

Electricity Transmission Network Service Provider Performance Data

Introduction

This workbook contains performance data for electricity transmission businesses in the National Energy Market (NEM). The charts and data are presented for a range of financial and network performance measures.

Interpretation

The data covers the regulatory years from 2006 to 2017. It is reported on an end of year basis. All transmission businesses report on a financial year basis, hence the label 2015 refers to data collected for the year ending 30 June 2015 (or 31 March 2015 for AusNet (T)). Exceptions to this are tables 6,7 and 8, which are reported on a calendar year basis, in line with STPIS reporting timeframes.

All financial values have been converted to June 2017 dollars (or March 2017 dollars for AusNet (T)).

Sources

Data is classified as actual or forecast data.

Actual data is generally sourced from individual annual RIN responses, including economic benchmarking and category analysis RINs, or historical data provided at the time of regulatory determinations. The RIN responses of the transmission businesses are available on the AER website.

Forecast data is generally sourced from the final regulatory determinations made by the AER for each of the businesses, updated for decisions by the Australian Competition Tribunal, and other allowed adjustments.

Detailed data sources are listed in each of the worksheets.

VERSION RECORD

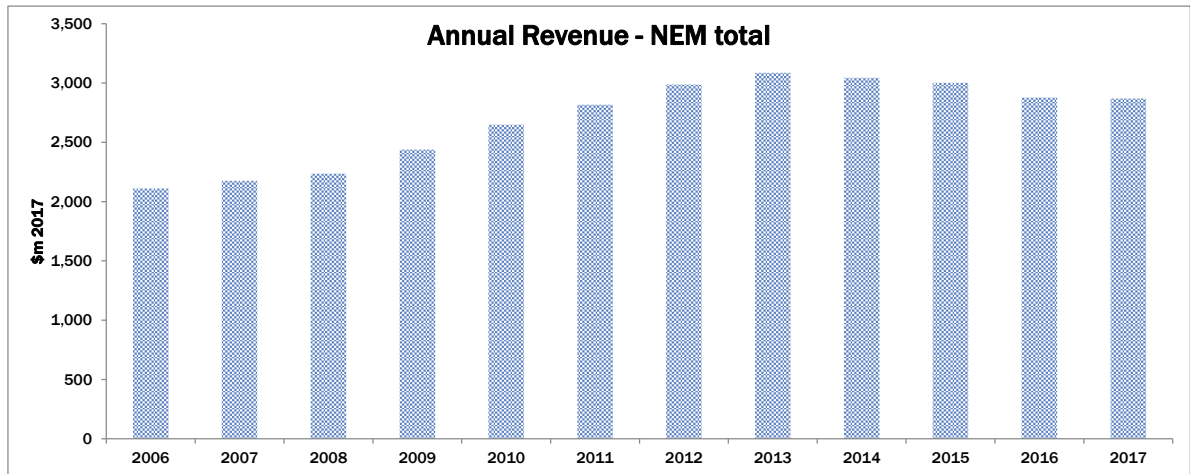
Version	Publication date	Data range/updates	
1	Feb 2018	Financial years	2005-06 to 2016-17
2	Aug 2018	Financial years	2005-06 to 2016-17 Amended Opex data to remove Easement Tax for AusNet Services

Electricity Transmission Network Service Provider **Performance Data**

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Revenue



Actual revenues are reported by the transmission businesses and include all components of their revenue associated with delivering prescribed transmission services. Transmission businesses are regulated via a revenue cap, which limits the revenues that can be earned in any year.

