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Review of Proposed Augmentation Capex in NSW DNSP Regulatory Proposals 2014 - 2019

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PROJECT 301010-01373 - REVIEW OF PROPOSED AUGMENTATION CAPEX IN NSW DNSP REGULATORY PROPOSALS 2014-19

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
0	Final Report issued to AER	R Touzel	P Liggins	P Knispel	17/11/14		

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1 INTRODUCTION

1.1 Purpose of this report

The purpose of this report is to provide the Australian Energy Regulator (AER) with technical advice on aspects of the network augmentation capital expenditure (Augex) that the three NSW Distribution Network Service Providers (DNSPs) Endeavour Energy, Essential Energy and Ausgrid have proposed as part of their regulatory proposals for the 1 July 2014 to 30 June 2019 period. The assessment contained in this report is intended to assist the AER in establishing appropriate capital expenditure allowances as an input to its Draft Decisions on three DNSB's revenue levels.

The assessment is based on a limited scope review, which does not take into account all factors or all reasonable methods for determining an expenditure allowance in accordance with the National Electricity Rules (NER). It is understood that the AER will establish capital expenditure allowances for the three DNSPs based on assessments undertaken by its own staff and that other advisers are also contributing to this assessment.

1.2 Scope of requested work

The AER issued a scope of work to Deloitte Touche Tohmatsu ("Deloitte") on 17 July 2014 requesting assistance in reviewing a sample of projects or programs of work to identify any systemic issues that may result in biases in capital expenditure forecasting by the three NSW DNSPs. The assistance was to "identify whether a business' processes, systems, behaviours and/or cultures are leading to any biases in the capex forecasts" and to "identify whether these biases mean that the capex forecast does not meet the capex criteria (i.e. efficient and prudent capex)."

The AER noted three areas in which it considered there may be systemic issues and identified three related hypotheses that should be assessed:

- The business' forecast is reasonable and unbiased.
- The business' costs and work practices are prudent and efficient.
- The business' risk management is prudent and efficient.

The AER also identified a number of questions that should be considered in assessing these hypotheses and these are set out in Appendix A. The work was to be carried out in two stages:

- Stage 1 - assessment of a small sample of projects.
- Stage 2 – a broadening of the sample size and more detailed assessment to provide greater certainty in respect of the findings.

It should also be noted that the AER subsequently confined the Deloitte scope to the Augex component of Capex only and Stage 2 of the assessment did not proceed.

This report has been prepared by WorleyParsons, a technical specialist subcontractor to Deloitte in providing services to the AER.

1.3 Structure of this report

This report has been structured as a single report to cover the three NSW DNSPs with dedicated sections for each of the three businesses. Each of these sections presents the related assessment to support the findings of this report.

2 ENDEAVOUR ENERGY

2.1 Introduction

This section provides the background and assessment of the AER hypotheses in respect of the Endeavour Energy (Endeavour) business. It outlines the Augex proposed over the 2014-19 regulatory control period in the context of the total Capex and it then provides a historical context in terms of the proposed Augex in the expenditure categories over this period and the previous (2009-14) period.

Sample projects or programs have been selected to test the AER hypotheses and these are assessed and conclusions drawn.

2.2 Summary of Endeavour Energy's proposed Augex

Based on data provided in its RIN, Endeavour has proposed $315M of Augex (real $June 2014) in the 2014–19 regulatory control period as part of its overall Capex of $2048M , excluding capital contributions, and as indicated in Table 1. It is understood that the Augex covers direct costs only and that the capitalised overheads indicated in the RIN line item are applied at a project or program level but details of the apportionment of these indirect costs have not been provided. Similarly, no indication has been provided as to whether any aspects of the "balancing item" relate to Augex.

Table 1: Capex proposed by Endeavour Energy ($M real, June 2014)

Expenditure Category	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Replacement expenditure	169	160	142	140	129	740
Connections	15	15	15	15	16	76
Augmentation Expenditure	116	64	39	50	46	315
Non-network	54	33	29	29	31	176
Capitalised network overheads	38	36	36	37	36	183
Capitalised corporate overheads	25	23	25	26	27	126
Balancing item	76	90	88	89	89	433
TOTAL GROSS CAPEX (includes capcons)	493	422	375	386	372	2048
Capcons	60	60	60	60	60	302
TOTAL GROSS CAPEX (excludes capcons)	433	361	314	326	312	1746

Source: Endeavour Energy RIN data

The breakdown of the proposed Augex over the new regulatory control period is indicated in Table 2, this has been extracted from the RIN and it is expressed in the RIN asset segment groups and in $ nominal[1]. It also shows the expenditure on the same basis for the previous regulatory control period. \

[1] Table 2 has been extracted directly from RIN "Table 2.3.4 Augex Data - Total Expenditure". Endeavour was requested to reconcile differences between this expenditure forecast for the 2014-19 period and that shown in more detail in the Augex model summary RIN Table 2.4.6 "Capex and net capacity added by segment group". The data shown in Table 2 have been confirmed as the Augex forecast forming the basis of the Regulatory Proposal.

Table 2: Augex proposed by Endeavour Energy ($ nominal)

AUGMENTATION CAPEX	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
	Actual/estimate ($000s)					Forecast ($000s)				
SUBTRANSMISSION SUBSTATIONS, SWITCHING STATIONS, ZONE SUBSTATIONS	75,699	99,965	140,976	134,445	88,094	42,426	28,009	13,292	28,747	25,175
SUBTRANSMISSION LINES	23,547	46,806	63,210	66,937	54,954	21,301	18,028	8,662	6,666	7,309
HV FEEDERS	28,416	26,555	44,803	60,370	39,517	48,359	14,652	12,954	11,799	11,419
HV FEEDERS - LAND PURCHASES AND EASEMENTS	0	0	0	0	0	0	0	0	0	0
DISTRIBUTION SUBSTATIONS	9,457	8,022	5,474	2,497	3,945	4,438	4,573	4,735	4,912	5,050
DISTRIBUTION SUBSTATIONS - LAND PURCH AND EASEMENTS	96	120	84	48	60	60	60	60	60	60
LV FEEDERS	4,233	4,428	2,886	2,125	2,821	2,504	2,332	2,408	2,494	2,566
LV FEEDERS - LAND PURCHASES AND EASEMENTS	0	0	0	0	0	0	0	0	0	0
OTHER ASSETS	0	0	0	0	0	0	0	0	0	0
TOTAL	141,447	185,896	257,433	266,422	189,391	119,088	67,654	42,111	54,678	51,579

Source: Endeavour Energy RIN data

2.3 Comparison of proposed Augex with that for previous period

The proposed total Augex for 2014-19 of $315M compares to a total of $1041M or an average of $208M per year during the 2009-14 regulatory control period. The main driver of the significantly higher level of Augex during the former period was expenditure to comply with the December 2007 "NSW Design, Reliability and Planning Licence Conditions". As a licence holder, Endeavour was required to be "as compliant as reasonably practicable with the applicable *design planning criteria* in Schedule 1" by 1 July 2014. Some of the planned compliance works had not been completed as of 1 July 2014 and the higher level of projected Augex in 2014-16 reflects the completion of these works. Schedule 1 of the NSW licence conditions has been subsequently repealed with effect from 1 July 2014.

A further but less significant factor in the difference in Augex between the two periods has been the change in peak load and energy consumption since 2009. The load demand had been projected to increase throughout the 2009-14 period. After peaking in 2010/11, energy consumption supplied from the Endeavour network fell from 2011/12 and it fell by 11% over the complete 2009-14 regulatory control period. Whilst there is some projected increase in maximum demand over the new period, it is not expected to reach the reach the peak of 2010-11 level. Endeavour has advised that "the vast majority of forward capital expenditure proposals are development driven and are related to the need to facilitate customer connection in the greenfield release areas of North West and South West Sydney".

