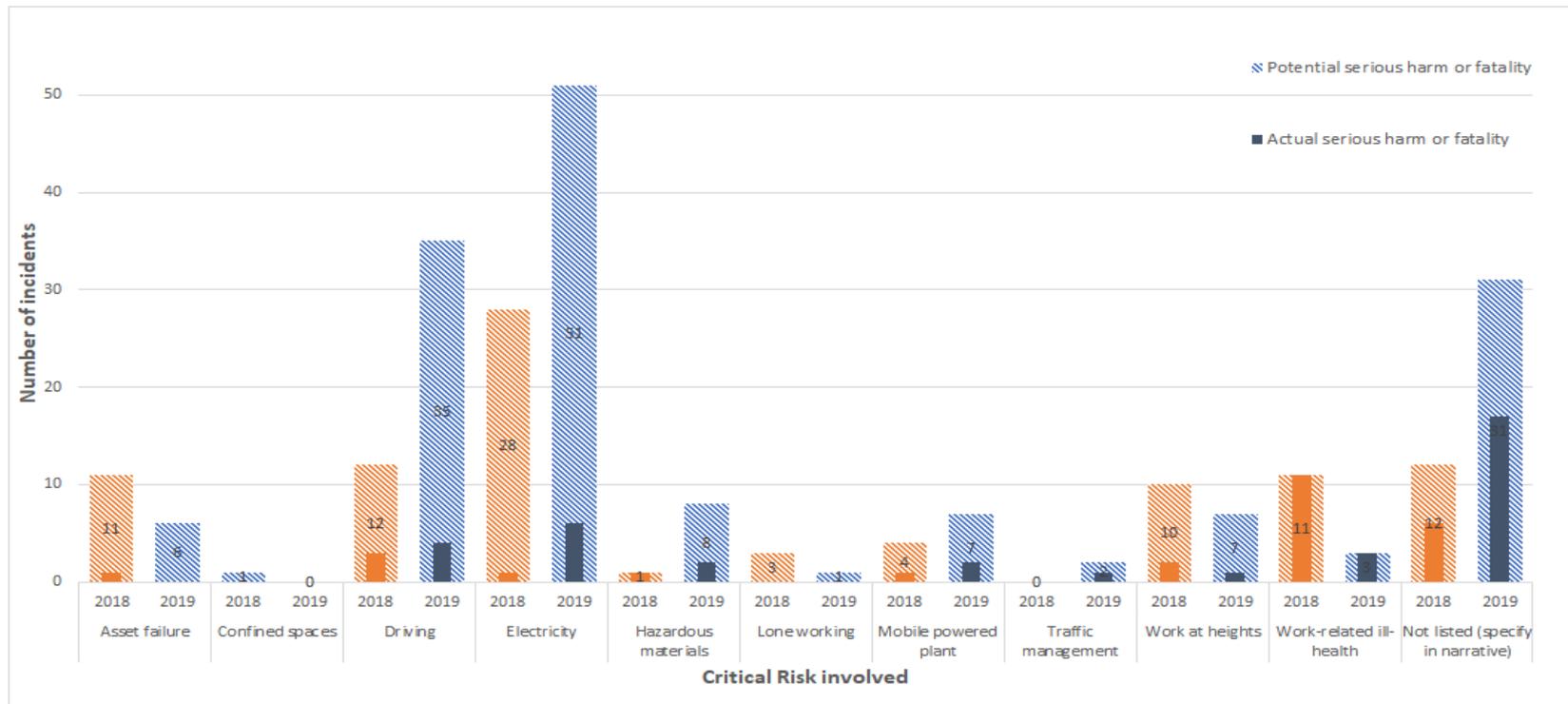
When using LTISR calculations, the disparity between sector results and trends is much more pronounced. The distribution sector is the most affected by time lost, with an average of 20 calendar days lost per 200,000 hours worked in 2018/19, a decrease from 30 days lost in 2017/18. Both the generation and transmission sectors experienced a slight year to year increase in their average LTISR result in 2019, but overall shows a downward trend since 2015.