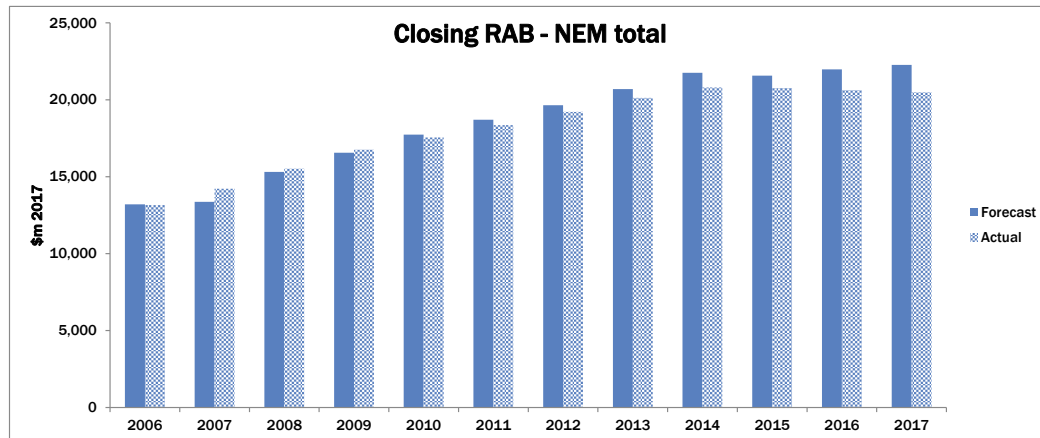
Actual Revenue

	\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Powerlink	QLD	629	663	675	728	773	832	918	933	960	996	1,009	
Transgrid	NSW	610	629	651	691	796	845	901	945	935	889	760	
AusNet Services	VIC	492	493	513	566	590	597	601	614	619	601	584	
ElectraNet	SA	226	231	233	279	294	312	332	354	302	316	329	
TasNetworks	TAS	154	159	163	175	196	230	236	239	229	201	196	
NEM Total			2,111	2,176	2,236	2,438	2,648	2,816	2,987	3,086	3,044	3,002	2,878

Sources:

Economic benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Regulatory Asset Base (RAB)



The regulatory asset base represents the value of the network at a given point in time. The value of the network changes each year due to through capital expenditures, depreciation, and disposal of assets.

Actual Closing RAB

\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	3,989	4,847	5,559	6,066	6,395	6,671	7,167	7,481	7,604	7,449	7,309	7,144
Transgrid	NSW	4,288	4,393	4,674	5,106	5,399	5,633	5,776	6,133	6,470	6,443	6,431	6,348
AusNet Services	VIC	2,539	2,533	2,585	2,747	2,729	2,730	2,750	2,791	2,913	3,066	3,046	3,091
ElectraNet	SA	1,365	1,398	1,639	1,687	1,769	1,982	2,106	2,261	2,327	2,335	2,403	2,476
TasNetworks	TAS	979	1,049	1,064	1,152	1,260	1,339	1,418	1,460	1,483	1,465	1,432	1,421
NEM Total		13,161	14,221	15,522	16,758	17,551	18,355	19,217	20,127	20,796	20,758	20,621	20,481

Sources:

Actual closing RAB has been taken from Roll forward models developed as part of final regulatory decisions, as made by the AER or jurisdictional regulators, and as updated by the Australian Competition Tribunal. Where a final decision for a regulatory period is not yet available, draft decisions or regulatory proposals have been used.

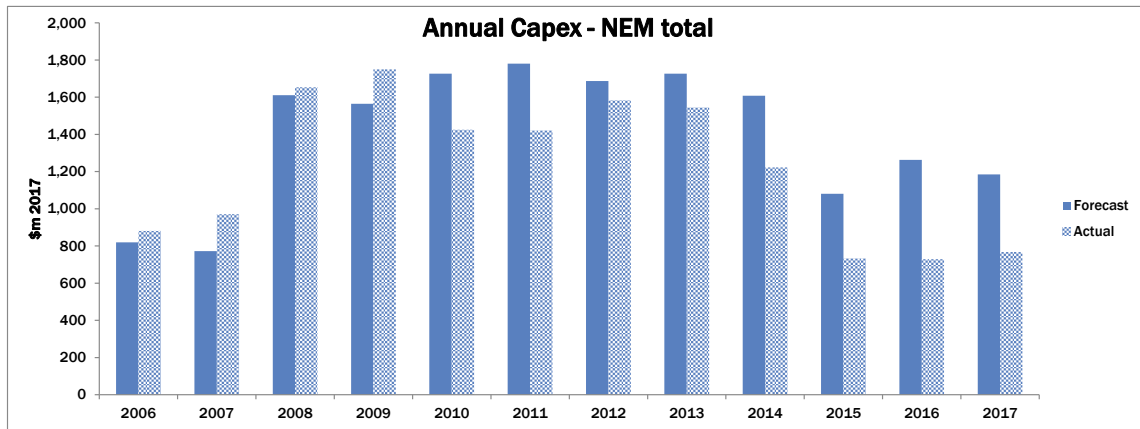
Forecast Closing RAB

\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	3,919	3,857	5,511	6,125	6,443	6,814	7,084	7,650	8,030	8,196	8,392	8,642
Transgrid	NSW	4,324	4,471	4,794	5,023	5,494	5,835	6,310	6,710	6,931	6,399	6,460	6,434
AusNet Services	VIC	2,611	2,598	2,582	2,730	2,733	2,758	2,788	2,791	2,838	3,038	3,080	3,116
ElectraNet	SA	1,395	1,414	1,386	1,643	1,786	1,885	2,001	2,017	2,382	2,458	2,556	2,589
TasNetworks	TAS	960	1,032	1,038	1,034	1,277	1,409	1,466	1,523	1,575	1,480	1,492	1,488
NEM Total		13,209	13,371	15,312	16,555	17,732	18,701	19,649	20,691	21,757	21,571	21,980	22,268

Sources:

Forecast closing RAB has been taken from post tax revenue models developed as part of final regulatory decisions, as made by the AER or jurisdictional regulators, and as adjusted by the Australian Competition Tribunal. Updates to data (for example due to a contingent project being triggered) are also taken into account.

