



Electricity Engineers'
Association

**HEALTH &
SAFETY**

2017

Electricity Supply Industry Safety Performance Indicators Report

Reporting period: 1 July 2016 - 30 June 2017

EEA.CO.NZ



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Industry snapshot



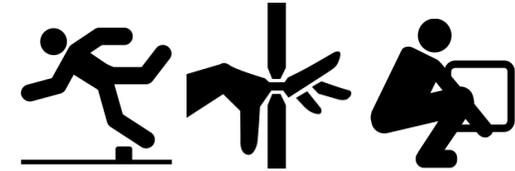
0 fatalities for four consecutive years



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



42% of all LTIs resulted in more than one week off work (40% last year)



The most common causes of severe LTIs: Slips, trips, falls; crushed or caught by object; lifting



LTIFR Trends to 2016
Compared to 2009 baselines



TRIFR Trends
Over the last three years

Category	LTIFR Trends to 2016 Compared to 2009 baselines	TRIFR Trends Over the last three years
 Generation	 From 0.8 to average of 0.4	 From 1.5 to 1.8
 Transmission	 From 0.5 to average of 0.5	 From 2.6 to 1.0
 Distribution	 From 2.7 to average of 1.7	 From 5.5 to 3.6
 Retail	 From 0.7 to average of 0.7	 From 2.2 to 1.7
 Industry	 From 1.5 to average of 1.1	 From 3.7 to 2.5

Industry results for 2016/17

The below table summarises all safety performance results gathered over the reporting period 1 July 2016 to 30 June 2017, broken down by industry sectors.

Electricity Supply Industry - Summary of safety data and performance indicators															
Year ended 2017	FTEs	Fatalities	LTIs	RWIs	MTIs	TRIs	Days Lost to LTIs	Days of Restricted Work	LTIFR	RWIFR	MTIFR	TRIFR	LTISR	RWISR	ATLR to LTIs
Generation	1817	0	10	5	17	32	96	79	0.6	0.3	0.9	1.8	5	4	10
Transmission	1705	0	3	2	12	17	249	20	0.2	0.1	0.7	1.0	15	1	83
Distribution < 100 employees	433	0	15	1	7	23	350	5	3.5	0.2	1.6	5.3	81	1	23
Distribution ≥ 100 and < 250 empl.	1944	0	48	11	32	91	431	178	2.5	0.6	1.6	4.7	22	9	9
Distribution ≥ 250 employees	3102	0	32	5	46	83	442	302	1.0	0.2	1.5	2.7	14	10	14
<i>Distribution total</i>	<i>5479</i>	<i>0</i>	<i>95</i>	<i>17</i>	<i>85</i>	<i>197</i>	<i>1223</i>	<i>485</i>	<i>1.7</i>	<i>0.3</i>	<i>1.6</i>	<i>3.6</i>	<i>22</i>	<i>9</i>	<i>13</i>
Retail	2622	0	17	6	22	45	137	24	0.6	0.2	0.8	1.7	5	1	8
Industry	11624	0	125	30	136	291	1705	608	1.1	0.3	1.2	2.5	15	5	14

Past data updates

Some LTIs reported in 2015/16 continued to impact lost time reporting in 2016/17. As these incidents happened in 2015/16, 2015/16 lost time data has been updated accordingly. Similarly, it is expected that 2016/17 will require minor updates due to a few injuries that are currently continuing to impact time lost at the time this Report has been prepared.

Further minor amendments were made on historical FTE and injury numbers following verbal clarifications on our reporting specifications.

Restricted Work Injury reporting

Accuracy of Restricted Work Injury reporting has greatly improved over the past three years, as survey participants started implementing Total Recordable Injury monitoring requirements as part of their internal safety reporting system. Only four companies advised they were unable to provide RWI data this year.

While EEA decided to adjust sector and industry calculations for RWI and TRI frequency rates and RWI severity rates to make up for RWI underreporting in 2014/15 and 2015/16, these adjustments were not deemed necessary for 2016/17 results.