The substantial completion of the licence compliance work, repeal of the former Schedule 1 conditions from 1 July 2014 and the low load growth projections are the key drivers of the lower Augex projections in the 2014-19 regulatory control period.

2.4 Sample projects and related issues

The sampling of the Endeavour Augex projects or programs to test the AER hypotheses focussed on assessing Endeavour's forecast expenditure given the changes to the licence conditions for the new period, i.e. the transition from a deterministic planning methodology for assessing investments to a probabilistic or risk-based cost-benefit analysis methodology, reduced load demand forecasts and Networks NSW cost reduction strategies. In particular, the assessment focussed on:

- High expenditure/carryover at start of period
- Project deferrals from the previous period and the basis for the revised timing and costing

- Distribution Works Program
- New Growth Programs
- Design Planning Criteria

2.4.1 High expenditure at start of period

Endeavour has 19 constraint-driven projects scheduled for completion in 2014/15 and two further projects scheduled for initiation in 2015/16. These projects form part of the works that were identified to comply with Schedule 1 of the Design, Reliability and Performance Licence Conditions. As previously indicated, the NSW DNSPs were required to be "as compliant as reasonably practicable" by 1 July 2014 and fully compliant by 1 July 2019. Given that Schedule 1 of the licence conditions was formally repealed in January 2014, Endeavour was asked to justify the timing and level of expenditure for these projects.

Endeavour has indicated that the carryover expenditure into 2014/15 is $23M and that in the majority of the cases it was not considered prudent to stop the related projects due to their advanced status and the likelihood of contract penalties. Two projects were reviewed and rescoped based on a reassessment of the cost-benefit analysis taking into account the changed licence and load conditions and utilising risk and VCR assessment techniques.

2.4.2 Project deferrals from previous period

In its Regulatory Proposal, Endeavour identified a series of demand-driven projects (Collimore St, Holsworthy and West Epping Zone Substations, Minto Area distribution feeders and the High Voltage Development Program) that had been deferred from the 2009-14 period. Endeavour was asked to provide details of the original timing, proposed new timing, planning justification, strategies to achieve cost reductions and consideration of non-network methods considered to achieve Augex deferral. An assessment of Endeavour's responses in respect of these projects has indicated that:

- The projected timing of these projects was reasonable taking into account the revised load forecasts.
- Lower cost alternatives or staging with minimal initial infrastructure were being considered as long term solutions or to defer expenditure, this suggests that the regulatory proposal expenditure forecasts are likely to be biased on the high side
- Non-network solutions including demand management had been considered and where appropriate had been implemented to defer Augex.

The High Voltage Development Program is discussed in more detail in Section 2.4.4.

2.4.3 New growth programs

Significant customer driven capacity augmentation is anticipated with greenfield releases in North West and South West of Sydney. Endeavour has based its forecast expenditures in these areas on information from a variety of sources including the NSW Department of Planning, local councils, developers and other utilities. In developing these forecasts, it has developed a probability of the need for infrastructure in each of the identified land release precincts. The projected expenditure has also been based on the establishment of minimum or interim requirements such as single or mobile transformers that will enable the risk of slower than anticipated growth rates to be managed.

2.4.4 Distribution works program.

The Endeavour Regulatory Proposal indicates that it was possible to defer expenditure in the 2009-14 period of $100M for the High Voltage Development Program and these works form part of the Distribution Works Program for the new regulatory control period. The projected expenditure for the 2014-19 Distribution Works Program has been indicated as $88.8M in the Endeavour "Strategic Asset Management Plan 2014/15 – 2023/24" (SAMP). It is noted from the "Distribution Works Program 2014-19" that it has been possible to revise the projected 5-year expenditure down from the $88.9M stated in the SAMP to $54.9M, a reduction of $33.9M or 38%, and this is the basis of the regulatory forecast. The reduction was achieved through a related risk assessment, more detailed assessment and cost-benefit analysis. It is also noted that some of this reduction was achieved through the upgrading of feeder protection systems rather than augmentation to meet increased fault level conditions.

Endeavour has clarified that this review of the Distribution Works Program was carried out post the November 2013 completion of the SAMP forecasts and that the SAMP had not been updated even though both documents have been dated April 2014. Further clarification was sought from Endeavour regarding the application of more detailed risk assessment and cost-benefit to other works programs included in the SAMP forecasts. Endeavour has advised that appropriate levels of risk and expenditure are reviewed as part of obtaining approval for and implementing augmentation expenditure ("Gate 3") and to date the similar savings have not been identified for other augmentation related investments. The expenditure forecasts in the Regulatory Proposal are likely to be biased on the high side.

2.4.5 Design planning criteria

Following the repeal on 1 July 2014 of the Schedule 1 conditions of the NSW "Design, Performance and Reliability Licence Conditions" which had prescribed deterministic security standards at various levels of the network, Endeavour is working with Networks NSW, Essential Energy and Ausgrid towards developing formal documented planning standards that will take into account the likelihood of failure and Value of Customer Reliability (VCR). In the interim, Endeavour has introduced a risk-based cost-benefit analysis utilising VCR. Endeavour demonstrated that it has applied VCR analysis to re-assess a proposed constraint-driven augmentation (Feeder 512) and this has resulted in a reduction in scope for the project compared to that which had been determined under the previous planning standards[2]. AEMO released the final report from its VCR review in September 2014 and it determined state-based VCR values of 30-40% lower than the value used by Endeavour derived from the AER Service Target Performance Incentive Scheme. The consequence of this is that the customer benefits calculated using the new AEMO values would be 30-40% lower and this would have the relative impact of deferring Augex expenditure. In the example case provided by Endeavour (Feeder 512), the lower VCR value reinforces the decision to curtail the project and not to commit to commencing the remaining stages. Endeavour's probabilistic approach to planning for new growth in the North West and South of Sydney is also consistent with the changes in the

[2] Endeavour has used a VCR value of $55.49/kWh. The AEMO "Value of Customer Reliability: Final Report", September 2014 determined state-based values for NSW of $38.35/kWh (excluding direct connects) for cost-benefit analyses of distribution loads and $34.15/kWh (including direct connects) for projects which supply both distribution and direct connect load.

planning standards and Endeavour has confirmed that the related expenditure forecasts included in its Regulatory Proposal have been based on probability-weighted cost estimates.

2.4.6 Work Practices

Endeavour's work practices have been considered in more detail in the "NSW DNSP Labour Analysis Report" prepared by Deloitte.

During the 2009-14 regulatory control period, Endeavour adopted a 'Peak Resourcing Strategy' to meet the Capex requirements which it considered could not be met by its existing workforce. This included contracting out of project management and engineering work as well as project delivery works through a competitive tendering process. From a position of virtually no outsourcing of Capex works at the beginning of the period, Endeavour reached a peak of 25 per cent of all man hours outsourced for its Capex program, which decreased to 20 per cent in the final years of the regulatory period.

Although the projected expenditure levels are significantly lower, Endeavour plans to maintain a level of 20% outsourcing of its Capex delivery during the 2014-19 regulatory control period. Endeavour proposes to do this through the 'blended delivery model' which involves contractors working alongside employees and programs of work traditionally undertaken by employees being outsourced. The blended delivery model follows on from the Peak Resourcing Strategy employed during the 2009-14 regulatory period. Endeavour has indicated that one of the key objectives of the blended delivery model is to improve the overall productivity of its workforce as well as to fill short term resource gaps. This is consistent with experience and benefits gained though the outsourcing of works during the previous period particularly in relation to improvement of internal processes and project management practices. As an example, Endeavour has claimed that it has achieved a 50% reduction in the fit-out costs for a zone substation since 2009 as a result of the exposure to external practices.