Capex



Capital expenditure measures the new investments in the transmission networks. This includes augmentation of the network, replacement of assets, improving network performance and non-network investments (e.g. buildings). All data is reported on an as-incurred basis.

Actual annual capex

\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	355	317	828	751	523	484	703	489	336	166	136	174
Transgrid	NSW	206	280	401	689	477	414	391	529	510	262	253	204
AusNet Services	VIC	136	139	137	111	130	126	147	188	155	159	143	176
ElectraNet	SA	90	104	210	118	138	265	201	245	140	118	171	162
TasNetworks	TAS	94	131	78	81	156	132	140	93	82	26	25	51
NEM Total		881	971	1,654	1,749	1,425	1,421	1,583	1,544	1,223	732	729	767

Sources:

Actual capex has been taken from Roll forward models developed as part of final regulatory decisions, as made by the AER or jurisdictional regulators, and as updated by the Australian Competition Tribunal. Where a Final decision RFM is unavailable, Draft decision data has been used, and if no AER decisions available, annual regulatory account submissions.

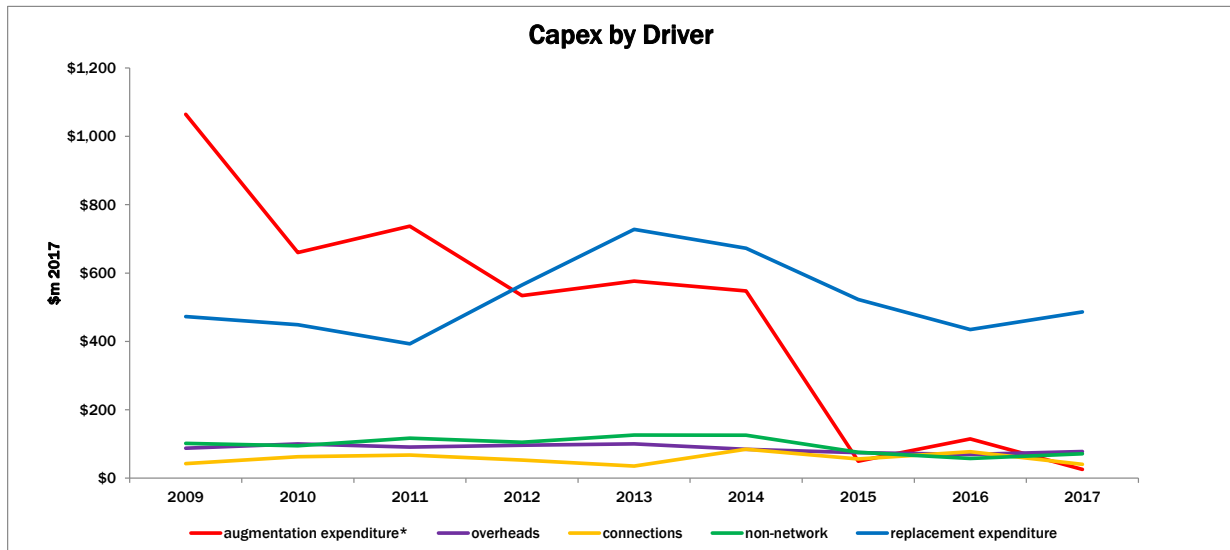
Forecast annual capex

\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	299	137	894	816	538	603	514	743	613	437	486	550
Transgrid	NSW	250	301	476	399	643	548	674	619	465	268	320	247
AusNet Services	VIC	79	109	112	144	138	163	173	151	185	158	191	190
ElectraNet	SA	121	108	73	159	218	278	215	96	226	164	199	143
TasNetworks	TAS	71	117	55	46	190	188	112	118	118	53	68	55
NEM Total		819	772	1,611	1,564	1,727	1,780	1,687	1,727	1,608	1,080	1,263	1,185

Sources:

Forecast capex is sourced from post tax revenue models determined as part of final regulatory decisions, as made by the AER or jurisdictional regulators, and as adjusted by the Australian Competition Tribunal. Updates to data supplied (for example due to a contingent project being triggered) are also taken into account.

Capital expenditure by driver



Transmission businesses are required to report their capital expenditure annually by driver. This shows how the transmission businesses investment's were split between the various categories. The terms of the Category Analysis RIN does result in some expenditures being classified into more than one driver (figures for each driver must be mutually exclusive and collectively exhaustive). As such totals may not reconcile with Chart 3 totals due to some expenditures falling into more than one driver.

