

Unit Cost Methodology & Estimation Approach 2020-25

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1. Introduction

The purpose of this document is to inform stakeholders regarding the Unit Cost and Estimation Methodology prior to Energex and Ergon Energy Network submitting the 2020-25 regulatory proposals to the Australian Energy Regulator (AER) in January 2019.

The details contained in this document are based on the information available at the time of publication and reflect an aligned unit cost and estimation methodology across the Energex and Ergon Energy Network distribution networks following the establishment of Energy Queensland Limited (Energy Queensland).

The Estimation Systems used by Ergon Energy and Energex provide the business with an ability to estimate the resources required to do work. Estimates are used by the business to forecast resource requirements (Materials, Labour and Contract), as well as enable the management of project costs throughout the program and project lifecycles. Specifically, the Estimation System is a key enabler of the following activities:

- Strategic forecasting of resource requirements;
- Tactical forecasting and resource scheduling;
- Project delivery;
- Investment approval and financial options analysis; and
- PoW reporting.

The Estimation System must cover a wide range of projects from high volume, short cycle, low cost or standardised projects; too low volume, long duration and high cost and complexity.

The Unit Cost and Estimation Methodologies provide the business with the means to use and maintain the Estimation System.

2. Unit Cost Methodology

The Unit Cost methodology utilises quantiles of units delivered (physicals) and the total cost per units delivered (contract, materials and labour) to derive an average Unit Cost.

Unit Costs are created based on the best estimate of resources to deliver a task based on known costs and work practices. The initial estimate is improved over time based on actual cost and changes in work practices or other input costs. The goal of the Unit Rates methodology is to establish the efficient cost of delivering work.

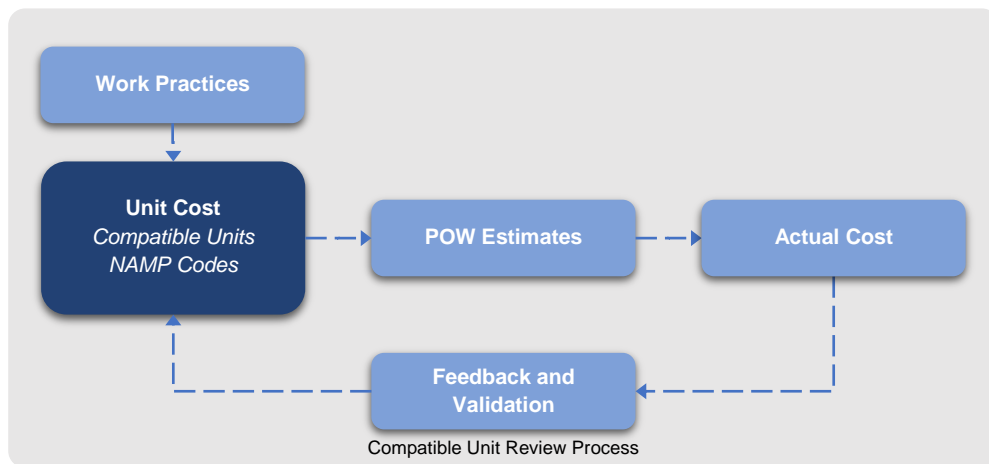


Figure 2-1 Unit Rate Feedback process

The Estimation System uses two types of unit costs, NAMP unit costs and Compatible Unit (CU) unit costs.

2.1 NAMP unit costs

Programs of work that are the same or similar in nature and repeatable are typically combined under a common Network Asset Management Plan (NAMP) code. Opex and Capex planned programs of work are developed using specific NAMPs or multiple NAMP products and utilise the NAMP Unit Costs to develop forecast budgets by program.

NAMP Unit Cost performance is measured over budget periods and analysed;

- To determine the effectiveness of efficiency measures introduced as part of operational continuous improvement processes,
- to assess cost impacts due to changes in network engineering standards or operational work practices and;
- to determine other Area specific operational constraints (e.g. due to rural or remote geographical operations).

In addition, NAMP Unit Cost performance is reviewed annually in conjunction with multiple subject matter experts to better understand, isolate and treat cost drivers that can include;

- accuracy of materials usage;
- equipment usage;
- ancillary contract usage (traffic control, earthing, vacuum excavation)
- impacts of program optimisation (batching and bundling);
- crew structures and supporting Fleet (optimal crewing);
- physical location of the work (travel and accommodation impacts);
- network drivers (network access issues);
- internal versus external resources used to deliver the work;
- safety standards changing work practices;
- changes in construction standards.

Identification of specific drivers of cost may then form part of continuous improvement programs to further identify and refine opportunities to improve efficiency and reduce program delivery costs.

Where new NAMPs are developed, and no historical data is available to inform the unit cost to complete the works, subject matter experts are used to advise on the estimated costs to complete those works. These new NAMP products form part of the cyclical review program.

