# Attachment G - Detailed Basis of Estimates

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#### 1.1 Purpose

This document has been prepared for the Australian Energy Regulator (AER) to provide further information on the relevant cost estimates that have been included in the modelling for the Bushfire Risk Reclassification Contingent Project ("the Project"). The costs are shown and utilised within the document Attachment F – Cost Benefit Analysis – Confidential.

The Project costs are primarily for addressing vegetation treatment of:

- 7,508km of newly identified highest bushfire risk priority ("P1") zones across our network, of which
- 3,849 km has overhanging vegetation (based on LiDAR data capture).

#### 1.2 Cost changes in the vegetation management industry

Our economic assessment of vegetation cutting costs is based on existing vegetation contract rates with a trend factor applied. This trend factor is to account for expected price increases over the eight-year transition. The factor is derived from an independent assessment of Essential Energy's vegetation management costs and capturing industry trends - conducted **September 2024**.

The existing vegetation contracts will be renewed on or before **existing vegetation**. The outcomes from this market process have the potential to materially impact the vegetation treatment costs incurred by Essential Energy as part of this Project.

Essential Energy engaged a third-party independent consulting group, **sector** to assess the expected changes to vegetation management costs over the eight-year transition, in comparison to the existing contractor rates, that were struck in 2021.

The report highlighted key factors influencing costs within the vegetation management industry, including rising labour costs, inflation, energy prices, environmental factors such as climate change, as well as variations in cost based on geographic region.



See Attachment I – Independent Report on Vegetation Management Costs – Confidential.

#### 1.3 Contingency

Contingency for this Project has been calculated in line with guidance from the Association for the Advancement of Cost Engineering 96R-18 cost estimate classification system ("ACCE"). It has been applied only to those cost items where Essential Energy has limited control over the quantities, unit cost and/or complexity of the work. These items are:

- 1. Vegetation transition cutting -
- 2. Network outage costs -
- 3. Avoided SAPS (capex & opex) -
- 4. Additional digital data acquisition –

Figure 1 below provides a visual representation of the specific costs and the components within them that are uncertain, primarily outside of Essential Energy's control, and to which the relevant contingencies have been applied.

#### Figure 1: Breakdown of contingency calculation for costs with uncertainty



\*AACE - Association for the Advancement of Cost Engineering 96R-18 cost estimate classification system

#### 1.4 Vegetation transition cutting costs

## The primary cost model rates each VMA by CTS treatment complexity factors and extrapolates sampled unit rate costs based on these factors. The factors which are used to calculate the treatment complexity score for each VMA are derived from NEARA (digital twin) analysis of LiDAR data.

The factors used to calculate the complexity score for each VMA include, the length of vegetation corridor that needs CTS treatment (non-CTS length), the number of LiDAR points in CTS space (which is a proxy for vegetation volume to be removed), and the average tree height at the edge of the corridor. For more detail, refer to Attachment D.

it noes not account for the inherent uncertainty within the cost modelling. This uncertainty is addressed using contingency. As shown in Figure 1, contingency is applied to the quantity, unit cost, and complexity components of the vegetation transition cutting cost for this program.

Due to the age of the LiDAR data, there has likely been significant vegetation growth since the data was captured and thus an under-representation within the cost modelling of the vegetation volume; including density of vegetation to be removed and the length of a bay that needs treatment. LiDAR capture last occurred across various regions between 2014- 2021. The Mid-North coast data is from 2018.

Further, the cost modelling does not consider that some VMAs are highly inaccessible, increasing the complexity, and thus time to treat CTS. For example, in areas where an Elevated Work Platform (EWP) cannot provide access to the vegetation above the conductors, vegetation 'climber' crews are required to trim these trees.

Finally, due to the labour-intensive nature of scoping, it was only possible to sample 4 VMAs to predict the costs for the other 286 VMAs. Three of these sample VMAs sit at the lower end of the complexity scale (1-3) and thus their costs are likely unrepresentative of the higher complexity (4-10) VMAs.

Overall, the result is a contingency of **second** applied to the vegetation treatment cost, resulting in a total vegetation treatment cost of \$58.4M in capital expenditure over the eight-year transition.

