31 January 2023

Attachment 5.2.c: Customer value framework

Ausgrid's 2024-29 Regulatory Proposal

Empowering communities for a resilient,
affordable and net-zero future.

Ausgrid

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1 Introduction

The Customer Value Framework (**Value Framework**) details how risk dimensions have been monetised to support quantitative risk assessments (**QRA**). Using a common set of dimensions and metrics across asset decisions allows Ausgrid to assess those decisions across a common base, as well as allowing us to optimise decisions that reflect Ausgrid's corporate and asset management objectives.

In order to meet customer priorities, the framework is subject to ongoing reviews and therefore represents the current metrics for monetising consequences and quantifying benefits. Alternative values may have been used in the past based upon the information available at that point in time. A summary of the outputs of this framework is provided in Appendix A.

1.1 Purpose of this document

The purpose of this document is to set out the value dimensions and metrics used to support risk-based decision-making. To enable a like for like comparison to cost, value metrics are represented as monetised values. These values have been informed by:

- External requirements;
- Guidance documentation;
- Historical experience.

These monetised value metrics form an input to risk assessments which in-turn inform risk-based decision-making. This relationship is shown below:

Figure 1: Value Metrics

1.2 National Electricity Objective and Rules

The National Electricity Objective (**NEO**) is to promote the efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity. The specification of Ausgrid's Value Framework aligns to this objective by providing a common set of value dimensions for making investment decisions that unlock the most net-economic benefits for customers.

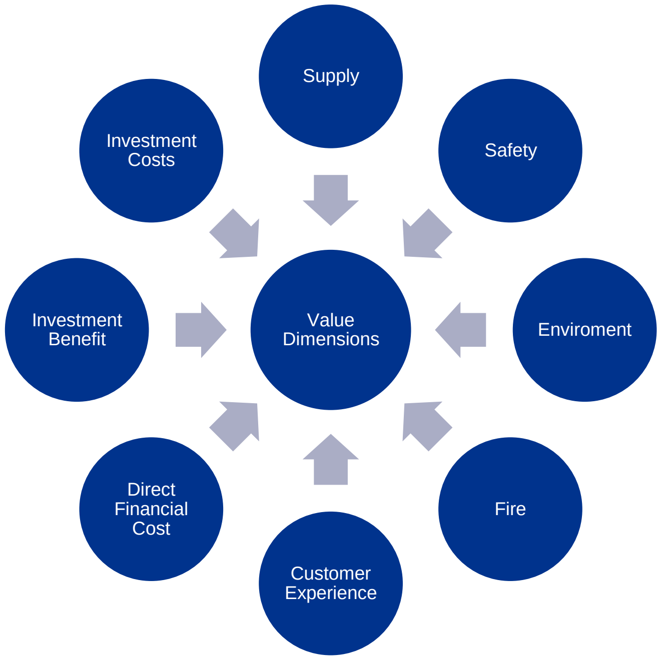
The National Electricity Rules (**NER**) support the NEO by defining a set of capital expenditure (**capex**) objectives which the Australian Energy Regulator (**AER**) must consider when assessing a regulatory proposal. The Value Framework supports the development of an investment portfolio that aligns to these capex objectives, which are to:

1. Meet or manage the expected demand
2. Comply with all applicable regulatory obligations or requirements
3. Maintain the quality, reliability and security of supply
4. Maintain the safety of the distribution system

1.3 Principles

The Value Framework defines the economic impact (benefits and costs) to Ausgrid and the community that are expected to arise from the occurrence of events (e.g. asset failure and potential hazardous events) across different **value dimensions**. These value dimensions are shown in Figure 2. In estimating the economic impacts, it is important to justifiably determine the appropriate economic value within each value dimension. **Value metrics** are assigned to each value dimension to determine the total economic impact.

Figure 2: Value dimensions included in the Customer Value Framework



1.3.1 Economic value

Economic value metrics are determined based on societal value, which reflects the value to the organisation (e.g. shareholder value) and the value to customers. In defining societal value Ausgrid draws on the National Electricity Objective in identifying values that are relevant to the efficient investment in, and efficient operation and use of, energy services for the long-term interests of consumers of energy.

Valuing impacts based on societal value is considered appropriate because, as a rule, it is the Network Service Provider's customers that receive the benefits (or incur the cost) associated with managing the network.

The unique characteristics of each value dimension means that the Value Framework has application for modelling and comparing risks for a variety of treatments. The relativity of the value metrics (to each other) is of crucial importance as the planning process considers how varying expenditure scenarios impact on the risk / benefit profile, and the subsequent treatments implemented on the network.

1.3.2 Range / Severity

The economic value of network events may have a range of different consequence magnitudes across each of the value metrics. Depending on the value metric and the asset, the economic value is determined using either one of two methods:

1. Distinct value, or;
2. Value severity scale.

1.3.3 Distinct Value

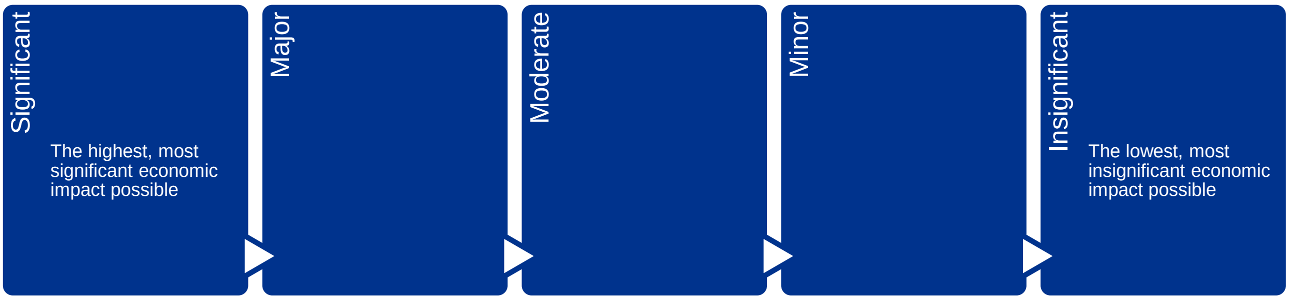
A distinct value approach is used when the economic consequence of an event varies based on defined asset characteristics, such as the average energy load that it carries. This approach applies a specific economic value to an asset event. The Value Framework defines the characteristics and method for calculating the value to apply.

1.3.4 Value Severity Scale

A value scale approach is used where the economic consequence varies between defined levels of severity. In some cases, the distinct value approach can be converted to a value severity scale where the consequences associated with asset types fall into clear categories, for example, bushfire severity. Bushfire severity can be attributed to individual assets based on bushfire prone land mapping. However, if bushfire prone land is then further categorised into severity levels, the bushfire value for different levels of consequence can be assigned through a value severity scale.

The value severity scale applied is consistent with the **Risk Management Framework** (**RMF**) and the **Opportunities and Threat Risk Matrix**. A five-point severity scale is utilised with an economic value assigned to each level as detailed below:

Figure 3: Value Scale by Severity Level



The severity levels for each key risk theme are defined within the RMF. These severity levels are translated from the RMF to a monetised consequence value by severity level within this document. A summary of these values is provided in the section following.

1.3.5 Escalation factors

The values outlined in this framework are at a point in time and are expected to be inflated as appropriate using either a Consumer Price Index (**CPI**) or Wage Price Index (**WPI**).