Capex by Driver

Reported Capex spent annually (\$m 2017)	2009	2010	2011	2012	2013	2014	2015	2016	2017
augmentation expenditure*	1,064.5	660.3	736.9	534.1	576.3	547.5	49.3	114.8	25.5
overheads	87.4	99.8	90.9	96.0	100.2	84.3	74.6	69.3	77.7
connections	42.3	62.3	67.5	52.9	35.2	84.5	56.1	77.4	40.3
non-network	101.5	94.6	116.7	104.8	126.0	125.3	75.8	57.5	71.0
replacement expenditure	472.8	448.5	392.9	565.1	727.8	672.4	522.8	434.6	486.4

Notes:

*Does not include Victorian augmentation expenditure

Sources:

Category Analysis RINs 2008-13, 2014, 2015, 2016, 2017

Powerlink

Reported Capex spent annually (\$m 2017)	2009	2010	2011	2012	2013	2014	2015	2016	2017
augmentation expenditure	463.1	223.2	300.6	208.0	196.3	270.0	10.0	12.0	0.0
overheads	35.0	28.1	25.8	25.0	24.5	20.3	13.0	7.3	12.0
connections	18.2	4.5	4.7	6.3	3.1	5.3	1.4	0.0	0.0
non-network	29.6	37.6	37.7	32.0	34.8	13.5	7.9	13.2	17.5
replacement expenditure	189.5	155.5	80.5	202.1	233.4	255.3	149.3	51.9	115.7

Transgrid

Reported Capex spent annually (\$m 2017)	2009	2010	2011	2012	2013	2014	2015	2016	2017
augmentation expenditure	520.2	289.8	215.6	184.8	287.0	240.2	22.6	54.3	4.8
overheads	29.2	45.1	32.5	37.8	41.3	33.9	33.8	29.8	31.1
connections	0.0	0.0	0.0	0.0	0.0	2.9	2.5	1.8	0.8
non-network	39.5	25.5	30.0	44.4	54.9	72.5	36.1	21.2	23.1
replacement expenditure	97.5	117.3	138.0	130.5	146.8	160.7	168.1	139.8	121.0

AusNet Services

Reported Capex spent annually (\$m 2017)	2009	2010	2011	2012	2013	2014	2015	2016	2017
augmentation expenditure*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
overheads	12.2	13.1	14.1	15.2	17.4	15.2	13.5	17.8	13.4
connections	9.2	27.3	6.4	4.1	16.6	60.6	32.7	73.2	36.0
non-network	13.4	10.8	15.9	13.1	18.0	22.6	22.3	10.3	8.2
replacement expenditure	87.6	106.5	96.3	122.0	154.8	118.6	123.4	124.0	114.6

Notes:

*Augmentation of Vic transmission networks is carried out by AEMO, hence \$0 expenditure reported by AusNet Services

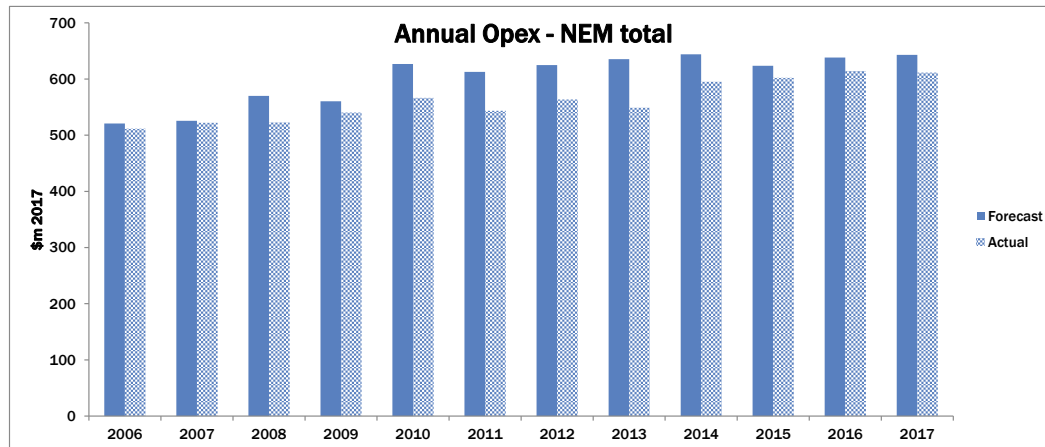
ElectraNet

Reported Capex spent annually (\$m 2017)	2009	2010	2011	2012	2013	2014	2015	2016	2017
augmentation expenditure	14.2	45.4	179.5	87.6	82.2	32.7	16.6	48.2	19.5
overheads	7.2	9.6	14.1	14.6	14.1	12.2	11.4	10.0	10.3
connections	14.4	23.2	30.8	16.3	13.4	15.6	19.4	2.3	3.5
non-network	8.4	9.8	8.2	7.8	12.7	11.1	6.2	7.3	12.1
replacement expenditure	72.7	49.5	32.9	63.9	120.1	66.9	64.7	103.9	106.5

TasNetworks

Reported Capex spent annually (\$m 2017)	2009	2010	2011	2012	2013	2014	2015	2016	2017
augmentation expenditure	66.9	101.9	41.2	53.7	10.8	4.6	0.1	0.3	1.2
overheads	3.7	3.9	4.4	3.3	2.8	2.7	2.9	4.4	10.7
connections	0.6	7.2	25.6	26.2	2.1	0.1	0.0	0.0	0.0
non-network	10.6	10.9	24.9	7.5	5.8	5.5	3.3	5.4	10.2
replacement expenditure	25.5	19.7	45.2	46.6	72.7	70.7	17.4	15.0	28.7

Opex



Operating expenditure includes network operation, maintenance and other non-capital costs incurred by the transmission businesses. Easement taxes applicable to AusNet Services have been removed for this report.

