Attachment 4.04

Advisian - Review of standard and remaining lives of assets

January 2015

Ausgrid revised regulatory proposal attachment

Advisian

WorleyParsons Group

Review of Standard and Remaining Lives of Assets

Networks NSW

12 January 2015

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Declaration

I have read, understood and complied with the Federal Court of Australia's Practice Note CM 7 – Expert Witness in Proceedings in the Federal Court of Australia.

The opinions contained in this report are based wholly or substantially on the specialised knowledge gained through the training, study and experience outlined in the Curriculum Vitae that is attached in Appendix C.

Signature:

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Qualifications of persons assisting in preparation of this report:

Oliver Jones, BEng, CPEng, Senior Consultant, Advisian Pty Ltd

1 Executive Summary

Advisian (formerly Evans & Peck) was engaged by Ausgrid on behalf of Networks New South Wales (NSW) to provide an independent expert opinion on the standard and remaining asset lives employed in each of the businesses Roll Forward Model and Post-Tax Revenue Model for the calculation of each respective regulatory depreciation revenue building block.

In response to the Terms of Reference for this report, Advisian has reviewed the current AEMC rules, and objectives of the regulatory depreciation building block allowance, as well as the principles and assessment approach taken by the AER, with respect to determination of standard and remaining asset lives and the regulatory depreciation building block within the PTRM.

In identifying the basis for the current standard and remaining lives applied by each of the Networks NSW DNSP businesses, Advisian has identified that the asset lives in the RFM and PTRM have been continuously rolled forward from the historical optimised depreciated replacement value calculations conducted using Standard Lives from the 2004 NSW Treasury Guidelines on the Valuation of Electricity Network Assets, within which the standard lives had "*been derived from industry experience including an ESAA Member Survey in 2000*". Consequently with the advancement of network investment, both in the types of network assets installed, as well as the network data systems which support the capture and analysis of real network activity, the standard lives in the Networks NSW businesses RFM and PTRM are not aligned to the lives that are being experienced in practice.

In assessing the current AEMC rules, and evaluating the regulatory guidance documentation for an assets economic life, Advisian considers that using actual network data to inform the calculation of the useful economic life over which an asset should be depreciated, is reasonable on the basis that the approach outlined in this report:

- Is in accordance with the National Electricity Rules;
- More accurately reflects actual network activity[1]; and
- Minimises asset write-down risks to future network customers[2].

As detailed in Sections 6 and 7 of this report, calculation of standard and remaining asset class lives on the basis of a capital weighted average of the mean economic lives within Ausgrid's Category Analysis RIN, will result in the following amended standard and remaining asset class lives for each of the asset classes as highlighted in gold, across the Networks NSW businesses.

	Standard Asset Lives (Years)			Remaining Asset Lives (Years)		
Regulatory Asset Classes	Ausgrid	Endeavour Energy	Essential Energy	Ausgrid	Endeavour Energy	Essential Energy
Sub-transmission lines and cables	41.2	45.6	40.5	30.6	30.7	29.4
Cable tunnel (dx)	70	n/a	n/a	67.4	n/a	n/a
Distribution lines and cables	41.6	40.1	40.6	40.4	33.2	35.6

[1] *this aligns the timing of the Return of Asset building block revenue closer to the point at which the investment was required to meet network demand.*

[2] *Asset write-downs as a result of asset replacements/retirements/disposals at lives much shorter than accounted for in depreciation terms.*

	Standard Asset Lives (Years)			Remaining Asset Lives (Years)		
Substations	46.8	40	40.2	34.8	28.2	25.2
Transformers	37.4	40.6	36.35	27.2	23.5	23.2
Low voltage lines and cables	40.76	41.1	39.4	34.2	25.2	24.5
Customer metering and load control	25	25	25.9	14.5	23.1	19.9
Communications (digital) - dx	10	n/a	n/a	5.6	n/a	n/a
Total communications	10.2	8.4	7	3.1	6.9	5.6
Systems IT (dx)	7	n/a	n/a	4.9	n/a	n/a
Ancillary substation equipment (dx)	15	n/a	n/a	12.4	n/a	n/a
Land and easements	n/a	n/a	n/a	n/a	n/a	n/a
Furniture, fittings, plant and equipment	17.4	13	13	12.5	8.1	8.4
Land (non-system)	n/a	n/a	n/a	n/a	n/a	n/a
Other non-system assets	29.4	n/a	15	7.7	n/a	13.4
IT systems	5	5	5	3.3	3.5	3.6
Motor vehicles	10.2	8	8	6.3	5.7	5.1
Buildings	35.9	50	50	30	44.8	47.6
Equity raising costs	47.4	42.4	46.3	43.4	37	44.7
Emergency spares (major plant, excludes inventory)	n/a	23.6	n/a	n/a	12.9	n/a

This report details Advisian's findings and its recommended approach for the determination of standard and remaining asset lives on the basis of a capital weighted average of the economic lives as reported in Ausgrid's Category Analysis RIN. The following table illustrates Advisian's calculation of the resultant impact to each Networks NSW 2014/15-2018/19 regulatory control PTRM's, based upon the data in each business' original proposal for determination of the respective regulatory revenue allowance.

Networks NSW Business	Regulatory Building Block	Regulatory Control Period (Year) ($m nominal change on Original Proposal)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Ausgrid	RAB	0.00	-24.27	-52.08	-83.63	-119.21
	Return of Asset	24.27	27.81	31.55	35.58	39.59
	Return on Asset (Equity)	0.00	-0.98	-2.11	-3.38	-4.82
	Annual Revenue	31.31	33.45	35.46	37.49	39.08
Endeavour Energy	RAB	0.00	-8.23	-17.75	-28.61	-40.92
	Return of Asset	8.23	9.52	10.86	12.31	13.89
	Return on Asset (Equity)	0.00	-0.33	-0.72	-1.16	-1.65
	Annual Revenue	10.62	11.46	12.23	13.00	13.81

Networks NSW Business	Regulatory Building Block	Regulatory Control Period (Year) ($m nominal change on Original Proposal)				
Essential Energy	RAB	0.00	-24.90	-53.43	-85.93	-122.59
	Return of Asset	24.90	28.53	32.50	36.66	41.26
	Return on Asset (Equity)	0.00	-1.01	-2.16	-3.47	-4.96
	Annual Revenue	32.13	34.31	36.55	38.66	40.89

2 Introduction

Advisian (formerly Evans & Peck) was engaged by Ausgrid on behalf of Networks New South Wales (NSW) to provide an independent expert opinion in response to the following questions:

1) What are the fundamental principles and approach adopted by the Australian Energy Regulator (AER) in assessing and endorsing asset class standard and remaining lives for inclusion in the distribution determination Roll Forward Model (RFM) and Post-Tax Revenue Model (PTRM)? Do the practices adopted by the Networks NSW businesses align to the Australian Energy Market Commission (AEMC) rules and AER principles? Do the practices align with the fundamental driver for asset depreciation?

2) What are the existing commonalities/differences across each Networks NSW business and the National Electricity Market (NEM) Distribution Network Service Provider's (DNSP) for the calculation of asset class standard and remaining lives? Is there scope for common practices between Networks NSW businesses in the adoption of asset class lives and what impact might a change in practice have on each businesses regulatory submission?

3) What are the existing commonalities/differences across each Networks NSW business in alignment between the engineering, regulatory and accounting lives of asset classes? Is there scope for commonality of asset class lives across engineering, regulatory and accounting lives and what impact might a change in practice have on each businesses practices and regulatory submission?

4) On what basis might the Networks NSW businesses adopt different asset class standard and remaining lives which more closely align depreciation revenue to the expenditure quantum and timing requirements of the businesses? And what business/network/customer impact might this have on the regulated revenue requirement for each business?

In responding to these questions Advisian has:

(a) Reviewed the current processes for determining standard and remaining asset lives across each of the three Networks NSW businesses, and identified any differences between each;

(b) Assessed and outlined alternative approaches to the determination of standard and remaining asset lives, and the likely impact each alternative may have on regulatory, customer and business objectives; and

(c) Recommended an approach to the determination of standard and remaining assets lives and how the approach may be implemented within both the RFM and the PTRM.

This report addresses the questions in accordance with the Terms of Reference included in Appendix A.

2.1 Report Structure

To address the question, Advisian has first considered the background and formation of the existing processes and data for the standard and remaining accounting, regulatory and technical asset lives, and the depreciated value of the respective regulatory asset classes.

We have then outlined our assessment approach and detailed the basis for our opinion through the remainder of the report, as follows:

- Section 4: Reviews the current AEMC rules and the principles and assessment approach taken by the AER with respect to determination of standard and remaining asset lives and the depreciation component of the PTRM.
- Section 5: Outlines the background and current state of standard asset lives and depreciated asset value, and identifies key issues within the current regulatory model and reporting context.
- Section 6: Assesses alternative approaches and details Advisian's opinion on the determination of standard and remaining asset lives, and the likely impact each alternative may have on the depreciation component of the Maximum Allowable Revenue (MAR) for each of the Networks NSW businesses.
- Section 7: Details Advisian's recommendation of the application of the proposed amended standard and remaining assets lives and concludes the report.

3 Background

Networks NSW has identified concerns with the calculation of the Return of Assets component of its revenue, which represents the depreciation expense that is recovered from customers. As a result, the depreciation profile and timing of depreciation cash flow is not well aligned to the actual asset lives experienced by the network businesses.

The depreciation component of revenue acts to expense existing assets. However, high level financial and asset management indicators frequently use depreciation as a proxy for the expected level of replacement capital expenditure to sustain existing assets. In this regard, the use of shorter asset lives in the calculation of depreciation revenue allowance may allow for a more cost reflective recovery of capital expenditure closer to the period in time at which customer and demand growth generated the requirement for network augmentation and replacement activity, providing an inherent benefit to a network business in maintaining capital recovery, and reducing risk to future customers of asset write-downs on assets replaced or disposed significantly earlier than the respective depreciation schedules had accounted for.

Networks NSW considers that it may be possible to amend the asset lives that are used for the calculation of the regulatory depreciation expense so that the timing and quantum better aligns to the asset lives reflected in the captured network data and the data used for asset replacement forecasting.

This report provides Advisian's independent opinion on reasonable approaches to the application of standard asset lives, remaining asset lives and weighting processes in the PTRM for each of the Networks NSW businesses as they prepare their amended proposal to the AER.

3.1 Regulatory Context

The AER applies asset life information provided by DNSP's in two areas of its regulatory determinations. These are:

(a) The calculation of the Return of Assets (Depreciation) building block and Regulatory Asset Base (RAB) value in the RFM and the PTRM;

(b) The Repex model which is used to inform the AER's assessment of the businesses' proposed replacement capex.

Indirectly, the asset life information also influences:

(a) The Return on Assets (WACC x RAB) building block due to the centrality of depreciation assumptions to the value of the RAB; and

(b) The Benchmark Tax Expense Building Block to the extent which the tax and regulatory depreciation lives are aligned.

Therefore the asset life information provided by the Networks NSW businesses is fundamental to the determination of allowable revenue. Notwithstanding this, the statements on the requirements and usage of asset life information contained in the National Electricity Rules Clause 6.5.5. Depreciation[3], and the AER's handbooks for both the PTRM[4] and RFM[5], do not explicitly detail the requirements for

[3] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

[4] *Electricity distribution network service providers Post-tax revenue model handbook June 2008*

determination of standard and remaining asset lives. In addition the terminology differences referring to asset lives between the NERs, regulatory reporting requirements and the regulatory models introduce inconsistencies in the reporting of asset life information between businesses. Therefore the methodologies and reported information remains inconsistent between different NEM DNSPs.

Whilst this report is primarily focused on the standard and remaining lives used for the determination of the regulatory depreciation revenue building block, where relevant, we have also considered the economic lives that have been presented at a more granular level in the technical portion of the RIN information.