2 Value Dimensions Overview

The Value Framework defines ten value dimensions that reflect the broad categories into which economic value (benefits) can be allocated. Each value dimension contains several value metrics against which dollar values are assigned. Table 1 presents an overview of the value dimensions used in this Value Framework and the value metrics used within each. The Value Dimensions are split into two categories:

1. The **risks** avoided from treatments (repair, refurbish or replace); and

2. The **financial costs** avoided from treatments (repair, refurbish or replace)

Where applicable, the risks associated with the network are aligned to the NEOs. When combined with the costs avoided through the implementation of treatments, the full benefit of treatments can be evaluated against their cost.

Table 1: Value Dimensions and Metrics

Value Dimensions	NER Capex Objectives	Value Metrics		
Risks				
Supply	1,3	Loss of Supply	DER Curtailment	
Safety	4	Disability Weighted Value of Life	WHS Cost	Grossly Disproportionate Factor
Environment	2	Remediation Costs	Greenhouse Gas Emissions	Noise Impacts
Fire	2,4	Safety Consequence	Property Damage	Environmental Damage
Customer Experience	n/a	Time to Resolution	Time to Obtain Information	
Financial				
Direct Financial Costs	n/a	Reactive Replacement Premium	Asset Repairs	
Investment Benefits	n/a	Avoided OPEX	Other Productivity Benefits	
Investment Costs	n/a	Activity Cost	Financing Rate	Investment Lifetime

Different value metrics are used for different purposes within Ausgrid. Table 2 outlines where each metric is typically used. This will continue to be reviewed and changed as appropriate when new or emerging risks or benefits are identified.

Table 2: Typical Value Metric business usage

Value Dimensions	Value Metric	REPEX	AUGEX	OTI	ICT	Non-network Property	Fleet
Supply	Loss of supply	✓	✓	✓	✓	✓	×
	DER Curtailment	×	✓	×	✓	×	×
Safety	Disability weighted value of life / WHS cost	✓	✓	✓	✓	✓	✓
	Grossly disproportionate factor	✓	✓	✓	×	✓	✓
Environment	Remediation cost (oil spill) water and land	✓	✓	×	×	×	×
	Greenhouse gas emission	✓	✓	✓	✓	✓	✓
	Noise impacts	×	×	×	×	✓	×
Fire	Safety consequence	✓	✓	✓	×	✓	×
	Property damage	✓	×	✓	×	✓	×
	Environmental damage	✓	✓	✓	×	✓	×
Customer Experience	Time to Resolution	×	×	✓	✓	×	×
	Time to Obtain Information	×	×	×	✓	×	×
Direct Financial Costs	Reactive replacement premium	✓	×	✓	✓	✓	×
	Asset repairs	✓	✓	✓	✓	✓	×
Investment Benefits	Avoided OPEX	✓	✓	✓	✓	✓	✓
	Other Productivity Benefits	✓	×	✓	✓	✓	✓
Investment Costs	Activity cost	✓	✓	✓	✓	✓	✓
	Financing rate	✓	✓	✓	✓	✓	✓
	Investment lifetime	✓	✓	✓	✓	✓	✓

The following sections provide further details for each of the value dimensions and the value metrics.

3 Supply

The value dimension of Supply quantifies costs associated with the network failing to provide its primary objective, to transport electricity from sources to loads. The value metrics for Supply include:

1. The **Loss of Supply (Expected Unserved Energy)** to represent the cost associated with a failure of the network to supply electricity.

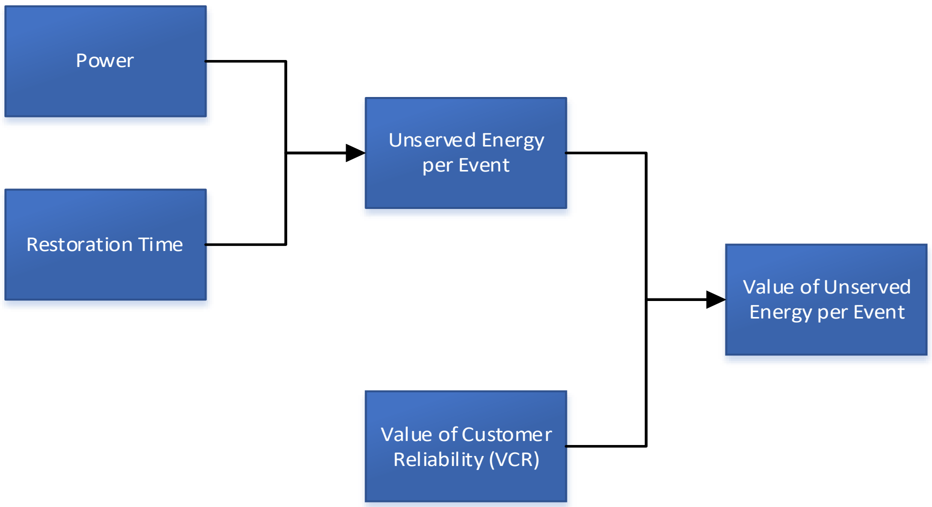
2. **Distributed Energy Resources (DER) Curtailment** to represent the cost associated with the unavailability of DER.

The value of supply risk is summarised as a single value that is calculated for each asset unit in the network, on the basis of the unique characteristics of each asset unit. The value for each asset is a weighted average of the expected range of supply risks (such as duration and coincident failures). This differs to other value dimensions where values are calculated for multiple severity levels.

3.1 Loss of Supply

Ausgrid determines the potential loss of supply based upon the value of unserved energy. Unserved energy is valued using the 'Value of Customer Reliability' (**VCR**) approach as outlined in Figure 4**.**

Figure 4: Value of Loss of Supply (Value of Unserved Energy) Metric



Unserved energy for a given event is valued according to the following equation:

$$Value\ of\ Unserved\ Energy\ per\ Event = Restoration\ Time \times Power \times VCR$$

The restoration time is measured in hours and reflects the expected duration of the outage for the affected customers (weighted average). The value of unserved energy for a given event can be monetised by multiplying this by the VCR ($ per kWh) for the relevant customer segment.

3.1.1 Value of Customer Reliability

The AER states that *"Reliable electricity supply is important as electricity outages have customer impacts including costs related to lost productivity and business revenues, and intangible or indirect costs such as a reduction in convenience, comfort, safety and amenity provided by electricity".*[1]

VCR values are published by the AER and are available here: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/values-of-customer-reliability. VCR values are measured in $ per kWh.

The VCR values defined by the AER for a range of customer types are available in the appendices of the above webpage.

- Residential loads: refer to the NSW value in Table 1-1 of Appendices A-E. If the specific climate zone for the customer is known the more detailed values in Table 1-2 of Appendix F may be used instead.
- Business loads: refer to the values in Tables 1-3 and 1-4 of Appendices A-E.

When forecasting loss of supply risk, the VCR value can be inflated using a Consumer Price Index (CPI) forecast or held constant in real terms.

3.1.2 Restoration Time

Restoration time is derived by assessing relevant similar historical events from interruption data stored in Ausgrid's corporate systems.

Where there is not sufficient outage data to calculate a reasonable restoration time, data for similar assets or causes or network definitions are substituted.

For the purposes of forecasting, the outage duration value can be assumed to not change over time unless there is an anticipated change in how the network will respond to outages.