Actual annual opex

\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	158	166	180	173	179	173	179	183	193	220	224	229
Transgrid	NSW	160	159	150	150	169	158	170	156	187	175	173	172
AusNet Services	VIC	82	80	73	94	95	87	82	83	88	88	91	88
ElectraNet	SA	64	68	62	66	68	74	81	77	79	83	87	91
TasNetworks	TAS	47	49	58	56	56	53	52	49	49	36	38	32
NEM Total		512	522	523	540	567	543	563	549	595	602	614	611

Sources:

Economic Benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

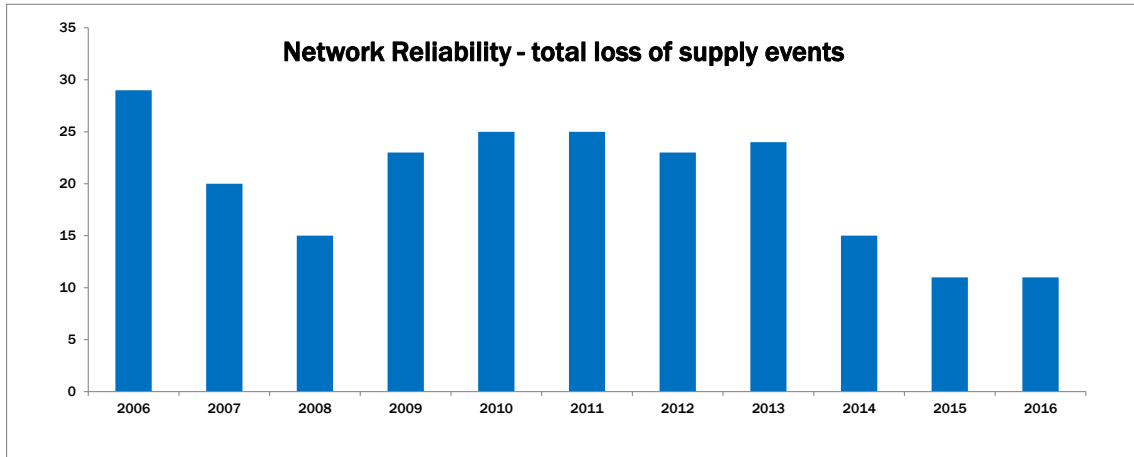
Forecast annual opex

\$m 2017	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	135	138	183	188	197	188	194	193	203	206	219	223
Transgrid	NSW	161	160	160	160	196	188	194	201	197	179	177	182
AusNet Services	VIC	106	109	111	101	101	101	99	99	98	107	107	96
ElectraNet	SA	74	76	78	73	74	75	78	80	85	86	90	96
TasNetworks	TAS	44	43	39	39	59	60	60	63	62	46	46	46
NEM Total		521	526	570	560	627	613	625	635	644	623	638	643

Sources:

Forecast opex has been taken from post tax revenue models determined as part of final regulatory decisions, as made by the AER or jurisdictional regulators, and as adjusted by the Australian Competition Tribunal. Updates to data supplied are also taken into account.

Quality of Services - Reliability - outage events



Reliability is an important component of network performance. Network performance measures form part of the service target performance incentive scheme (STPIS) relevant to the transmission businesses.

Loss of supply events measure the number of times energy is not available for set periods of times to transmission network customers. These thresholds vary for each business between 0.05 and 1.0 system minutes, as outlined in published AER STPIS decisions.