2.5 Conclusions in respect of AER hypotheses

Endeavour's Augex program has been examined in the manner required by the AER. It is considered that Endeavour's forecast Augex costs are likely to be higher than would be incurred by a prudent and efficient service provider. We consider this primarily because:

- The application of risk assessment techniques to all projected programs of work would likely result in some further reductions in projected expenditure.
- The current Enterprise Bargaining Agreement (EBA) conditions constrain the business in pursuing further prudent changes to improve work practices, efficiency and costs to the business

Following the repeal of Schedule 1 of the Design, Reliability and Performance Licence Conditions, Endeavour has prudently adopted and is applying interim design planning criteria utilising risk-based cost-benefit analysis and VCR pending development of new planning criteria in collaboration with Networks NSW, Augrid and Essential Energy.

2.5.1 The business forecast is reasonable and unbiased

Whilst there is some evidence of bias in the decisions made in the 2009-14 regulatory period with respect to load forecasting and possible over commitment to the licence compliance works impacting on early expenditure in the current period, there is clear evidence that Endeavour has improved its business forecasting processes for the 2014-19 period and that it is applying more prudent techniques to the forecasting of augmentation expenditure and its timing. The expenditure forecasts are likely to be biased given that that more detailed reviews and cost-benefit analysis of options is being carried out as part of the Gate 3 approval process during the regulatory control period and that savings that can be realised are not reflected in the Regulatory Proposal.

There is also evidence that further reductions in projected expenditure may be possible through the application of risk assessment techniques to all projected programs of work. The application of these techniques and the consideration of non-augmentation options has resulted in a reduction of 38% to the projected expenditure for the Distribution Works Program and reductions to projected expenditure in other programs would be expected when they are subjected to a similar analysis. It is not anticipated that the reductions would be at the same level as for the Distribution Works Program given the nature of projects involved and that they have already been subject to reductions through the Networks NSW Network Investment Prioritisation process, however, it would be reasonable to expect reductions in the order of 10 to 20%.

2.5.2 The business costs and work practices are prudent and efficient

Endeavour recognises the need to further reduce costs and improve work practices and also that reductions and improvements have been made through the outsourcing of Capex works in the previous regulatory control period. Although there is a reduction of labour demand as a consequence of the significantly lower Capex projected for the 2014-19 period, Endeavour plans to outsource 20% of its Capex work through its blended delivery model with the objective of improving its overall productivity. As Deloitte has suggested, the current Enterprise Bargaining Agreement (EBA) conditions embed relatively high unit labour costs into the business.

2.5.3 The business risk management is considered prudent and efficient

Endeavour is applying an increasing level of business risk management to its business and it carries out prudent risk assessments as part of its approval processes for commitment to projects and programs. As a consequence of the timing and development of these assessments, the expenditure forecasts in the Regulatory Proposal do not reflect potential savings that could be realised in the Augex program. Further efficiency gains could be achieved by the application of more detailed risk assessment during the forecasting or asset management strategy phase of programs.

Following the repeal of Schedule 1 of the Design, Reliability and Performance Licence Conditions, Endeavour has prudently adopted and is applying interim design planning criteria utilising risk-based cost-benefit analysis and VCR pending development of new planning criteria in collaboration with Networks NSW, Ausgrid and Essential Energy. The final VCR review report issued by AEMO in September 2014 has determined a VCR value of 30-40% lower for NSW than the value that has been used initially by Endeavour and this will result in a consequential lowering of customer benefits and further deferment of Augex when it is applied.

3 AUSGRID

3.1 Introduction

This section provides the background and assessment of the AER hypotheses in respect of the Ausgrid business. It outlines the Augex proposed over the 2014-19 regulatory control period in the context of the total Capex and it then provides a historical context in terms of the proposed Augex in the expenditure categories over this period and the previous (2009-14) period.

Sample projects or programs have been selected to test the AER hypotheses and these are assessed and conclusions drawn.

3.2 Summary of Ausgrid's proposed Augex

Based on data provided in its RIN, Ausgrid has proposed $490M of Augex (real, $June 2014) in the 2014–19 regulatory control period as part of its overall Capex of $4421M , excluding capital contributions, and as indicated in Table 3. It is understood that the Augex covers direct costs only and that the capitalised overheads indicated in the RIN line item are applied at a project or program level but details of the apportionment of these indirect costs have not been provided. Similarly, no indication has been provided as to whether any aspects of the "balancing item" relate to Augex.

Table 3: Capex proposed by Ausgrid ($M real, June 2014)

Expenditure Category	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Replacement expenditure	691	704	611	574	527	3107
Connections	28	32	36	35	33	165
Augmentation Expenditure	122	91	85	91	100	490
Non-network	113	137	131	115	79	575
Capitalised network overheads	146	142	124	118	109	639
Capitalised corporate overheads	21	20	18	17	15	91
Balancing item	*-21*	*-38*	*-29*	*-29*	*-5*	*-122*
TOTAL GROSS CAPEX (includes capcons)	1100	1089	975	921	858	4943
Capital contributions	89	104	118	107	104	522
TOTAL GROSS CAPEX (excludes capcons)	1012	985	857	814	754	4421

Source: Ausgrid RIN data

The breakdown of the proposed Augex over the new regulatory control period is indicated in Table 4, this has been extracted from the RIN and it is expressed in real $ and in the RIN asset segment groups. It also shows the expenditure on the same basis for the previous regulatory control period.

Table 4: Augex proposed by Ausgrid

AUGMENTATION CAPEX	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
	Actual/ estimate ($000s nominal)					Forecast ($000s real June 2014)				
SUBTRANSMISSION SUBSTATIONS, SWITCHING STATIONS, ZONE SUBSTATIONS	146,663	157,366	157,238	98,183	83,784	6,479	6,881	1,067	3,494	1,628
SUBTRANSMISSION LINES	88,304	89,575	105,668	74,340	58,512	28,621	4,222	605	479	3,989
HV FEEDERS	77,249	114,029	107,067	87,715	32,467	56,713	41,081	46,093	50,837	57,152
HV FEEDERS - LAND PURCHASES AND EASEMENTS	655	649	643	520	575	162	127	133	137	143
DISTRIBUTION SUBSTATIONS	39,600	61,790	50,237	37,762	34,291	8,625	11,274	11,423	11,606	11,760
DISTRIBUTION SUBSTATIONS - LAND PURCH AND EASEMENTS	336	352	302	224	248	25	35	33	31	29
LV FEEDERS	51,036	60,193	65,670	48,325	61,285	16,763	23,467	23,878	24,388	24,851
LV FEEDERS - LAND PURCHASES AND EASEMENTS	433	343	395	287	317	48	73	69	66	62
OTHER ASSETS	58,311	28,147	19,472	7,188	4,195	4,326	3,531	2,116	444	570
TOTAL	462,586	512,443	506,692	354,543	275,674	121,762	90,691	85,415	91,482	100,183

Source: Ausgrid RIN data

3.3 Comparison of proposed Augex with that for previous period

The proposed total Augex for 2014-19 of $490M compares to a total of $2,112M or an average of $422M per year during the 2009-14 regulatory control period. The main driver of the significantly higher level of Augex during the former period was expenditure to comply with the December 2007 "NSW Design, Reliability and Planning Licence Conditions". As a licence holder, Ausgrid was required to be "as compliant as reasonably practicable with the applicable *design planning criteria* in Schedule 1" by 1 July 2014. Some of the planned compliance works had not been completed as of 1 July 2014 and the higher level of projected Augex in 2014/15 reflects the completion of these works as well as some other carryover projects. Schedule 1 of the NSW licence conditions has been subsequently repealed with effect from 1 July 2014.