#### 1.5 Vegetation maintenance costs

Following the initial vegetation cutting for this Project (as discussed in section 1.4) and achieving compliance, these newly identified highest bushfire risk areas will incur higher ongoing maintenance costs than was reflected in our 2024-29 forecasts. The newly identified P1 areas that will be CTS and need their vegetation corridors to be kept clear to a higher standard than previously, to comply with the P1 vegetation clearance standards. This means that the ongoing maintenance costs (opex) are incrementally higher because of the bushfire risk reclassification.

The incremental cost increase has been calculated as a proportion of the existing contracted cost to maintain these VMAs. This accounts for the additional work required to maintain the increased vegetation volume associated with the ongoing maintenance of the overhang space.

#### Each VMA has a historical contracted maintenance cost.

To account for phasing of the CTS vegetation cutting an annualised weighted additional maintenance rate was applied to all affected VMAs through the remainder of the project.

No contingency has been applied to this figure and the above methodology results in a cumulative maintenance cost of \$9.4M in operational expenditure over the eight-year transition.

#### 1.6 SAPS costs and avoided costs due to SAPS

Essential Energy can save on vegetation CTS cutting costs through the installation of SAPS which have already been funded in our 2024-29 regulatory Determination. Powerline removal, coupled with the provision of SAPS for each impacted customer, is not a practicable, prudent or efficient option to be deployed *at scale* given the 3,849km of powerlines in the new P1 areas identified as requiring overhanging vegetation requiring removal.

In the time between publishing Essential Energy's Draft Project Assessment Report and the Final Project Assessment Report, the Essential Energy Planning Team updated its analysis and has identified an additional 105 SAPS sites which are NPV Positive. The Draft Project Assessment Report identified 103 potential SAPS sites, and the Final Project Assessment Report identified a maximum of 208 potential SAPS sites. The resultant maximum impacted line length is 214km *if all projects were to proceed* and *all projects were in non-clear-to-sky locations*.

The driver for this increase in feasible SAPS sites was Essential Energy Network Risk Management approving the use of the updated bushfire cost-of-consequence values (the updated bushfire risk modelling) by the Essential Energy Planning Team within the SAPS assessment models.

Recent SAPS rollouts to date have shown that 31% of identified customers may agree to go off-grid and convert to a SAPS, and therefore we are assuming that we can install 64 SAPS to replace 66km of powerline.

We have calculated a cost of \$12M for the actual installation of 64 SAPS over the duration of the Project – this value has been calculated using the same methodology as used and approved in our 2024-29 determination, adjusted for the updated bushfire risk modelling. However, for the purposes of this Project and only capturing the incremental costs to Essential Energy, these installation costs are excluded. Although we have only confirmed funding for SAPS through to June 2029, for the purposes of this Project

we are anticipating that SAPS will continue to be funded in the 2029-34 regulatory period as part of our BAU. Thus we have excluded the full \$12M for 64 SAPS, rather than only \$5.6M which is the equivalent funding for 30 sites planned to be installed during 2024-29 for this Project.

When SAPS are installed and powerlines removed, there is an ongoing capital expenditure benefit relating to not having to replace the removed section of line, and in the case of newly P1 vegetation management areas, not having to establish clear-to-sky vegetation corridors. This is represented in the cost benefit analysis as avoided CAPEX due to SAPS installations.

Similarly, when powerlines are removed, so too is the obligation to maintain that section of line and the vegetation which surrounds it. This creates an operational expenditure benefit, which is represented in the cost benefit analysis as avoided OPEX due to SAPS installations.

The application of a 15% contingency for uncertainty related to quantities of SAPS being installed and powerlines being removed (rather than undertaking vegetation treatment), is primarily driven by the uncertain customer acceptance rates for SAPS instead of ongoing grid-connection and vegetation management. It does not include other uncertainties such as length of line to be removed for a SAPS installation or complexity of vegetation cutting avoided. The uncertainty regarding the quantity of SAPS being installed results in the estimated avoided vegetation treatment cost decreasing.

The total avoided costs due to SAPS installations are \$2.2M of avoided capital expenditure and \$0.8M of avoided operational expenditure over the eight-year transition.