3.1.3 Power

The power consumption of the customers interrupted (load at risk) is used to determine the unserved energy. This should be based on forecast loads, but where forecast loads are unavailable, it can be assumed that the historical load is unchanged for near term investments.

The source of historical load data depends on the asset under investigation. It is reasonable to use data from customer metering or data from network load monitoring devices which can be accessed in various corporate systems. For large investment decisions, the load at risk and loss of supply impact may be derived using detailed load flow and network state enumeration techniques.

Where customers have small scale embedded generation (rooftop solar PV), the metered consumption data will underestimate the actual underlying consumption. As a network outage will cause an embedded generator to shut down[2] it is the customer's underlying consumption that is affected, not only the portion seen in the metering data. As a result, the internal embedded generator use is estimated and added to the customer's consumption for the purposes of calculating the load at risk for a given network element.

[1] Refer to AER Values of Customer Reliability (https://www.aer.gov.au/system/files/AER%20-%20Values%20of%20Customer%20Reliability%20Review%20-%20Factsheet%20-%20December%202019.pdf)

[2] Customers with energy storage systems may be able to island and continue generating (or use stored energy to avoid any outage). However, the total number of these customers are very low do not need to be accounted for at the current time. If there is a significant increase in behind the meter energy storage systems this assumption should be revisited.

3.2 DER Customer Export Curtailment Value (CECV)

The Customer Export Curtailment Value (**CECV**) of DER is the value of DER export of electricity to the market. It represents the lost opportunities to all customers through the curtailment of DER.

DER curtailment occurs when customer DER is restricted or completely isolated, typically due to network constraints. Curtailment is typically due to over-voltages in low voltage networks and can be addressed through a variety of options including augmentation and non-network services. Augmentation solutions can include asset uprates, replacements, voltage balancing devices and community batteries. Ausgrid prioritises the use of dynamic services such as dynamic pricing to incentivise customer behaviour prior to network augmentation.

The AER has published a high–resolution pricing model of curtailment which sets a price per kWh of curtailed energy for every 30-minute interval over the next 20 years (starting FY22–23). Quantitative forecasts of curtailed energy for every 30-minute interval have been made for four full years over this period (2024, 2029, 2034 and 2039) under each of the AEMO scenarios by combining the results of DER modelling and interval meter voltage data as is available.

This information is used to estimate the amount and value of curtailed energy for these years. This approach corresponds to Method 1 in the AER Final CECV methodology – June 2022[3]. Estimates of energy lost to curtailment in intervening years may be obtained by extrapolation. Ausgrid is assessing the value of CECV in response to the AER's DER integration expenditure guidance note – June 2022.

[3] Final CECV methodology Explanatory statement, AER (June 2022)

4 Safety (Worker and Public)

The value dimension of Safety quantifies organisation, individual and community costs associated with injuries and fatalities caused by the failure of, or interaction with, network assets. Ausgrid values worker and public safety identically for the purposes of informing asset decision making.

The value metrics for safety include:

1. The Disability Weighted Value of Life to represent society's willingness to pay to avoid serious injuries and/or fatalities. This is included in the minor, moderate, major and significant severity levels within Table 3.

2. A Work Health & Safety (**WHS**) Cost to represent the cost to the network, individuals and the community of minor injuries for which a value of life approach is not appropriate. This is included in the insignificant severity level only within Table 3.

3. A Grossly Disproportionate Factor multiplier applied to safety consequences to align with legislative requirements to invest in consequence avoidance whenever the costs are not grossly disproportionate to the risk reduction achieved.

The values applied to each value metric represent the estimated total cost for each consequence severity level. That is, they include the economic cost borne by the injured person, the cost borne by Ausgrid (whether that is lost productivity and/or fines or penalties, etc), and the cost borne by society.

The value of safety risk is calculated for five severity levels using the above value metrics. Safety consequences are generally the result of an asset failing or an interaction with an asset.

The consequence value for safety risks is calculated across a severity scale, with five values ranging from Insignificant to Significant.

The insignificant severity level uses a WHS cost approach while the other four severity levels apply the Disability Weighted Value of Life approach . The WHS cost approach is used because the value of life approach is too coarse to apply to very low severity injuries.

The proposed values are shown in Table 3. Sources for the individual values are discussed in the following sub-sections.

Table 3: Safety Value of Consequence by Severity Level (as at August 2021)

Severity Level	Ausgrid Description (taken from RMF)	Value Metric Assumption	Calculation Assumption	Value of Consequence (FY21)
Insignificant	Low level injury/symptoms requiring first aid only	Minor injury requiring limited treatment. Valued using SafeWork Australia short term absence cost.	WHS Cost (Short term absence)	$5,000[4]
Minor	Non-permanent injuries/work related illnesses requiring medical treatment	Temporary injury that limits the victim's quality of life for 1 year. Valued using VLY multiplied by the weighting for a minor injury (e.g. nerve damage, sprain, dislocation).	VLY * 0.07	$15,540

[4] Derived using index value as at August 2021.

Severity Level	Ausgrid Description (taken from RMF)	Value Metric Assumption	Calculation Assumption	Value of Consequence (FY21)
Moderate	Significant non-permanent injury/work related illnesses requiring emergency surgery or hospitalisation for more than 7 days	Temporary injury that limits the victim's quality of life for 1 year. Valued using VLY multiplied by the weighting for a bone fracture of a major bone (e.g. femur, pelvis).	VLY * 0.25	$55,500
Major	Permanent injury/work related illnesses to one or more persons	Severe injury that permanently reduces the victim's quality of life. Valued using VSL multiplied by the weighting for an arm/leg amputation.	VSL * 0.3	$1,530,000
Significant	One or more fatalities. Multiple significant permanent injuries/work related illnesses	Fatality or severe injury that prevents the victim from working for the rest of their life. Valued using VSL.	VSL * 1	$5,100,000

For the purposes of forecasting, each safety severity level value can be inflated using a Wage Price Index forecast. This should be higher than the inflation forecast and results in an increase in real terms over the forecast period.

4.1 Disability Weighted Value of Life

Disability Weighted Value of Life is used for the severity levels of Minor through to Significant. This approach values the loss of quality of life (disability weightings), using an estimate of societal willingness to pay (value of statistical life).

Value of Statistical Life (**VSL**) values are published by the Federal Government Department of Prime Minister and Cabinet (Office of Best Practice Regulation) in the 'Best Practice Regulation Guidance Note: Value of Statistical Life'. The publication is available here: https://pmc.gov.au/resource-centre/regulation/best-practice-regulation-guidance-note-value-statistical-life

Two VSL values are available, a whole of life value (VSL) and an annual value (value of a statistical life year or VLY). VSL is appropriate for fatalities and permanent injuries that have a lifelong impact on the victim. VLY can be used for temporary impairment.

The VSL or VLY values are appropriate for total incapacitation where the victim has no quality of life. For injuries below the most significant level, some quality of life will be retained. To account for this, a disability weighting can be used.

The Best Practice Regulation Guidance Note refers to a source for disability weightings – that source is 'The Burden of Disease and Injury in Australia' (Mathers et al 1999) from the Australian Institute of Health and Welfare. The report is available here: https://dro.deakin.edu.au/eserv/DU:30046704/stevenson-burdenofdisease-1999.pdf. Disability weightings for injuries are found on pages 201-202.