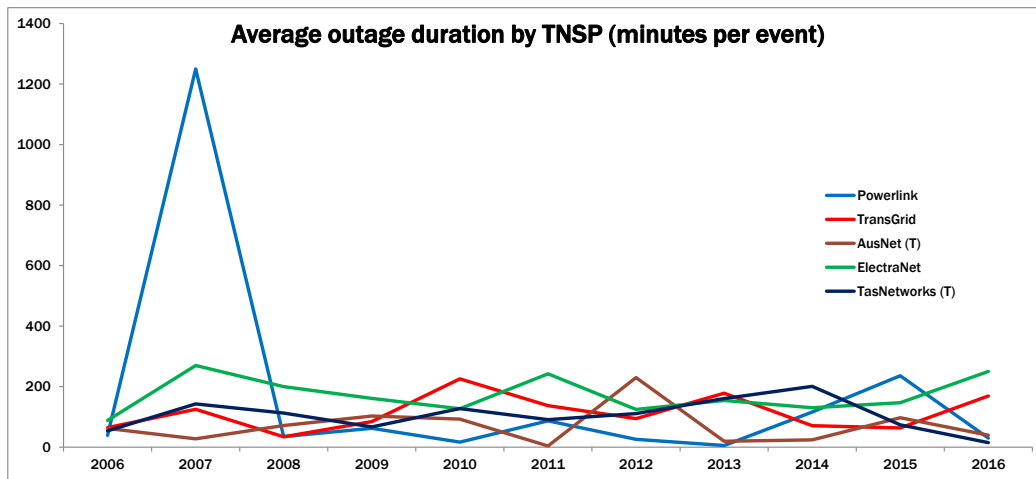
Loss of supply events

	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Powerlink	QLD	2	2	2	2	0	4	1	0	3	1	0
TransGrid	NSW	2	5	2	3	3	3	3	4	3	4	2
AusNet (T)	VIC	5	2	1	6	1	0	2	5	1	2	3
ElectraNet	SA	4	1	4	4	12	7	7	5	4	1	5
TasNetworks (T)	TAS	16	10	6	8	9	11	10	10	4	3	1
Total loss of supply events (LHS)		29	20	15	23	25	25	23	24	15	11	11

Sources:

Economic Benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Quality of Services - Reliability



Reliability is an important component of network performance. Network performance measures form part of the service target performance incentive scheme (STPIS) relevant to the transmission businesses.

Average outage duration shows the average length of time of unplanned outages on the transmission network that resulted in a loss of supply event. This includes emergency and extreme events and outages with less than 24 hours notice to affected customers. Outages caused by third party systems, at the direction of emergency services/AEMO, planned outages or transient interruptions of less than a minute are not included in this data.

Average outage duration is calculated as the total duration of outages divided by the number of events for each network.

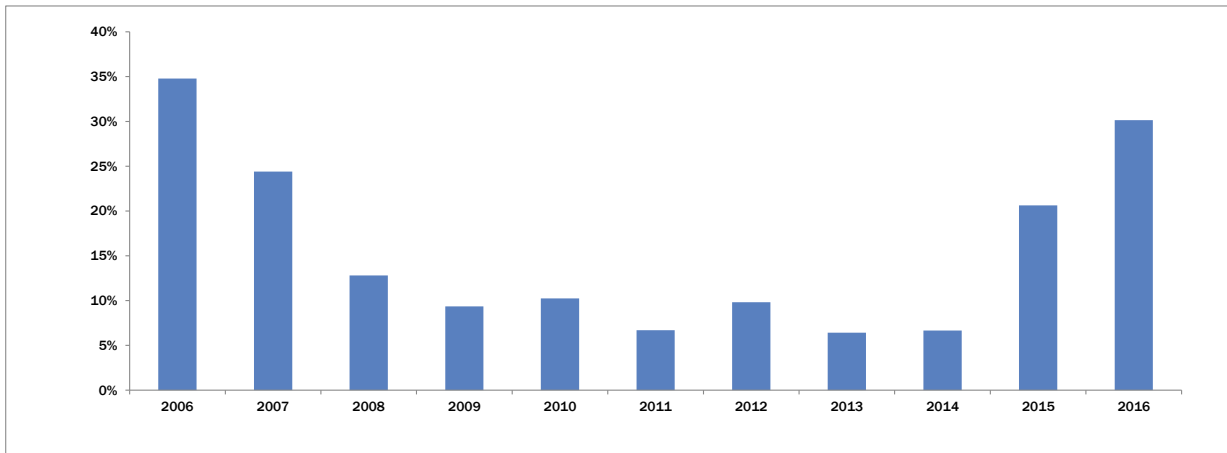
Average outage duration

	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Powerlink	QLD	39	1250	35	62	17	87	26	6	116	236	30
TransGrid	NSW	65	125	34	85	226	137	94	179	71	64	169
AusNet (T)	VIC	62	28	72	103	93	4	230	20	24	98	40
ElectraNet	SA	88	270	200	161	127	242	125	154	131	147	251
TasNetworks (T)	TAS	54	143	113	67	128	91	111	161	201	74	15

Sources:

Economic Benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Quality of Services - Market impact



Market impact measures the relative disruption of outages on customers. The relative disruption is determined by estimating the impact on energy price in the NEM - if an outage increases the energy price by more than \$10/MWh it is counted in the market impact measure.

The data excludes outages caused by force majeure events, resulting from third party systems, required to maintain personal safety or security, and other specific exclusions.