Over the past ten years, the industry’s average severity rate of lost time injuries has been fluctuating between 15 and 20 calendar days lost per 200,000 hours worked, with a recent decrease to an average of 12 in 2019, from 15 in 2016.

Note: EEA has begun reporting on lost time in terms of calendar days. Data for this is only available back to the 2014/15 reporting year. The figures are presented as actual counts rather than 3-yr rolling averages

Critical Risks

Figure 7. Comparison of identified potential Critical Risks and actual outcomes.



Second year of collecting data on Critical Risks

This was the second year in which the EEA has collected data on Critical Risk events and associated outcomes. 2018/19 saw an increase in significant events reported, including a 61% increase in potential events and a 38% increase in actual events compared from to the 2017/18 period. The increase in risks may be the result of increased risk reporting, rather than an increase in the number of risks themselves.

The highest number of injuries were classified in the “Not Listed” category (n=17), with the most significant events in that category appearing to involve asset failure or the potential to be struck by an object. A revision of risk categories or clearer definitions may be required to classify risks reported in this category. Review work is already underway for critical risks which includes this issue.

Consistent across both years, Critical Risk events involving electricity were identified most frequently. A notable increase in Critical Risks attributed to driving were reported this period, however the number of injuries reported was similar to last year. The higher proportion of electricity and driving risks reported compared to actual events suggests that companies have improved their visibility of these risks. This may point to the need to improve visibility for other risk areas, equally it may mean that the risk categories need to be revised.

Public Safety Snapshot



13* incidents of harm to the public

4 of which involved serious harm

*Excludes car vs pole accidents

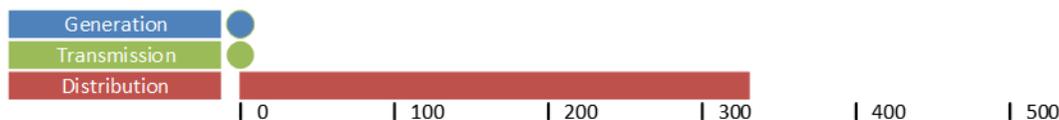


64 incidents resulting in significant damage to property



1416 Motor vehicle accidents involving electricity assets

616 of which were “car versus pole”



Second year of collecting data on public safety

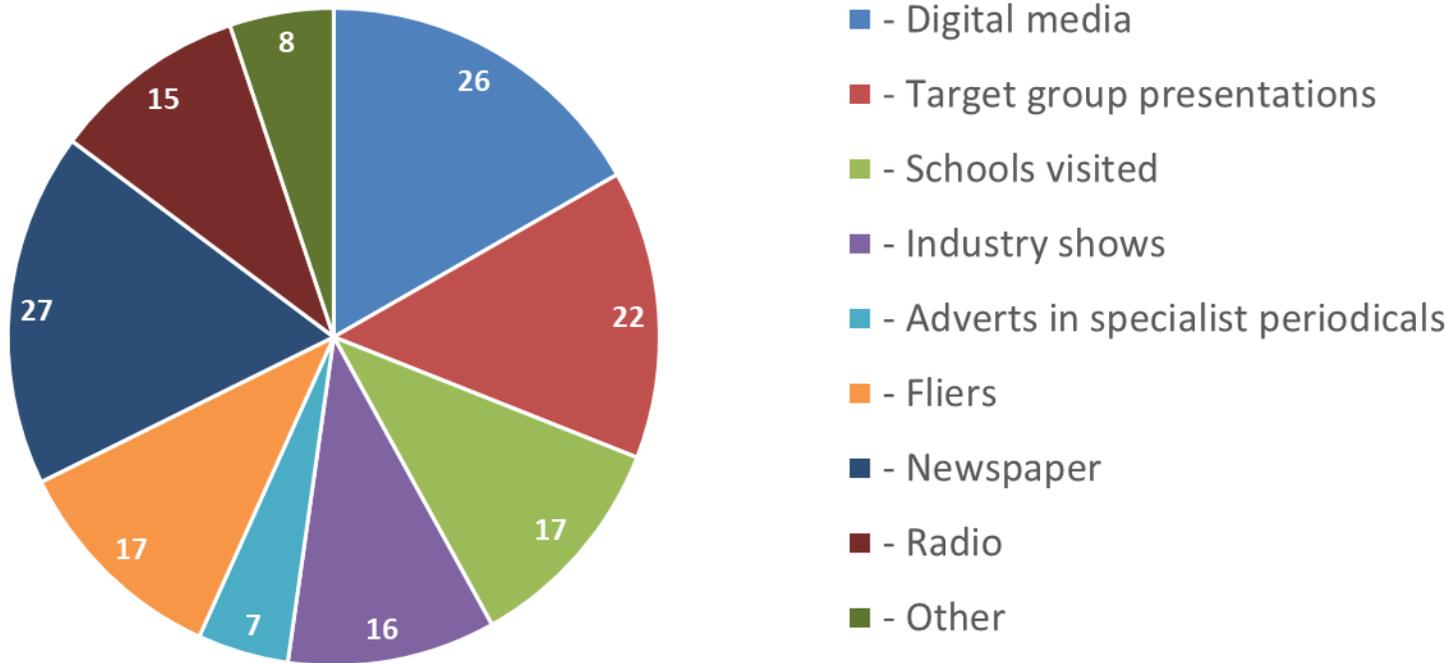
This was the second year in which the EEA has collected data on Public Safety, and for completeness we have included these.

