Electricity Engineers' Association

HEALTH & SAFETY

2018

Electricity Supply Industry Safety Performance Indicators Report

Reporting period: 1 July 2017 - 30 June 2018

EEA.CO.NZ

Industry snapshot

0 fatalities for five consecutive years

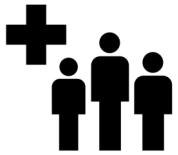
2020 25% ESI LTIFR reduction target from 2009 baseline already met

35% of all LTIs resulted in more than one week off work (42% last year)

The most common injuries for significant events: muscle strains while lifting or reaching

LTIFR Trends to 2018

Compared to 2009 baselines



TRIFR Trends

Over the last three years

Generation	From 0.8 to average of 0.5	From 1.4 to 1.5
Transmission	From 0.5 to average of 0.3	From 1.6 to 1.2
Distribution	From 2.8 to average of 1.6	From 4.0 to 4.4
Industry	From 1.5 to average of 0.9	From 2.5 to 2.7

Industry results for 2017/18

The below table summarises all safety performance results gathered over the reporting period 1 July 2017 to 30 June 2018, broken down by industry sectors.

Electricity Supply Industry - Summary of safety data and perfomance indicatiors															
Year ended 2018	**FTEs**	**Fatalities**	**LTIs**	**RWIs**	**MTIs**	**TRIs**	**Days Lost to LTIs**	**Days of Restricted Work**	**LTIFR**	**RWIFR**	**MTIFR**	**TRIFR**	**LTISR**	**RWISR**	**ATLR to LTIs**
Generation	5949	0	39	21	28	88	298	219	0.7	0.4	0.5	1.5	5	4	8
Transmission	1714	0	4	5	11	20	27	36	0.2	0.3	0.6	1.2	2	2	7
Distribution < 100 employees	433	0	13	3	10	26	305	2	3.0	0.7	2.3	6.0	70	0	23
Distribution≥ 100 and < 250 empl	1136	0	22	1	30	53	570	5	1.9	0.1	2.6	4.7	50	0	26
Distribution ≥ 250 employees	4134	0	58	30	85	173	831	652	1.4	0.7	2.1	4.2	20	16	14
Distribution Total	5703	0	93	34	125	252	1706	659	1.6	0.6	2.2	4.4	30	12	18
Industry	**13365**	**0**	**136**	**60**	**164**	**360**	**2031**	**914**	**1.0**	**0.4**	**1.2**	**2.7**	**15**	**7**	**15**

Past data updates

Several generator companies report their data to the StayLive group and the EEA has begun to use the data collected by them. The data StayLive has collected only goes back to 2012 and there have been some discrepancies between that data and the reported figures (FTEs and Incidents) EEA has received directly. This would mean that any data provided by generators from before 2012 could not be directly comparable. However, it was decided to use EEA data for the 2009-2012 period to allow for benchmarking to the WorkSafe fatality and incident reduction targets. The benefit of being able to have these benchmarks outweighed the potential impact of the discrepancies in the 2009-2012 years.

Combining Generator and Retail sectors

The companies reporting to StayLive have merged the results for Retail and Generation segments. As a consequence, this report combines the results for these two sectors.

LTI and RWI reporting as calendar days

Starting this 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.

Update on survey participants

One medium size Distribution company was not able to participate in the report this year.

The company's historical information has been removed from the report to allow for relevant sector trend analysis.

Taking into account this missing individual company data, we estimate that this year's report covers, with 33 participating asset owners, 99% of 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 2014/15 to 2017/18) per 200,000