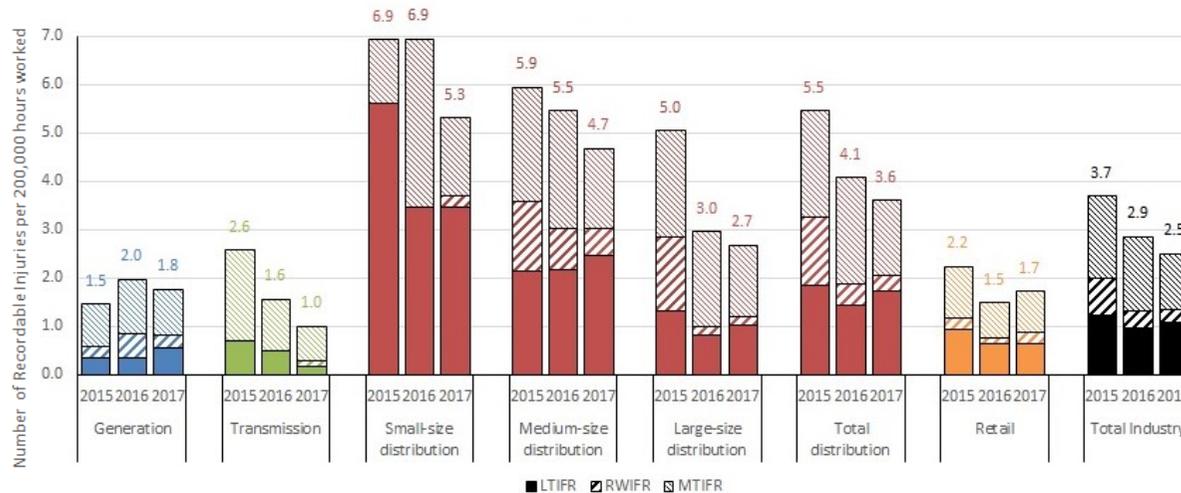
Update on survey participants

One large distribution company, which had participated since 2004, decided not to provide safety performance data in 2015/16 and 2016/17. In 2014/15, the data for this company covered 26% of all large distribution companies' FTEs, 17% of all distribution FTEs, and 8% of all industry FTEs. 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, 85% of all FTEs in the combined generation, transmission and distribution sectors.

Total recordable injuries

Figure 1. Total Recordable Injury Frequency Rates (Actuals 2014/15 to 2016/17) per 200,000 hours worked, by Sectors



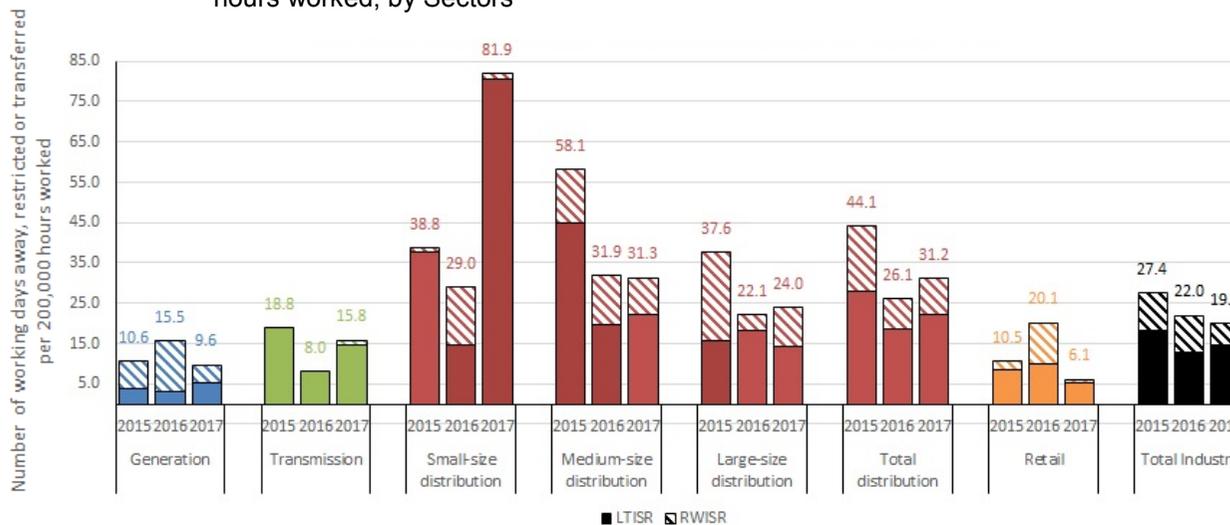
Notes:

- 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 working days.