3.4 Sample projects and related issues

The sampling of the Ausgrid Augex projects or programs to test the AER hypotheses focussed on assessing Ausgrid's forecast expenditure given the changes to the licence conditions for the new period i.e. the transition from a deterministic planning methodology for assessing investments to a probabilistic or risk-based cost-benefit analysis methodology, reduced load demand projects and Networks NSW cost reduction strategies. In particular, the assessment focussed on:

- High expenditure/carryover at start of period
- Project deferrals from the previous period and the basis for the revised timing and costing
- HV feeders and the 11kV Model
- Design Planning Criteria

3.4.1 High expenditure at start of period

Ausgrid has confirmed that all projects required to meet the former Schedule 1 licence conditions were either competed by 30 June 2014 or are well within their construction phase. Delays had been experienced with some projects in the previous regulatory control period due to approval and delivery issues. Ausgrid has also confirmed that the carryover expenditure for completion of construction of these projects in the new regulatory control period is $40-50M, primarily in 2014/15. This is consistent with the projected Augex for the year 2014/15 being $30-35M higher than the level for the

following three years. Given the advanced state of construction of these projects, is it not practicable to reassess or rescope these against the new licence conditions.

3.4.2 Project deferrals from previous period

Ausgrid's Regulatory Proposal indicated that reductions in load growth and improvements in forecasting methodology had enabled improved scheduling of augmentation projects. Ausgrid was asked to identify specific projects that had been deferred from the previous regulatory period and also to explain any differences in projected expenditure given Networks NSW stated focus on reductions in capital and operating costs.

Ausgrid identified the following five projects as having been deferred into the 2014-19 regulatory control period:

- CBD 11kV load transfers ($10.2M)
- BFW-Belmore Park Feeder 90Y replacement ($19.4M)
- Top Ryde additional Transformer, additional switchgear and load transfer
- Narrabeen and Belrose Zone CLC upratings, 2019 ($0.5M)
- Camperdown additional transformer

Not all details of costs and timing were provided. Indications were given of changing conditions such as load forecasts, repeal of the Schedule 1 licence conditions and other network changes (e.g. retirements) that would impact on timing and the final scope and costs of projects. Although there was a recognition of factors impacting on costs, there was no evidence of optimisation of costs or risk-based techniques in the current forecasts and consequently the costs included in the forecasts are likely to be high.

3.4.3 HV Feeders and the 11kV model

Ausgrid's major projected Augex throughout the 2014-19 regulatory control period is for high voltage feeders. This expenditure has been forecast using a new "11kV Model" except for the CBD area. Given its recent introduction and the significance of the impact of the model's output on Ausgrid's expenditure forecast, the model was selected for more detailed assessment. As the model operates on Ausgrid's SAP system, it was not possible to directly access or test the model and reliance was placed on the response to questions and discussions with Ausgrid.

No description of the model was available and a specification "Modelling Planning and Analysis (MPA) Phase 5", Business Requirement Document Project Code IC-00387 was provided as the primary documentation used in the assessment. Prior to its development, the 11kV system had been modelled offline using Excel spreadsheets that relied on manual data extraction from the corporate SAP, GIS and demand forecast systems to perform complex forecasting calculations. This approach was labour intensive, relied heavily on external consultants and had a risk of data integrity issues. The offline forecasting models did not cater directly for changes to demand forecasts and changes in licence conditions. The ability to integrate such changes and increase the flexibility of the forecasting was a requirement for the modelling development. The model was also specified to develop compliance backlog and growth components into the expenditure forecasts.

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Ausgrid was asked to provide copies of inputs, outputs and assumptions to the model for the 2014-19 regulatory control period and it was also asked to demonstrate the model in response to the following changes or conditions:

1. Changes to the licence conditions for the new period, i.e. the repeal of Schedule 1 from 1 July 2014. Ausgrid responded that its planning staff had been aware of the proposed changes to the licence conditions since November 2013 and, although it had issued a preliminary planning procedure internally, there had not been time to develop a new forecasting model. Ausgrid has not used the model to forecast the backlog of compliance expenditure and it commented that the majority of compliance projects were now complete or that the remaining projects were well advanced in their construction.

   Given the time constraints, Ausgrid stated that it had used conservative assumptions for load growth at the zone substation level "to address the changing Licence requirements". Little or no forecast load growth had been assumed and peak demand growth had been assumed to be uniform across all feeders from a substation. Examination of the input data indicated little or no growth in loading on most substations during the year 2014/15 but that the load growth seems to increase on most zone substations in 2015/16 and remain relatively constant averaging around 1.5 - 2% per annum across all substations over the remaining forecast period. Further examination of the input data indicates that it has been based on the 2013 load demand forecast and not the 2014 forecast. The lower demand levels of the 2014 forecast translate to lower demands at a zone substation level and in more substations experiencing negative load growth which is treated as zero growth in the model.

   The use of the higher demand 2013 forecast and previous licence conditions as bases for modelling will clearly increase the forecast expenditure and bias the expenditure forecasts upwards in the Regulatory Proposal.

   It is understood that Ausgrid is in the process of modelling the changes to the licence conditions but the results from this were not available at the time of preparing this report.

2. Changes to the forecast load demand by +/-10% of the forecast load level to show the impact on both the compliance backlog and growth components of the Augex forecast. As noted above, the model for the Regulatory Proposal forecast expenditure was based on the previous licence conditions, Ausgrid also commented that it would not expect a significant impact on forecast expenditures given the status of the compliance projects. In regard to the impact of a demand change on the growth component of expenditure, Ausgrid responded that it had not been able to carry out the sensitivity tests with the model due to time constraints.

   From a high level analysis and the results of previous sensitivity tests, Ausgrid expected that a 10% reduction in the forecast demand would result in an equivalent reduction in the related Capex requirements. Ausgrid provided the projections given in Table 5 of the impact on growth expenditure from variations in the demand growth for each for each substation by 10% - this shows the projected impact in the Capex as being an equivalent 10% increase or reduction in the levels forecast by the 11kV model.

Table 5: High level impact of demand growth change on Ausgrid 11kV model Capex forecast

Scenario Real $'000 (2013-14)	2014/15	2015/16	2016/17	2017/18	2018/19
11kV growth model capex	4,223	24,912	30,337	36,313	33,961
+10% demand growth	4,645	27,403	33,371	39,944	37,357
-10% demand growth	3,801	22,420	27,303	32,682	30,565

Source: Ausgrid response dated 24 September 2014

3. Changes to any maximum values of feeder utilisation used in the model. Ausgrid responded that the theoretical maximum utilisation values for each feeder are derived using a Monte Carlo simulation of feeder loadings and configurations running in parallel with the 11kV model rather than as fixed inputs to the model.

3.4.4 Design planning criteria

Following the repeal on 1 July 2014 of the Schedule 1 conditions of the NSW "Design, Performance and Reliability Licence Conditions" which had prescribed deterministic security standards at various levels of the network, Ausgrid is working with Networks NSW, Endeavour and Essential Energy towards developing formal documented planning standards that will take into account the likelihood of failure and Value of Customer Reliability (VCR). Ausgrid has introduced an interim planning standard from 1 July 2014. The interim standard is based predominantly on the previous standard with the exception to a change for underground sub-transmission lines in triggering the consideration of options under N-1 conditions. Planning for the distribution system is to continue on the basis of the previous licence conditions triggering the consideration of options.

The interim standard also outlines a cost-benefit approach to be used in assessing options:

> "For **both distribution and sub-transmission** planning, demand driven projects will be screened based on the value of $/kVA determined by dividing the indicative cost of the most likely solution by the gap between forecast demand and the licence capacity limit. This is a simple screening indicator of the likely cost-benefit ratio of the project under any economic evaluation approach."

Threshold values have not been indicated and will be determined "based on a review of recent decisions and the typical spread of values observed. Any project where this value is lower than the threshold should continue through the planning process on the existing basis." It is noted that Ausgrid's approach does not refer to a VCR (value of customer reliability) assessment, such as is being applied by Endeavour, and that will form part of future standards.

The interim standard applies from 1 July 2014 and there was no evidence of this being applied in the sample projects or programs examined. As indicated in sections 3.4.2 and 3.4.3, the expenditure forecasts for the projects or programs sampled have been based on the previous licence conditions and this will bias upwards the forecasts forming the Regulatory Proposal.