For major injuries, the weighting for foot and leg amputations of 0.3 is used. As this is a permanent injury, the full VSL value is used.

Moderate injuries are temporary, so the single year VLY value is used. For moderate injuries, a disability weighting of 0.25 was selected. This value is within the range of several broken bone values, such as vertebra (0.266), pelvis (0.247) and patella, tibia or fibula (0.271).

Minor injuries are also temporary, so the single year VLY value is used. For minor injuries the weighting of 0.07 was selected. This is based on the values for nerve damage (0.064), sprains (0.064) and dislocation (0.074).

The Best Practice Regulation Guidance Note is updated annually to escalate the values of VSL and VLY. The escalation approach is to use the Wage Price Index, which is typically higher than the rate of inflation. Forecasts of VSL and VLY should use the same approach. If a forecast for the Wage Price Index is not available, a historic average growth rate should be used. ABS data on the Wage Price Index is available here: https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/wage-price-index-australia/latest-release#data-download.

4.2 Work Health & Safety (WHS) Cost

For low severity safety consequences, an alternate approach has been used because the value of life approach was determined to be too coarse to apply to these very low severity injuries.

Estimates for costs of minor injuries are available from SafeWork Australia. The values were developed for 2012-13 and require escalation to be comparable with the other values used for safety. The report is available here: https://www.safeworkaustralia.gov.au/system/files/documents/1702/cost-of-work-related-injury-and-disease-2012-13.docx.pdf

The costs considered by SafeWork Australia are:

- Direct costs
    - Workers' compensation premiums paid by employers
    - Payments to injured or incapacitated workers from workers' compensation jurisdictions
- Indirect costs
    - Lost productivity
    - Loss of current and future earnings
    - Lost potential output and the cost of providing social welfare programs for injured or incapacitated workers

The report also provides estimates for higher severity injuries. The values are comparable to those calculated using the VSL approach. The VSL approach is more widely used in the electricity sector and uses more up-to-date information so is the preferred source for all but low severity safety consequences.

For alignment with the VSL source, the SafeWork Australia values are escalated using the Wage Price Index (available here: https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/wage-price-index-australia/latest-release#data-download).

Using the series 'Quarterly Index; Total hourly rates of pay excluding bonuses; Australia; Private and Public; All industries', the index value was 115.5 at June 2013 and was 136.1 at March 2021 (the VSL values were published August 2020). The escalation factor from the published WHS cost is 1.18.

The SafeWork Australia report puts the value of a minor injury at $4,200 in 2012-13 (refer to page 26, Table 1.9), which equates to a 2020 value of $4,949.

4.3 Grossly Disproportionality Factor

The application of AS 5577 Electricity Network Safety Management Systems in managing safety risks associated with the operation of an electricity network is a mandated requirement in NSW. The standard requires network safety risks to be eliminated, and if this is not reasonably practicable, then to be reduced to as low as reasonably practicable (**ALARP**).

Reasonably practicable as described by Safe Work Australia[5] represents "*that which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including:*

a. the likelihood of the hazard or the risk concerned occurring; and
b. the degree of harm that might result from the hazard or the risk; and
c. what the person concerned knows, or ought reasonably to know, about the hazard or risk, and about the ways of eliminating or minimising the risk; and
d. the availability and suitability of ways to eliminate or minimise the risk; and
e. after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk."

Where possible a quantified approach is adopted with Engineering judgement, for the evaluation of health and safety risks so far as is reasonably practicable (SFAIRP) for the purpose of asset related decision making through the monetisation of risk. As noted in point 'e' above, where the risk and the treatment are quantified, the effort and expense of a treatment must be shown to be grossly disproportionate to the risk before it is discounted as a treatment.

Guidance from the Health Safety Executive[6] (UK) suggests that a Grossly Disproportionate Factor (GDF) between 2 and 10 can be used. Higher values are used for situations where extensive harm is possible if the risk event were to occur. Similar guidance from Ireland's Commission of Energy Regulation requires robust justification for using GDF less than 10[7] when quantitative assessment, less sophisticated or informed risk techniques are utilised. The application of the GDF allows for the prioritisation of investment to meet community expectations that the organisation should invest a greater multiple to reduce some risks as compared to others.

The application of a GDF to the consequence value represents the organisations appetite to spend more than the value of the safety risk avoided to reduce the risk. GDF is applied based on the severity of the safety consequence which reflects expectations that more investment should be made to prevent serious injuries than minor injuries. As a result, Ausgrid applies the range of GDFs of 2 - 10 escalating with increasing severity level as shown in Table 4.

Table 4: Grossly Disproportionate Factor by Severity Level

Severity Level	Insignificant	Minor	Moderate	Major	Significant
Grossly Disproportionate Factor	2	4	6	8	10

The weighted average of the above GDFs when applied by objective[8] asset incident severity level to a consequence category for a specific asset population will be in the range of 2 and 10 and as a result consistent with the values referenced in the AER 'Asset Replacement Planning Industry practice application note'[9] and allows for contextual & specific circumstances[10] to determine the GDF.

[5] How to Determine What is Reasonably Practicable to Meet a Health and Safety Duty, Safe Work Australia (May 2013)
[6] Cost Benefit Analysis (CBA) checklist, Health and Safety Executive, United Kingdom, viewed on 8 October 2020 <http://www.hse.gov.uk/risk/theory/alarpcheck.htm>
[7] https://www.cru.ie/wp-content/uploads/2017/11/CER16106-ALARP-Guidance-V3.0.pdf
[8] Safe Work Australia - guide_reasonably_practicable.pdf (safeworkaustralia.gov.au)
[9] Industry practice application note – Asset Replacement Planning, AER (January 2019)
[10] Safe Work Australia - guide_reasonably_practicable.pdf (safeworkaustralia.gov.au)

5 Environment

The value dimension of Environment quantifies the consequences to the environment caused by the failure or operation of network assets. There are three value metrics for environment:

1. The **Remediation Costs** to represent costs incurred by the network to return the environment to its pre-asset failure state
2. The **Greenhouse Gas Emissions** to represent the cost to society of the emission of gasses that may contribute to climate change (or emissions pricing if applicable), less any emissions related fines and penalties
3. The **Noise impacts** to represent the decreased property value to impacted receivers, less any noise related fines and penalties.

Environmental costs may be incurred without the functional failure of an asset. This includes when an asset has defects that cause the leaking of liquids or gasses into the environment or defects that cause excessive noise.

Environmental costs are also incurred when an asset functionally fails and the failure mode results in some or all of the stored liquid or gas being released into the environment.

For high value investment decisions (e.g. oil filled sub-transmission cable replacements) the potential environmental impacts may be calculated directly using the distinct value methodology. This is done to consider unique site conditions and individual constraints.

5.1 Remediation Costs

This value metric incorporates direct costs incurred by Ausgrid to remediate environmental damage where appropriate. This value metric excludes fines and penalties incurred due to the release of materials.

Oil clean-up costs are related to the quantity of oil spilled and entering either a waterway, the groundwater or contaminating land.

The volume of oil that leaks into the environment will depend on the oil capacity unique to each asset and the failure mode and the presence of protective equipment, such as oil bunding. Based on Ausgrid's incident register, the average oil lost is 80L for a pole transformer failure/leak, 185L for a kiosk/chamber transformer failure/leak and 391L for a zone transformer failure/leak. Kiosks/chambers and zone substations have oil containment systems which would contain most of the oil (assume 80%) in the event of a failure.