Frequency rates - Total Recordable Injuries

The industry's TRIFR decreased by 14% in 2016/17 compared to 2015/16, mainly due to a lower frequency rate of Medical Treatment and Restricted Work Injuries. All but the retail sector experienced a year-to-year decrease in TRIFR.

Figure 2. Days Away, Restricted or Transferred Rates (Actuals 2014/15 to 2016/17) per 200,000 hours worked, by Sectors



Severity rates - Days off and on restricted work

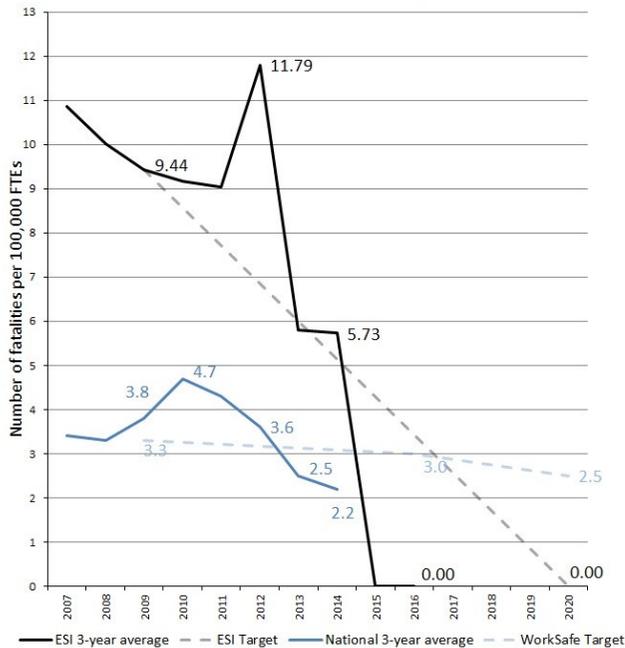
There was a sharp increase in Lost Time Injury severity rate for the small-size distribution peer group, with 350 working days reported away from work in 2016/17 compared to 51 in 2015/16. The injuries leading to this increase resulted from falls from ladder and stairs, as well as being struck by equipment.

Year-to-year improvements in lost and restricted work time severity rates in the generation and retail sectors balance the increased severity rates in the transmission and distribution sectors. This results in an ESI rate decreasing from a total of 22 working days away from work or on light duties per 200,000 hours in 2015/16 to a rate of 20 in 2016/17.

Fatalities

The electricity supply industry has experienced no fatalities for four consecutive years. The latest national three-year average shows there were 2.2 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.