3.4.5 Work Practices

Ausgrid's work practices have been considered in more detail in the "NSW DNSP Labour Analysis Report" prepared by Deloitte.

During the 2009-14 regulatory control period, Ausgrid adopted a range of measures to meet the Capex requirements which it considered could not be met by its existing workforce. This included increasing its internal workforce through recruitment and contract labour in the period in the first two years and outsourcing of work. The key Augex-related initiative was the establishment of alliances with private engineering contractors for the delivery of projects. Two alliances were established in October 2009 to concentrate on the delivery of zone substations works and a third alliance was established in December 2011 to focus on the 132kV cable program. The strategy in establishing these alliances was to enable Ausgrid to deliver its substantial works program in the zone substation and cable areas within the previous regulatory control period. In total 95 projects were allocated to the alliances, primarily in the period 2009 -11 and by January 2014, 67 projects had been completed. In relation to the remaining projects, 21 had reverted to Ausgrid for completion with the downturn in Capex works in the latter part of the regulatory period and seven had been cancelled from the program. The alliances have been terminated.

Ausgrid considers that the alliance strategy in the 2009-14 period strengthened the market capability and competitiveness for any future outsourcing of work in the future and this will be of benefit for any future outsourcing of work on a competitive basis. It is understood that Ausgrid does not have specific targets for outsourcing a percentage of its Capex in the 2014-19 regulatory control period but that it will also be following a "blended resource model" which involves contractors working alongside employees and programs of work traditionally undertaken by employees being outsourced.

The clear objective of outsourcing of work in the 2009-14 period was to achieve delivery targets rather than achieving efficiencies or productivity. Ausgrid advised that the development of improved procurement processes, use of technology and exposure to external contractors practices have resulted in the lowering of projected costs for particular areas of work. Ausgrid has also stated that these benefits have been reflected in the unit costs used in developing the expenditure projections. However, it is also noted that Ausgrid identified that the alliances did not reap benefits from competitive tension or achieve the benefits that might have followed from the integration of Ausgrid subject matter experts in the alliances.

3.5 Conclusions in respect of AER hypotheses

Ausgrid's Augex program has been examined in the manner required by the AER. It is considered that Ausgrid's forecast Augex costs are likely to be higher than would be incurred by a prudent and efficient service provider because:

- The program has been developed primarily on the licence conditions applying in the previous regulatory control period and it has only considered in limited detail the likely impact of the changes to the licence conditions from 1 July 2014.
- The application of risk based cost benefit analysis assessment techniques to projected programs of work would likely result in further reductions in projected expenditure.

- The current Enterprise Bargaining Agreement (EBA) conditions constrain the business in the rate of pursuing further prudent changes to improve work practices, efficiency and costs to the business.

3.5.1 The business forecast is reasonable and unbiased

There is some evidence of bias in the decisions made in the 2009 -14 regulatory period with respect to load forecasting and possible over commitment to complete the licence compliance works that has impacted on early expenditure in the current period. Whilst there is evidence that Ausgrid has improved its demand forecasting processes for the 2014-19 period, expenditure forecasts for at least one major program (HV Feeders) have been based on the higher demand 2013 load forecasts with consequential higher expenditure projections Only limited consideration has been given to the impact of the changes to the licence conditions from 1 July 2014 with the Augex forecasts having been based primarily on the previous licence conditions, this will also bias those forecasts. There is also evidence that further reductions in projected expenditure may be possible through the application of risk assessment techniques to all projected programs of work.

3.5.2 The business costs and work practices are prudent and efficient

Although the primary objective in the outsourcing of work in the 2009-14 regulatory control period was to ensure delivery of the high Capex program within the period, Ausgrid recognises also that improvements to work practices and reductions in costs have been made through the outsourcing of Capex works. The alliance strategy used for outsourcing of significant Augex in the past period has been terminated and it is understood that outsourcing of work will be through the "blended delivery model", no specific target has been indicated for the level of outsourcing during the 2014-19 period. Although the potential for cost reductions in some areas has been identified, there has not been a strong sense or evidence that Ausgrid is pursuing the most cost effective practices for delivery of its Augex program. As Deloitte has suggested, the current Enterprise Bargaining Agreement (EBA) conditions embed relatively high unit labour costs into the business. The business risk management is considered prudent and efficient

Ausgrid has not demonstrated evidence of prudent or efficient risk management processes as part of its Regulatory Proposal or in responses to questions relating to the proposal. There has been no strong indication that risk-based assessments have been used in developing expenditure forecasts for new projects or in the review of deferred projects apart from the reductions imposed by Networks NSW with its Network Investment Prioritisation process. Efficiency gains could be achieved by the application of detailed risk assessment during the forecasting or asset management strategy development phase of programs.

Following the repeal of Schedule 1 of the NSW "Design, Reliability and Performance Licence Conditions", Ausgrid has adopted interim design planning criteria based primarily on the previous licence conditions triggering a consideration of options and a cost-benefit analysis that considers the risk of loss of supply but with threshold limits not clearly defined. The forecasts for HV feeders, Ausgrid's major Augex category, have been based on the former planning standards.

4 ESSENTIAL ENERGY

4.1 Introduction

This section provides the background and assessment of the AER hypotheses in respect of the Essential Energy ("Essential") business. It outlines the Augex proposed over the 2014-19 regulatory control period in the context of the total Capex and it then provides a historical context in terms of the proposed Augex in the expenditure categories over this period and the previous (2009-14) period.

Sample projects or programs have been selected to test the AER hypotheses and these are assessed and conclusions drawn.

4.2 Summary of Essential Energy's proposed Augex

Based on data provided in its RIN, Essential proposes $745M of Augex (real $June 2014) in the 2014–19 regulatory control period as part of its overall Capex of $2619M, excluding capital contributions, and as indicated in Table 6. It is understood that the Augex covers direct costs only and that the capitalised overheads indicated in the RIN line item are applied at a project or program level but details of the apportionment of these indirect costs have not been provided. Similarly, no indication has been provided as to whether any aspects of the "balancing item" relate to Augex.

Table 6: Capex proposed by Essential Energy ($M real, June 2014)

Expenditure category	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Replacement expenditure	154	165	180	177	180	**857**
Connections	6	6	6	6	6	**30**
Augmentation Expenditure	169	155	144	140	137	**745**
Non-network	78	55	55	50	46	**284**
Capitalised network overheads	56	56	57	57	57	**282**
Capitalised corporate overheads	80	79	80	80	81	**399**
Balancing item	92	65	71	64	66	**358**
TOTAL GROSS CAPEX (includes capcons)	**635**	**580**	**592**	**575**	**573**	**2,955**
Capcons	89	61	64	61	61	**336**
TOTAL GROSS CAPEX (excludes capcons)	**545**	**519**	**528**	**515**	**512**	**2,619**

Source: Essential RIN data

The breakdown of the proposed Augex over the new regulatory control period is indicated in Table 7, this has been extracted from the RIN and it is expressed in the RIN asset segment groups. It also shows the expenditure on the same basis for the previous regulatory control period.