[5]*Electricity distribution network service providers Roll forward model handbook June 2008*

4 Current Regulatory Approach

The AER's fundamental principles and approach to the assessment and determination of the regulatory depreciation building block relies on the standard and remaining lives that have been provided for the purpose of calculating the value of the RAB using the RFM and PTRM. This section summarises the AER's approach to assessing and determining the regulatory depreciation schedules forming the regulatory depreciation building block revenue, in accordance with the AEMC rules and AER principles, and describes the key assumptions that underlie the application in the RFM and PTRM of each of the Networks NSW businesses.

4.1 NER Requirements

The AER currently assess the benchmark efficient depreciation costs of each of the Networks NSW businesses in accordance with Clause 6.5.5[6] of the National Electricity Rules as follows:

"6.5.5 Depreciation

a) The depreciation for each regulatory year:

1) must be calculated on the value of the assets as included in the regulatory asset base, as at the beginning of that regulatory year, for the relevant distribution system; and

2) must be calculated:

i. providing such depreciation schedules conform with the requirements set out in paragraph (b), using the depreciation schedules for each asset or category of assets that are nominated in the relevant Distribution Network Service Provider's building block proposal; or

ii. to the extent the depreciation schedules nominated in the Distribution Network Service Provider's building block proposal do not so conform, using the depreciation schedules determined for that purpose by the AER.

b) The depreciation schedules referred to in paragraph (a) must conform to the following requirements:

1) the schedules must depreciate using a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets;

2) the sum of the real value of the depreciation that is attributable to any asset or category of assets over the economic life of that asset or category of assets (such real value being calculated as at the time the value of that asset or category of assets was first included in the regulatory asset base for the relevant distribution system) must be equivalent to the value at which that asset or category of assets was first included in the regulatory asset base for the relevant distribution system;

3) *the economic life of the relevant assets and the depreciation methods and rates underpinning the calculation of depreciation for a given regulatory control period must be consistent with those determined for the same assets on a prospective basis in the distribution determination for that period."*[7]

Essentially the NERs require that the AER make a determination for each regulatory control period on the value of the opening RAB and the forecast depreciation. The opening RAB is calculated in the

[6] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

[7] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

RFM which requires the approved opening RAB of the prior regulatory control period to form the basis for the calculation of the opening RAB for the next regulatory control period, with the following adjustments applied.

(a) actual[8] capital expenditure;

(b) actual[9] depreciation; and

(c) actual[10] CPI.

The roll forward mechanism to determine the opening asset base in the RFM, and ex-ante determination of the regulatory depreciation component of revenue is illustrated in Figure 4-1 below.

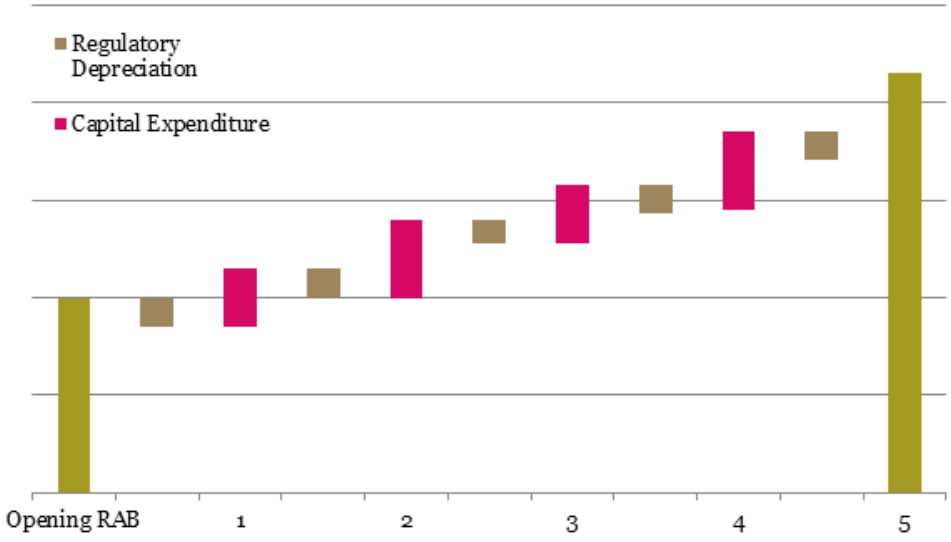

Figure 4-1 - RFM Model Depreciation Deduction and Capital Expenditure Addition (Illustrative Only)

Source: Advisian

Once the opening RAB is calculated, the year on year depreciation revenue building block for the next regulatory control period is calculated in the AER's PTRM. As depicted in Figure 4-2, this model effectively:

(a) Calculates a straight line depreciation component on the remaining lives of each asset class within the existing opening RAB[11]; and

[8] *In accordance with AEMC, National Electricity Rules, Version 65, 1 October 2014, Clause 6.12.3. pp. 711-712Advisian notes that the AER retains some discretion to approve either actual or forecast depreciation for regulatory purposes. Historically actual regulatory depreciation has been used in the majority of cases.*

[9] *ibid*

[10] *ibid*

[11] *Electricity distribution network service providers Post-tax revenue model handbook June 2008*

(b) Adds the depreciation associated with the forecast capex at the beginning of each regulatory year within the control period as estimated at the installation date of the asset.[12]

Within the PTRM, adjustments are made to the regulatory depreciation allowance for new capex to:

(a) Apply a half-real vanilla WACC to compensate for the six-month period before capex is included in the RAB[13];

(b) Increase the RAB by CPI to maintain the real value of the RAB; and

(c) Reduce the nominal value of the RAB to reflect return of capital through the regulatory depreciation building block allowance[14].

The key assumptions that underlie these operations are discussed in the following section.

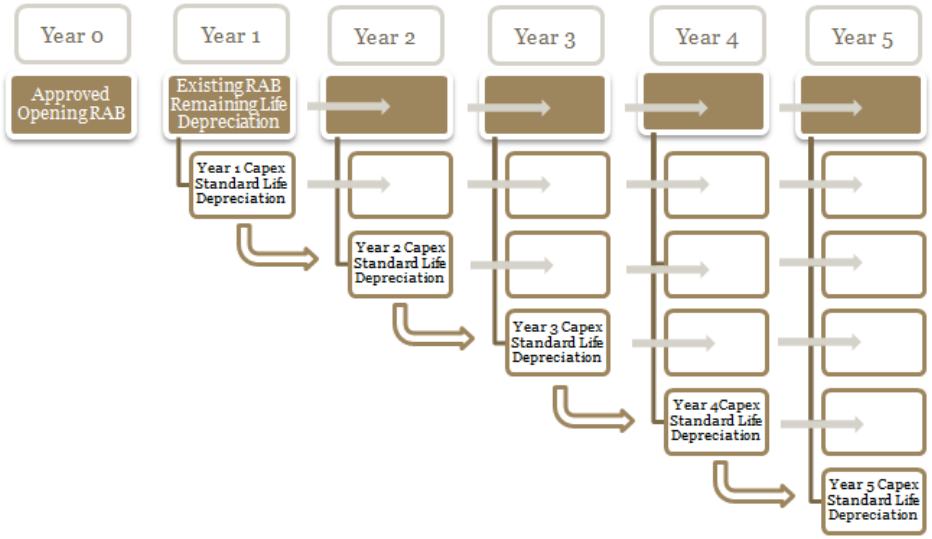

Figure 4-2 - Return of Asset PTRM Building Block (Illustrative Only)

Source: Advisian

In addition to the requirements of the NER rule 6.5.5[15], under Schedule *S6.1.3 Additional Information and Matters (12)*[16] the NERs also require the following additional information regarding its proposed depreciation profiles in submission of its building block proposal:

[12] *ibid*

[13] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 - Rolling forward the RAB and depreciation p11-12*

[14] *ibid*

[15] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

[16] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 745-746*

"S6.1.3 Additional information and matters

12) the depreciation schedules nominated by the Distribution Network Service Provider for the purposes of clause 6.5.5 , which categorise the relevant assets for these purposes by reference to well accepted categories such as:

(i.) asset class (e.g. distribution lines and substations); or

(ii.) category driver (e.g. regulatory obligation or requirement, replacement, reliability, net market benefit, and business support), together with:

(iii.) details of all amounts, values and other inputs used by the Distribution Network Service Provider to compile those depreciation schedules;

(iv.) a demonstration that those depreciation schedules conform with the requirements set out in clause 6.5.5(b); and

(v.) an explanation of the calculation of the amounts, values and inputs referred to in subparagraph (iii);

This effectively requires all data and qualifications to be provided with the regulatory submission PTRM in support of the calculation of asset lives and aggregated asset categories, for determination of the regulatory depreciation schedules and allowances.

4.2 Objective of the Depreciation Building Block Allowance

The depreciation building block allowance enables the DNSPs to recover, over the life of the assets, the cost of the capital expenditure employed in engineering and constructing the transmission and distribution power networks. The calculation of the standard life over which capital expenditure is depreciated, in accordance with the NERs 6.5.5 (b) (1), (2) & (3)[17], requires that the determination of the depreciation schedule of any particular asset or class of assets must conform to the following:

1) Must depreciate using a profile that reflects the nature of the assets or category of assets over their economic life;

2) Must be equivalent to the real value at which that asset or category of assets was first included in the regulatory asset base;

3) The economic life and the depreciation rates must be consistent with those determined for the same assets on a prospective basis in the distribution determination for that period.

Each clause of the above rules allow the DNSPs to expense the assets over a period reflective of the life for which the asset provides economic value to the network and customers, as well as ensuring protection of network consumers from over recovery of asset value or significant step changes in

[17] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

depreciation expense as a result of disposal or devaluation of assets with significant residual value in the RAB.

Advisian's interpretation of the rule requirements and its intended purpose is that an asset or category of assets depreciation schedule should be aligned closely to the period of time that:

(a) The DNSPs can accurately account that the assets are providing economic value to network consumers;

(b) The assets were installed to meet a particular network demand or economic activity; and

(c) Minimises asset stranding risk in which future customers may be charged for current network investment.

On this basis, Advisian considers that the rules recognise the need for, and accommodate the adjustment to standard and remaining lives over the life of network assets. This is subject to submission of appropriate supporting information in accordance with Schedule 6.1.3[18] and the AER's approval as part of its regulatory determination.

4.3 Key Assumptions

The following section discusses the key assumptions which underpin the AER's processes embedded in the RFM and PTRM calculations. Figure 4-3 below illustrates the regulatory revenue building blocks calculated in the PTRM, for which each DNSP must provide evidence to substantiate its annual revenue requirement for each regulatory year of the regulatory control period in accordance with NER 6.3 Building block determinations[19].

[18] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 745-746*

[19] *AEMC, National Electricity Rules, Version 65, 1 October 2014, Part C Building Block Determinations for Standard Control Services pp. 650-690*

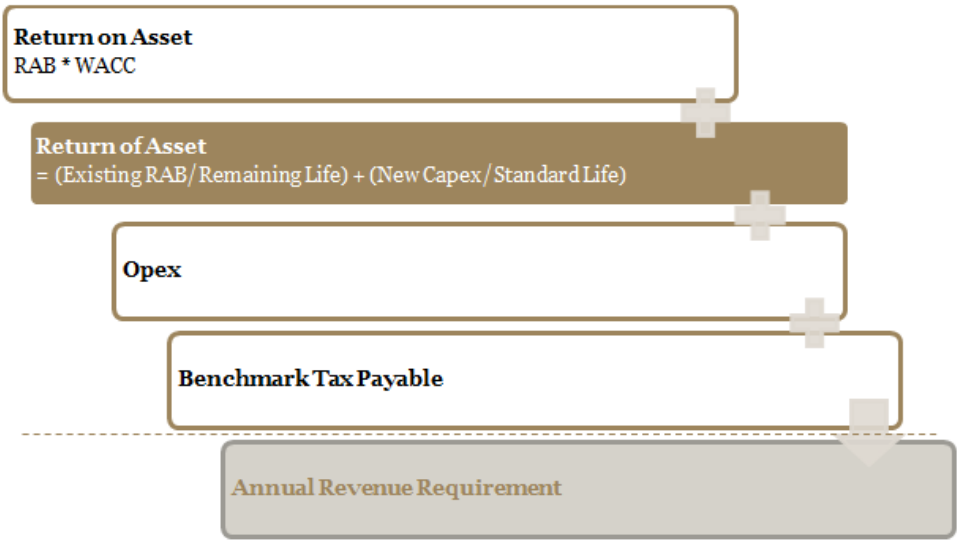

Figure 4-3 - PTRM Building Block Annual Revenue Requirement (Illustrative Only)

Source: Advisian summary of Electricity distribution network service provider's Post-tax revenue model

As highlighted in Figure 4-3 the standard life and remaining life assumptions directly impact the Return of Assets building block, and indirectly affect the Return on Assets building block through the effect of regulatory depreciation on the RAB. The following key assumptions form the basis for calculation of the regulatory depreciation, and the impact each has on the building blocks within a DNSPs annual revenue allowance.