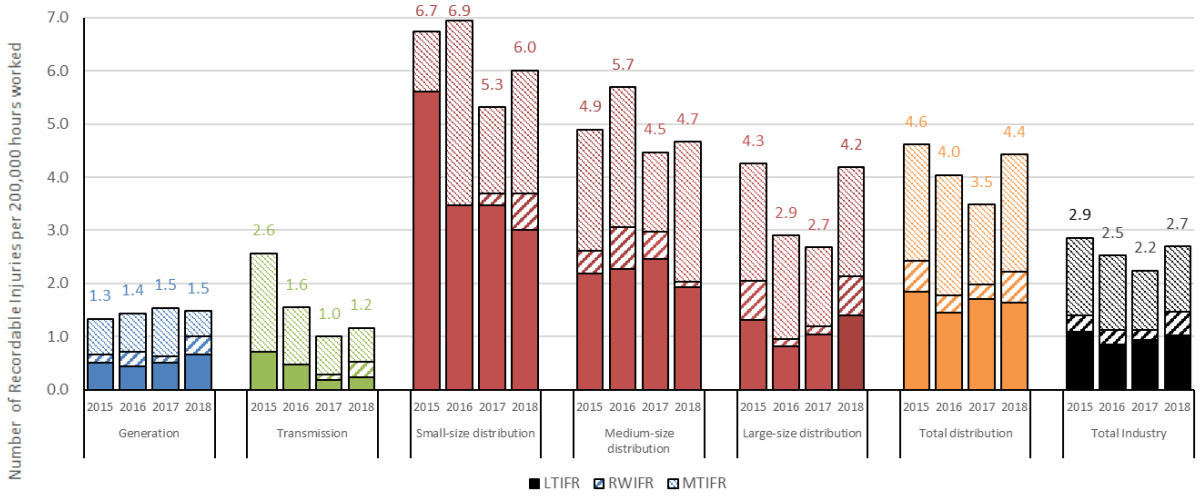
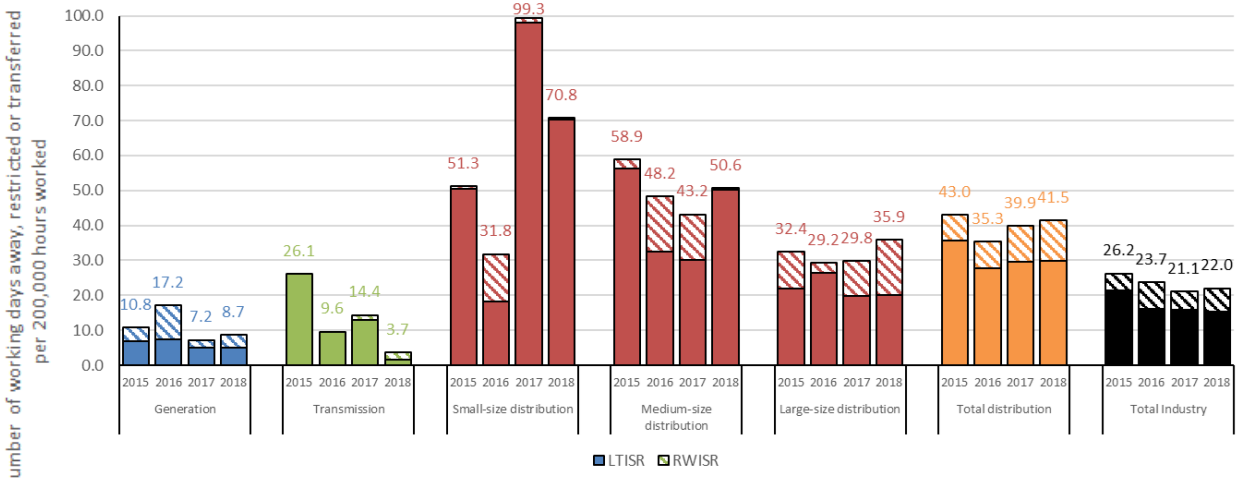


Figure 2. Days Away, Restricted or Transferred Rates (Actuals 2014/15 to 2017/18) per 200,000



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 increased by 20% in 2017/18 compared to 2016/17, mainly due to a higher count of incidents at large distribution companies.

All but the generation sector experienced a year-to-year increase in TRIFR.

Severity rates - Days off and on restricted work

There was an increase in overall severity rate for the medium-size distribution peer group from 43 calendar days in 2016/17 to 51 in 2017/18. This was a result of an additional 42 lost time days even though there were only 5 days of restricted work.