There was significant variability in reports, and it will take us a few years to establish reliable baseline data to assess against, so we are treating the data with caution. It is worth noting that a portion of the variability may be due to misreporting, which can arise for a variety of reasons including survey design. Notwithstanding, it is possible that companies reporting zero incidents would benefit from reviewing their systems to ensure that they are meeting their investigation and documentation requirements under regulations 49(e) and 50(1)(b) of the Electricity (Safety) Regulations 2010.

The Public Safety Working Group is reviewing the metrics that we collect so that we can improve our visibility of what matters across the whole electricity supply industry. This is likely to lead to new or clarified metrics next time we collect data.

Public Safety

Figure 8. Breakdown of safety awareness campaign media (by number of companies using that medium).

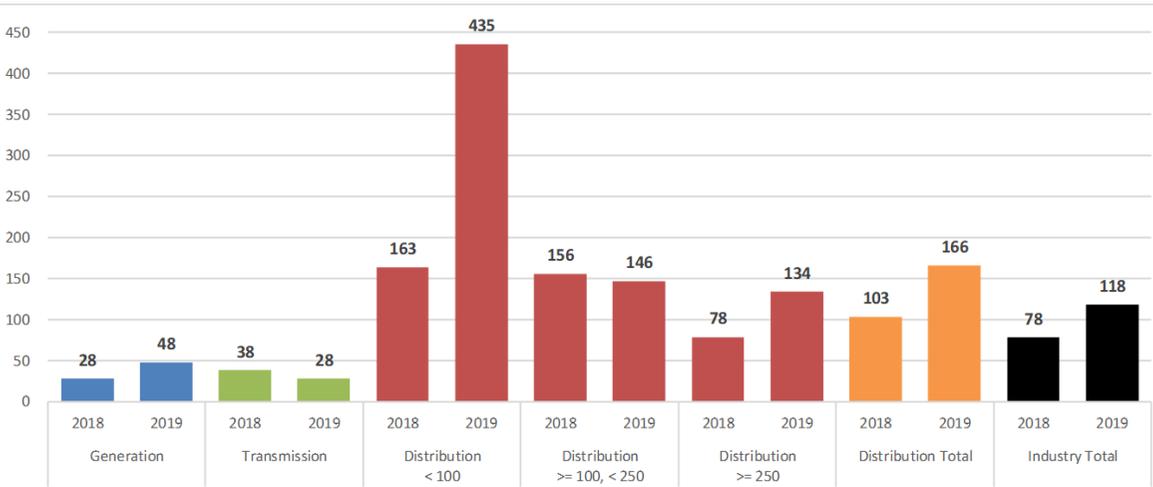


Safety awareness campaigns

Newspaper and digital media are the most frequently used media channel for communicating about public safety, followed closely by target group presentations. Half of respondents did not use any other forms of communication.