4.3.1 Standard Lives

The RFM and PTRM require the input of standard lives[20] for each high level asset class used by the business (e.g. sub-transmission lines and cables, substations, transformers). These are fixed for a regulatory control period and used to calculate the depreciation allowance attributable to historical actual (RFM) and forecast (PTRM) capital expenditure over the period.

The PTRM Handbook 2008 defines an asset class' standard life as "*how long the infrastructure would physically last had it just been built*"[21]. The RFM handbook requires that standard lives "*must accord with those used in the previous distribution determination*"[22], furthermore, any changes to the standard lives (or remaining lives) that is proposed by the DNSP's is subject to AER review and acceptance[23]. Table 4-1 details the standard lives of each of the Networks NSW businesses as set in the AER draft decision.

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[20] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 2.1 Input Sheet- Standard Life p7*

[21] *ibid*

[22] *Electricity distribution network service providers Roll forward model handbook June 2008 – Standard Life p5*

[23] *Final decision New South Wales distribution determination 2009–10 to 2013–14 28 April 2009 10.4.2 Updating input data p214-215*

Table 4-1 AERs Draft Decision on Standard Asset Lives as at July 1 2014

Standard Asset Lives (Years)	Ausgrid	Endeavour Energy	Essential Energy
Sub-transmission lines and cables	46.3	47.4	54.936.4
Cable tunnel (dx)	70	n/a	n/a
Distribution lines and cables	58	50.6	53.8
Substations	46.8	40	40.2
Transformers	45.9	44.3	45.8
Low voltage lines and cables	52.1	52.4	51.5
Customer metering and load control	25	25	25.9
Communications (digital) - dx	10	n/a	n/a
Total communications	10.2	8.4	7
Systems IT (dx)	7	n/a	n/a
Ancillary substation equipment (dx)	15	n/a	n/a
Land and easements	n/a	n/a	n/a
Furniture, fittings, plant and equipment	17.4	13	13
Land (non-system)	n/a	n/a	n/a
Other non-system assets	29.4	n/a	15
IT systems	5	5	5
Motor vehicles	10.2	8	8
Buildings	35.9	50	50
Equity raising costs	47.4	42.4	46.3
Emergency spares (major plant, excludes inventory)	n/a	23.6	n/a

Source: AER Draft Determinations Attachment 5: Regulatory depreciation[24] [25][26]

4.3.2 Remaining Lives

AER guidance on the remaining life for each asset class is that remaining lives are to be based on the economic life of the assets, which is "*generally assumed to be the weighted average remaining life of all individual assets in the class*"[27].

[24] *Draft Decision Ausgrid distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-5 p 14*

[25] *Draft decision Endeavour Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-3 p13*

[26] *Draft decision Essential Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-3 p13-14*

[27] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 Footnote 4 p7*

As depicted in Figure 4-4, current regulatory RFM treatment calculates remaining asset lives based on the depreciated value of assets forming the RAB. The value weighted average of the opening RAB remaining life and the actual annual capex multiplied by the respective asset class standard life result in a roll forward remaining life for each asset class to be included in the PTRM. In accordance with the Distribution Roll Forward Model Handbook the standard life for each asset class "*must accord with those used in the previous distribution determination*"[28].

Figure 4-4 - RFM Remaining Life Calculation (Illustrative Only)

Source: Advisian

Table 4-2 details the remaining lives of each of the Networks NSW businesses as set in the AER draft decision.

Table 4-2 - AERs Draft Decision on Remaining Asset Lives as at July 1 2014

Remaining Asset Lives (Years)	Ausgrid	Endeavour Energy	Essential Energy
Sub-transmission lines and cables	32.9	31.7	36.4
Cable tunnel (dx)	67.4	n/a	n/a
Distribution lines and cables	46.8	38.3	42.3
Substations	34.8	28.2	25.2
Transformers	30.5	24.6	26.7
Low voltage lines and cables	40	27	28.9

[28] *Electricity distribution network service providers Roll forward model handbook June 2008 Standard Life p5*

Remaining Asset Lives (Years)	Ausgrid	Endeavour Energy	Essential Energy
Customer metering and load control	14.5	23.1	19.9
Communications (digital) - dx	5.6	n/a	n/a
Total communications	3.1	6.9	5.6
Systems IT (dx)	4.9	n/a	n/a
Ancillary substation equipment (dx)	12.4	n/a	n/a
Land and easements	n/a	n/a	n/a
Furniture, fittings, plant and equipment	12.5	8.1	8.4
Land (non-system)	n/a	n/a	n/a
Other non-system assets	7.7	n/a	13.4
IT systems	3.3	3.5	3.6
Motor vehicles	6.3	5.7	5.1
Buildings	30	44.8	47.6
Equity raising costs	43.4	37	44.7
Emergency spares (major plant, excludes inventory)	n/a	12.9	n/a

Source: *AER Draft Determinations Attachment 5: Regulatory depreciation*[29][30][31]

4.3.3 Asset Classes

The PTRM is structured based on asset categorisations which are presented at a more aggregated level than the asset categories used for internal asset management purposes and as required to populate the AER's annual RIN, Category Analysis RIN, Economic Benchmarking RIN and Repex models. Whilst there is facility in the PTRM to accommodate a larger number of asset classes, in practice a substantial change to asset categorisations would be difficult due to the need to reconcile historical asset categories and revise internal systems to report on a different basis.

As the asset classes used for calculation of regulatory depreciation allowance are not consistent with the discrete asset classes used for other regulatory expenditure assessment or asset management purposes, there is an inherent inconsistency across NEM DNSPs in the aggregation of asset classes, as well as the correlation between how assets are expensed for regulatory purposes and the actual end of life at which an asset will be replaced or disposed.

In accordance with the capital weighted average calculation of remaining asset lives for regulatory depreciation purposes as depicted in Figure 4-4, the aggregated regulatory asset classes on both a

[29] *Draft Decision Ausgrid distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-5 p 14*

[30] *Draft decision Endeavour Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-3 p13*

[31] *Draft decision Essential Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-3 p13-14*

regulatory and accounting perspective should align such that by calculating the remaining life by multiplying regulatory standard asset lives and capital expenditure, the weightings within each regulatory category are matched, and remain consistent as a result of capital additions or disposals, essentially ensuring that the regulatory treatment can be reconciled to accounting treatment.

4.3.4 Nominal Regulatory Depreciation

As per NER 6.4.3 (b) (1)[32] the AER allow for the indexation of the RAB to maintain the real value of the RAB. This ensures the RAB remains current in nominal terms and is intended to eliminate the step changes that may arise from periodic RAB revaluations.

As visible in Figure 4-5 (assuming no future capital expense is incurred beyond the 2014/15 to 2018/19 regulatory control period), the regulatory revenue profile appears as a delayed expensing of real depreciation due to the above discussed allowance to maintain the nominal value of the RAB, however the inflation adjusted RAB value effectively allows for the above mentioned increased short term return on capital in nominal terms, crossing over to a longer term increased regulated depreciation revenue on an approximate 20 year horizon. The sum of both profiles equating to the total nominal depreciation over the entire depreciation period, therefore preserving the total return of capital to the DNSP in present value terms.

[32] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 652*

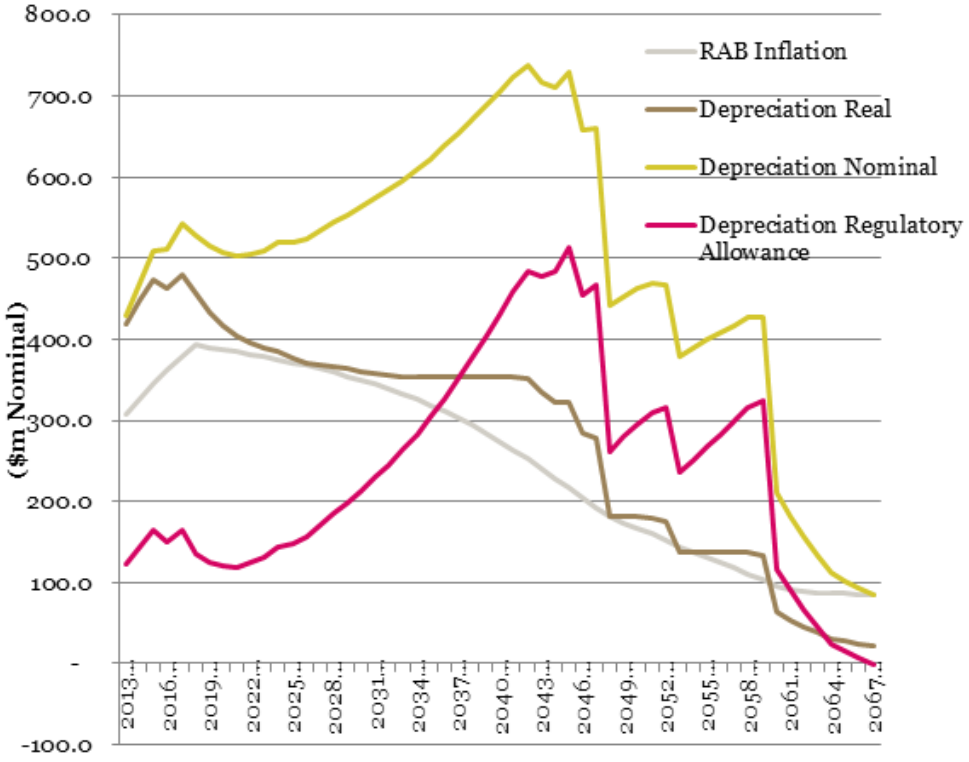

Figure 4-5 - Regulatory Depreciation Profile

Source: Advisian analysis of Ausgrid PTRM

The AER's explanation in each of the Draft Decision's[33][34][35], is that the above described methodology enables the NEM DNSPs to share in the benefit of an increasing RAB value over time, whilst preventing over compensation via the depreciation building block in accordance with NER 6.5.5. (b) (2)[36]. This approach however, results in the 'back-ending' of nominal cash flows in relation to asset depreciation expense. This further exposes future customers to increased prices as a result of the sharp increase in nominal regulatory depreciation revenue that is visible in Figure 4-5 (noting that no allowance for future investment has been made in the analysis).

4.3.5 Benchmark Tax Lives

The PTRM recognises that assets may be depreciated over a different life for the purpose of calculating tax depreciation. Due to this distinction, the RFM and PTRM also calculate the value of

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[33] *Draft Decision Ausgrid distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 5.4.1 Depreciation approach p11*

[34] *Draft Decision Endeavour Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 5.4.1 Depreciation approach p11*

[35] *Draft Decision Essential Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 5.4.1 Depreciation approach p11*

[36] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 660*

the tax asset base and tax depreciation[37]. The tax lives for each asset class are "*based on the tax life specified by the Australian Tax Office (ATO) for the category of assets and commissioning date*"[38].

As tax depreciation affects the benchmark tax building block of a DNSP's revenue but not the Return of Assets (regulatory depreciation) building block Advisian has not considered tax lives further.

[37] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 2.1 Input Sheet- Opening Tax Value, Tax Remaining Life, Tax Standard Life p7*

[38] *ibid*

5 Networks NSW Data

This section considers the asset life data provided by the Networks NSW businesses in response to the following questions in the Terms of Reference.

2) What are the existing commonalities/differences across each Networks NSW business and the NEM DNSPs for the calculation of asset class standard and remaining useful lives? Is there scope for common practices between Networks NSW businesses in the adoption of asset class lives and what impact might a change in practice have on each businesses regulatory submission?