Small-size size distribution companies has a strong improvement in their overall severity rate compared to last year, but it was still much higher than the results for 2014/15 and 2015/16

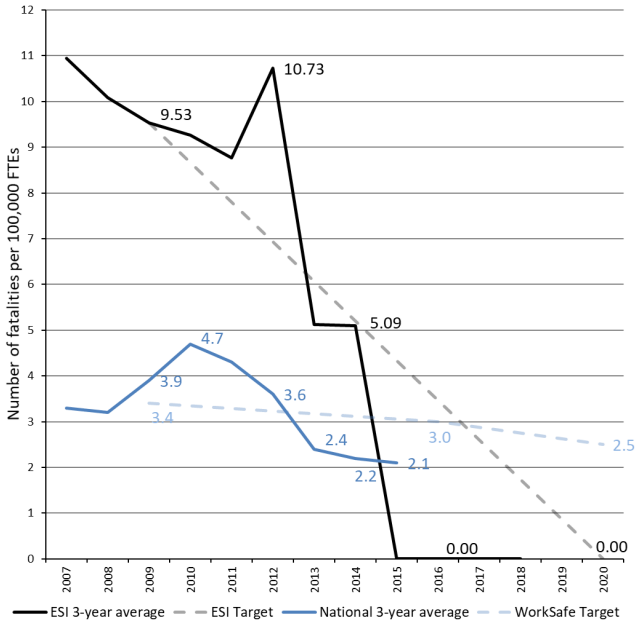
Year-to-year improvements in lost and restricted work time severity rates in the transmission sector and a steady trend in the generation sector balance the increased severity rates in the distribution sector.

This results in an ESI rate increasing slightly from a total of 21 calendar days away from work or on light duties per 200,000 hours in 2016/17 to a rate of 22 in 2017/18.

Fatalities

The electricity supply industry has experienced no fatalities for five consecutive years. The latest national three-year average shows there were 2.1 work-related deaths per 100,000 FTEs in New Zealand in 2014.

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.

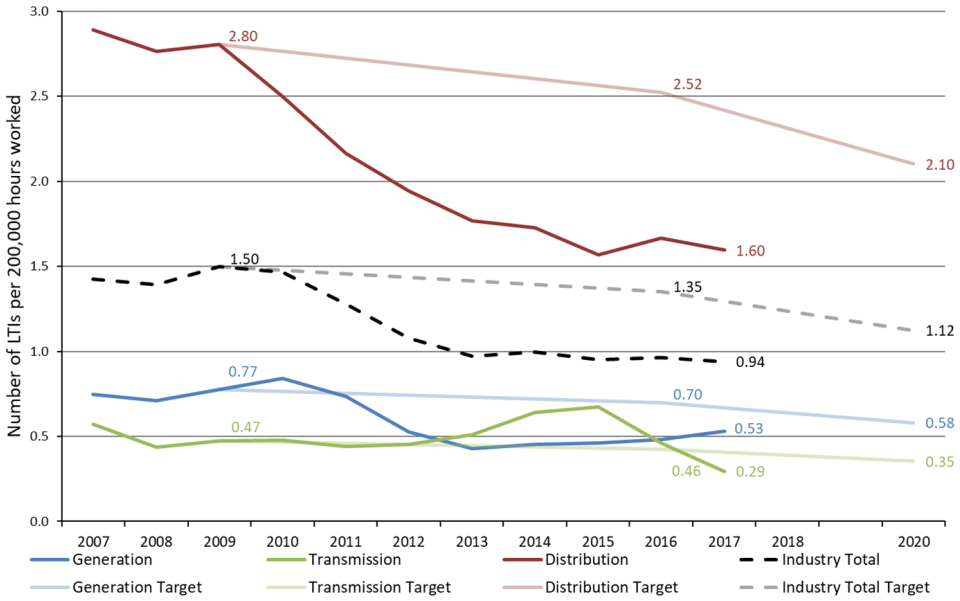
11 fatalities were reported by the industry since EEA started analysing ESI safety performance indicators in 2004.

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 tagets				
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 taget - 25%	0.58	0.35	2.10	1.12
2018 Actual	0.66	0.23	1.63	1.02

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 2017/18, the industry's LTIFR was below both its 2016 and 2020 targets.

While in 2017/18, most sectors had reached their 2016 LTIFR reduction target (based on actual 2016/17 figures), a ten-year trend analysis indicates that only the distribution and transmission sectors have maintained the decrease in their LTIFR results.