For oil filled sub-transmission cables a detectable leak is one of at least 5L per day. For surface water and ground water, the severity levels relate to the amount of oil that escapes into the environment from the asset. The total cost for each severity level is as follows:

$$Remediation\ Cost\ (water) = Oil\ Leaked\ into\ the\ Environment\ (Litres)\ \times\ Cleanup\ Cost\ per\ Litre$$

The clean-up cost per litre of oil released into the environment is monetised using the financial equivalence $3,491 per litre[11] in direct cost ground water impact, based on 1L of oil released impacting 1ML of ground water[12]. This same cost can be applied for surface water.

For sub-surface leaks the clean-up costs would be lower in less sensitive areas such as away from waterways and sensitive groundwater areas. A factor of 0.05 is applied to these areas followed by 0.2 for sensitive

[11] Direct Cost Ground Water Impact (Deloitte Access Economics 2013, referenced in UPSS RIS) – escalated to FY2022
[12] Regulatory Impact Statement Proposed Protection of the Environment Operations. Environment Protection Authority June 2014.

groundwater areas and 1 for waterways. To account for these areas, scaling factors of 1, 0.2 and 0.05 are applied to these areas respectively.

For above ground leaks the clean-up costs would significantly increase in areas such as wetlands and aquatic reserves followed by waterways and then other areas. To account for these areas, scaling factors of 2, 1.5 and 1 are applied to these areas respectively.

The chance of oil entering a waterway is dependent on the proximity of an asset to drains and waterways. Factors applied for <20m, 20m-100m, 100m-500m and >500m are 1, 0.8, 0.2 and 0.1 respectively.

An additional factor that would increase the clean-up cost would be the presence of PCBs. It is estimated that this would double the clean-up cost. Where the PCB leak is unknown, a factor of 1.25 would be appropriate for oil filled equipment purchased prior to 1997, given that approximately 25% of transformers from this vintage contain PCBs. All oil filled cables are now free of PCBs.

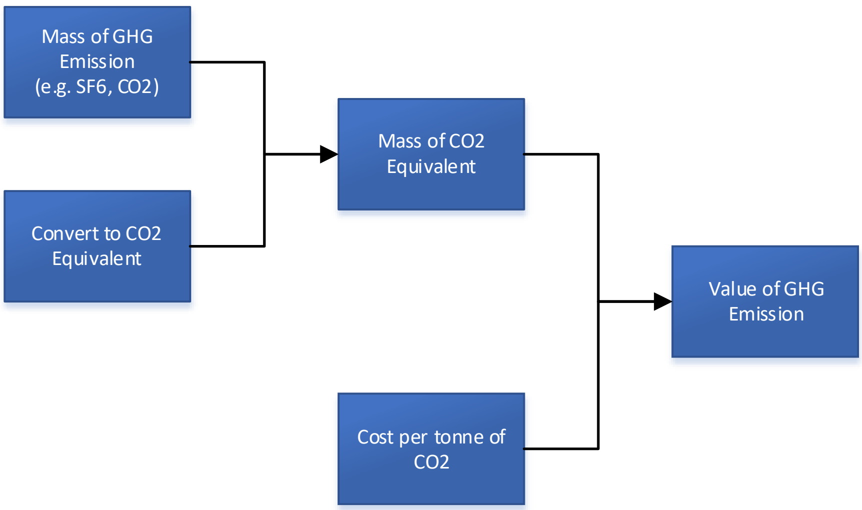
For the purposes of forecasting, environmental remediation costs can be inflated using a network cost growth rate that is consistent with other forecasts and/or parameters used for regulatory forecasting purposes.

5.2 Greenhouse Gas Emissions

This value metric places a value on greenhouse gas (GHG) emissions. GHG emissions result in societal costs due to their contribution to climate change.

Greenhouse gas (GHG) emissions can be valued using carbon prices and the emission mass, and an associated cost per unit mass (expressed in $/kg) of carbon emitted. Gasses other than carbon dioxide can be converted to a carbon-dioxide equivalent (CO_2-e) using an appropriate conversion factor[13].

Figure 5: Value of Greenhouse Gas (GHG) Emission Value Metric



The main GHG that may be released by network assets is sulphur hexafluoride (SF6), which is used as an electrical insulator in switchgear and some major transformers. From the source above, 1kg of SF6 gas is equivalent to 23,500kg of CO_2.

[13] Clean Energy Regulator, Global Warming Potentials (https://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/global-warming-potentials)

Future government policy relating to SF6 remains uncertain. This includes a future risk of a carbon price being applied to our SF6 leakages or stock. There are two prices that can be used:

- European Union Emissions Trading System prices (EU ETS), quoted in Euros and converted to Australian dollars[14]. The EU ETS scheme is one of the most well-established carbon pricing schemes globally and has high trading volumes and interacts with other international carbon pricing schemes so is an appropriate international price for carbon.

- Australian Carbon Credit Units (ACCU) prices[15] published by the Clean Energy Regulator represent a local price for carbon. The market is shallow compared to international markets and prices are in part determined by government policy, which does not currently require most emitters to participate in the market.

As of June 2021, the most recent prices are approximately €50 (~AUD$80) per tonne for EU ETS credits and AUD$16.90 per tonne for ACCUs. The higher EU ETS price is more representative of societal costs, although academic studies into the true societal cost (as opposed to a market-based price) may calculate different values. Market prices are preferred as a value metric due to the uncertainty of, and lack of agreement between, other sources.

If an emissions price becomes applicable, the societal cost and financial cost are not additive as the financial cost relates to the same societal cost.

Ausgrid has adopted a shadow price in relation to SF6 gas of $50 per tonne CO_2 equivalent which is generally consistent with the above costs. With the SF6 equivalency to CO_2 this relates to a shadow price of $1,175 per kg of SF6.

For the purposes of forecasting, the carbon price can be inflated using a CPI forecast or held constant in real terms. If a carbon price forecast is available that should be used instead.

5.3 Noise impacts

There have been a number of studies seeking to value costs associated with noise. For example, one study suggests people would pay $2,500 per window for sound proofing. Another study suggests people would be willing to pay an additional 1% to 3% of construction costs for a soundproofed building. A study summarising the societal costs put the costs of noise pollution between 0.2% to 2% of GDP. For NSW this equates to over $12 billion[16].

The cost of noise pollution is dependent on the extent of noise above background levels and the number of affected receivers. Noise complaints are typically justified at 5 decibels (dB) above background levels. An additional 5dB noise penalty is applied to transformer noise to account for the annoying tonal frequencies.

A study by Ableson (1996)[17] estimates that a 1dB (A weighted) increase in traffic noise resulted in property values in Sydney decreasing by between 0.14% and 1.26%. As at May 2022, the median house and unit prices in Sydney were $1.4M and $830k respectively[18]. Therefore, the cost is $17,854 per impacted house per decibel.

Severity levels would be highest for residential land use and decrease for other areas. It is assumed impacts to other areas would be 20% of those for a residential property.