3) What are the existing commonalities/differences across each Networks NSW business in alignment between the engineering, regulatory and accounting lives of asset classes? Is there scope for commonality of asset class lives across engineering, regulatory and accounting lives and what impact might a change in practice have on each businesses practices and regulatory submission?

The following Section 5.1 summarises the sources of asset life information used by the businesses. Section 5.2 describes the key issues identified by Advisian, with respect to each of the key assumptions which underpin the calculation of the regulatory depreciation building block allowance within both the RFM and PTRM.

5.1 Existing Sources of Asset Life Information

The Networks NSW businesses necessarily use a number of sources of asset lives used in the operation of their businesses. As these are used for different purposes, they are typically categorised differently to align with accounting, tax and business reporting requirements as well as to respond to different regulatory functions[39]. Table 5-1 summarises the sources of asset life information that are used for regulatory purposes.

Table 5-1 – Sources of Asset Life Data

	Ausgrid	Endeavour Energy	Essential Energy
Statutory Accounts	Remaining Lives calculated on written down value weighted average of standard lives from 2004 Optimised Depreciated Replacement Cost (ODRC) treasury guidelines[40]. Standard Lives brought forward from previous regulatory approved values as per New South Wales Treasury Guidelines on Valuation of Electricity Network Assets[41]. Categories recorded in Fixed Assets Register and aggregated to regulatory		

[39] *For example, RAB v capex/Opex/ forecasting purposes*

[40] *Networks NSW provided data*

[41] *Valuation of Electricity Network Assets A Policy Guideline for New South Wales Distribution Network Service Providers July 2001February 2004 Table 1 Table of Standard Replacement Costs and Effective Lives*

	Ausgrid	Endeavour Energy	Essential Energy
	categories.		
Regulatory Asset Base	Remaining Useful Lives calculated in RFM. Standard Lives brought forward from previous approved PTRM. Categories aligned to categories historically reported to the AER.		
Regulatory Tax Asset Value	Remaining Tax Lives calculated in RFM. Weighted average of ATO Standard Tax Lives.[42] Categories aligned to categories recorded in Fixed Assets Register and aggregated to regulatory categories.		
Engineering and Expenditure Planning	Maintenance and Asset Management from business database/GIS/ Historical Registers. Economic Lives for annual regulatory reporting from business database/GIS/ Historical Registers including replacements, failures, augmentation. Categories aligned to business structure and role responsibilities.	Standard Lives (Planning). Economic Lives (Maintenance and Asset Management). Categories aligned to business structure and role responsibilities.	

Source: Advisian, Networks NSW

For clarity, Advisian has outlined the purpose that each of the asset life information plays in the calculation of a DNSP's regulated revenue.

Table 5-2 - Regulatory Purpose of Asset Life Information

	Remaining Useful Lives	Standard Lives
Statutory Accounts	Calculation of the remaining depreciation for existing assets.	Calculate the value of depreciation associated with new assets.
Regulatory Accounts	Calculation of the remaining regulatory depreciation for the opening RAB in the PTRM.	Calculate the value of regulatory depreciation associated with new assets.

[42] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 2.1 Input Sheet- Opening Tax Value, Tax Remaining Life, Tax Standard Life p7*

	Remaining Useful Lives	Standard Lives
Benchmark Tax	Calculation of the remaining tax depreciation for the benchmark tax building block.	Calculation of tax depreciation associated with new assets for the benchmark tax building block.
Engineering	Planning and managing asset replacement, maintenance and augmentation requirements.	

Source: Advisian

Advisian notes that our analysis is limited to the regulatory treatment of asset lives for the purpose of calculating the return of assets building block. We have not considered, and do not provide an expert opinion, on taxation treatment or statutory accounting matters.

5.2 Key Issues Identification and Evaluation

Based on Advisian's review and evaluation of the AER methodologies and information provided by the Networks NSW businesses, we have identified four key issues relating to the application of asset lives and the regulatory treatment of remaining asset lives for the purpose of calculating the regulatory depreciation allowance building block. These are:

1) Definition of economic life;

2) Use of standard life as a proxy for economic life;

3) Calculation of remaining life; and

4) Categorisation of assets.

The following sections discuss the impact of each of these issues on the calculation of the regulatory depreciation expense that is included in the networks NSW businesses revenue allowance.

5.2.1 Economic Life

Advisian notes that NER 6.5.5[43] requires that regulatory depreciation is calculated such that:

1) The schedules must depreciate using a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets[44];

2) The sum of the real value of the depreciation that is attributable to any asset or category of assets over the economic life must be equivalent to the value at which that asset or category of assets was first included in the regulatory asset base[45]; and

[43] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

[44] *AEMC, National Electricity Rules, Version 65, 1 October 2014, 6.5.5 (b)(1) p.660*

[45] *AEMC, National Electricity Rules, Version 65, 1 October 2014, 6.5.5 (b)(2) p.660*

3) The economic life of the relevant assets and the depreciation methods and rates must be consistent with those determined for the same assets on a prospective basis in the distribution determination for that period[46].

The reliance of the rules on the use of the economic life rather than standard life acknowledges the difficulty in estimating a single standard life for electricity distribution assets. For instance, a substation can be comprised of several assets which have separate discrete lives when viewed in isolation. These include transformers, civil works, switchgear, secondary systems, conductors, structures and buildings, yet as a group, 'substations' are assigned a standard life of approximately 40-50 years across NEM DNSPs for regulatory depreciation purposes.

Consequently the aggregation of asset classes for regulatory depreciation purposes must adequately weight the capital value and standard lives of all subset assets, such that the depreciation schedule of a category represents the overall economic life and provides an appropriately timed expensing of the capital invested.

5.2.2 Standard Life as a proxy for Economic Life

In accordance with the detail in Section 4.3.1 of the current regulatory treatment of standard asset lives, Advisian understands that the NER 6.5.5 (b) (1) & (2), and the PTRM and RFM handbooks, requires that the calculation of standard lives reflects the nature of the assets, and how long the infrastructure would be expected to last had it just been built[47]. Standard lives are used as an approximation of installed asset life for the calculation of the depreciation of forecast capex over the forecast regulatory control period, and calculation of the roll-forward remaining lives within the RFM.

In accordance with the following definition of economic life within the AERs Explanatory Statement –Final Category Analysis RINs:

"An asset's economic life is the estimated period after installation of the asset during which the asset will be capable of delivering the same effective service as it could at its installation date"[48]

In addition to the following statement of the requirements for AER annual RIN reporting:

We note the term 'standard life' is interchangeable with the term 'economic life'. In the final RINs we have replaced references to 'standard life' with 'economic life'[49].

Given the AER's clarification for RIN purposes that economic life and standard life should be read interchangeably, the application of an asset's useful economic life based on network data collected annually by each of the DNSPs represents a reasonable approach for forecasting the period of time that a category of assets can be expected to provide useful economic benefit to customers.

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[46] *AEMC, National Electricity Rules, Version 65, 1 October 2014, 6.5.5 (b)(3) p.660*

[47] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 2.1 Input Sheet- Standard Life p7*

[48] *Better regulation Explanatory statement Final regulatory information notices to collect information for category analysis March 2014 p56*

[49] *ibid*

The standard and remaining lives in the RFM and PTRM have been continuously rolled forward from the historical depreciated value weighted average calculations conducted using Standard Lives from the 2004 NSW Treasury Guidelines on the Valuation of Electricity Network Assets, within which the Standard Lives had "*been derived from industry experience including an ESAA Member Survey in 2000*"[50]. Consequently the standard lives in the Networks NSW businesses RFM and PTRM are not aligned to the lives that are being experienced in practice, as captured in the DNSPs' asset management information systems.

	Network services												
	Ausgrid	Endeavour Energy	Essential Energy	Ergon	Energex	Jemena	SPAusNet	CitiPower	PowerCor	United Energy	SA Power Networks	Aurora	ActewAGL
TABLE 3.3.4 - ASSET LIVES	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)	Service Life (Years)
Table 3.3.4.1 Asset Lives – estimated service life of new assets	2013-14	2012-13	2013-14	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13
Overhead network assets less than 33kV (wires and poles)	55.327	49.397	53.000	48.200	45.000	64.130	47.000	49.100	50.900	35.600	55.000	35.000	62.600
Underground network assets less than 33kV (cables)	57.278	60.000	54.000	58.500	60.000	46.670	55.000	49.100	50.900	35.600	55.000	60.000	48.000
Distribution substations including transformers	46.696	41.474	45.000	44.900	40.100	45.580	62.000	49.100	50.900	35.600	45.000	40.000	72.800
Overhead network assets 33kV and above (wires and towers / poles etc)	47.501	56.673	55.000	52.800	50.500	62.470	54.000	49.100	50.900	60.000	55.000	50.000	
Underground network assets 33kV and above(cables, ducts etc)	45.899	45.000	54.000	45.000	45.000	40.000	55.000	49.100	50.900	60.000	55.000	60.000	
Zone substations and transformers	46.244	45.491	46.000	39.800	49.900	39.270	57.000	49.100	50.900	60.000	45.000	40.000	48.100
Meters		25.000	26.000	16.300						5.000			
"Other" assets with long lives	17.809	49.771	24.000	29.100	24.700	65.929		11.700	14.900	7.500	18.902	40.000	
"Other" assets with short lives	6.421	6.595	7.000	6.800	7.800	11.692	5.000	6.000	6.000	5.000	5.000	5.028	
Table 3.3.4.2 Asset Lives – estimated residual service life	2013-14	2012-13	2013-14	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13
Overhead network assets less than 33kV (wires and poles)	43.501	41.130	21.412	25.200	27.300	32.610	23.000	22.850	26.925	21.500	15.645	15.300	20.400
Underground network assets less than 33kV (cables)	46.133	52.601	33.139	48.000	45.900	34.500	43.000	22.850	26.925	21.500	12.884	38.783	26.000
Distribution substations including transformers	33.942	34.880	20.209	29.200	30.400	27.550	39.000	22.850	26.925	21.500	18.981	18.763	33.400
Overhead network assets 33kV and above (wires and towers / poles etc)	33.750	47.201	21.677	27.200	37.400	39.550	29.000	22.850	26.925	24.000	21.210	31.038	26.900
Underground network assets 33kV and above (cables, ducts etc)	34.741	35.252	34.017	36.900	32.700	30.000	43.000	22.850	26.925	24.000	21.210	37.908	49.300
Zone substations and transformers	34.657	39.513	15.242	26.100	37.100	18.330	29.000	22.850	26.925	24.000	18.981	12.967	27.200
Meters		14.196	1.883	10.800				4.189	3.935	5.000			19.000
"Other" assets with long lives	10.673	40.093	19.465	17.400	19.000	46.243		6.110	8.286	7.500	7.080	24.064	
"Other" assets with short lives	4.444	3.435	1.001	3.300	5.100	7.439	2.764	5.613	3.934	5.000	1.893	1.000	

Figure 5-1 - RAB Standard Lives across NEM DNSPs

Source: Advisian mapping of DNSP RIN Submission data

[50] *New South Wales Treasury Valuation of Electricity Network Assets A Policy Guideline for New South Wales Distribution Network Service Providers February 2004 3.5.1 Standard Effective Lives*

Similarly, as depicted in Figure 5-1 the standard lives as included in the current RAB asset lives tend to materially overstate the lives for similar assets when compared to other NEM DNSP's.

Therefore Advisian considers that the Network NSW businesses should move to align the standard lives used for depreciation purposes with the actual asset life data captured for recent regulatory reporting purposes.

5.2.3 Calculation of Remaining Life

As discussed in Section 4.3.2, the remaining life for each asset class forms the basis for calculation of the regulatory depreciation of the existing asset base in the PTRM. The calculation of the remaining lives as depicted in Figure 4-4 is conducted in the RFM using the weighted average of the opening RAB value multiplied by the remaining opening asset life and the standard lives of each asset class[51] multiplied by the capital installed during the respective regulatory period.