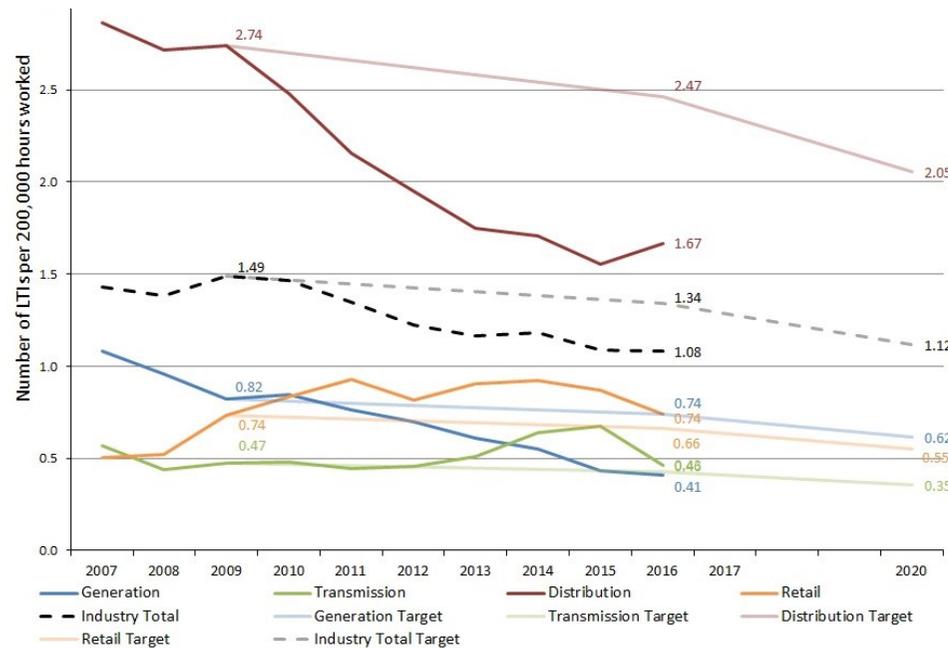
11 fatalities were reported by the industry since EEA started analysing ESI safety performance indicators in 2004.

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 ESI sectors					
2009 three-year average Baseline, 2016 and 2020 targets					
Year End	Generation	Transmission	Distribution	Retail	Industry Total
2009 baseline	0.82	0.47	2.74	0.74	1.49
2016 target -10%	0.74	0.43	2.47	0.66	1.34
2020 target -25%	0.62	0.35	2.05	0.55	1.12
2017 Actual	0.55	0.18	1.73	0.65	1.08

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 2016/17, the industry’s LTIFR was below both its 2016 and 2020 targets.

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

	Generation	↘	From 0.8 to average of 0.4
	Transmission	→	From 0.5 to average of 0.5
	Distribution	↘	From 2.7 to average of 1.7
	Retail	→	From 0.7 to average of 0.7
	Industry	↘	From 1.5 to average of 1.1

Lost time injuries

Figure 5. ATLR to LTIs Trends (three-year moving averages) per 200,000 hours worked, by Sectors

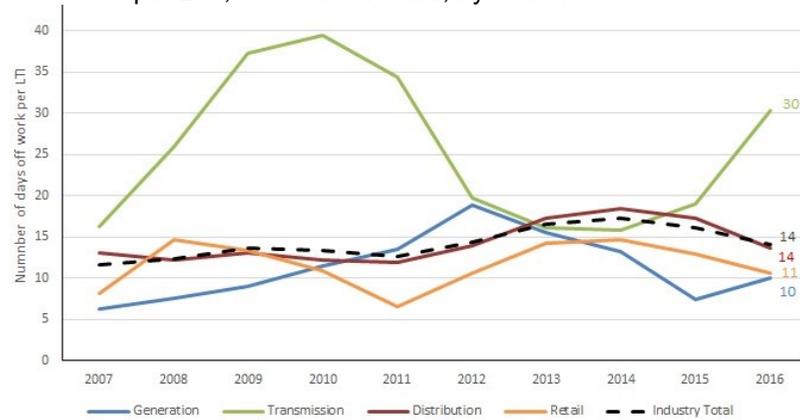
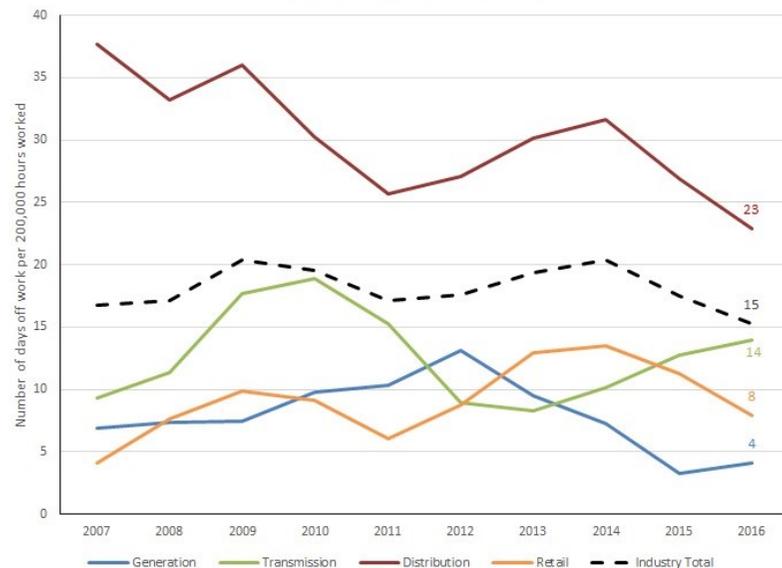