Leading Indicators: audits and corrective actions

Figure 9. Audits per 100 Operational FTEs



This was the second year EEA has requested data on leading indicators from the industry. Audits per 100 Operational FTEs and corrective actions completed within timeframe are presented in Figures 9 and 10.

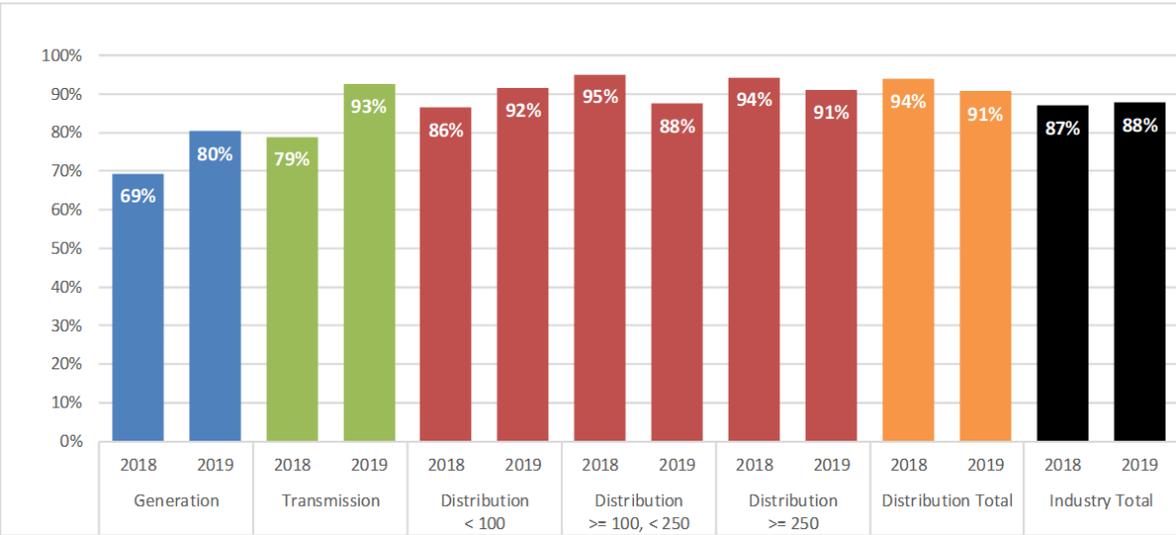
Audits per 100 Operational FTEs

The number of audits for the industry increased by 51% between 2017/18 and 2018/19. Distribution companies, in particular small-sized distribution companies, showed the highest rate of activity in this area.

Percentage of corrective actions completed within timeframe

The percentage of corrective actions completed within timeframes in 2018/19 remains consistent with industry totals from 2017/18. Medium and large size distribution companies experienced a decrease in corrective actions completed, with all other sectors experiencing a year-to-year increase.