Advisian understands that the requirements of NER 6.5.5 (b) (1) & (2), and the PTRM and RFM handbooks, requires that the calculation of remaining asset lives reflects the distribution of remaining life of existing and new assets and the depreciated value of those assets.

Additionally the requirement that the standard lives applied in the calculation of remaining lives for each asset class "*must accord with those used in the previous distribution determination*"[52], essentially represents a forecast of standard life as at the beginning of the previous period.

The AER roll-forward model should ensure that on a regulatory control period timeframe, each DNSP RAB and the remaining life of the assets which comprise the RAB, are maintained such that network revaluations or write-downs do not occur as a result of the regulatory determination process.

Furthermore, the application of standard lives that were determined at the commencement of the previous 5 year period is inconsistent with:

(a) historical AER review and acceptance[53] of the inclusion of actual capital expenditure rather than forecast capital expenditure in the weighted calculation of remaining asset class lives; and

(b) the AER's recent Better Regulation program[54] guidance to DNSPs to align practices and incorporate real world data, as a "*deeper data set*[55]", to more accurately determine replacement capex and report network activity.

As shown in Figure 5-2, the effect of applying the legacy standard lives, which are greater than those reported in the category analysis RIN data, to the actual capital expenditure is a significant increase in the remaining asset lives calculated in the RFM. Across the 5 most significant asset classes (in regulatory depreciation terms) the longer legacy standard life assumption increases the remaining

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[51] *ibid*

[52] *Electricity distribution network service providers Roll forward model handbook June 2008 - Standard Life p5*

[53] *Final decision New South Wales distribution determination 2009–10 to 2013–14 28 April 2009 10.4.2 Updating input data p214-215*

[54] *AER Better regulation Explanatory statement Final regulatory information notices to collect information for category analysis March 2014*

[55] *AER Better regulation Explanatory statement Final regulatory information notices to collect information for category analysis March 2014 5.2 Reasons for AER position p49*

life substantially (on average of 27% over the prior 5 year period) and creates a significant extension of asset depreciation schedules.

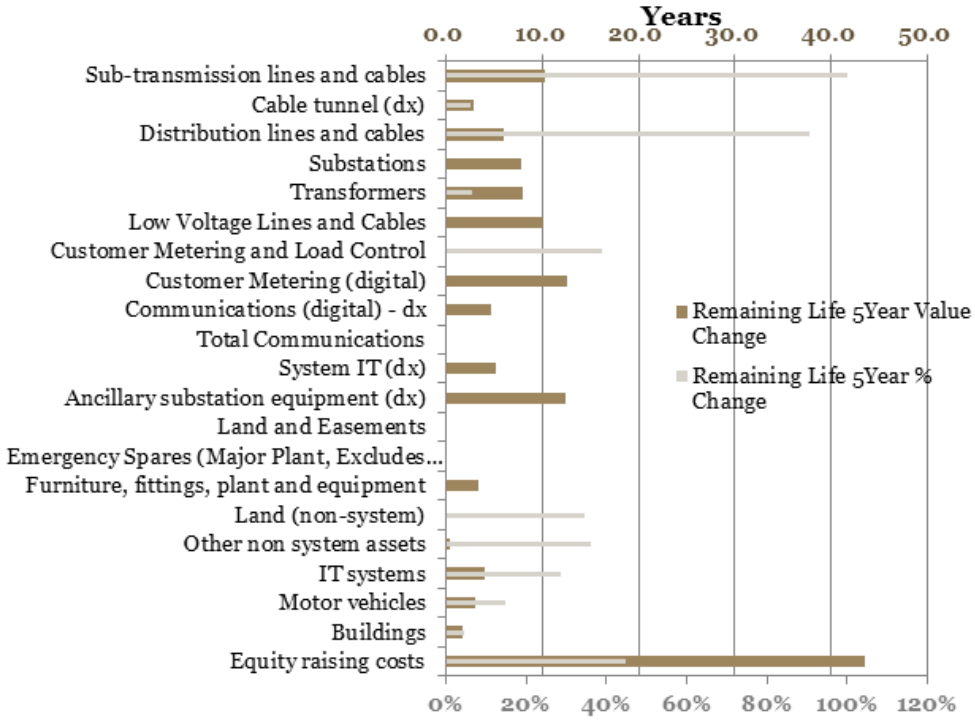

Figure 5-2 - 2014-19 Roll Forward Model Remaining Life Increase
Source: Ausgrid Proposal – Ausgrid -4.03 Ausgrid RAB – Distribution 2014

The much longer legacy standard lives have been included in the RFM calculation of the opening lives for the 2014/15 to 2018/19 regulatory control period. Consequently, due to the significant recent investment in the network, this results in a depreciation profile that does not align with the businesses actual experience, and spreads costs primarily caused by current customers recent augmentation requirements to be borne by future customers, over a time period where it is unlikely that they will still be receiving an economic benefit as retaining longer lives will ultimately result in future asset write-downs.

Therefore Advisian has identified that:

(a) the scale of investment in the network during the previous regulatory control period; and

(b) the misalignment between the Networks NSW businesses standard life assumptions

is such that the use of legacy standard life assumptions is likely to have a material and long term impact on the calculation of remaining life. As a result, it is preferable (subject to AER acceptance) to apply an adjustment to the remaining life of assets installed over the last regulatory control period to avoid entrenching an excessively long asset life assumption in the remaining life that is carried forward to subsequent regulatory control periods.

Similarly, as per the inclusion of actual capital expenditure rather than forecast capital expenditure to inform the weighted average calculation of remaining asset class lives, it is also reasonable that standard lives as recorded by the Networks NSW businesses during the previous five year regulatory

period are also used to inform the calculation of remaining lives in the RFM. Representing the actual standard (economic) lives experienced by the businesses.

5.2.4 Categorisation of Assets

As noted in Section 4.3, there are currently inconsistencies between asset classes used for statutory, tax, regulatory, management and technical reporting. Whilst this is not unexpected, it arises from the need for asset life estimates to fulfil a range of business purposes, which may not be aligned to the categories used in the PTRM and RFM to track the RAB values. The aggregate regulatory determination asset classes in comparison to those reported in the annual regulatory RINs, which provide detail at a much more granular level, do not align, consequently this does not support like for like comparison across DNSPs.

Investigation of the weighted average calculation undertaken by each of the Networks NSW businesses in calculating standard lives in the ODRC as described in 5.2.2, reveals current accounting asset classes are aligned to the same discrete asset classes in the ODRC. Documented mapping tables have also been created to align the accounting asset classes currently used by the businesses to the regulatory asset categories.

In evaluation of the discrete asset classes utilised in the ODRC to the asset classes of the current category analysis RIN, as depicted in Figure 5-3 a comparison can be drawn between to two sets of asset classes such that the adoption of the economic lives within the category analysis RIN could reasonably replace the standard asset lives adopted at the time of ODRC.

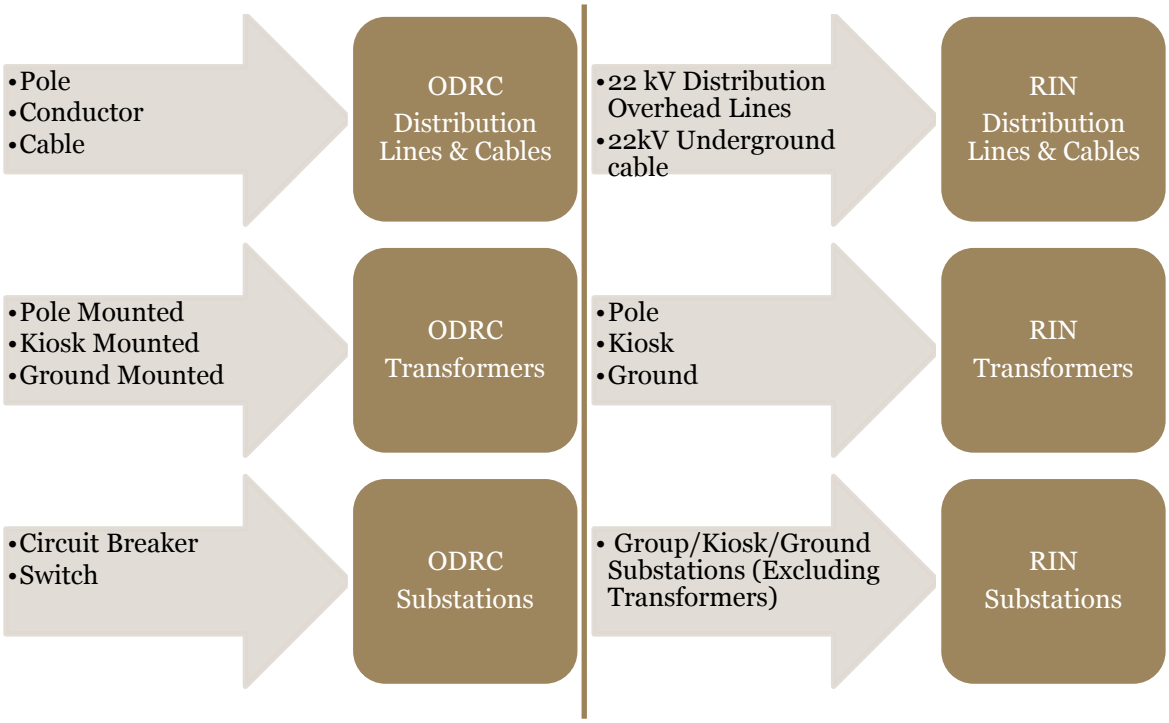

Figure 5-3 - Asset Class Categorisation Example (Illustrative Only)

A mapping of the two data sets demonstrates that the aggregation of the data as captured in the category analysis RIN will reconcile the same assets from an asset management and engineering

perspective to the accounting categories within which capital additions and disposals and currently captured.

Adoption of the economic lives as reported in the category analysis RIN in replacement of the standard lives in the ODRC under an equivalent asset class aggregation provides for alignment of current reported asset data without requirement to conduct a reconciliation of asset value attributed across different asset classes. The utilisation of RIN categories aggregated to the regulatory categories will additionally ensure visibility across NEM DNSPs of the economic lives which are forming the regulatory standard lives.

6 Alternative Approach Assessment

In response to the following questions in the Terms of Reference, this section considers the alternate determination of asset life data for inclusion in each of the Networks NSW businesses building block revenue models for the 2014/15-2018/19 regulatory revenue determination.

4) On what basis might the Networks NSW businesses adopt different asset class standard and remaining useful lives which more closely align depreciation revenue to the expenditure quantum and timing requirements of the businesses? And what business/network/customer impact might this have on the regulated revenue requirement for each business?

As detailed in each of the previous sections of this report, current AER regulatory reporting practices and Better Regulation program guidance require each of the NEM DNSPs to provide evidence to substantiate actual and forecast network activity in support of a proposed allowable regulatory control period revenue, it is therefore reasonable that the utilisation of the captured network data shall further support revenue profiles more accurately reflecting network activity. The following section details an assessment of alternate processes and applications in addressing the issues identified in Section 5.2.

6.1 Network Data Determination of Asset Lives

As detailed in Sections 4 and 5 of this report, as a result of historical industry guidelines and practices, regulatory arrangements, and incomplete network data, determination and treatment of both standard and remaining asset lives has been set on industry guidelines and engineering assumptions[56].

Significant recent investments in improving electronic data capture, storage and utilisation, and increasing regulatory emphasis on accuracy and reliability[57] of data to support forecast expenditure through the better regulation program guidance[58], in addition to the AEMC rules which require that "*the schedules must depreciate using a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets*", provides a case for utilisation of the network data to inform the calculation of standard and useful remaining lives for the purpose of calculation of regulatory depreciation.

6.2 Weighted Average Calculation of Asset Lives

As a result of the capital value weighted average calculation of remaining lives within the RFM at an aggregate asset category level, the greater dollar value of recent capital expenditure extends the estimated remaining life of existing assets, causing the depreciation schedule of the aging assets within an aggregated asset class to extend beyond their actual economic useful remaining life.