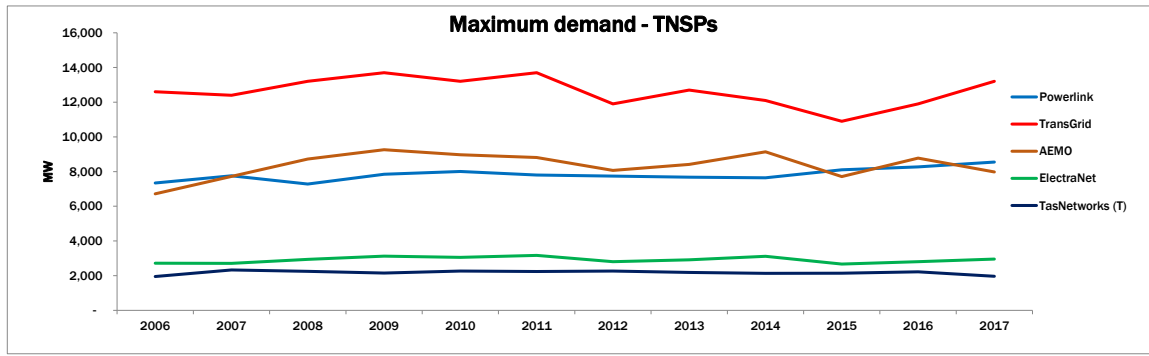
Market impact indicator

	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Powerlink	QLD	4%	3%	1%	1%	1%	0%	0%	0%	4%	0%	0%
TransGrid	NSW	3%	3%	3%	2%	1%	1%	1%	1%	1%	1%	3%
AusNet (T)	VIC	1%	3%	3%	1%	2%	3%	2%	1%	1%	2%	10%
ElectraNet	SA	27%	10%	5%	4%	2%	2%	5%	3%	0%	17%	14%
TasNetworks	TAS	0%	6%	0%	1%	4%	1%	1%	2%	1%	0%	3%
Percentage of dispatch intervals where the transmission network impacted market outcomes		35%	24%	13%	9%	10%	7%	10%	6%	7%	21%	30%

Sources:

Economic Benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Maximum demand (MW)



Maximum demand is reported as the coincident maximum demand on each transmission network. That is the overall demand at the single point in time demand across the entire network was at its highest. Maximum demand information can be used to inform expenditure decisions, and is one of the indicators of demand that the AER uses to assess expenditure proposals.

Maximum demand (MW)

	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	7,337	7,758	7,281	7,849	8,003	7,797	7,740	7,681	7,638	8,105	8,272	8,548
TransGrid	NSW	12,600	12,400	13,200	13,700	13,200	13,700	11,900	12,700	12,100	10,900	11,900	13,200
AEMO	VIC	6,718	7,719	8,721	9,260	8,975	8,813	8,071	8,411	9,137	7,715	8,780	7,980
ElectraNet	SA	2,717	2,707	2,940	3,128	3,055	3,169	2,808	2,914	3,115	2,668	2,804	2,955
TasNetworks (T)	TAS	1,950	2,330	2,245	2,154	2,267	2,239	2,264	2,185	2,132	2,143	2,219	1,964

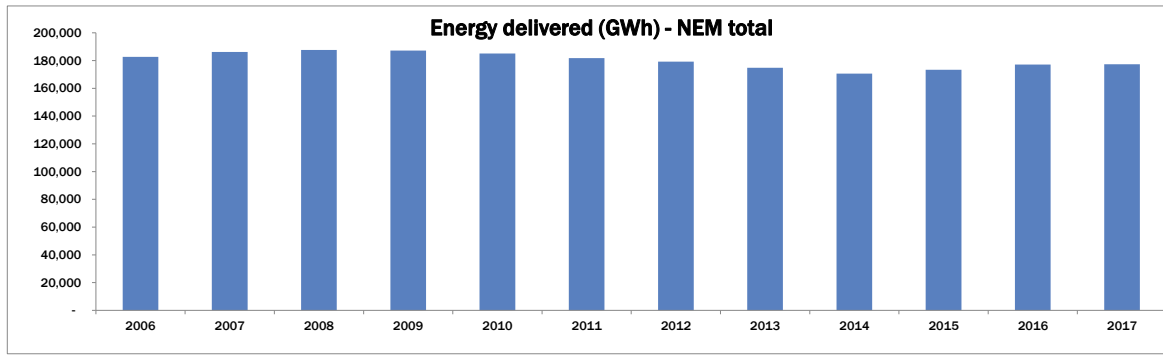
Notes:

AEMO 2007 - this data is an average of the reported amounts in 2006 and 2008. AEMO did not provide maximum demand information for 2007.

Sources:

Economic benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Energy delivered (Gwh)



Energy delivered is a measure of total energy transported through the transmission system in each year. The information reported includes energy delivered to distribution networks and directly connected end users. Energy delivered to other transmission networks is excluded.