#### 1.7 Network outage costs

Network outages are required for safe work near or around powerlines, in particular when vegetation is required to be cleared directly above a conductor. In some cases, the conductors also need to be brought to ground to safely complete the vegetation treatment and avoid asset damage.

These network outage costs are for Operations staff only. That is, the time the relevant depot's team spend planning the outage and holding the access permit (network supervision) on site for the duration of the outage. It does not include the vegetation team members or vegetation contractors who also work on the outages. The incremental costs associated with accepting network access requests, then writing and running a switching sheet in the control room have not been included either. In addition, there are instances where an outage is not possible, so other arrangements (and associated expenses) will be made to enable the use of live-line crews. There are also resources invested to manage complaints, obtaining notices of entry (including at times engaging the police) and managing incompatible tree removal refusals.

Network outage costs, as a category, are therefore the only item that includes overheads in this contingent project. It is reflective of the increase in the number of outages needed to complete this Project, as well as the increased level of business activities needing to be done across multiple areas of the business associated with increased levels of outages.

This cost item has been developed using the following methodology:

- The assumption was made that one outage per switching segment will be required in sections of the
  network which have been newly upgraded to P1. A switching segment is a series of bays that can be
  isolated from a single point.
- This result of this analysis was an expected 1,348 outages required to facilitate the CTS transition.

contingency applied (as per Figure 1) due to the uncertainty of vegetation density, length of the segment requiring CTS treatment, and how many outages will be needed for the contractors to undertake the work. Quite often the volume of vegetation clearing cannot be completed within the timeframe of a single day outage, and subsequent outages need to be scheduled. In addition, vegetation contractors do not undertake work if it is raining. The outage model does not account for outage rescheduling costs associated with wet weather.

This has led to a network outage cost estimate of \$9.3M over the eight year transition.

#### 1.8 Additional aerial and ground-based inspection assurance

During the proposed CTS transition program, the existing cyclic vegetation management program must continue in parallel. Additional assurance controls will be implemented to ensure both the cyclic cutting program and the CTS transition cutting program are both meeting the stated regulatory requirements and project performance milestones.

One of the assurance tools employed will be the use of specific aerial inspections, just like those used for Essential Energy's Pre-Summer Bushfire Inspections (PSBI). These will be conducted by a mix of drones and helicopters.

These aerial inspections will identify vegetation incursions in VMAs that are deferred due to the labour intensive nature of the high priority CTS work. Essential Energy needs to manage the bushfire risk to a level of 'So Far as Is Reasonably Practicable' (SFAIRP) in all VMAs whist the business is in a period of transition.

To ensure Essential Energy is managing network risk SFAIRP, we will prioritise the new P1 vegetation treatment. Current modelling highlights that the lower value work will be deferred sometimes, for example in P3 areas, due to the finite nature of the vegetation resource pool.

Some sites will be unable to be inspected aerially, and a ground-based crew with a drone is required to complete the inspection. An example of when this occurs, is on properties with livestock that are disturbed/spooked by helicopters.

There is no contingency applied to this cost item. The total capital expenditure is in the order of \$200k per year, so across the transition period this extra cost is \$1.6M.

#### 1.9 Additional assurance from digital data acquisition

The second of the assurance tools during the period of transition is digital data acquisition to enable digital twin modelling of the risk associated with vegetation contacts. This will assist with the prioritisation of risk mitigation activities that are required to occur throughout the transition.

Risk analytics will be supported by strategic digital twin data acquisition at intervals throughout the transition. An interval approach will be used, with digital data acquisition occurring in year zero, year three and year six of the transition, to enable risk differentiators, such as growth rate and site access, to be monitored and treatment plans to be modified as necessary.



A contingency has therefore been applied to this cost item, for a total of \$6.4M in capital expenditure over the transition period.

#### 1.10 Internal labour

The transition cutting project will occur over an 8-year period and will be run separately but concurrently with the cyclical vegetation inspection and cutting program. Given the complexities and logistics associated with this Project, a small, dedicated team will be acquired to manage these works, and relevant information will be shared to ensure a coordinated approach with feedback loops and appropriate escalation of issues.

This will include five Technical Officers, one for each of the geographic network footprint areas to coordinate the delivery of outages and resolve complex customer interactions, as well as a CTS Vegetation

Planning Officer, a Vegetation Compliance Supervisor, a CTS Reporting Officer, an Environmental Specialist and a Communications and Stakeholder Engagement Specialist.