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[56] *New South Wales Treasury Valuation of Electricity Network Assets A Policy Guideline for New South Wales Distribution Network Service Providers February 2004 3.5.1 Standard Effective Lives*

[57] *Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution November 2013 Accuracy and reliability p15*

[58] *ibid*

Advisian considered two alternate approaches to the determination of remaining useful asset lives:

1) Weighted average based on the volume of installed assets.

   In this case, the aggregate installed asset volumes are input to the weighted average calculation within the RFM rather than aggregate asset costs.

2) Calculation of remaining asset lives based on the asset age profile.

   In this case, economic replacement lives from the annual category analysis RIN data are used to derive a volume weighted installed asset age (calculated from the age profiles) which is then subtracted from the respective asset class economic replacement lives to determine the remaining expected lives of installed asset classes.

Following our analysis, Advisian considers that neither of these approaches is consistent with the requirements of the NER on the following basis:

1) Weighted average based on the volume of installed assets.

   - As per the NERs rule 6.5.5. (a) (1) the depreciation for each regulatory year "*must be calculated on the value of the assets as included in the regulatory asset base"*[59]. Therefore indicating that as a weighted average calculation of remaining lives for depreciation purposes, the calculation must be based on the asset value as included in the RAB.
   - Installed asset volumes do not accurately reflect each businesses capitalisation policy or customer contributions of installed assets, therefore not accurately reconciling with the total installed RAB value. Asset classes which are not categorised discreetly under an existing asset category (e.g. pole top structures, cross-arms), or have been deducted from the RAB as having been funded by customer contributions, will not accurately represent the capital which should be returned to the DNSP.
   - Additionally, for non-discrete assets e.g. conductors and cables, total installed asset quantities are not captured on a consistent basis to enable 'like for like' comparison across businesses.

2) Calculation of remaining asset lives based on the asset age profile

   - Given historical depreciation schedules, as well as asset characteristics and maintenance practices, many asset classes are older or nearing the current average economic replacement age. This is particularly the case for distribution transformers where at a network aggregate level, significant localised replacement volumes under recent augmentation projects have seen many transformers replaced years earlier than they otherwise would have been replaced under condition assessment. This activity can be seen as shortening the expected asset lives, however, many existing distribution transformers still remain in adequate service in other areas of the network.
   - Across multiple asset classes this effect may result in approximate remaining lives being calculated at less than 5-10years for certain asset classes, effectively calling for significant value write down on assets which are actually capable of providing network value for a greater number of years.

[59] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660*

6.3 Consistency across Networks NSW businesses

Following investigation of Networks NSW regulatory data, in addition to interviews undertaken with representatives from each of the Networks NSW businesses, Advisian notes that the standard asset lives as included in each of the respective original regulatory proposal PTRM's had been calculated in the 2004 IPART Cost Building Block Revenue Model based on value weighted averages of the 2004 NSW Treasury Guidelines Standard Asset Lives[60]. This demonstrates that a common set of standard asset lives was accepted as a basis for all NSW distribution businesses based on shared network experiences relevant to the period of time and availability of supporting data.

The 2004 Optimised Depreciated Replacement Cost valuation was used as the basis for the initial valuation, with the remaining lives amended via the roll forward model in subsequent determinations.

In accordance with the 5 year historical data requirements of the AER explanatory statement – final category analysis RINs[61], the data presented by most NEM DNSPs reflects that standard (economic) lives have since been revised to reflect actual network data. Following a comparative assessment against the other NEM DNSPs publicly available Category Analysis RIN data, both Endeavour Energy[62] and Essential Energy[63] demonstrate consistently higher economic lives across the majority of asset classes when compared to other NEM DNSP's.

Ausgrid has identified in the category analysis basis of preparation[64] a number of actual network system data sources for the determination of economic lives across most of the material asset classes. In each of their respective basis for preparation documents both Endeavour Energy[65] and Essential Energy[66] have not provided detail on the calculation of asset class economic life, and on the basis of interviews conducted with representatives from each of the business there has been an increasing focus on utilisation of real network data, however for many of the large volume asset classes a further number of years may be required prior to managing a data set of substantial size to support calculation of the required information.

Therefore, Advisian considers that the data as determined by Ausgrid in its most recent category analysis RIN in accordance with broader industry practice and the guidance provided in the AER's explanatory statement [67] provides a reasonable data set for the recalculation of a set of common standard asset lives. In particular, this will align the Networks NSW businesses standard lives more

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[60] *New South Wales Treasury Valuation of Electricity Network Assets A Policy Guideline for New South Wales Distribution Network Service Providers February 2004 3.5.1 Standard Effective Lives*

[61] *AER Better regulation Explanatory statement Final regulatory information notices to collect information for category analysis March 2014*

[62] *Endeavour 2012-13 - RIN response - Appendix 1b - RIN Non-financial templates - 13 December 2013 - PUBLIC.xls*

[63] *Essential 2012-13 - RIN Response - Attachment 9 non-financial information - 13 December 2013 - PUBLIC.xlsx*

[64] *Ausgrid Basis of Preparation Response to Category Analysis Regulatory Information Notice Submission date 31 October 2014 Template 5.2 – Asset age profiles p126-132*

[65] *Basis of Preparation Endeavour Energy Response to AER Determination RIN Submission date: 30 May 2014*

[66] *Essential Energy BASIS OF PREPARATION RESPONSE TO RESET RIN Version updated as at 29 May 2014*

[67] *AER Better regulation Explanatory statement Final regulatory information notices to collect information for category analysis March 2014*

closely with the approaches adopted by other DNSPs peer and in turn this will tend to reduce reporting anomalies over time.

6.4 Treatment of Asset Categories

Advisian has investigated the annual Category Analysis RIN data and basis for preparation documentation submitted to and approved by the AER, in addition to conducting a series of interviews to determine the basis on which each Networks NSW business is collecting, aggregating and inputting data into the annual regulatory reports and distribution determination.

As determined within the 2004 ODRC asset category weighted average calculation of standard lives, on the basis of application of the mean economic lives as reported in the category analysis RIN in replacement of the ODRC standard lives, with an equivalent asset class aggregation as described in Section 5.2.4, Advisian considers a common mapping across each of the Networks NSW businesses of the economic lives within the annual category analysis RIN to the regulatory categories to form the basis for calculation of 'Standard Lives' applicable to each of the Networks NSW businesses for input to the PTRM, additionally to be used for the calculation of the Remaining Asset Lives.

In accordance with the value weighted average calculation of aggregate standard lives in the ODRC, and in alignment with application of real network economic replacement data forming the basis for determining standard asset lives, Advisian considers that the aggregation of the discrete asset classes in the category analysis RIN, for the purpose of calculating the standard lives for inclusion in the regulatory models, is calculated via a Capex value weighted average as per the following.

Each of the businesses is required to report on historical and forecast replacement expenditure and installation quantities, from which a replacement unit cost can be calculated. This unit cost is then multiplied by the most recent 50 years installed quantities in the Category Analysis Age Profile Sheet, representing a total installed weighting for each of the Repex asset classes, over the 50 year period for which the network data is most accurately available. This methodology ensures economic replacement activity and capital expenditure align, and further enables a weighting of installed network assets which appropriately proportions the value of each asset class within its respective aggregate regulatory asset category.

7 Conclusion

In addressing each of the key issues as detailed in Section 6, the following section concludes Advisian's recommendations for amendment of standard and remaining asset lives for the following four regulatory asset classes as used in the calculation of regulatory depreciation within the PTRM. This section also concludes Advisian evaluation of the resultant impact the revised asset lives will have on each of the Networks NSW regulatory revenue requirements.

1) Sub-transmission lines and cables;

2) Distribution lines and cables;

3) Transformers; and

4) Low voltage lines and cables.

7.1 Calculation of Asset Lives

7.1.1 Standard Asset Lives

Following evaluation of the key issues as discussed in Section 5.2, and comparative assessment against the current regulatory reported economic asset lives of NEM DNSP peers as detailed in Figure 5.1, Advisian considers that a robust and prudent case exists for the calculation of standard asset lives of the four asset classes listed in Section 7 from a weighted average of the category analysis RIN mean economic asset lives, on the basis that economic lives as standard lives, represent the nature of the assets as currently experienced within each of the network businesses.

Advisian recommends that the standard and remaining asset lives of the four asset classes listed above are to be amended, as the asset lives included in each of the Networks NSW 2014/15-2018/19 original proposals are materially longer than is currently being experienced by the networks as demonstrated in the category analysis RIN data of the associated asset classes.

Advisian consider that, as per Sections 5.2 & 6.1, and in accordance with significant recent investment in network data capture and analytics, Ausgrid has sufficiently advanced in the capture, accuracy and reporting of its network data for the respective asset classes within each of the four regulatory categories listed above, such that the mean economic lives within Ausgrid's Category Analysis RIN reasonably reflect the lives expected by each of the Networks NSW businesses, therefore applicable to amendment of each of the Networks NSW standard asset lives.

Amendment of each of the Networks NSW standard asset lives in accordance with Ausgrid's reported data will additionally enable each of the Networks NSW DNSPs to align closer to the standard lives as adopted by other NEM DNSPs.

Application of the category analysis RIN mean economic lives in accordance with the asset class aggregation as described in Section 7.1.3.will result in the standard asset lives as per Table 7-1.

Table 7-1 - Recommended Standard Lives for inclusion in Amended Proposal for the 2014/15-2018/19 regulatory control period

Standard Asset Lives (Years)	Ausgrid	Endeavour Energy	Essential Energy
Sub-transmission lines and cables (Original Proposal)	46.3	47.4	54.9
Sub-transmission lines and cables (Amended Proposal)	41.2	45.6	40.5
Cable tunnel (dx)	70	n/a	n/a
Distribution lines and cables (Original Proposal)	58	50.6	53.8
Distribution lines and cables (Amended Proposal)	41.6	40.1	40.6
Substations	46.8	40	40.2
Transformers (Original Proposal)	45.9	44.3	45.8
Transformers (Amended Proposal)	37.4	40.6	36.35
Low voltage lines and cables (Original Proposal)	52.1	52.4	51.5
Low voltage lines and cables (Amended Proposal)	40.76	41.1	39.4
Customer metering and load control	25	25	25.9
Communications (digital) - dx	10	n/a	n/a
Total communications	10.2	8.4	7
Systems IT (dx)	7	n/a	n/a
Ancillary substation equipment (dx)	15	n/a	n/a
Land and easements	n/a	n/a	n/a
Furniture, fittings, plant and equipment	17.4	13	13
Land (non-system)	n/a	n/a	n/a
Other non-system assets	29.4	n/a	15
IT systems	5	5	5
Motor vehicles	10.2	8	8
Buildings	35.9	50	50
Equity raising costs	47.4	42.4	44.7
Emergency spares (major plant, excludes inventory)	n/a	23.6	17.9

Although the regulatory asset class “Substations” represents a significant percentage of each of the Networks NSW regulatory asset bases, the corresponding assets classes within the category analysis

RIN assets, as a source of mean economic life data, does not provide a representative weighting of the sub asset classes which would typically form the "Substations" asset class (e.g. switchyard assets, earthing and earth grid assets, buildings and control room equipment). Therefore as the mean economic life data required to revise the determination of standard asset class lives for the "Substations" asset class is not available for the asset's applicable to the class, Advisian does not consider that amendment can be supported at this point in time.

Advisian also noted that the economic life of "concrete poles" across all voltage categories in the Category Analysis RIN data, at 24.61 years, was not consistent with other experiences and unrepresentative of a reasonable expectation of asset life on a comparative analysis of the "concrete poles" mean economic lives of each of the NEM DNSP's. In consultation with Ausgrid network representatives, we found that the sample size of concrete poles in the available network data against each of the voltage categories in the Category Analysis RIN was small due to categorisation issues and therefore insufficient to determine an accurate estimate of useful asset life. As a result we extended the sample size to include "street-lighting" concrete poles, which for the purpose of determining a standard asset life for depreciation purposes reasonably represents the same engineering characteristics of a concrete power pole, a resultant mean economic life of 40.81 years is calculated.