Figure 10. % of corrective actions completed within timeframe



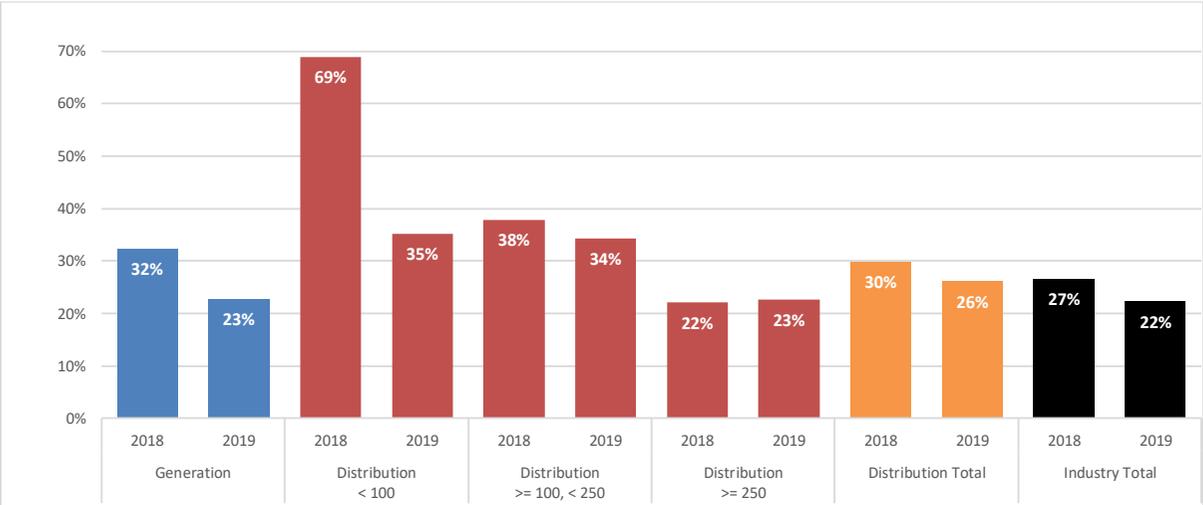
Average Time Lost per LTI - Trends

The average time lost to LTIs is a simple severity calculation, representing the number of calendar days lost per LTI (it is not applied to days of restricted work and RWIs).

The sharp increase in average time lost per LTI in the transmission sector in 2016/17 seemed to be an outlier and the results for the last two years have dropped to below industry average.

Leading Indicators: D&A testing and H&S site visits

Figure 11. % Operational personnel tested for drugs / alcohol

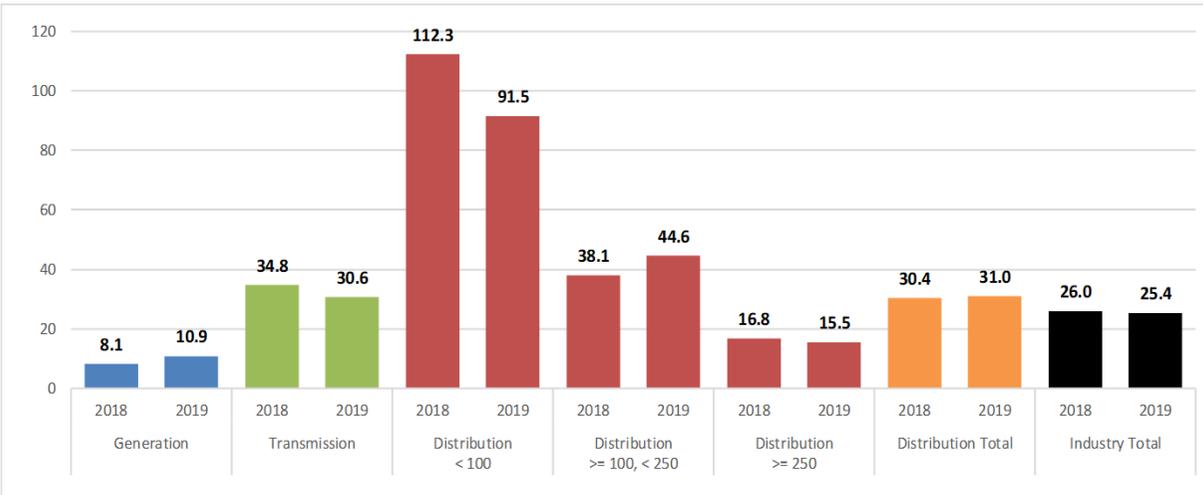


The percentage of Operational personnel tested for drugs/alcohol and H&S site visits from Executives and General Managers 100 Operational FTEs are shown in Figures 11 and 12.