Generation	→	From 0.7 to average of 0.7
Transmission	↘	From 0.4 to average of 0.2
Distribution	↘	From 3.1 to average of 1.6
Industry	↘	From 1.5 to average of 1.0

Lost time injuries

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

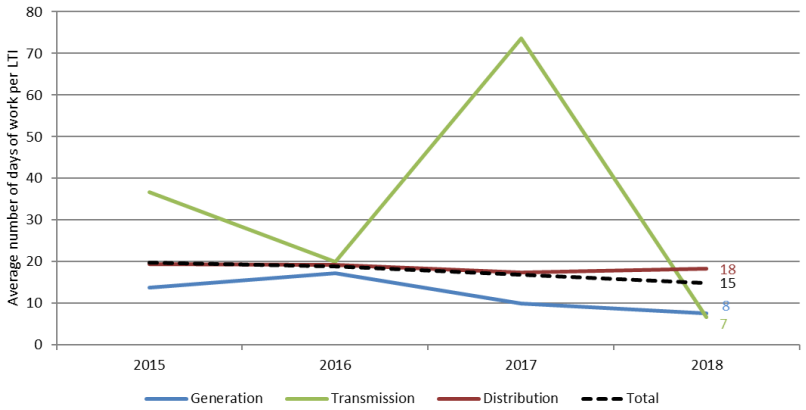
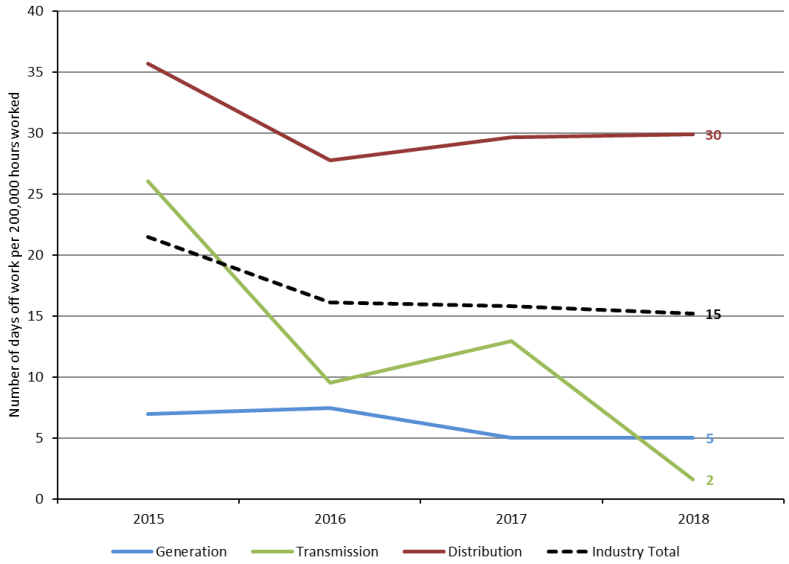


Figure 6. LTISR Trends per 200,000 hours worked, by Sectors



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 current year have dropped to below industry average.

The industry has continued its decrease from 19 calendar days lost per LTI in 2015 to reach 15 in 2018.

Lost Time Injury Severity Rate

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.

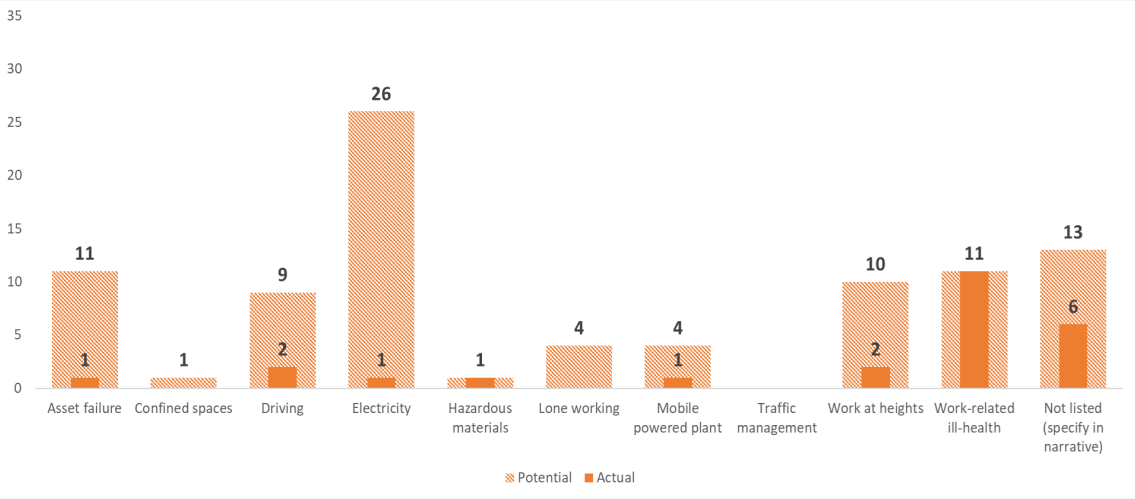
When using LTISR calculations, the disparity between sector results and trends is much more pronounced. The distribution sector is the most affected by time lost, with an average of 30 calendar days lost per 200,000 hours worked in 2017/18. The generation sector has experienced a slight decrease in their average LTISR results over the past few years, while the transmission LTISR has had a strong decrease from an average of 26 in 2015 to 2 in 2018.