[14] EMBER, EU Carbon Price Tracker (https://ember-climate.org/data/carbon-price-viewer/)
[15] Clean Energy Regulator, Quarterly Carbon Market Reports (http://www.cleanenergyregulator.gov.au/csf/market-information/Pages/quarterly-Market-report.aspx)
[16] NSW Environment Protection Authority, Regulatory Impact Statement (2017) (https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/poeo-noise-control-regulation-2017-draft-regulatory-impact-statement-160267.pdf)
[17] Abelson P 1996, Project Appraisal and Valuation of the Environment: General Principles and Six Case Studies in Developing Countries, Macmillan, London
[18] CoreLogic, Hedonic Home Value Index (2 May 2022)

6 Fire

The value dimension of Fire quantifies losses associated with lives, property and the environment resulting from fires started by the failure of network assets.

Network initiated bushfires are one of the highest priority risks that the electricity network poses to the safety of the public, property and the environment. The risks associated with network-initiated bushfire represent a critical risk to achieving each of the five primary objectives of the ES(SNM) Regulation (the others being public safety, worker safety, loss of supply, and protection of property). Accordingly, fire has been categorised as a unique value dimension given its inherent risk profile to Ausgrid and the wider community consequences.

The three value metrics used for fire are:

1. The **Safety consequences (life loss)** to represent the costs to society of injuries and fatalities caused by fire.

2. **Property damage (house loss)** to represent the replacement cost of property damaged or destroyed by fire.

3. **Environmental damage (plantation loss)** to represent the cost to society of damage to the environment caused by fire.

The consequence costs for bushfire risks are derived from bushfire simulation modelling commissioned by Ausgrid from the University of Melbourne (UoM) [19]. The PHOENIX RapidFire Fire Simulator[20] was used to determine the predominant landscape-scale fire risk outcomes starting from areas within Ausgrid's supply network. For additional detail on the modelling methodology refer to the Project IGNIS report[21].

The modelling included two variants, one where ignition points were modelled at regular intervals along Ausgrid's network (**Lines approach**) and a second where ignition points were modelled on a grid that covered the Ausgrid service region (**Grid approach**). Multiple simulations were run for each ignition point and covered a range of different Forest Fire Danger Index (**FFDI**) ratings (number of days at rating per annum) and weather parameters (the historic rate of fire starts on days with particular weather conditions) of each simulation scenario. Ausgrid summarised both of these approaches at the suburb level so that there is one fire consequence for all assets located in each suburb.

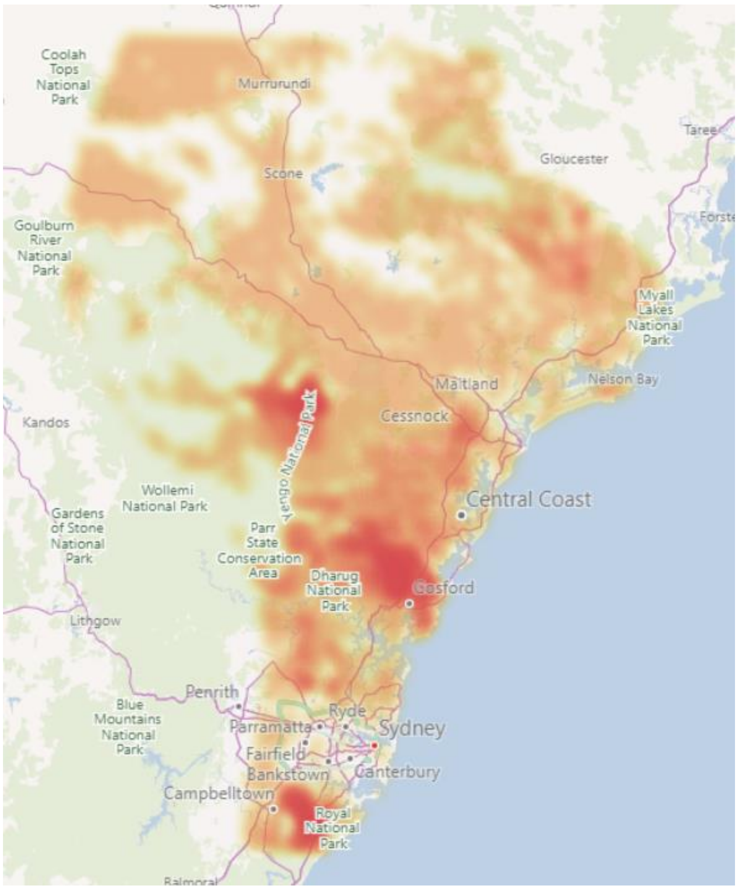
Where a suburb had at least one ignition point in the Lines approach, the average of these values was used. If the suburb did not have any ignition points in the Lines approach the Grid approach was used. For suburbs where no ignitions were modelled a regional average was used based on the average fire consequence across all suburbs in the region. The Lines approach is preferred where it is available as the Grid approach often has ignition points in parkland that may be far from most Ausgrid network assets and so will often have a significantly higher calculated fire consequence.

The calculated fire consequence for individual ignitions ranges from $0 (typical in low risk settings such as inner city suburbs) to just over $3.1b (suburban fringe bordering national parks on windy catastrophic fire risk days). On a low FFDI day the highest fire consequence cost across all ignition points used in the modelling is $96m. These values are mediated significantly by the probability of the required fire conditions being observed. Furthermore, for most suburbs the fire consequence is an average of multiple ignition simulations which range from high risk points close to bushland and low risk points within built up areas. Due to the effects of this value mediation, the upper end of the range of fire consequence cost values for individual suburbs in just over $18m.

[19] Fire Impact Assessment from and to the Ausgrid Power Network. The University of Melbourne 22nd November 2019.
[20] Tolhurst K, Shields B, Chong D. 2008. Phoenix: Development and Application of a Bushfire Risk Management Tool. Australian Journal of Emergency Management, The 23:47-54
[21] Quantifying Major Bushfire Consequences. Bushfire and Natural Hazards CRC 31st January 2020.

The fire consequence values in the Ausgrid service region is shown in the following figure.

Figure 6: Fire Cost of Consequence Map



6.1 Safety Consequences

The safety component of the fire risk values should be adjusted to align with the safety value metrics in Section 4.1. This can be done by using the raw quantities of injuries forecast and multiplying these by the appropriate safety severity risk value. The safety component should be multiplied by appropriate GDFs.

6.2 Property Damage

Property damage values (house loss) associated with fire spread and consequence modelling are used without any changes. A value of $618,538[22] per building is used which corresponds to the average reconstruction value of a residential building (structure and contents).

6.3 Environment Damage

Environment damage values associated with fire spread and consequence modelling are used without any changes. A value of $10,722[23] per hectare of plantation destroyed is used which corresponds to the cost of the loss due to fire and the cost to clear and re-establish the trees.

[22] Derived using index value as at June 2022
[23] Derived using index value as at June 2022

6.4 Other Consequences

The Project IGNIS report outlined a number of other factors to be considered as part of bushfire modelling which Ausgrid have chosen not to include at this time. Some of these factors include:

- Livestock;
- Horticulture, crops and pastures; and
- Firefighting costs.

Also excluded was the factor relating to power line damages as this was assumed to be damage to Ausgrid assets and captured within other metrics.

7 Customer Experience

Ausgrid uses this metric for ICT and Transformation purposes. This metric is not used for asset decision making purposes.

The AER published their final decision on the Customer Service Incentive Scheme (**CSIS**) in July 2020. The CSIS encourages Ausgrid to engage with its customers to identify the customer services they want improved, and then set targets to improve those services. The CSIS provides a reward for improving customer service, or penalties if service deteriorates.