Table 7: Augex proposed by Essential Energy

AUGMENTATION CAPEX	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
	Actual/ estimate ($000s nominal)					Forecast ($000s real June 2014)				
SUBTRANSMISSION SUBSTATIONS, SWITCHING STATIONS, ZONE SUBSTATIONS	59,111	37,402	47,734	46,517	22,240	28,682	16,548	15,584	7,418	16,040
SUBTRANSMISSION LINES	42,248	62,107	54,213	58,302	45,824	31,321	28,593	7,497	15,373	985
HV FEEDERS	96,894	97,889	122,630	102,433	76,664	71,825	79,366	84,345	84,965	85,156
HV FEEDERS - LAND PURCHASES AND EASEMENTS	14,853	7,614	8,565	11,080	5,171	5,544	728	218	0	0
DISTRIBUTION SUBSTATIONS	3,766	5,155	6,008	4,408	3,193	11,574	9,854	8,838	7,971	9,130
DISTRIBUTION SUBSTATIONS - LAND PURCH AND EASEMENTS	0	0	0	0	0	0	0	0	0	0
LV FEEDERS	10,024	18,183	24,809	32,844	22,285	12,056	12,230	12,310	12,360	12,327
LV FEEDERS - LAND PURCHASES AND EASEMENTS	0	0	0	0	0	0	0	0	0	0
OTHER ASSETS	9,804	6,283	7,405	7,771	5,805	8,138	7,448	14,920	12,239	13,061
TOTAL	236,700	234,633	271,365	263,355	181,182	169,140	154,766	143,712	140,325	136,698

Source: Essential Energy RIN data

4.3 Comparison of proposed Augex with that for previous period

The proposed total Augex for 2014-19 of $745M compares to a total of $1,187M or an average of $237M per year during the 2009-14 regulatory control period. The main driver of the significantly higher level of Augex during the former period was expenditure to comply with the December 2007 NSW "Design, Reliability and Planning Licence Conditions". As a licence holder, Essential was required to be "as compliant as reasonably practicable with the applicable *design planning criteria* in Schedule 1" by 1 July 2014. Some of the planned compliance works had not been completed as of 1 July 2014 and the higher level of projected Augex in 2014-16 reflects the completion of these works as well as some other carryover projects. Schedule 1 of the NSW licence conditions has been subsequently repealed with effect from 1 July 2014.

A further but less significant factor in the difference in Augex between the two periods has been the change in peak load and energy consumption since 2009. The load demand had been projected to increase throughout the 2009-14 period. The peak demand peaked in 2010/11 but was lower than the forecast level for that year than in the forecasts underpinning the 2009-14 regulatory determination. The peak demand fell in 2011/12 and at the end of the regulatory control period (2013/14) it was below the 2009/10 level. The change in forecast load growth led to a curtailment of growth-related projects, particularly areas where major forecast developments had not proceeded or were delayed and the growth related expenditure during the period has resulted in additional capacity being established in the network with the anticipated growth not materialising.

In the 2014-19 regulatory control period, NEIR has projected that total energy demand on the Essential network will continue to decline until late in the period although overall numbers of customers will grow year-on-year, albeit at a modest rate. Even though overall projections of growth are flat, the Essential network is diverse in its nature and it has pockets of peak demand growth that will require augmentation. This augmentation will be primarily at the distribution level and this is reflected in the relatively constant expenditure projected for HV feeders, distribution substations and LV feeders throughout the period whereas there is a decline in expenditure on sub transmission and zone substation works following completion of the related licence compliance works.

4.4 Sample projects and related issues

The sampling of the Essential Augex projects or programs to test the AER hypotheses focussed on assessing Essential's forecast expenditure given the changes to the licence conditions for the new period, i.e. the transition from a deterministic planning methodology for assessing investments to a probabilistic or risk-based cost-benefit analysis methodology, reduced load demand forecasts and Networks NSW cost reduction strategies. In particular, the assessment focussed on:

- High expenditure/carryover at start of period
- Rescheduled sub transmission/zone substation projects
- Deferred sub transmission/zone substation projects
- HV feeders
- Design planning criteria

4.4.1 High expenditure at start of period

Essential has confirmed that the higher expenditure levels in the years 2014-16 are due to the carryover of projects commenced or committed in the previous regulatory control period, particularly in relation to licence compliance related works. Delays associated with "planning criteria and approval procedure changes" leading to delays in easement acquisitions, procure and construction contract establishment were cited as the reasons for delays in commencement and completion of these projects. These projects included the second TG Beryl to Dunedoo 66kV line, the second TG Parkes to Parkes Town 66kV line, the second Wagga to Temora 132kV line and the Dubbo RTS to Dubbo West ZS 66kV line reconstruction to 132kV. Given the advanced state of construction of these projects, is it not practicable to reassess or rescope these against the new licence conditions.

In addition to these projects that have been initiated, six other sub transmission projects that formed part of the licence compliance program in the 2009-14 regulatory control period were rescheduled for implementation in the 2014-19 period and a further six projects were deferred – these are discussed in the following sections 4.4.2 and 4.4.3.

4.4.2 Rescheduled sub transmission/zone substation projects

Essential has rescheduled the following sub transmission and zone substation projects for completion in the 2014-19 regulatory control period:

- Wellington-Dubbo 132kV Stage 3
- Nyngan-Cobar 66kV feeder
- Orange 66kV network
- Wagga Wagga 66kV network
- West Griffith 33kV network
- Cartwrights Hill 66/11kV zone substation

Essential has indicated that the rescheduling of these projects is due to delays experienced in the planning and approval procedures and resource constraints rather than changes in load forecasts, the Wellington-Dubbo 132kV project is an exception to this. Essential has also acknowledged that changes to the licencing conditions through the repeal of Schedule 1 may result in changes to the scoping and staging of the projects based on the new planning methodologies being formulated by Networks NSW and the NSW DNSPs. The projected expenditure in the Regulatory Proposal is

based on the previous licence conditions and Essential has indicated that the assessment of alternatives and other potential changes that could reduce costs will be carried out as part of the ongoing planning review and investment approval processes. It was noted that risk assessments per se have not been common practice in Essential's planning and investment decision processes and examples of cost-benefit analyses could not be provided for projects in the various Augex segment groups.

4.4.3 Deferred sub transmission/zone substation projects

Essential has identified a further six sub transmission projects that were deferred until beyond the 2014-19 regulatory control period. The costs of these projects were not included in the Augex forecasts. These projects are:

- Boggy Creek-Nambucca Heads 66kV feeder
- Temora-Thanowring 66kV feeder
- Evans Lane-Batemans Bay 132kV feeder
- Beryl-Mudgee (tee) 132kV feeder (a cheaper immediate alternative was identified with an auto-changeover scheme to be added to the existing arrangement by 2015/16)
- Taree-Failford-Tuncurry-Forster-Bohnock 66kV feeders (a cheaper alternative was identified with the existing system by adding reactive support and revised line ratings)
- TransGrid Tamworth TS-Quirindi 66kV feeder

The basis for deferral of these augmentation projects has been stated as the repeal of the Schedule 1 licence conditions (responses from Essential dated 17 September 2014). It is also noted that in some cases the revised peak demand forecasts have fallen below the previous 15MVA criteria level – in these cases the projects would have been deferred under the previous conditions. Asset condition rather than augmentation reasons could result in future investment in the feeders identified, the Evans Lane-Batemans Bay 132kV feeder is an example of this. Changes in load forecasts could also result in a need to review these deferments particularly in cases where new spot loads or changes could be created by developer decisions, e.g. for mining and agriculture.

