



14 February 2017

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Our ref: 9110238
Your ref:

RE: ElectraNet telecommunications asset life review

Dear Rainer

GHD has been engaged by ElectraNet to provide advice regarding the appropriate standard life for their telecommunications assets to support efficient asset management decisions and the development of depreciation schedules that reflect the economic life of these assets for the purposes of ElectraNet's forthcoming revenue determination which will take effect on 1 July 2018.

The scope of telecommunication assets to be assessed is limited to electronic telecommunications equipment, and excludes civil infrastructure, such as support structures and buildings, and cables.

The key issues to be considered in assessing an appropriate asset life include:

- telecommunication asset lives adopted by other Australian electricity utilities
- Australian Taxation Office current ruling on effective life of depreciating assets
- performance of existing ElectraNet electronic telecommunications assets
- obsolescence of equipment and implications for the availability of maintenance support from vendors
- publicly available data from other industry sectors on telecommunications replacement cycles

1 Assets included in review

A telecommunications bearer network is typically a fully integrated platform consisting of microwave radio and optical fibre bearers supporting the delivery of SCADA, protection, data and voice telephony services. Locations that are difficult to access may utilise low bandwidth power line carrier systems.

The telecommunications asset groups and asset type categorised under each group for electronics equipment only are summarised as follows:

- Bearer Terminating Equipment
 - digital microwave radio - radio terminals, antenna and feeder equipment
 - power line carrier

- digital line terminating equipment (multiplexing equipment, optical fibre line drivers, optical power amplifiers),
- Network Equipment
 - Plesiochronous Digital Hierarchy (PDH) equipment
 - Internet Protocol (IP) network equipment, including firewalls, IP/ Multiprotocol Label Switching (MPLS) routers and switches
 - Voice Over Internet Protocol (VoIP) devices
- Service Equipment
 - interface equipment
- Network Synchronisation Equipment
 - reference clock sources
 - clock branching
- Network Management Equipment
 - alarm management

This review excludes consideration of site infrastructure asset groups which include but are not limited to telecommunications buildings, site power supplies, solar systems, diesel generators, 48V DC power supply systems and converters, underground conduits and pits, underground and overhead optical fibre cables.

2 Current position

ElectraNet currently applies an asset life of 15 years to all electronic telecommunications equipment.

3 Recent AER decisions

Clause 6A.6.3 (b)(1) of the National Electricity Rules¹ discusses the calculation of depreciation of transmission network assets, and states that the depreciation schedules “... *must depreciate using a profile that reflects that nature of the assets or category of assets over the economic life of that asset or category of assets.*”

An electricity transmission utility may adopt the manufacturer's design life or the expected economic life of the assets for depreciation purposes, where the design life or the expected economic life of the asset may reflect the minimum life that most of the assets are expected to remain in service.

¹ <http://www.aemc.gov.au/Energy-Rules/National-electricity-rules/Current-Rules> Version 88, January 2017

In its draft decision² for Powerlink, the Australian Energy Regulator (AER) stated “... *the same asset types should have the same standard asset life applied across TNSPs, taking into account any environmental or operational factors that may impact on the expected useful life of the asset*”³

The following table summarises the current regulatory depreciation schedules for electronic communication assets for selected electricity transmission utilities, based on information from recent regulatory decisions or current asset management practices.

Utility	Assets	Standard Asset Life (years)	Comments
TasNetworks	Site infrastructure type assets - communications buildings, access tracks, support structures Optical Fibre Underground Cable (OPUC) Copper cables AC connection Earthing systems	45	Accepted in AER draft decision Nov 2014
	Telecommunications type assets - microwave radio, optical terminal equipment	10	
	Packet and software based systems, switches/routers, management software	5	
AusNet Services	Support structures - towers	70	Adopted in current Asset Management Strategy
	Buildings and civil infrastructure	45	
	Cables - OPGW, underground fibre	40	
	Power Line Carrier equipment	15	
	Electronic equipment - SDH, PDH, radio rugged switches	10	
Western Power	Operational electronic equipment	11	Economic life used for the regulatory asset base and depreciation allowance
	IT type assets	6	
TransGrid	All communications class assets	10	AER accepted new asset category “Communications (short life) 2014-18” with asset life of 10 years to reflect expected economic life for these asset types in draft decision Nov 2014

² AER, *Draft Decision Powerlink transmission determination 2017-18 to 2021-22: Attachment 5 – Regulatory depreciation*, September 2016

³ *Ibid.*, section 5.4.1, p. 12

Utility	Assets	Standard Asset Life (years)	Comments
Powerlink	All communications class assets	15	Accepted in AER draft decision Sep 2016; and AER accepted 10.7 years for "Communications" forecast asset replacement life for repex-based forecast capex

Powerlink adopted a method that used a modified version of the AER Replacement Capital Expenditure (repex) model to forecast capital expenditure, calibrating the inputs to reflect the asset age profile, asset management practices and historic replacement quantities. In the AER draft decision, it accepted a forecast asset replacement life⁴ for communication assets of 10.7 years for the purposes of modelling efficient and prudent expenditure for this type of asset.