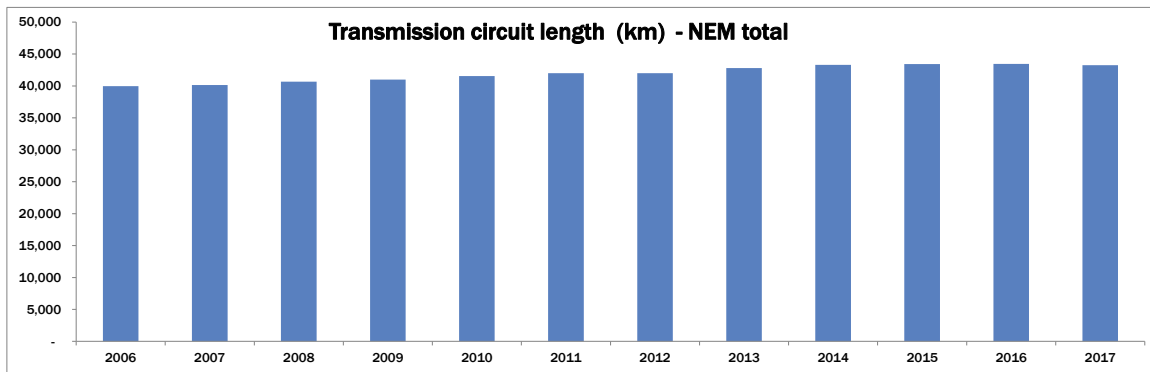
Energy delivered (GWh)

	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink	QLD	45,060	45,382	45,653	46,907	46,927	45,241	45,394	45,651	45,145	46,982	49,384	50,124
TransGrid	NSW	70,338	72,128	72,532	71,426	69,426	68,531	66,546	62,848	60,400	63,400	63,900	65,800
	AEMO VIC	44,577	45,321	45,600	44,832	44,951	44,021	44,017	43,180	42,632	40,806	41,408	39,594
ElectraNet	SA	12,571	13,107	13,107	13,327	13,266	13,362	12,992	12,928	12,341	11,952	12,326	11,817
TasNetworks (T)	TAS	10,085	10,238	10,738	10,688	10,522	10,610	10,268	10,193	10,044	10,186	10,074	10,038
NEM Total		182,631	186,177	187,630	187,180	185,094	181,766	179,217	174,800	170,563	173,326	177,092	177,372

Sources:

Economic benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Circuit length



The circuit length data is measured at the end of each regulatory year. It includes both overhead lines and underground cables. Circuit length is always greater than or equal to route length, as a double circuit line that traverses 10 kms is counted as 20 km of circuit length.

Circuit length - total

State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink QLD	11,701	11,893	12,429	12,865	13,321	13,738	13,702	14,314	14,773	14,755	14,756	14,533
TransGrid NSW	12,517	12,526	12,524	12,523	12,682	12,682	12,697	12,894	12,930	13,025	13,039	13,078
AusNet (T) VIC	6,573	6,573	6,573	6,573	6,573	6,573	6,573	6,573	6,573	6,573	6,559	6,560
ElectraNet SA	5,601	5,519	5,519	5,504	5,502	5,505	5,526	5,527	5,529	5,521	5,524	5,520
TasNetworks (T) TAS	3,581	3,622	3,622	3,520	3,481	3,493	3,493	3,503	3,504	3,564	3,564	3,564
NEM Total	39,973	40,133	40,666	40,985	41,560	41,991	41,992	42,811	43,308	43,438	43,442	43,254

Circuit length - overhead

State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink QLD	11,685	11,877	12,413	12,848	13,304	13,717	13,681	14,292	14,751	14,733	14,734	14,511
TransGrid NSW	12,469	12,479	12,476	12,475	12,635	12,634	12,649	12,846	12,878	12,943	12,957	12,997
AusNet (T) VIC	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,548	6,551
ElectraNet SA	5,592	5,510	5,510	5,495	5,493	5,496	5,499	5,500	5,502	5,494	5,497	5,492
TasNetworks (T) TAS	3,568	3,609	3,609	3,507	3,468	3,480	3,480	3,480	3,480	3,540	3,540	3,540
NEM Total	39,876	40,036	40,569	40,887	41,461	41,889	41,871	42,680	43,173	43,272	43,276	43,091

Sources:

Economic benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017

Circuit length - underground

State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Powerlink QLD	16	16	16	17	17	21	21	22	22	22	22	22
TransGrid NSW	48	48	48	48	48	48	48	48	51	82	82	82
AusNet (T) VIC	11	11	11	11	11	11	11	11	11	11	11	9
ElectraNet SA	9	9	9	9	9	9	27	27	27	27	27	27
TasNetworks (T) TAS	13	13	13	13	13	13	13	23	24	24	24	24
NEM Total	97	97	97	98	98	102	121	131	135	166	166	163

Sources:

Economic benchmarking RIN responses, 2006-13, 2014, 2015, 2016, 2017