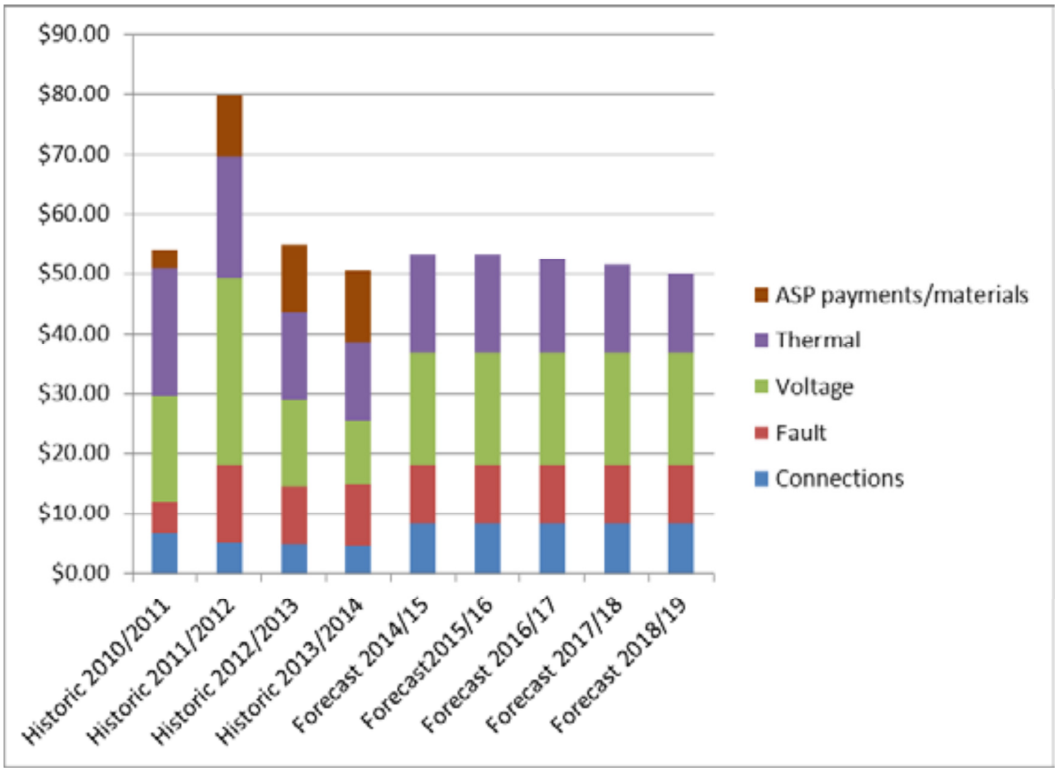
4.4.4 HV Feeders

Expenditure on HV feeders is the major component of Augex and it covers growth, reliability and compliance (safety, environmental and legal) associated with HV overhead and underground lines and switchgear. This is projected to remain at a high level of $72 – 85M p.a in real terms throughout the regulatory period and expenditure has not fallen in line with reductions in other asset classes during the period. HV feeder expenditure peaked in the last period at $122M ($nominal) in 2011/12 and it has declined progressively over the past two years and is projected to decline further to $72M in 2014/15. For 2013/14, the estimate in the RIN is shown as $76.7M. It is understood that this was based on a new 2013/14 forecast in February 2014.

The four largest HV feeder growth programs (voltage constraints, thermal constraints, fault level constraints and customer connections) were examined. This indicated that expenditure is projected to remain at a high level of $53M p.a. (reducing later in the period as a result of demand management capex) in real terms throughout the regulatory period but this does not reflect the significant reductions projected in expenditure for other asset classes during the period. As shown in Figure 1 provided by Essential, expenditure on these programs peaked in the last period at $80M in 2011/12

but has declined progressively over the past two years. The 2013/14-18/19 forecast was based on the average of the 2012/13 actual and 2013/14 forecast in February 2014. The actual expenditure in 2013/14 was $1.5M below this forecast. This suggests that the requirement for this expenditure has trended down significantly from the high of 2011/12 and that the forecast may be higher than it should be. It is pertinent to note that Essential has advised that its original projection for HV feeder growth expenditure categories was based on the 2011/12 expenditure ($80M). This was reduced to the lower level of the past two years as an outcome of the Networks NSW Network Investment Prioritisation review.

Figure 1: Historic and projected HV feeder growth program expenditure



Souce: Essential Energy response dated 17 September 2014 to AER Essential Augex workshop of 5 September 2014

Essential Energy has based its underlying expenditure level on all reactionary programs for HV feeders on the average of the expenditure over the past two years (i.e. the actual expenditure for 2012/13 and the estimated expenditure for 2013/14) and it has assumed that the allocation of this expenditure will follow the same breakdown as the average allocation over the past four years. The increases in 2015/16 and 2016/17 are due primarily to demand management (power factor correction $1M in 2015/16 and increasing to $3M p.a. over 2016-19), network technology program ($2M p.a.2016-10) and compliance (LIDAR capitalised data capture $4.7M p.a. 2015-2019). A saving of $6M over the period from demand management benefits has also been factored into the forecasts.

The expenditure in most subcategories is reactionary and due primarily to the consequences of growth, e.g. power quality issues. Although overall growth projections are flat there will be local pockets of growth and Essential considers that the expenditure over the past two years under similar conditions is the best indicator of future requirements. Whilst the concept of using past expenditure for forecasting is supported, it is considered that this also needs to account for any underlying trends such as experienced from 2012. A further reinforcement of this been the understood $1.5M in $25M underspend for the last six months of 2013/14 for the growth related progams even though it was reforecast in February 2014. Whilst recognising that this expenditure is reactionary and will be influenced by local growth factors, it is also considered that under the flat overall growth conditions projected for the current period, the rate of expenditure required is likely to continue to fall as a consequence of the impact on network conditions and performance of past augmentation and replacement expenditure.

4.4.5 Design planning criteria

Essential is participating with Ausgrid, Endeavour and Networks NSW in the development of a consistent approach to planning methodologies and standards following the repeal of Schedule 1 of the NSW "Design, Reliability and Performance Licence Conditions", it has also indicated that these methodologies and criteria are expected to be defined by late 2014 or early 2015. It also indicated on 17 September 2014 that "As such, a number of Essential Energy's major sub transmission project assessments and options are in a state of fluidity with currently noted project outcomes likely to change with the finalization of the common replacement planning requirements." A similar situation would apply to other key projects and it would appear that Essential is awaiting an outcome of the joint DNSP and Networks NSW initiative and that, unlike Endeavour and Ausgrid, it has not issued an interim planning standard.

Essential's responses to a range of questions has indicated that it is well aware that the outcomes of planning and investment or commitment decision making are likely to be different under the changed licence conditions and new planning standards and that it is prudent to review its forecasts accordingly. It is anticipated that VCR assessment will be an integral part of the new planning and assessment methodology. Essential has already applied this in a limited way to support the assessment of the Tamworth TS-Quirindi 66kV feeder project noting that the assessment outcomes will be influenced significantly by the decisions to be made in respect of the VCR values.

AEMO released the final report from its VCR review in September 2014 and it determined state-based VCR values of 30-40% lower than the value used by Essential which had been derived from the AER Service Target Performance Incentive Scheme[3]. The consequence of this is that the customer benefits calculated using the new AEMO values would be 30-40% lower. In the example of the Tamworth TS-Quirindi 66kV feeder, the lower VCR value would still support the assessment outcome albeit at a lower at a lower customer benefit.

[3] Essential has used a VCR value of $55.49/kWh. The AEMO "Value of Customer Reliability: Final Report", September 2014 determineded state-based values for NSW of $38.35/kWh (excluding direct connects) for cost-benefit analyses of distribution loads and $34.15/kWh (including direct connects) for projects which supply both distribution and direct connect load.

4.4.6 Work practices

Essential's work practices have been considered in more detail in the "NSW DNSP Labour Analysis Report" prepared by Deloitte.

During the 2009-14 regulatory control period, Essential adopted a range of measures to meet the Capex requirements which it considered could not be met by its existing workforce. This included a strategy of increasing its internal resources over the period 2009/10 to 2013 followed by a reduction in 2013/14 with the downturn in the Capex program. Essential pursued outsourcing opportunities in addition to increasing its internal workforce and these focused primarily on increasing its existing network outsourcing program areas to free-up its internal labour force for the new Capex projects. Significant outsourcing of Augex occurred for the increased work in the sub transmission lines and zone substation segments during the period and its "one-off" nature. The geographic spread of Essential's network and Capex program was another factor in its strategy given the reduced availability of skilled contractors in some regional areas. This will also be a consideration for Essential in the strategy to be followed in the 2014-19 period which will be based on a "blended resource model", similar to that to be used by Endeavour and Ausgrid.