We note that most of the utilities listed in the table have adopted a reduced asset life of 10 years for new electronic communication assets to reflect the changing technologies, and the shorter obsolescent life that typically apply to this newer technology. In addition, Powerlink has adopted a forecast replacement life of 10.7 years for new electronic communications assets as part of their capital expenditure forecast for the next regulatory period.

4 Taxation ruling

The current taxation ruling TR2016/1⁵ from the Australian Taxation Office (ATO), effective 1 July 2016, is the view of the ATO concerning the effective life of depreciating assets. This ruling discusses the methodology used by the Commissioner of Taxation in determining the effective asset life for calculating depreciation in accordance with the provisions of the *Income Tax Assessment Act 1997*.

The ATO has determined the effective life of a depreciating asset by estimating the period it can be used by an entity for a taxable purpose or for producing income:

- assuming it will be subject to wear and tear at a rate that is reasonable for the Commissioner to assume
- assuming it will be maintained in reasonably good order and condition
- having regard to the period within which it is likely to be scrapped, sold for no more than scrap or abandoned

⁴ AER, *Draft Decision Powerlink transmission determination 2017-18 to 2021-22: Attachment 6 – Capital expenditure*, September 2016, section B.3.3, Table 6.8, p. 6-49

⁵ ATO, *TR2016/1 Taxation Ruling Income tax: effective life of depreciating assets*, 29 June 2016

The factors used in consideration of the effective lives include:

- physical life of asset
- engineering information
- manufacturer's specifications
- industry use of the asset
- use of asset by different industries
- level of repairs and maintenance
- industry standards
- experience of users of the asset
- retention periods
- obsolescence
- scrapping or abandonment practices
- leasing periods (where applicable)
- economic analysis of useful period
- conditions in any secondary trading market

The following table summarises a selection of the published effective lives for specified electronic telecommunications services.⁶

Category	Asset	Effective Life (years)
Backbone network assets	Cross connects (including digital and optical)	15
	Multiplexers	15
	Optical amplifiers	15
	Optical patch panels	25
Microwave radio assets	Antennas - high capacity	10
	Microwave radio systems - high capacity	10
	Multiplexers	10
Mobile telecommunications	Base station assets - antennas, battery backup, radio transmitters/ receivers and rectifiers	6
	Base station controller hardware	10
	Microwave assets - antennas, electronic multiplexers and transmitters/receivers	10
	Mobile switching centre hardware	10
Telephones	Handsets	10
Telecommunications assets	Air conditioning units	5
	Batteries and rectifiers	6
	Racks	20

Under the Electricity supply section, the ATO nominates an effective life of 12½ years for a broad asset category defined as “control, monitoring, communications and protection systems”.⁷ We consider this is

⁶ Ibid., asset categories 58010 to 58090, pp. 204-6

⁷ Asset categories 26110 to 26400, p. 167

an average effective life, given the specified telecommunications assets within this ruling predominately have an effective life of 10 years, and protection systems typically have a 15-year effective life.

The ATO taxation ruling is not a legally binding document, and “... *the Commissioner only takes account of normal industry practice when estimating effective life ... [those] who choose to self-assess, however, can take account of their own particular circumstances of use.*”⁸

For the purposes of this review, we have relied upon this taxation ruling as an indicative guide to support our assessment of a 10-year asset life.

5 Industry standard references

5.1 NSW Treasury Guidelines

For many years in Australia, the valuation of electricity networks was based generally on the principles and methodology provided in the NSW Treasury document “*Valuation of Electricity Network Assets – A Policy Guideline for NSW DNSP’s*”. There being no other recognised State or National document on the application of ODRC asset valuation methodologies to electricity networks, the NSW Treasury Guidelines have become the de-facto standard for regulatory valuations of electricity network assets in Australia.

The NSW Treasury Guidelines assigned a class life based on Australian and overseas experience at the time, and the adopted level of disaggregation was not as detailed as is often applied today.

The following table summarises the asset lives for the nominated communication asset classes.

Asset category	Asset	Asset life (years)
Communications	Pilot cable - overhead	35
	Pilot cable - underground	60
	Fibre optic cable	NA
	UHF/VHF transmitter/repeater	NA
	General communications (terminal equipment etc.)	10

Section 2.4.3 states that the “...*effective working life of an asset is its estimated life, assuming continued use in its present function as part of a continuing business. It is considered to be at an end when profitability is exceeded by operating and maintenance costs.*”

We have used the NSW Treasury Guidelines as an indicative guide to the industry standard for electronic communications asset life, and note that it recommends a 10-year asset life for communications assets.

⁸ ATO, TR2016/1 Taxation Ruling Income tax: effective life of depreciating assets, 29 June 2016, p. 10

5.2 Commerce Commission

The Commerce Commission (the Commission) is New Zealand's competition enforcement and regulatory agency. Through a range of regulatory tools, the Commission promotes competitive outcomes in markets where competition is not possible.