Figure 6. LTISR Trends (three-year moving averages) per 200,000 hours worked, by Sectors



Average Time Lost (ATLR) to LTIs and LTISR trend results are presented in Figures 5 and 6 in **three-year moving averages** to smooth variations across consecutive years and facilitate long-term trend analysis.

Average Time Lost per LTI - Trends

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

After a slow increase from a three-year average of 12 working days lost per LTI in 2007 to 17 in 2014, the industry’s average time lost per LTI has been slightly decreasing over the past three years to reach 14 in 2016.

The sharp increase in average time lost per LTI in the transmission sector is due to one fall from height injury that resulted in multiple fractures in 2016/17.

Lost Time Injury Severity Rate

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

Over the past ten years, the industry’s average severity rate of lost time injuries has been fluctuating between 17 and 20 working days lost per 200,000 hours worked, with a recent decrease to an average of 15 in 2016.

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 23 working days lost per 200,000 hours worked in 2016, however this is a sharp decrease compared to the 2007 average peak of 38.

The generation and retail sectors have experienced slight decreases in their average LTISR results over the past few years, while the transmission LTISR has increased from an average of 8 in 2013 to 14 in 2016.

Severity

Figure 7. Breakdown of injuries resulting in more than a week away from work, by harm mechanism
2015/16 (inner circle) and 2016/17 (outer circle) comparison

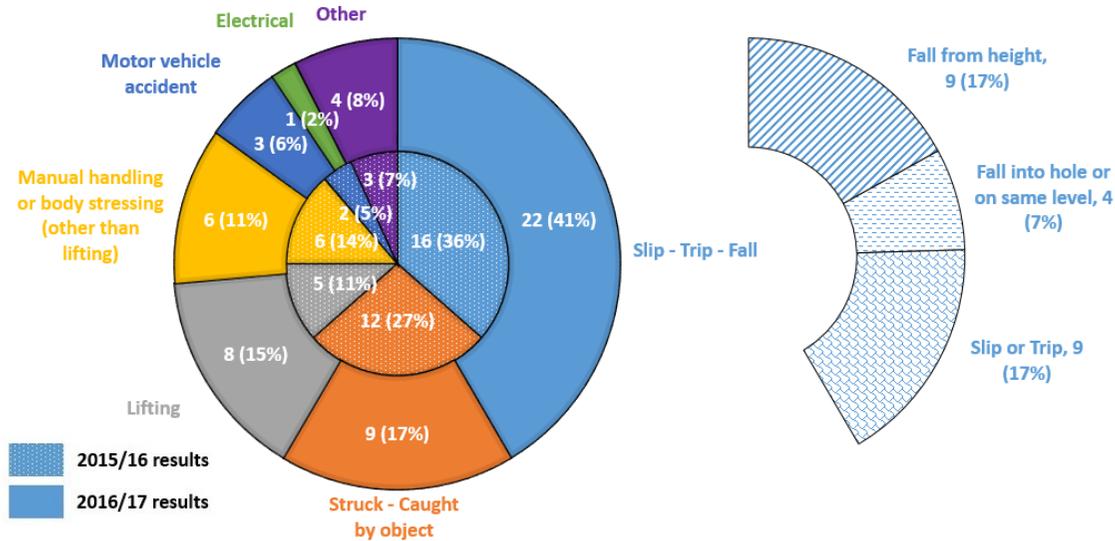
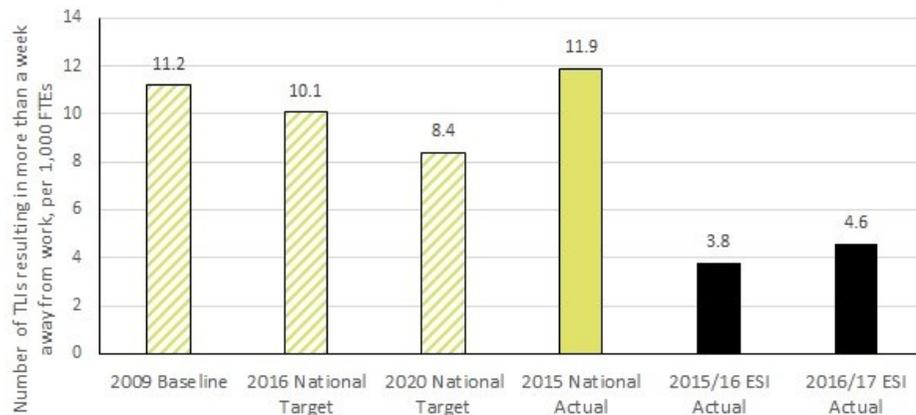