Although the clear objective of outsourcing of work in the 2009-14 period was to achieve delivery targets rather than achieving efficiencies or productivity, Essential also acknowledges efficiency improvements have resulted to internal practices from exposure to those of external contractors.

4.5 Conclusions in respect of AER hypotheses

Essential's Augex program has been examined in the manner required by the AER. It is considered that Essential's forecast Augex costs are likely to be higher than would be incurred by a prudent and efficient service provider because:

- Only limited consideration has been given to the impact of the changes to the licence conditions from 1 July 2014. Significant expenditure based on the previous conditions has been deferred or rescheduled into the 2014-19 regulatory control period, the related forecasts for this expenditure have been based on the previous licence conditions.
- The application of risk based cost benefit analysis assessment techniques to projected programs of work would likely result in reductions to projected expenditure.
- There has been a downward trend since 2012 in the costs associated with HV feeder works and this trend has only been partly recognised.
- As Deloitte has suggested, the current Enterprise Bargaining Agreement (EBA) conditions have embed relatively high unit labour costs in the business.

4.5.1 The business forecast is reasonable and unbiased

There is some evidence of bias in the decisions made in the 2009 -14 regulatory control period with respect to load forecasting and possible over commitment to complete the licence compliance works. This was compounded by delays in planning, approvals, easement acquisition, procurement and construction as well as resource constraints. An impact of this has been increased expenditure in the current period for projects already committed and a deferment of other yet to be committed projects into this period. Given the significant Capex reduction in the 2014-19 period, there is less risk that projected expenditure forecasts cannot be met. There is evidence that Essential has improved its

demand forecasting processes for the 2014-19 period, however, it is understood that these processes were not fully implemented prior to submission of its Regulatory Proposal. It is considered that this is unlikely to have had a significant impact on the expenditure forecasts given that major forecast components are based on historic expenditure and trends.

Although there is clear recognition of the need, and pending clarification of new NSW planning standards and methodologies, only limited consideration has been given to the impact of the changes to the licence conditions from 1 July 2014 with the Augex forecasts having been based primarily on the previous conditions. This will bias those forecasts. There is also evidence that further reductions in projected expenditure may be possible through the application of risk assessment techniques and consideration of alternatives to projected programs of work. In the case of HV Feeders, the forecasts have been based on the average expenditure in this segment over the past two years which included an estimate for 2013/14. Although the use of past expenditure levels is appropriate, it is considered that it would be prudent to recognise the actual level of expenditure for 2013/14 rather than the forecast. It is also considered that under the flat overall growth projections, the rate of expenditure required to address localised growth issues is likely to continue to fall during the 2014-19 period due to the impact of past expenditure in improving network conditions and performance.

4.5.2 The business costs and work practices are prudent and efficient

Although the primary objective in the outsourcing of work in the 2009-14 regulatory control period was to ensure delivery of the high Capex program within the period, Essential recognises also that improvements to work practices and reductions in costs have been made through the outsourcing of Capex works. It is understood that outsourcing of work in the 2009-14 regulatory control period will be through the "blended delivery model", no specific target has been indicated for the level of outsourcing during the period. Although the potential for cost reductions in some areas has been identified, there has not been a strong sense or evidence that Essential is pursuing the most cost effective practices for delivery of its Augex program. The wide geographical area covered by Essential's network creates specific issues in the availability of skilled external resources in regional areas and the optimum role for deployment and operation of Essential depots. The current Enterprise Bargaining Agreement (EBA) conditions also constrain the business in the rate at which it could pursue further prudent changes to improve work practices, efficiency and costs to the business.

4.5.3 The business risk management is considered prudent and efficient

Essential has not demonstrated evidence of established prudent or efficient risk management processes in its Regulatory Proposal or in responses to questions relating to the proposal. There has been no indication that risk-based assessments have been used in developing expenditure forecasts for new projects or in the review of deferred projects apart from the reductions imposed by Networks NSW with its Network Investment Prioritisation process. Efficiency gains could be achieved by the application of risk and option assessment during the forecasting or asset management strategy development phase of programs.

Following the repeal of Schedule 1 of the NSW "Design, Reliability and Performance Licence Conditions", Essential is awaiting finalisation of new planning standards and mechanisms being developed jointly with Ausgrid, Endeavour and Networks NSW prior to finalising planning and

commitments on major pending and future projects. There is a clear recognition that improved processes will be required going forward and Essential also recognised that these processes would be expected to identify reductions and deferment in the timing of Augex. Whilst these processes will promote a prudent approach to the actual commitment of expenditure during the period and for future planning, they do not remove biases in the existing Regulatory Proposal forecasts.

APPENDIX A: AER Questions Relating to Hypotheses

Within the context of good industry practices there are a number of questions that the consultant should consider in assessing these hypotheses (questions are not in any specific order):

The business forecast is reasonable and unbiased

- Are the forecasting practices and assumptions reasonable and unbiased?
    - Note: this applies to all relevant types of forecasts, e.g. expenditures, volumes, resources, performance trends. Among other matters, consideration of practices and assumptions should extend to the standards applied implicitly or explicitly) over the forecast period.
- Do the differences between historical forecasts and corresponding actual expenditures demonstrate unbiased forecasts?
    - Can any variations between historical forecasts and actual expenditure be reasonably explained in terms of prudent and efficient responses to changes in the business circumstances?
- Are the resources estimates and unit rates employed in the business' expenditure forecasts reasonable and unbiased estimates?
- Do estimates include additional works or deliverables that are not related to the identified need(s) for the work?
- Does the business' overall capex works portfolio reflect an efficient allocation of resources over time and ensure delivery of the planned works?

The business' costs and work practices are prudent and efficient

- Do benchmarks demonstrate that the forecast costs are commensurate with industry levels of efficiency after accounting for the reasonable impact of exogenous factors?
- Do the trends in performance outcomes reasonably indicate that the required or efficient service levels are unlikely to be maintained unless additional or modified actions (and hence costs) are taken to intervene?
- Are works reasonably strategically aligned to efficiently allocate resources to the maintenance and development of the network over time?
- Are work practices effective and efficient at achieving the required outcomes with the minimum resources reasonably required?
- In terms of FTE numbers, deployment, insourced versus outsourced resources, do these arrangements reasonably the minimum costs necessary to undertake the work volumes required to achieve the capex objectives and maintain the required or efficient service levels?

The business' risk management is prudent and efficient

- Is the business' (implicit or explicit) identification, characterisation and evaluation of risk a reasonable and unbiased estimate?

  - Note: consideration should extend to the nature and character of the hazard, its extent, timing, frequency or realisation, and consequence of realisation including the impact on performance targets and/or performance trends on the required or efficient service levels.
- Is the selection of risk treatment (accept, manage, mitigate, avoid) unbiased and reasonably optimal in terms of customer costs and benefits as well as who can reasonable manage the risk?
  - Note: consideration of this aspect should extend to the whether the selection of options (e.g. operational, demand management, risk management, capital based) demonstrates bias in risk management practices (e.g. build the risk out (avoid) rather than manage operationally). Consideration should also include whether the business already treats the risk through other current or planned risk treatments and the implication of this in terms of the significance of the risk and the customer costs and benefits.
- Is investment timing unbiased and reasonably optimal in terms of risk adjusted customer costs and benefits?
- Excluding required (mandated) changes, are any changes in the levels of risk (implicitly or explicitly) commensurate with changes in customer costs or benefits?
- Are work volumes and resources allocated to maintain performance at the required or efficient service levels commensurate with the risk adjusted customer costs and benefits?
  - Note: consideration should include how work volumes and allocation of resources reflects targeted management of root causes of that drive performance trends commensurate with the risk adjusted customer costs and benefits.
- Do the relevant applicable standards (i.e. planning, design, asset management, operational standards) applied by the business (implicitly or explicitly) reasonably allocate risk commensurate with the customer costs and benefits?
- Are any risk allowances unbiased estimates of total portfolio level risks?