The five **Vegetation Technical Officers** are required to enable consistency across all roles and responsibilities within each Senior Program Supervisor's team during the CTS transition. These officers will be required to co-ordinate switching for CTS vegetation clearing. The role will also be responsible for generating and executing Notice of Entries for their respective geographical area. The Technical Officer is responsible for facilitating liaisons with third parties such as the National Parks and Wildlife Service, NSW Rail Authorities, etc.

In addition, it was evidenced in the VMA scoping data acquired in preparing this application, that the cost (and time) to *achieve* clear to sky vegetation removal is significantly greater than the cost to *maintain* CTS once it is achieved for the first time. In these new P1 areas, trees will be removed or trimmed to a much greater extent than Essential Energy has previously needed to. As a result, customers will require additional engagement and property owner's queries and complaints will increase. This role will be critical in maintaining Essential Energy's social licence on the ground throughout the vegetation transition.

The **CTS Vegetation Planning Officer** role is accountable for developing, maintaining and communicating the annual program schedule, specifically alignment of the clear to sky program with the current vegetation treatment cycle. This role is the conduit between the regional operations team (who undertake planned asset works) and the vegetation team, to ensure synergies when planning vegetation and asset outages. It plays a key part in reporting emerging trends, making risk-based recommendations and adhering to program governance requirements.

Further, the role is critical for collaborating with external stakeholders to identify where there may be significant customer discontentment with vegetation removal. This early identification will allow program re-scheduling where possible, to build social licence and enable additional community engagement. This will minimise the delivery risk to the overall program whilst ensuring customer expectations are met.

The **CTS Vegetation Compliance Supervisor** role is responsible for managing the Program Compliance & Vegetation Customer and Stakeholder team. The role will be pivotal to ensure contractual compliance is not only met but exceeded. By focusing on improved customer outcomes, during this period of change, the role will guarantee that our operations align with new bushfire ratings.

Additionally, this position is important in implementing initiatives stemming from the tree investment model (giving back trees in communities to offset tree removals). This role has a focus on developing Memorandums of Understanding with Councils, National Parks, and the NSW Police to accommodate inconsistent processes within the various agencies and explain why new areas are required to comply with CTS standards. This will foster stronger partnerships and collaboration during the transition.

This role will be instrumental in ensuring appropriate safety performance both internally and externally throughout the period of change.

The **CTS Reporting Officer** is responsible for enabling the CTS program completion, quality & financial reporting. The role manages and monitors expenditure against the program. This includes accurate and transparent cost capture, data cleansing, trend analysis and reporting of the CTS CAPEX alongside the cyclic vegetation OPEX. The accuracy of this data is necessary for our annual regulatory reporting to the AER.

Financial and performance data will be flowing in program and the cyclic program, both of which require reporting and governance throughout the transition.

These reports will be required by external stakeholders such as the Independent Pricing and Regulatory Tribunal (IPART), as well as variations of the report required for internal management. The data will also be used in our annual regulatory reporting to the AER.

The **Environmental Specialist** role is responsible for facilitating the environmental impact assessment process and co-ordinating the environmental / heritage assessments and approvals to support the additional tree removals and trimming required to achieve P1 compliance in the new P1 areas. Ecological

assessments are needed in all bays where three or more trees require removal. For the CTS transition it is estimated that 49 ecological assessments will be required across the transition period.

An Aboriginal heritage / archaeological assessment will also be required in VMAs that are transitioning to P1. The Environmental Specialist role will be responsible for evaluating the level of existing disturbance and landscape characteristics that may indicate the likely presence, or absence, of Aboriginal objects. Further, if any scarred trees (separate to Aboriginal objects) are recorded at or near the proposed tree removal sites then a more comprehensive assessment of the most appropriate network solution must be developed.

The Environmental Services team has two FTE resources dedicated to ensuring Essential Energy's statutory obligations relating to environmental impact assessments (EIAs) and approvals are met across the business. Currently, these two resources are almost entirely committed to supporting the EIA and approval process for a dozen or so major complex connections (i.e., major projects) to our network.