Percentage of Operational personnel tested for drugs / alcohol

The percentage of Operational industry personnel tested for drugs / alcohol decreased to 22% in 2018/19 from 27% in 2017/18. The greatest year-to-year decreases were experienced by the generation and small sized distribution sector. A number of companies, including transmission provided the number of drug / alcohol tests undertaken (rather than personnel tested) and were excluded from the analysis. This may have contributed to the decrease in personnel tested for the 2018/19 period.

Figure 12. H&S site visits from Exec and GMs per 100 Operational FTEs



Health and safety site visits from Executives and General Managers per 100 Operational FTEs

The number of H&S safety site visits for 2018/19 remains consistent with 2017/18. Despite a year-to-year reduction in the number of site visits for 2018/19, small size distribution companies continue to be the most active in this area.

Leading Indicators vs Incident Rates

Small distribution companies have the highest rates of activity over the last two years for three of the leading indicators. In addition to being the industry sector with the highest incident rates, small distribution companies have experienced the greatest year-to-year decrease in recordable injuries. Additional years of results should help to establish the impact of leading indicators on reducing the number of incidents.

Cross-industry benchmarking

Figure 13. TRIFR benchmarking with members of the Business Leaders' Forum

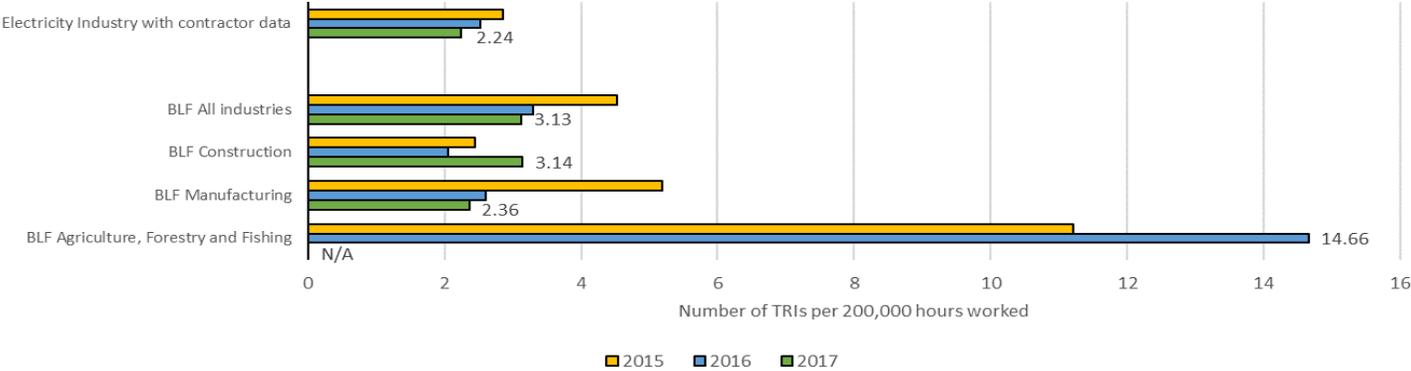
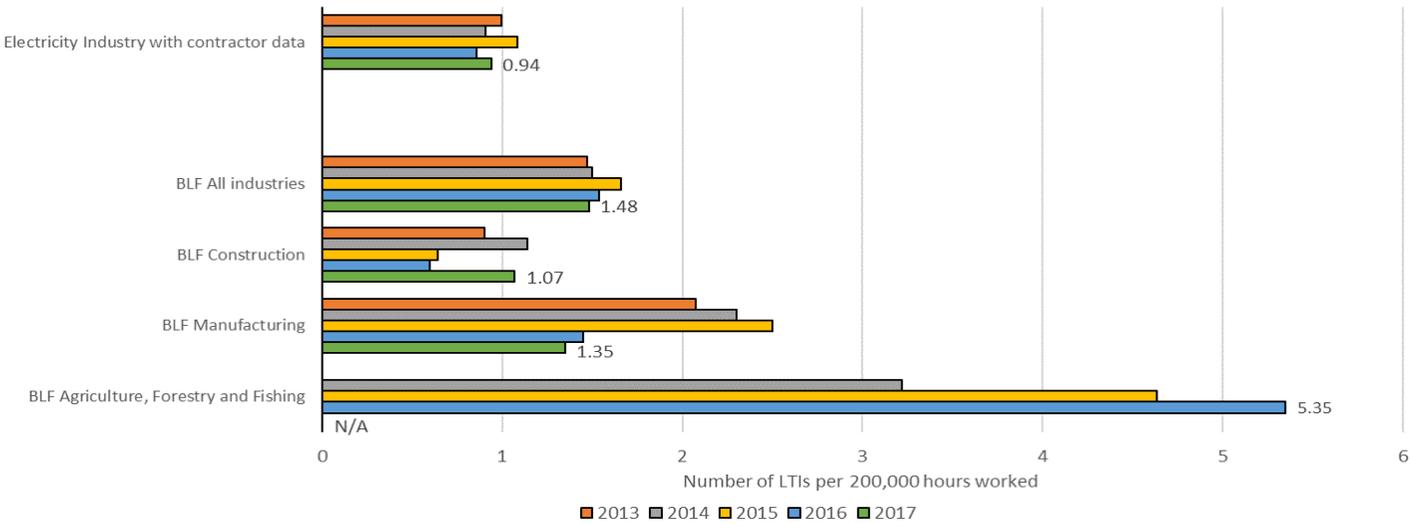