The scheme requires that performance parameters for customer service, and the associated financial component, be developed through engagement with customers. The CSIS places a cap on the incentive and penalty that can apply in any year to ±0.5% of the annual revenue, or circa ±$7m. It is therefore reasonable that the value dimension should not exceed this quantum. This value metric is considered a future improvement and requires engagement with customer groups.

The value metrics for customer experience (**CE**) include:

1. **Time to Resolution** to represent the costs associated with the customer time to resolve an issue.
2. **Time to Obtain Information** to represent the costs associated with the customer time to obtain information.

7.1 Time to Resolution

The customer value of time to resolve an issue is calculated using:

$$Value\ of\ CE_{Resolution\ Time} = Customer\ Time(mins)\ \times\ 75\%\ \times\ VCR$$

The value of VCR is discounted to reflect that some resolutions are not related to loss of supply such as a branch on the line.

7.2 Time to Obtain Information

The customer value of time to obtain information is calculated using:

$$Value\ of\ CE_{Obtain\ Information} = Customer\ Time(mins)\ \times\ 50\%\ \times\ VCR$$

The value of VCR is discounted to reflect that some information requirements are not related to loss of supply such as the time for vegetation management.

8 Direct Financial Costs

The value dimension of Direct Financial Costs quantifies the costs to the network that occur as a result of an asset failure that are not included within any other value dimension (i.e. excluding environmental remediation and fines, etc.).

The value metrics for direct financial costs include:

1. A **Reactive Replacement Premium** to represent the additional costs incurred to replace an asset reactively after a failure relative to a planned replacement, including overtime costs and productivity costs due to diverting resources from other tasks;

2. **Asset Repairs** to represent the cost of repairing assets after failure;

3. **Investigation Costs** to represent the cost of investigating the cause of consequences after-the-fact. At this point in time Ausgrid is not incorporating this metric; and

4. **Litigation Costs** to represent all legal costs, including court ordered payments, that may result from an asset failure and consequences that resulted from the failure. At this point in time Ausgrid is not incorporating this metric.

Some financial costs relating to the network are excluded to avoid double counting. This includes payments related to regulatory incentive schemes.

The value of financial risk consists of multiple components, some of which are closely linked to other value dimensions (for example, litigation costs are higher for severe fires compared to minor fires). Most of the individual value metrics are calculated for five severity levels, with the remainder having a single fixed value (such as the reactive replacement premium, which can be assumed as a single value that is independent of the failure mode or any other consequences). For those with multiple severity levels, the model framework defines/calculates the probability of each severity occurring, which is outside of the scope of the value framework.

8.1 Reactive Replacement Premium

The reactive replacement premium is based on the additional costs incurred to replace failed assets reactively. This considers:

- After hour callouts and overtime rates payable;
- Productivity loss due to diverting staff from planned works;
- Allocation of the annual cost of retaining on-call or reserve staff for emergency response ;and
- Allocation of the cost of equipment and spare parts kept at depots or stores for emergency response.

If a reasonable estimate of the above costs can be calculated for an asset class, this should be used. If an estimate cannot be calculated a value of 17% of the planned replacement unit rate should be used, which was calculated using average resource impacts across all programs.

For forecasts, reactive replacement premiums can be inflated using a network cost growth rate that is consistent with other forecasts and/or parameters used for regulatory forecasting purposes. If available, different escalation rates can be applied to the materials, labour and other cost components as appropriate.

8.2 Asset Repairs

Repair costs are based on current unit costs for repairs of assets. A combination of historical costs and bottom-up cost analysis, including procurement and labour rates, is used depending on what is available. Repair costs will differ depending on the type of failure that has occurred so are calculated on a failure mode basis rather than a single value per asset. Repairs will only be applicable for a sub-set of failure modes. If unit rates are not available, the rate is calculated from a sample of recent historic repairs.

For forecasts, asset repair costs can be inflated using a network cost growth rate that is consistent with other forecasts and/or parameters used for regulatory forecasting purposes. If available, different escalation rates can be applied to the materials, labour and other cost components as appropriate.

9 Investment Benefits

The value dimension of Investment Benefits quantifies avoidable costs associated with replacing a degraded asset with a new equivalent or other benefits resulting from undertaking the investment.

There are two value metrics used for investment benefits:

1. The **Avoided OPEX** to represent a reduction in the annual OPEX cost of an asset (e.g. reduced maintenance needs) after a degraded unit is replaced with a new equivalent. This could also include annual OPEX (e.g. improved labour productivity) resulting from having the new asset installed and operating on the network.

2. **Other Productivity Benefits** to represent a broad range of benefits that may be realised due to technological improvements or opportunities to augment the network during replacement at low incremental cost. These benefits are to be calculated on a case-by-case basis.

The value of investment benefits is summarised as a single value that is calculated for each asset unit in the network, based on the unique characteristics of each asset unit. This differs to other value dimensions where values are calculated for multiple severity levels.

9.1 Avoided OPEX

Avoided OPEX is equal to the difference in average OPEX between a degraded asset and a new asset. In many instances, the OPEX for a new asset is zero (for example, below ground pole inspections and maintenance is typically zero for the first 15 years of life).

$$Avoided\ Opex = Opex_{Condition=i} - Opex_{Condition=0}$$

The value of OPEX is calculated from historical actual expenditure at the asset class level, with condition as a parameter. For simplicity, OPEX may be at a low rate below a certain condition/age and at a higher rate above that condition/age. The rates across both time periods are still be derived from historical data.

For forecasts, the value of avoided OPEX can be inflated using Ausgrid’s internal operating cost adjustment factors.

9.2 Other Productivity Benefits

Other benefits represent a broad range of benefits that may be due to technological improvements or opportunities to augment the network during replacement at low incremental cost.

Other benefits are to be determined/calculated on a case by case basis as appropriate for individual asset replacement projects.

10 Investment Costs

The value dimension of Investment Costs quantifies the actual expected costs associated with undertaking the investment. These costs could be funded under network CAPEX or OPEX.

There are three value metrics used for investment costs:

1. The **Activity Cost** to represent the CAPEX and OPEX cost of replacement, refurbishment or other activity applied to an asset under normal circumstances

2. The **Financing Rate** to represent the annual cost of financing the investment, measured as a percentage of the replacement cost

3. The **Investment Lifetime** to represent the length of time the activity applied to the asset is expected to remain useful for

These three value metrics are combined to calculate the annualised cost of the asset replacement. The annualised cost of asset replacement is outside of the scope of the value framework.

The value of investment costs are summarised as a single value that is calculated for each asset unit in the network, based on the unique characteristics of each asset unit. This differs to other value dimensions where values are calculated for multiple severity levels.

10.1 Activity Cost

Activity costs are based on current unit rates for each activity that can be applied to an asset. Some activity types, such as repairs, will only be applicable for a sub-set of asset/sub-asset classes. If unit rates are not available, the rate is calculated from a sample of recent historic activities. Some of the key asset related activity types are provided in the table below.