For the inclusion of concrete poles in the weighted average calculation of each of the:

- Low voltage lines and cables;
- Distribution lines and cables; and
- Sub-transmission lines and cables

regulatory asset classes, a mean economic life of 40.81 has been utilised. This economic life, which contributes to the weighted average calculation of each of the regulatory asset classes, more accurately represents a reasonable engineering expectation of the standard life of concrete poles, and aligns with current comparable industry data.

7.1.2 Remaining Asset Lives

Following evaluation of the calculation of remaining asset lives as discussed in Section 5.2.3 for inclusion in the regulatory PTRM, Advisian advises that a robust and prudent case exists for the calculation of remaining asset lives of the four asset classes listed in Section 7, via the application of the standard lives determined from the methodology described in Section 7.1.1, on the basis that the actual installed capital weighted average calculation of remaining asset lives should incorporate the actual standard lives experienced throughout the respective period, in place of the implied forecast standard lives, as per inclusion of the lives from the previous approved PTRM model.

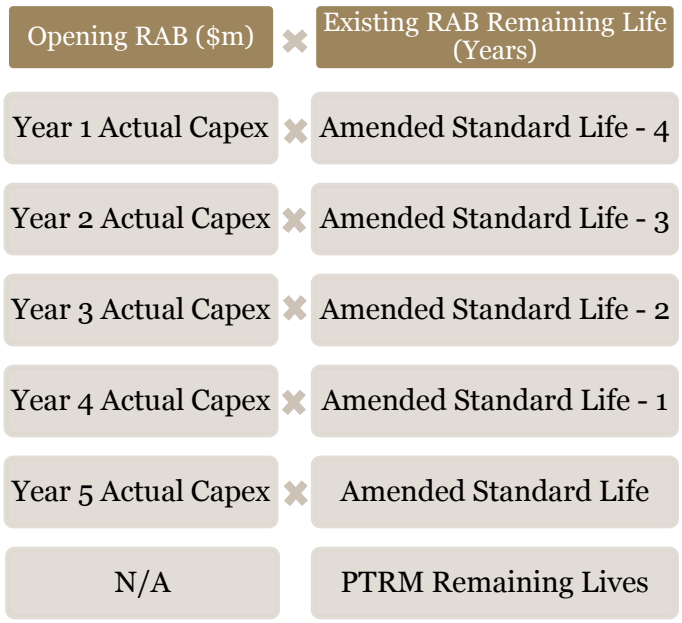

Figure 7-1 - PTRM Calculation of Remaining Asset Lives (Illustrative Only)

Source: Advisian

As detailed in Section 4.3.2 and in accordance with the PTRM Handbook 2008[68] the remaining life for inclusion in the PTRM input sheet is "based on the economic life of the assets"[69], and shall be "generally assumed to be the weighted average remaining life of all individual assets in the class."[70]. Therefore in accordance with the regulatory guidance on determination of remaining asset lives, and in addressing the issues associated with application of forecast standard lives longer than are reasonably expected to provide economic value to the network as detailed in Section 5.2.3, Advisian recommends that calculation of remaining asset lives of the four asset classes as listed in Section 7for inclusion in the PTRM, is to be conducted as illustrated in Figure 7-1as an additional input calculation to the PTRM, utilising the existing asset base and remaining life, and actual capital expenditure, multiplied by the amended standard asset lives as recommended in Table 7.1, resulting in the amended remaining asset lives as per Table 7.2.

Table 7-2 - Recommended Remaining Lives for inclusion in Amended Proposal for the 2014/15-2018/19 regulatory control period

Remaining Asset Lives (Years)	Ausgrid	Endeavour Energy	Essential Energy
Sub-transmission lines and cables (Original Proposal)	32.9	31.7	36.4
Sub-transmission lines and cables (Amended Proposal)	30.6	30.7	29.4
Cable tunnel (dx)	67.4	n/a	n/a

[68] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 p7*

[69] *ibid*

[70] *Electricity distribution network service providers Post-tax revenue model handbook June 2008 p7 Footnote 4*

Remaining Asset Lives (Years)	Ausgrid	Endeavour Energy	Essential Energy
Distribution lines and cables (Original Proposal)	46.8	38.3	42.3
Distribution lines and cables (Amended Proposal)	40.4	33.2	35.6
Substations	34.8	28.2	25.2
Transformers (Original Proposal)	30.5	24.6	26.7
Transformers (Amended Proposal)	27.2	23.5	23.2
Low voltage lines and cables (Original Proposal)	40	27	28.9
Low voltage lines and cables (Amended Proposal)	34.2	25.2	24.5
Customer metering and load control	14.5	23.1	19.9
Communications (digital) - dx	5.6	n/a	n/a
Total communications	3.1	6.9	5.6
Systems IT (dx)	4.9	n/a	n/a
Ancillary substation equipment (dx)	12.4	n/a	n/a
Land and easements	n/a	n/a	n/a
Furniture, fittings, plant and equipment	12.5	8.1	8.4
Land (non-system)	n/a	n/a	n/a
Other non-system assets	7.7	n/a	13.4
IT systems	3.3	3.5	3.6
Motor vehicles	6.3	5.7	5.1
Buildings	30	44.8	47.6
Equity raising costs	43.4	37	40.7
Emergency spares (major plant, excludes inventory)	n/a	12.9	6.2

As the RFM is essentially a regulatory model for the determination of the opening regulatory asset base for the upcoming regulatory control period, in order to minimise regulatory asset value write-down risk, and in accordance with NER 6.5.5 (a)(2)(i)[71] to reconcile the actual regulatory depreciation accrued during the prior regulatory period and the depreciation deducted from the RAB, Advisian recommends that the RFM is not amended and the standard asset lives applied in the RFM remain unchanged from the lives as determined in the PTRM of the prior period. This will ensure that all implementation of the recommendations to the asset lives as per this report will maintain the roll forward valuation of the RAB.

Calculation of the remaining asset lives for determination of the 2014/15-2018/19 regulatory control period depreciation building block within the PTRM, will therefore address only the future depreciation schedule of the closing asset base from the prior regulatory control period.

[71] *AEMC, National Electricity Rules, Version 65, 1 October 2014, 6.5.5 Depreciation (a)(2)(i) p660*

7.1.3 Regulatory Asset Class Aggregation

As discussed in Section 5.2.2 and 6.4, aggregation of the Category Analysis RIN mean economic lives to the regulatory asset classes via a capital expenditure weighted average calculation, provides for an equitable weighting of each asset value within the respective regulatory asset categories, therefore representing the respective end of useful life at which assets are currently being replaced or retired, and the alignment of the return of capital investment across each of the regulatory asset classes.

In addition to the detail in Sections 6 and 7, on the utilisation of category analysis RIN data to inform the calculation of standard and remaining asset lives, and in acknowledging that there are fundamental differences in the asset class lives used for regulatory and taxation purposes, the aggregation of RIN asset lives to the regulatory asset categories, and the categorisation of statutory accounting lives to the regulatory asset categories should align such that in the weighting of capex installations and disposals in calculating remaining asset lives, additional installed or disposed asset value is correctly accounted against the corresponding asset life depreciation schedule.

Advisian recommends that although there may be benefit in regulatory principle, there is no fundamental requirement for the further alignment of the asset class lives across the differing business requirements (e.g. asset management, statutory and taxation lives). However it is strongly recommended that for the purposes of accurate regulatory and accounting depreciation of capital additions and disposals, a consistent mapping of asset categorisations is undertaken and implemented for determination of standard lives across each of the three Networks NSW businesses.

7.2 Regulatory Impact

The recommended application of the above described adjustment to standard and remaining lives within each of the Networks NSW DNSP's regulatory submission PTRM's and the impact the recommendations would have on the amended regulatory proposal building blocks, including regulatory depreciation allowance, are presented in Tables 7-3, 7-4, 7-5 and 7-6.

Advisian notes that for all regulatory building block calculations purposes, the calculations have been conducted on the publicly available data in each of the Networks NSW Original Proposals.

Table 7-3 - PTRM Regulatory Asset Base

Networks NSW Business	Regulatory Building Block	Regulatory Asset Base ($m nominal)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Ausgrid (distribution)	Original Proposal	12,279.8	13,035.9	13,797.1	14,466.4	15,139.6
	Amended Proposal	12,279.8	13,011.7	13,744.9	14,382.8	15,020.4
	% Change	0%	-0.19%	-0.38%	-0.58%	-0.79%
Endeavour Energy	Original Proposal	5592.9	5982.4	6293.3	6554.0	6831.4
	Amended Proposal	5592.9	5974.1	6275.6	6525.4	6790.5
	% Change	0%	-0.14%	-0.28%	-0.44%	-0.6%
Essential Energy	Original Proposal	6770.3	7243.9	7680.9	8124.1	8562.0
	Amended Proposal	6770.3	7219.1	7627.4	8038.1	8439.4
	% Change	0%	-0.34%	-0.7%	-1.06%	-1.43%

As visible in Table 7-3 the adoption of shorter asset class standard and remaining lives for the asset classes as listed in Section 7 and associated increase of regulatory depreciation allowance correspondingly accelerates the reduction of the RAB. At a 25 year regulatory forecast the increased regulatory depreciation results in a reduction of approximately 30% nominal RAB value against the base case of the current regulatory forecast.

Table 7-4 - PTRM Building Block Regulatory Depreciation Revenue Requirement

Networks NSW Business	Regulatory Building Block	Regulatory Depreciation ($m nominal)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Ausgrid	Original Proposal	123.3	144.1	165.1	150.4	164.0
	Amended Proposal	147.6	171.9	196.7	185.9	203.6
	% Change	19.69%	19.30%	19.11%	23.66%	24.14%
Endeavour Energy	Original Proposal	62.6	72.3	83.1	88.0	93.3
	Amended Proposal	70.8	81.8	93.9	100.3	107.1
	% Change	13.16%	13.18%	13.08%	13.98%	14.90%
Essential Energy	Original Proposal	98.4	116.3	131.7	135.9	129.8
	Amended Proposal	123.3	144.9	164.2	172.6	171.0
	% Change	25.32%	24.52%	24.67%	26.98%	31.79%

As visible in Table 7-4 the application of amended standard asset lives to the calculation of asset remaining lives for inclusion in the PTRM, results in a step change increase to the regulatory depreciation allowance in accordance with the increased depreciation component on the existing opening asset base. The application of shorter standard asset class lives of the four asset categories as listed in Section 7 results in an incremental increase in the regulatory depreciation component proportional to the quantity of new capex in each of the respective regulatory asset categories.

Table 7-5 - PTRM Building Block Return on Equity Revenue Requirement

Networks NSW Business	Regulatory Building Block	Return on Equity ($m nominal)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Ausgrid	Original Proposal	496.6	527.2	557.9	585.0	612.3
	Amended Proposal	496.6	526.2	555.9	581.6	607.4
	% Change	0%	-0.19%	-.38%	-0.58%	-0.79%
Endeavour Energy	Original Proposal	226.2	241.9	254.5	265.0	276.3
	Amended Proposal	226.2	241.6	253.8	263.9	274.6
	% Change	0%	-0.14%	-0.28%	-0.44%	-0.6%
Essential Energy	Original Proposal	273.79	292.95	310.61	328.54	346.25
	Amended Proposal	273.79	291.94	308.45	325.06	341.29
	% Change	0%	-0.34%	-0.7%	-1.06%	-1.43%

As a result of the proportional relationship to the quantum of the RAB, the accelerated regulatory depreciation as a result of shorter asset class lives will result in lower total returns on equity.

Table 7-6 - PTRM Annual Revenue Requirement

Networks NSW Business	Regulatory Building Block	Annual Revenue Requirement ($m nominal)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Ausgrid	Original Proposal	1957.1	2079.1	2187.1	2293.5	2246.4
	Amended Proposal	1988.4	2112.6	2222.5	2331.0	2285.4
	% Change	1.60%	1.61%	1.62%	1.63%	1.74%
Endeavour Energy	Original Proposal	988.2	982.8	1053.1	1078.8	1090.3
	Amended Proposal	998.8	994.2	1065.3	1091.8	1104.1
	% Change	1.07%	1.17%	1.16%	1.21%	1.27%
Essential Energy	Original Proposal	1225.9	1260.0	1339.6	1490.5	1508.0
	Amended Proposal	1258.0	1294.3	1376.1	1529.1	1548.9
	% Change	2.62%	2.72%	2.73%	2.59%	2.71%

Commensurate to changes in each of the PTRM revenue building block components as detailed in Tables 7-3, 7-4 and 7-5, the annual revenue requirement for each of the Networks NSW businesses as visible in Table 7-6 will increase relative to the original regulatory proposal and the AER's draft decision.