With **Sector and additional complex connections already in the pipeline over the coming five to ten** years, Environmental Services is currently seeking approval for an additional resource to assist with resourcing this expected workload, as well as meeting BAU EIA and approval requirements. Given the scale and complexity of coordinating the EIA and approval process for this Project, another (fourth) dedicated FTE will be required to adequately resource this Project.

The **Communications and Stakeholder Engagement Specialist** is required to successfully deliver the Communications and Stakeholder Engagement Plan for the Project, ensuring effective proactive engagement with external stakeholders throughout the duration of the transition program.

At a high level the role is critical for ensuring that: stakeholders are informed and consulted about the CTS program objectives, scope, benefits, risks, and impacts; stakeholders have opportunities to provide feedback and input into the decision-making process; stakeholders' concerns and aspirations are acknowledged and addressed in advance where possible; staff and contractors are trained and supported to deliver the program successfully; and, the CTS program customer metrics are measured and evaluated against the program goals and stakeholder expectations.

This role is responsible for all proactive communications to external stakeholders including local councils, MPs, local land users, environmental advocates and other community groups with an interest in the Project. Further community engagement is expected to be required in areas with significant change in prioritisation, including community forums and the development of project-specific collateral including brochures, local radio communications and social media content to be rolled out in the new P1 areas.

Essential Energy currently has four FTE resources in the Community Relations function, with those resources wholly committed to supporting the organisation's BAU operations across our network footprint - an area approximately three times the size of Victoria. This includes support for planned and unplanned outage works, the management of escalated complaints, media relations and a range of other issues that are technically or procedurally complex.

The project-specific resource would ensure stakeholders across the network receive a consistent experience regarding the changes to vegetation management and CTS, and that any engagement lessons can be appropriately captured and improvements implemented for continuous improvement throughout the life of the program.

The forecasted cost of

the above roles over the transition period is \$13.7M in capital expenditure.

#### 1.11 Environmental assessments

The environmental assessment costs are made up of ecological assessments and Aboriginal heritage assessments.

The upgrade of 7,508km of network to P1 compliance will require tree removals. Where considerable tree removal outside the previously cleared powerline corridor is required, an EIA will need to be prepared to meet statutory obligations.

The EIA, most likely in the form of a Review of Environmental Factors (REF), often needs to be supported by an ecological impact assessment. The requirement for an EIA is in bays where three or more trees require removal.

Aboriginal heritage assessments, including engaging an archaeologist and potentially members of the Aboriginal community, will be needed where vegetation clearing is required in culturally significant areas.

There is no contingency applied to the environmental assessment costs which comprise ecological assessments and Aboriginal heritage assessments. The total capital expenditure budgeted for over the transition period for this cost item is \$2.3M.

#### 1.12 Other third-party costs

There are third party services needed to complete this work. Essential Energy has already incurred some fees, and over the course of this Project there will be a requirement for further third-party assistance.

To date these costs have included legal advice to modify existing vegetation contracts so the clear to sky vegetation treatment could begin in FY25, compliance reviews of the Final Project Assessment Report and the Contingent Project Application, and the independent industry review of vegetation management

There are also changes needed to third party IT systems to enable vegetation contractors to capture the CAPEX CTS costs of this Project separately to the cyclical vegetation management costs which are classed as operating expenditure. Essential Energy will incur costs to complete these system changes.

The upcoming vegetation contract renewals process will require additional assistance due to the complexity with the clear to sky transition work alongside the cyclic vegetation program. The completion of this bushfire priority zone transition will require vegetation resources, skill sets and specialised equipment that are unprecedented. It is imperative that our contracting partners find Essential Energy easy to do business with and positive business relationships are fostered. Essential Energy is seeking to build sustainable and fair relationships with our vegetation contractors to foster retention and ensure the vegetation program schedules negotiated with contractors, are appropriate and achievable.



There are also community relations initiatives already underway to enhance the social licence for this Project. Essential Energy is starting to work with community groups and is providing sponsorships to organisations such as Landcare in these project locations.

The total capital expenditure budgeted for this category of cost is \$0.5M over the transition period. We consider that this value over the duration of the Project, is a reasonable estimate of forecast costs for third-party assistance.

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