Table 5: Activity and Associated Expenditure Type Details

Activity Type	Expenditure Type	Description
Asset Planned Maintenance (e.g. Asset Inspection)	OPEX	Work associated with undertaking planned assessment of asset condition. This category includes testing and measurement and all routine visual inspection tasks designed to identify corrective issues and are carried out in a repetitive manner.
Asset Preventative Maintenance	OPEX	Asset treatments undertaken generally in conjunction with inspection, testing and condition monitoring (i.e. Planned Maintenance) and includes activities such as lubrication and exercising of moving parts.
Non-Direct Maintenance	OPEX	Work associated with enabling plant, tools and equipment that is used to support the delivery of the different asset maintenance activities defined above.
Asset Re-inspection	OPEX	Work associated with undertaking a planned maintenance activity with a reduced period than would be expected by the wider population of assets
Vegetation Maintenance	OPEX	Ausgrid's largest maintenance activity which includes identifying, scoping and undertaking proactive vegetation cutting to maintain safety clearances from electrical assets.
Asset Repair (Corrective Maintenance)	OPEX	All work associated with correcting defects that have not yet resulted in an asset 'breakdown'. Corrective maintenance is undertaken when assets fail to meet the threshold criteria set to enable it to remain in working order until the next planned maintenance cycle. These tasks are generally driven from the results of the inspection, testing and condition monitoring process.

Activity Type	Expenditure Type	Description
Asset Modifications / Design Changes	OPEX / CAPEX	Minor changes to the design of an asset to maintain or improve asset functionality.
Asset Damage due to third party	OPEX	All work associated with an asset that has ceased to perform its intended function due to factors beyond the design capability of the asset (e.g. digging into underground cables or a car hitting a pole causing asset malfunction). These failures cannot be managed through normal maintenance activities and may be carried out under emergency conditions.
Asset Damage due to Nature Induced Breakdowns	OPEX	All work associated with an asset that has ceased to perform its intended function due to factors beyond the design capability of the asset (e.g. animals causing asset malfunction or wind / lightning strikes). These failures cannot be managed through normal maintenance activities and may be carried out under emergency conditions.
Asset Fault and Emergency Breakdown	OPEX	All work associated with an asset that has ceased to perform its intended function (excluding nature induced breakdown and repairs due to third party damage).
Asset Replacement Planned	CAPEX	Work associated with replacing an asset with a new asset under normal conditions
Asset Replacement Reactive	CAPEX	Work associated with the unplanned replacement of an asset with a new asset under emergency conditions.
Asset Refurbishment (Life Extension)	CAPEX	Work associated with refurbishing and/or extending the life of an asset
Asset Removal	OPEX	Work associated with the removal of an asset or assets that are no longer required on the network.

For the purpose of forecasting, activity costs can be inflated using a network cost growth rate that is consistent with other forecasts and/or parameters used for regulatory forecasting purposes. If available, different escalation rates can be applied to the materials, labour and other cost components as appropriate.

10.2 Financing Rate

The Financing Rate is the annual cost of the funds required for investment in the activity.

Ausgrid’s Weighted Average Cost of Capital (WACC) should be used as the financing rate, or more specifically the ‘Real Vanilla’ WACC. For regulatory risk modelling the WACC forecast should be the same forecast included in the regulatory submission. For other modelling the WACC forecast should be from the most recent regulatory determination.

The annual financing cost is the activity cost multiplied by the financing rate.

10.3 Investment Lifetime

Investment Lifetime is the length of time the activity applied to the asset is expected to remain useful.

For an asset replacement activity, this is the expected length of time the replacement asset will remain in service. This should align to Ausgrid’s standard asset lives and reflect historical data (adjusted for technological/material improvements) for existing assets.

For refurbishment/repair activities the investment lifetime is based on the life extension of the overall asset or the length of time until the activity is required to be repeated. This aligns with Ausgrid's historic data for similar activities undertaken historically.

Appendix A – Summary of Outcomes

The table following provides a summary of the value dimensions and metrics described in this document and serves as a reference point. Additional detail and context to these values can be found in the body of the document.

Table 6: Consolidated Value Dimensions and Metrics

Value Dimensions	Value Metric	Insignificant	Minor	Moderate	Major	Significant
Supply	Loss of supply	VCR ($ per kWh) for the relevant customer segment				
	DER Curtailment	Value based on AER's DER integration expenditure guidance note – June 2022				
Safety	Disability weighted value of life / WHS cost	$5,000	$15,540	$55,500	$1,530,000	$5,100,000
	Grossly disproportionate factor	2	4	6	8	10
Environment	Remediation cost (oil spill) water and land	$3,000 for water and land remediation				
	Greenhouse gas emission	$50 per tonne CO2 equivalent				
	Noise impacts	$15,430 per impacted house per decibel and $9,463 per impacted unit per decibel				
Fire	Safety consequence	See Safety Value Dimension				
	Property damage	$618,538 per building				
	Environmental damage	$10,722 per hectare of plantation destroyed (bio-diversity)				
Customer Experience	Time to Resolution	$Customer\ Time(mins) \times 75\% \times VCR$				
	Time to Obtain Information	$Customer\ Time(mins) \times 50\% \times VCR$				
Direct Financial Costs	Reactive replacement premium	Value based on a 17% margin on top of the equivalent planned replacement cost				
	Asset repairs	Value based on current unit rates, and / or historical repair performance				
Investment Benefits	Avoided OPEX	Value based on historical annual OPEX (e.g. maintenance) benefits achieved by an investment.				
	Other Productivity Benefits	Value based on the benefits associated with a particular investment (e.g. technological improvements to labour productivity).				

Value Dimensions	Value Metric	Insignificant	Minor	Moderate	Major	Significant
Investment Costs	Activity cost	Value based on the CAPEX or OPEX cost associated with the investment (e.g. asset replacement / refurbishment / other activity) under normal conditions.				
	Financing rate	Value based on the annual cost to Ausgrid of financing the investment, measure as a percentage of the replacement cost. Ausgrid's Weighted Average Cost of Capital (WACC) is used as the financing rate, or more specifically the Real Vanilla WACC.				
	Investment lifetime	Value based upon the investment lifetime[24].				

[24] Investment lifetime is the length of time the activity applied to the asset is expected to remain useful for.

Appendix B – Risk Appetite Statement and Value Dimensions

The value framework provides a translation of the Risk Appetite Statement (RAS) into value dimensions and metrics to support the determination of economic value. This translation is achieved via a mapping between the RAS risk themes and value dimensions as shown in **Table A1** below.

The RAS risk themes and the value dimensions are linked through either one or many causal links that result in the risk (or benefit) associated with the value dimension being triggered.

Table A7: RAS Risk Themes and Value Dimensions

RAS Risk Themes	Asset Management Objectives					Value Dimensions
	Safety	Reliability	Affordability	Sustainability	Returns	
1. Health and Safety	✓					• Safety
2. Customer	✓	✓	✓	✓		• Customer Experience
3. Reputation	✓	✓	✓	✓		• Not included for asset decision making
4. Protective Security	✓	✓	✓			• Supply • Safety • Direct Financial Cost
5. Environment				✓		• Environment
6. Regulatory & Compliance				✓		• Compliance
7. People - Conduct	✓			✓		• Not included for asset decision making
8. People – Workforce and Culture	✓			✓		• Not included for asset decision making
9. Network Operations	✓	✓	✓	✓		• Supply • Fire
10. Finance			✓	✓		• Direct Financial Cost • Investment Benefit • Investment Cost • Property Damage
11. ICT - Operations	✓	✓	✓	✓		• Not included for asset decision making
12. New Business Risk Seeking					✓	• Not included for asset decision making