Over the past ten years, the industry's average severity rate of lost time injuries has been fluctuating between 17 and 20 calendar days lost per 200,000 hours worked, with a recent decrease to an average of 15 from 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. As a result, 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.



First year of collecting data on Critical Risks

This was the first year in which the EEA has collected data on Critical Risk events and associated outcomes.

There are some observations that could be used to improve participant reporting in the future

- Injuries related to sprains were initially classified by participants in the "Not Listed" category. These ended up comprising almost 2/3 of the entire count of outcomes.

These seem to indicate that definitions of categories and potential risks need to be communicated more clearly.

- There were several potential incidents in the driving category that were classified as having the potential for Serious Harm. Based on the description provided, it was decided that these had the potential for a fatality. In addition, there were no Traffic Management critical risk events reported.

This may point to the need for additional training to identify the inherent risk in tasks not directly related to Electricity.

Industry overview of identified Critical Risks and actual consequences

In 2017/18, 46% of all identified Critical Risk events resulting in actual consequences involved muscle strains while lifting or reaching

It is worth noting that, in its *Reducing Harm Action Plan* (July 2016), WorkSafe focuses on four risks, including this most common result of Significant Events in the electricity supply industry:

1. Slips, trips and falls
2. Working in and around vehicles
3. **Body stressing** (manual handling, repetitive strain)
4. Clean air

Identification of potential harm from Critical Risks.

Critical Risk events involving electricity were identified frequently but resulted in only one reported injury. This is contrasted with musculoskeletal injuries where the number of identified potential events matched actual events. This may indicate that workers are not as aware of situations where there is the potential for that kind of injury or that the reporting companies don't have visibility of Critical Risk events involving their employees.