The Commission uses the IRD depreciation schedule⁹ as a basis for pricing principle determinations in industry regulation. The following table shows the asset life schedule for selected telecommunications assets.¹⁰

Asset category	Asset	Useful life (years)
Communications	Telecommunications equipment (default class)	10
	Radio remote control devices	10
	Repeaters, line and network terminating equipment	8
	Antennas and networking equipment	12.5
	Telephone switching - DSLAM (card/sub rack/rack)	12.5
	Microwave links (modelled)	10 - 14

We note that the Commerce Commission has moved from its previous position of 15 years for electronic communications assets as specified in their 2004 Handbook for asset valuation of electricity businesses, to the more detailed asset depreciation schedules published by Inland Revenue. The IRD 2016 useful lives are consistent with the Australian electricity industry where 10 years is the typical economic life currently being adopted for new electronic communication assets by electricity utilities.

6 Assessment

6.1 Bearer equipment

For electronic bearer equipment, such as multiplexers, the strategic life for the asset is the limiting condition for determining the regulatory life. Typically, this equipment requires regular firmware and software upgrades to ensure reliable performance and protection from software viruses. With constantly changing technology, equipment quickly becomes obsolete, and suppliers will generally only offer support for equipment for approximately 10-15 years before it becomes too out-dated.

For field-based microwave and radio equipment, installation in remote areas exposes the equipment to harsh operating conditions, together with the supplier's capability to provide maintenance and repair support typically limits the regulatory and economic life of these assets to 10 years. Frequency changes also limit the life of antennas as these must be changed to accommodate any shifts in the operating spectrum.

⁹ Inland Revenue, *IR265 General depreciation rates*, September 2016

¹⁰ *Ibid.*, p. 41

We note that TasNetworks has an expected design life for the electronic network equipment of 10 years, with TasNetworks having taken consideration of manufacturer's advice, constantly changing and evolving technology, level of manufacturer technical support available, access to spare parts, performance levels and maintenance requirements.

TransGrid introduced an additional asset class "Communications (short life) 2014-18" for the electronic devices that form part of the communications systems in their network. The standard asset life of 10 years proposed by TransGrid was accepted by the AER as reflecting the expected economic lives of these types of assets.

As a comparison, the ATO taxation ruling TR2016/1 has a detailed schedule for telecommunication services, with microwave equipment and antennas, and multiplexers being allocated an effective life of 10 years.

6.2 Data communications network

The data communications network comprises the following assets:

- IP/MPLS switches
- field equipment mounting racks and panels

Obsolescence rather than asset condition is the dominant consideration. The strategic life for these types of assets is the relevant asset life, due to the rapid rate of technology change. Manufacturers will typically only provide support for switching equipment for a maximum of 5 years, after which it is more cost effective and better risk management to replace these switching assets rather than maintain them in service. It is essential that manufacturer support is available, as an operational and well-supported data communications network is important for efficient transmission network operation.

Anecdotal advice received from utility field staff considered field equipment mounting racks and panels generally provide 10 years of useful service, taking account of space required for the greater bandwidths and physical requirements for the equipment.

Advice received from an industry supplier nominates an anticipated useful life for nominal performance of its telecommunications equipment of 10 years.

6.3 Voice network

ElectraNet's voice network is currently delivered by two distinct systems:

- On-Net (ElectraNet owned PABX system)
- Off-Net (Telstra PSTN services)

The On-Net voice network is currently in transition from a TDM-based Ericsson system to an IP-based Cisco system, and by mid-2018 the transition to the IP system will be completed. The resulting network will comprise Cisco voice routers, IP telephones and ATAs (analogue telephone adaptors) for connecting existing analogue phones to the network.

The Off-Net voice network either is currently delivered by direct connection to Telstra's network (i.e. a telephone copper cable is brought into the substation from Telstra) or through IP delivery over ElectraNet's telecommunications network from one of a series of PSTN network injection sites.

As equipment for both voice networks are IP based, the asset maintenance and obsolescence considerations mentioned above for the data communications network apply equally to the voice network equipment.

7 Recommendation

Recent AER decisions have accepted 10 years as the asset life for electronic communication equipment for TasNetworks and TransGrid, and 10.7 years as the forecast average replacement life for Powerlink. This is consistent with the AER's position for standard asset lives for the same asset types across the different electricity transmission utilities, considering any specific factors that may affect the life of the asset.

The statutory and industry references we have reviewed are consistent in recommending a 10-year economic life for specific telecommunication assets similar to those used in the ElectraNet transmission network. Whilst the ATO taxation ruling is advisory rather than binding, it allocates similar effective lives for those nominated by the Inland Revenue Department in New Zealand, whose ruling is used by the Commerce Commission in formulating regulatory decisions. We consider that these statutory rulings recognise the technology change in telecommunications assets, and note that they have nominated their effective/useful lives based on industry considerations.

Therefore, it is our view is that ElectraNet is justified in changing its standard asset life for new electronic telecommunications assets from the existing 15 years to 10 years. This is consistent with good industry practice and better reflects the economic life of these assets.

Regards

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