Figure 14. LTIFR benchmarking with members of the Business Leaders' Forum



Note: Contractor data is excluded unless specified otherwise.

The Business Leaders' Forum (BLF) has been analysing Total Recordable Injury data and trends since 2012. Figures 13 and 14 provide an overview of short-term TRIFR and LTIFR trends across different BLF industries over years ended December for BLF, and years ended June for the electricity supply industry.

Unfortunately, BLF have not collected data this year, and so we are unable to provide a useful update on last-year's data.

If the trends remained consistent in other industries, electricity would continue to compare favourably with a low LTI rate.

BLF have advised us that they will resume data collection next year.

Future developments

Critical risks

The current EEA Health & Safety (H&S) strategy states that the electricity supply industry will reduce harm through:

focusing on significant hazard and risk areas including fatal and high impact low probability risks.

In support of this we have included a focus on the ESI Critical Risks in this report.

Review work is being carried out to ensure that we have identified the right risks, and to ensure they are sufficiently clear. You can expect to see a consultation paper on this work very soon.

In future years we aim to include further lead indicators that are linked to the implementation of critical controls. This can help us to establish how effective the focus on critical risks is.

Work-Related Ill Health

Focusing on the work-related health risks that are identified as priorities within the ESI, EEA aims to collate data to ensure that they are being effectively managed. As stated in the ESI H&S strategy the target is that:

By 2020 systems will be in place to collect data on lost time due to work-related ill health in the ESI to be able to measure performance and set targets for improvement.

Lead Indicators

To provide a more complete picture of ESI H&S performance, EEA embarked on a major project to develop high level meaningful lead indicators.

In 2018 the ESI agreed on lead indicators to monitor, and these are included in this report.

We will engage further with members to establish whether these have been useful and how they can be improved.



Glossary

Definitions

Full-Time Equivalent Employee (FTE)

Total number of employees, including part-time (prorated) and contractor employees, who worked for the electricity supply asset owner over the reporting year.

Total Recordable Injury (TRI)

The total of Fatalities, Lost Time Injuries, Restricted Work Injuries and Medical Treatment Injuries.

Fatality

Any case of work-related death.

Lost Time Injury (LTI)

A work-related injury or disease that results in at least one whole calendar day off work.

Restricted Work Injury (RWI)

A work-related injury or disease that results in work restrictions or a job transfer for at least one whole calendar day.

Medical Treatment Injury (MTI)

A work-related injury or disease that is being treated but does not lead to lost time or job restrictions. This excludes first-aid, diagnostic procedures and visits to a medical practitioner for counselling or observation.