Leading Indicators

Figure 8. Audits per 100 Operational FTEs

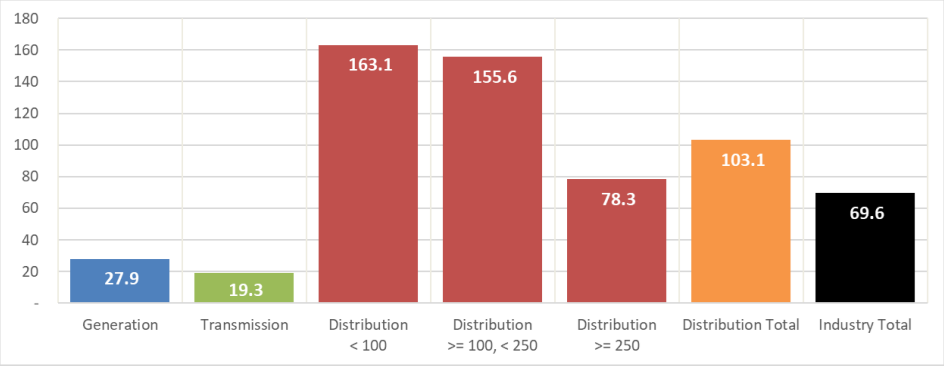


Figure 9. % of corrective actions completed within timeframe

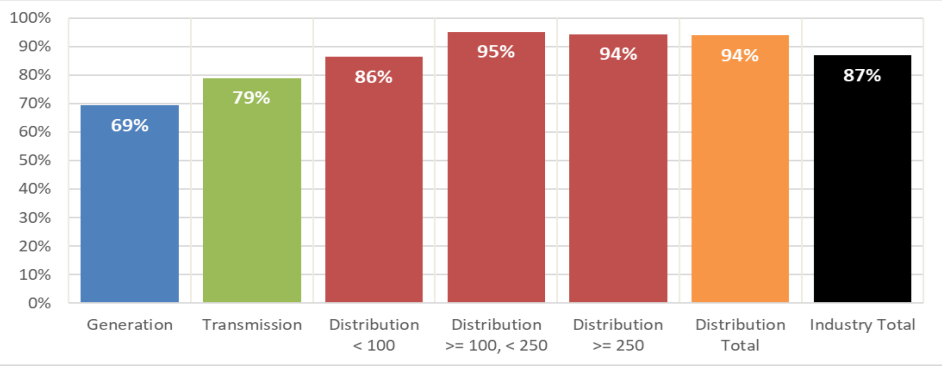


Figure 10. % personnel tested for drugs / alcohol

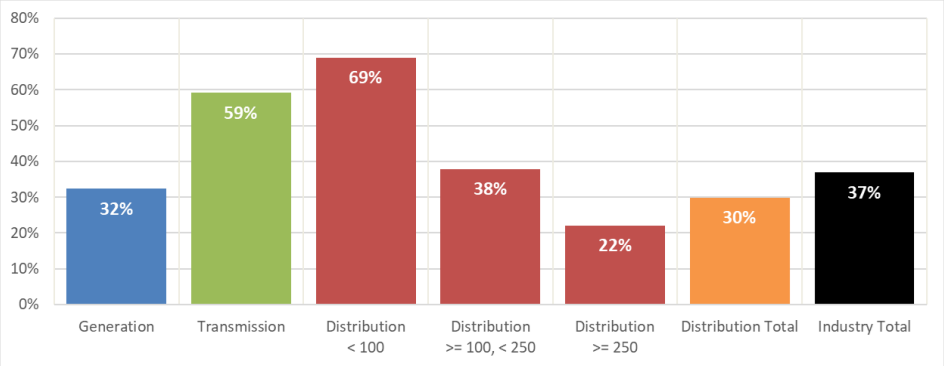
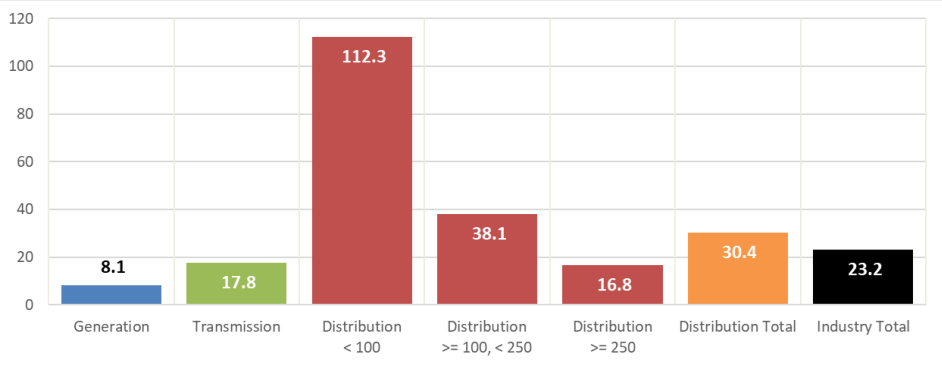


Figure 11. H&S site visits from Exec and GMs per 100 Operational FTEs



First year collecting leading indicator data

This was the first year EEA has requested data on leading indicators from the industry. As a result there is not enough information yet to establish trends and evaluate whether these measures and activities impact incident rates and could be considered leading indicators. However, even with a single year of data there can be some observations made.

Leading Indicators vs Incident Rates

For 3 of the Leading Indicator measures the Small Distributer companies show the highest rates of activity. However, this is also the industry category with the highest incident rate. This may be due to the size of the companies, but could also be seen as an effort to reduce the incident rate through proactive action. Additional years of results should help establish a relationship and indicate if these measures are effective.