Application of the recommendations of this report for the amendment of standard asset class lives and the calculation of remaining asset lives will result in a short term increase in annual regulatory revenue for each of the Networks NSW DNSPs as a result of the increased return of regulatory depreciation revenue building block. Over time however, under the assumption of no capex beyond the 5 year period as per the regulatory revenue model, this will result in reduced regulatory revenue as a result of the faster reduction of the regulated asset base and associated decrease of the return on asset revenue. This inherently benefits each of the Networks NSW businesses in maintaining capital recovery, and future customers in reducing risk of asset write-downs on assets replaced or disposed significantly earlier than the respective depreciation schedules had accounted for.

In supporting the assessment by the AER of the principles and supporting evidence for the Networks NSW businesses proposed increase in regulatory depreciation building block revenue, in accordance with the AEMC rules and regulatory guidance as detailed throughout this report, the increase in annual revenue allowance for the 2014/15-2018/19 is significantly influenced by the depreciation expense on the substantial recent investment in network growth and replacement activity. The long term benefit to current and future Networks NSW customers of increased Return of Asset building block revenue on historical and recent network investment will be borne through both a more rapidly reduced RAB and corresponding Return on Asset revenue, and reduction of residual value asset write-down risk.

7.3 Conclusion on Ausgrid Transmission Asset Lives

The current regulatory treatment of depreciation schedule calculation for transmission network assets, in accordance with AEMC rules 6A.6.3[72], is directly comparable to the regulatory

[72] *AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 774-775*

requirements for NEM DNSPs. Therefore in accordance with the Terms of Reference for assessment of the standard and remaining lives of Ausgrid's transmission network assets in addition to its distribution networks assets, Advisian has undertaken a review of the standard and remaining lives of Ausgrid's transmission assets within the regulatory RFM and PTRM, and category analysis RIN, in accordance with the same methodology applied throughout this report for each of the Networks NSW distribution businesses.

Following evaluation of the standard regulatory asset lives in Ausgrid's 2014/15-2018/19 regulatory control period proposed RFM and PTRM's, against the comparable mean economic lives of the category analysis RIN asset classes, Advisian have identified that the current lives employed in the calculation of the regulatory depreciation building block allowance do not materially differ from the lives Ausgrid have determined in calculating economic lives on actual network data.

Additionally Ausgrid's current transmission regulatory asset class lives are in close alignment to the comparable category analysis RIN asset classes as reported by each of the NEM DNSP's.

Following evaluation of the application of real network data to the inform the calculation of amended standard asset class lives, Advisian does not recommend amendment to Ausgrid's transmission network regulatory standard asset class lives on the basis that the current standard asset lives applied in each of the RFM and PTRM regulatory models, reflect an accurate estimation of the reasonably expected useful economic lives of the regulatory asset classes.

The calculation of remaining asset lives for transmission network assets applies the same installed capital weighted average calculation as per the distribution roll-forward model calculation. Advisian does not recommend amendment of the remaining lives as per the methodology recommended for Networks NSW distribution businesses, on the basis that the standard lives applied in the weighted average calculation for the assets installed during the prior 5 year regulatory control period, reflect an accurate estimation of the reasonably expected useful economic lives of the installed assets.

Advisian has made all the enquiries that Advisian believes are desirable and appropriate and that no matters of significance that Advisian regards as relevant have to Advisian's knowledge been withheld from the Court

Appendix A

Terms of Reference

Advisian (formerly Evans & Peck) was engaged by Ausgrid on behalf of Networks NSW to provide an independent expert opinion in response to the following terms of reference:

1) What are the fundamental principles and approach adopted by the AER in assessing and endorsing asset class standard and remaining lives for inclusion in the distribution determination RFM and PTRM? Do the practices adopted by the Networks NSW businesses align to the AEMC rules and AER principles? Do the practices align with the fundamental driver for asset depreciation?

2) What are the existing commonalities/differences across each Networks NSW business and the NEM DNSPs for the calculation of asset class standard and remaining lives? Is there scope for common practices between Networks NSW businesses in the adoption of asset class lives and what impact might a change in practice have on each businesses regulatory submission?

3) What are the existing commonalities/differences across each Networks NSW business in alignment between the engineering, regulatory and accounting lives of asset classes? Is there scope for commonality of asset class lives across engineering, regulatory and accounting lives and what impact might a change in practice have on each businesses practices and regulatory submission?

4) On what basis might the Networks NSW businesses adopt different asset class standard and remaining lives which more closely align depreciation revenue to the expenditure quantum and timing requirements of the businesses? And what business/network/customer impact might this have on the regulated revenue requirement for each business?

Appendix B

Reference Documents

The following documents have been referenced and relied upon in the preparation of this report. A copy of these documents has been provided in electronic format to Networks NSW to accompany this report.

No.	Reference Document
1.	AEMC, National Electricity Rules, Version 65, 1 October 2014, pp. 659-660
2.	AER, Better Regulation Expenditure Forecast Assessment Guideline for Electricity Distribution November 2013 Accuracy and reliability p15
3.	AER, Better regulation Explanatory statement Final regulatory information notices to collect information for category analysis March 2014
4.	AER, Draft Decision Ausgrid distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-5 p 14
5.	AER, Draft decision Endeavour Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-3 p13
6.	AER, Draft decision Essential Energy distribution determination 2015–16 to 2018–19 Attachment 5: Regulatory depreciation November 2014 Table 5-3 p13-14
7.	AER, Final decision New South Wales distribution determination 2009–10 to 2013–14 28 April 2009 10.4.2 Updating input data p214-215
8.	Ausgrid Basis of Preparation Response to Category Analysis Regulatory Information Notice Submission date 31 October 2014 Template 5.2 – Asset age profiles p126-132
9.	Electricity distribution network service providers Post-tax revenue model handbook June 2008
10.	Electricity distribution network service providers Roll forward model handbook June 2008
11.	Endeavour 2012-13 - RIN response - Appendix 1b - RIN Non-financial templates - 13 December 2013 - PUBLIC.xls
12.	Endeavour Energy Basis of Preparation Response to AER Determination RIN Submission date: 30 May 2014
13.	Essential 2012-13 - RIN Response - Attachment 9 non-financial information - 13 December 2013 - PUBLIC.xlsx

14.	Essential Energy BASIS OF PREPARATION RESPONSE TO RESET RIN Version updated as at 29 May 2014
15.	New South Wales Treasury Valuation of Electricity Network Assets A Policy Guideline for New South Wales Distribution Network Service Providers February 2004 3.5.1 Standard Effective Lives

Appendix C

Curriculum Vitae – Evan Mudge

Advisian

WorleyParsons Group

Evan Mudge

Associate

Overview

Evan has provided strategic consulting services to infrastructure clients across the Australia-Pacific region relating to major project investments, economic regulation, strategic asset management, risk management and project/capital governance frameworks.

With over 10 years of experience spanning over 25 Australian regulatory determinations, Evan has personally reviewed over $10b in capital expenditure on energy infrastructure and identified scope and cost efficiencies of over $2b. He has also assisted network businesses to prepare and optimise business cases for major ($100m+) and strategic infrastructure projects. His broad experience across project, contract and commercial management, engineering design, environmental approvals, pricing and economic regulation enables him to bring a unique combination of strategic thinking, commercial focus and pragmatism to his engagements.

Areas of Expertise

- Regulatory Advice
- Asset Strategy
- Cost Advisory
- Capital Program Review
- Risk Analysis
- Project Analysis & Evaluation
- Business Case Preparation
- Planning & Scheduling

Relevant Experience

Associate | Advisian | 2012 - Present

- Manage the preparation of TransGrid's response to the Economic Benchmarking and Revenue Reset Regulatory Information Notices that are required to support TransGrid's Revenue Proposal for the 2014/15 to 2018/19 period.
- Expert regulatory advice to regulated networks in NSW, Tasmania, Victoria, Queensland and ACT relating to cost estimation methodologies, replacement capex modelling, advanced metering infrastructure and regulatory submissions.
- Assessment of relative expenditure performance, asset intensity and the infrastructure burden placed on customers for each network serving the national electricity market.
- Explanation of the relative reliability performance trends of Australian electricity networks. Included comparison of different policy drivers and jurisdictional influences on reliability.
- Development of solar thermal commercialisation strategy and risk management plan for an Australian renewable energy technology developer.
- Development of contract management tools and performance incentive scheme for the primary coal haulage contract for a major coal-fired power station in NSW.

Consultant | Asset & Regulatory Strategy | Parsons Brinckerhoff | 2008 – 2012

- Evaluate capital investment in energy network assets including reviewing over $10b in forward expenditure portfolios for the Australian Energy Regulator, Economic Regulation Authority of WA and network businesses (including Jemena, ActewAGL, United Energy, CitiPower/Powercor and ETSA Utilities) across all states of Australia, New Zealand and the Pacific. Recommended investment program adjustments totalling over $2b.
- Expert regulatory advice to energy networks including an independent assessment of the AER's Repex model as part of the Victorian Electricity Distribution Price Review.
- Provide business case advice and analysis to support strategic initiatives such as Ausgrid's successful bid for the $100m Federal Smart Grid Smart City program funding, investigating the

Evan Mudge

Associate

optimal ownership model for electricity network communications assets in the NBN and providing an independent review of project costs for the largest transmission line project in WA ($300m).

- Due diligence evaluation of generation assets and associated contractual arrangements to support potential acquisition, including review of fuel supply arrangements for the NSW governments Gentrader divestment for a top tier energy generator-retailer.
- Advise Papua New Guinean Independent Public Business Corporation on a remedial strategy to address generation and transmission reliability issues affecting the economic development of the Lae, Madang and Highlands regions of the country.
- Energy (electricity, gas, carbon, network) procurement advice for major infrastructure operations such as Sydney Airport, Fremantle Ports, Sydney Metro Authority and major generation facilities.

Business Analyst and Commercial Manager | Gridx Power | 2007 – 2008

- Provide technical and commercial analysis of innovative energy generation projects and communicating business/project risks and opportunities to executive management, client representatives, project finance partners and potential equity investors, including:
- Negotiate fuel pricing arrangements, power purchase agreements, capital contributions, tariffs, equipment procurement and financing arrangements for innovative cogeneration/trigeneration (heat/power/cooling) projects.
- Quantify the financial, carbon and energy efficiency benefits and development of business case to facilitate investment decision making for the business/finance partners and clients.
- Optimise plant operation and equipment sizing (electricity/thermal and export sales) for optimal commercial and risk management outcomes.
- Develop pricing and contract terms in conjunction with the client's consultants to facilitate acceptable trade-offs between technical efficiency and commercial viability.
- Monitor wholesale and retail gas and electricity markets to ensure tariffs, operating schedules and business model remained viable in increasingly volatile markets.
- Provide commercial input to regulatory matters, including changes to the National Electricity Rules.

Research Engineer | Sustainable Energy | Bassett Applied Research (AECOM) | 2006 – 2007

Conducted industry leading analysis of energy and carbon efficient building design initiatives using advanced numerical modelling techniques. Also undertook complex acoustical and vibration analysis to facilitate environmental planning and assessment requirements for major infrastructure projects.

Qualifications & Affiliations

- Bachelor of Engineering (Hons), University of Technology Sydney
- Master of Applied Finance, Macquarie University

Work History

2012 - Present	Associate, Advisian (formerly Evans & Peck)
2008 - 2012	Consultant – Asset & Regulatory Strategy, Parsons Brinckerhoff
2007 - 2008	Business Analyst and Commercial Manager, Gridx Power
2006 – 2007	Research Engineer – Sustainable Energy, Bassett Applied Research (AECOM)
2004 - 2005	Mechanical Engineer, GHD Mining & Industry