Significant damage

Damage to property that is greater than superficial, so that the property is either damaged beyond repair and requires removal or demolition, or else requires substantial repair or reconstruction in order to restore it to a habitable, usable, or operable condition as appropriate (from NZS 7901)

Significant Event

Any incident or near miss that resulted, or could have resulted, in serious harm to a worker. For the purpose of significant event reporting, serious harm is considered to be any fatality or any injury or illness causing permanent impairment, e.g. amputation, serious burns, loss of eyesight, serious lacerations, asbestosis.

Serious Harm

From the Electricity Act 1992 (as amended 4 April 2016 by HASWA 2015):

serious harm means—

(a) death; or

(b) injury that consists of or includes loss of consciousness; or

(c) a notifiable injury or illness as defined in section 23 of the Health and Safety at Work Act 2015

Although the Health and Safety at Work Act definition is applicable to work situations, the list of notifiable injuries and illnesses provides an indication of the types of injuries or illnesses that would relate to serious harm to the public.

Examples include: serious burns, serious head or eye injury, impairments (whether temporary or permanent), electric shocks resulting in loss of bodily function or admission to hospital or medical treatment within 48 hours.

Property

Includes publicly and privately-owned property that is owned by a person other than the person who owns or operates the energy assets in accordance with the requirements of the Electricity Act (from NZS 7901)

Examples include: house fires, motor vehicle damage resulting in the vehicle being unsafe to drive.

Should not be reported: damage that did not require substantial repair, such as property fences if only a small section of the fence needed repairing.

For the purpose of collating these KPIs, “property” excludes livestock. Loss of livestock is to be reported separately.

Glossary

Calculations

Frequency rate

The frequency rate of incidents, expressed as the number of incidents per 200,000 hours worked. TRIFR, LTIFR, RWIFR and MTIFR indicate the frequency rates of, respectively, TRIs, LTIs, RWIs and MTIs.

Severity rate

The severity rate of incidents, expressed as time lost per 200,000 hours worked. LTISR and RWISR indicate the number of, respectively, calendar days away or restricted / transferred per 200,000 hours worked. DART rate is the sum of LTISR and RWISR, namely the number of calendar days away, restricted or transferred per 200,000 hours worked.

Time lost

Time lost (days away from work or days of restricted work) is expressed in calendar days for comparison with historical data. EEA is building up calendar days data over the next few years to move towards OSHA standards.

Average time lost rate per LTI

A simple severity rate, indicating time lost per incident. The average time lost rate is calculated only for LTIs.

Baseline and trends

2009 baselines are calculated as average rates from 2008 to 2010, as per WorkSafe methods. 10-year trends are based on three-year moving average rates, and the years indicated on the trend charts are the middle year of each three-year period.

Disclaimer

Disclaimer

EEA thanks members of the New Zealand electricity supply industry that have provided the information in support of this *Electricity Supply Industry (ESI) - Safety Performance Indicators Report*.

Every effort has been made to ensure that the information in this report is correct, however EEA:

- gives no warranty of accuracy or reliability as to the information contained in this report, and
- accepts no responsibility for loss arising in any way from, or in connection with, errors in or omissions of any information in this report.

This report should not be relied upon without first obtaining specific advice.

Confidentiality

Information contained in this report and in the attached benchmarking spreadsheets are confidential.

Copyright

This work is copyright. No part of this document may be copied or reproduced by any process without the written permission of the EEA. Participating companies may use parts of this document for internal reporting and use.

Contact

Phone: (04) 473 8600 • Email: admin@eea.co.nz

Icon credits

From the Noun Project: Lift by Rohan Gupta; Target by Barracuda; Ambulance by Mark Wehrhahn; Health Team by Luis Prado; Stumble by Eugene Dobrik; Man Electrocuted, and Injured Man, by Gan Khoon Lay; Transmission Tower by Olivier Guin; Power line by Nick Bluth; Dam by iconsmind.com; Electric Meter by Creative Stall; Give Electricity by Oliviu Stoian; Symbolon, and Car Impact by Freepik from www.flaticon.com