Cross-industry benchmarking

Figure 12. TRIFR benchmarking with members of the Business Leaders' Forum

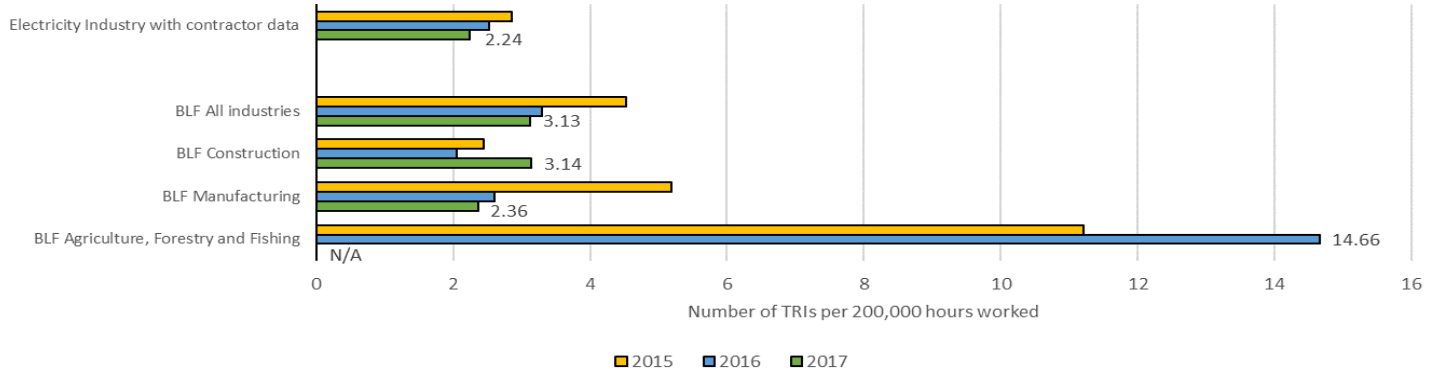
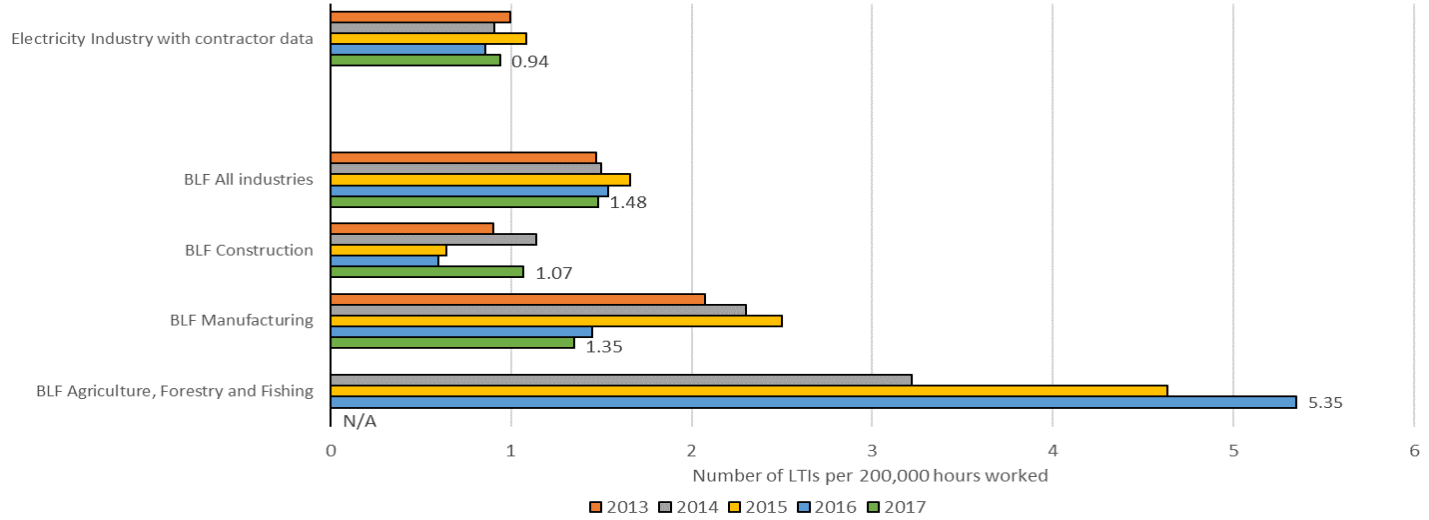


Figure 13. LTIFR benchmarking with members of the Business Leaders' Forum



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 12 and 13 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.

Overall, TRIFR and LTIFR results show similar patterns in injury frequency trends, with increasing harm rates for the construction industry, and slightly lower rates in the Manufacturing sector in 2017.

The electricity industry had a slight decrease in TRIFR but a slight increase in TRIFR. This is likely due to an increase in LTIs compared to MTIs and RWIs.

Note: The BLF has withheld the 2017 results for the Education/ Health and Agriculture/Forestry/ Fishing sectors as there were too few participants to maintain confidentiality of the data. (3 participants)

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. Further reports will comment on the validity of the Critical Risks.

Next year 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.

Earlier this year 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.

Disclaimer and glossary

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.

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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.

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.

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