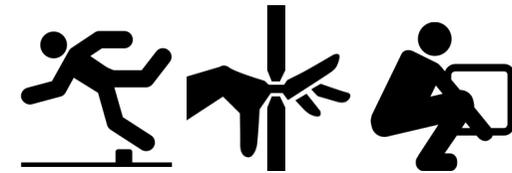
Figure 8. Rate of injuries resulting in more than a week away from work, per 1,000 FTEs



Industry overview of injuries resulting in more than a week away from work

In 2016/17, 42% of all LTIs reported by the industry led to more than a week away from work. The most common direct causes of harm are:

- Slips, trips and falls
- Struck or caught by object
- Lifting



It is worth noting that, in its *Reducing Harm Action Plan* (July 2016), WorkSafe focuses on four risks, including two of the most common causes of harm 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

In 2016/17, the ESI reported 53 LTIs that resulted in more than a week away from work. This equates to a rate of 4.6 such LTIs per 1,000 FTEs, well below WorkSafe's national (all industries) target of 8.4 by 2020.

Cross-industry benchmarking

Figure 9. TRIFR benchmarking with members of the Business Leaders' Forum

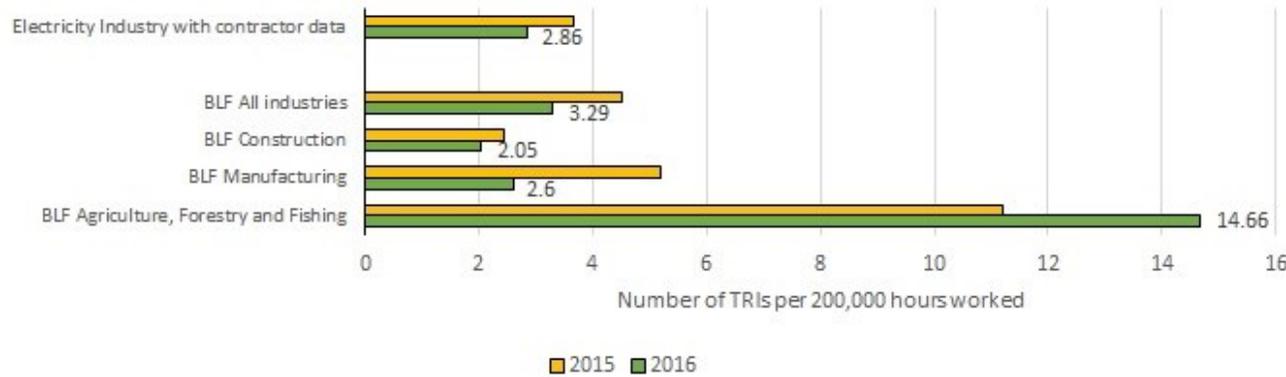
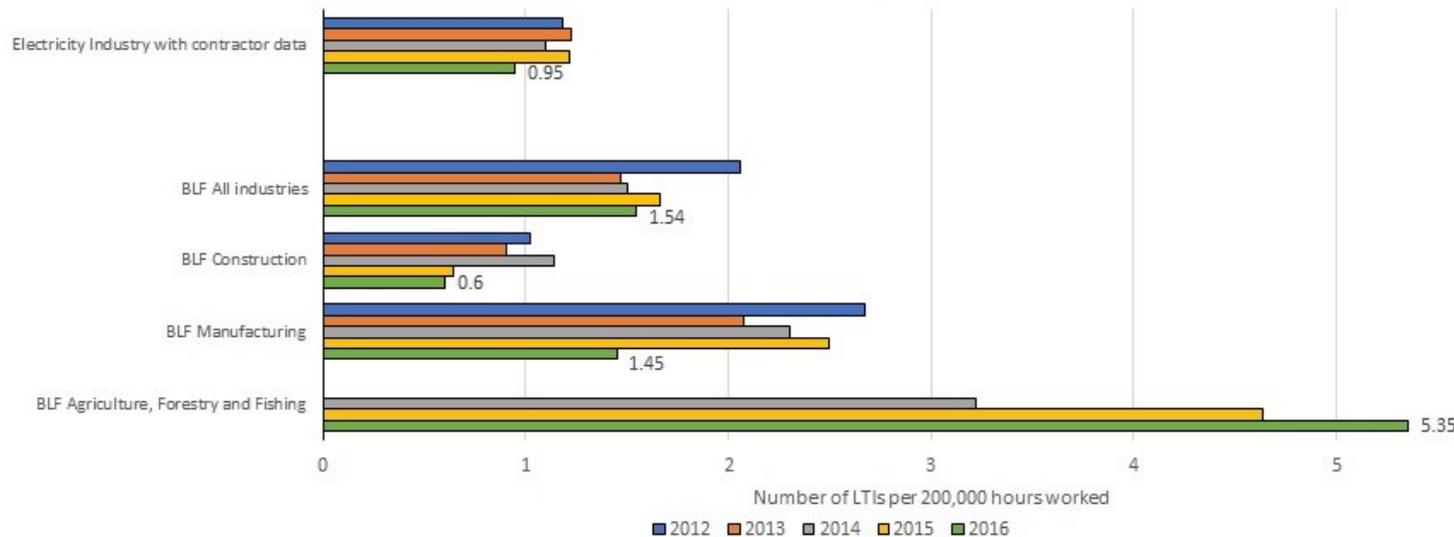


Figure 10. LTIFR benchmarking with members of the Business Leaders' Forum



Note: Contractor data is excluded unless specified otherwise.

The Business Leaders' Forum (BLF) has been analysing Total Recordable Injury data and trends for five years since 2012. Figures 9 and 10 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.

Both TRIFR and LTIFR results show similar pattern in injury frequency trends, with increasing harm rates for the Agriculture, Forestry and Fishing industries, noticeably lower rates in the Manufacturing sector in 2016, and slightly decreasing rates in both the Construction industry and the Electricity industry.

International benchmarking
 For some international industry benchmarking, please refer to the *Australia / New Zealand OHS Statistics Benchmarking Report 2007-2016*.

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 aim we have been working closely with all our stakeholders to determine the priority H&S risks for our industry. Based on an analysis of a detailed survey sent out to EEA members, these are:

- Electricity
- Work at Heights
- Driving
- Asset Failure
- Mobile Powered Plant
- Traffic management
- Hazardous materials
- Confined spaces
- Work-related ill-health
- Lone working

In addition to detailing the control measures for each of these risks, we will be seeking to develop appropriate metrics to provide reassurance that the control measures in place remain effective.

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 has embarked on a major project to develop high level meaningful lead indicators. Once agreed and finalised, these will be collated and presented alongside the current lagging safety performance indicators in future reports.



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:

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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, working days away or restricted / transferred per 200,000 hours worked. DART rate is the sum of LTISR and RWISR, namely the number of working 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 working 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.