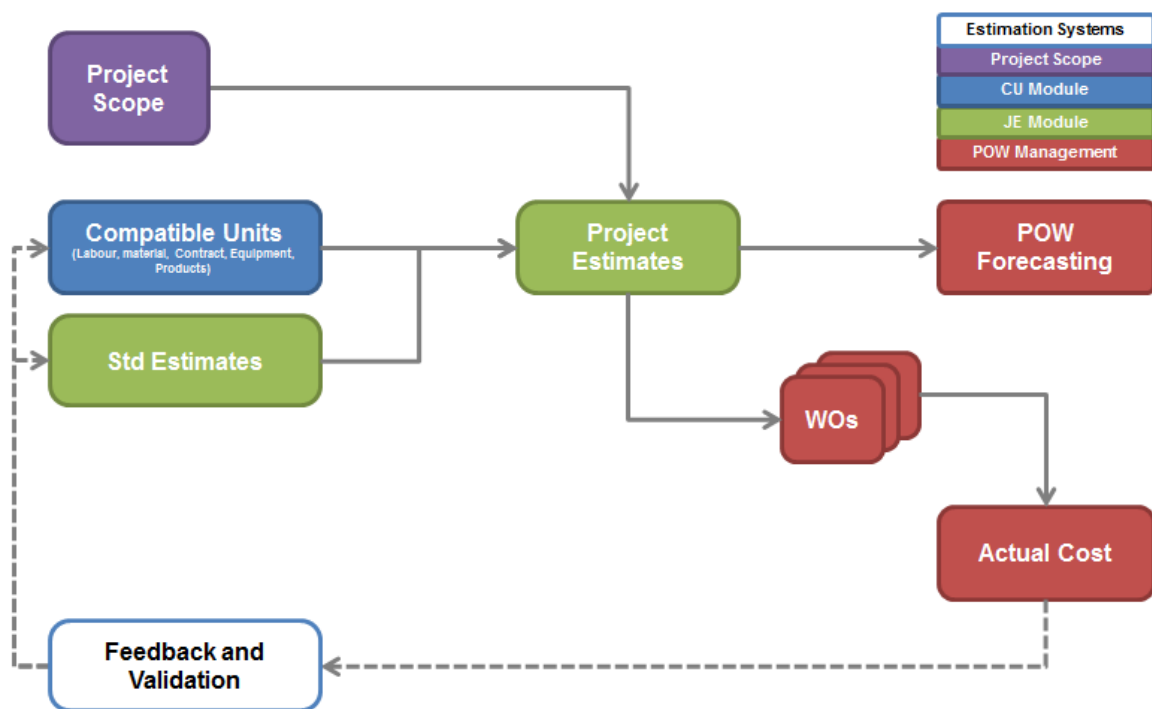


Figure 2 – Project/Program Build and Review Macro Process

2.2 Compatible Unit (CU) Costs

A Compatible Unit or “CU” is the base unit used for the quantification of labour, materials or contract costs in the Compatible Unit Module within the Ellipse Estimation system. CUs form the foundation for forecasting the amount of labour, materials and contract resources required to undertake a specific task.

CUs have been specifically developed to enable:

- The efficient update and maintenance of the estimation system, whereby compatible unit update or maintenance automatically reflects in any subsequent compatible unit where it's used.
- The efficient production of network project cost estimates whereby a first principle approach is not required every time an estimate is produced by including all required labour, material and contractor allocations without the estimator needing to individually specify every material item required or have detailed knowledge of the labour requirements for each resource type required to undertake the works.

To maintain currency, CUs are reviewed based on a range of triggers that include:

- Ad-hoc reviews requested by stakeholders;
- Periodic reviews such as annually or quarterly. These would typically reflect overhead and on-cost rate change requirements for forthcoming financial year, or identified quarterly changes in trends associated with unit rate types of work;
- Changes driven by work practices, contract or materials impacts; and
- Improvement opportunities identified through estimate accuracy reporting
- Strategic Review Programs i.e. implementation of new ERP/EAM solution.

3. Estimation Methodology

3.1 General

The Estimation Methodology is how the Unit Rates discussed above are collated and submitted to the POW through a combination of Standard Estimates, Project Estimates and Standard Jobs. Each method is set out below.

3.2 Standard Estimates

A **Standard Estimate** is created from a range of standard network ‘building block’ type constructions. A Standard estimate at minimum includes an appropriate work breakdown structure, estimated direct labour and other known materials costs inclusive of on-costs depending on intended use. Standard estimates exclude cost of borrowings, unknown costs and uncertainty allowances. There are three distinct types of standard estimates in use, which provide varying degrees of information dependent on type/purpose as follows:

- **Project Estimate template or proforma** – Standard estimates can be used during the creation of a network project cost estimate for commonly occurring works that often have considerable variation in components utilised and labour requirements. This is a “skeleton” or

“outline” which is designed to simplify estimate creation, improve efficiency and ensure consistency of compatible unit placement in an estimate by providing a structure for the application of appropriate compatible units. These are typically used as the starting point for AUGEX, CONNEX, and REPEX (excluding short cycle) project approval estimates.

- **Strategic or Routine project specifications** - In addition to a proforma that provides a structure, these standard estimates include compatible units (e.g. labour, materials, contractor, equipment and estimate model) representative of a specific project type. These are typically used for strategic estimates where a network building block style approach is undertaken, as well as for programs where routinely occurring project specifications associated with high volume, short cycle, projects. In these cases, a single estimate relates to a single project (e.g. a single project estimate for a specific NAMP line project).
- **Program development requirements** - produced for use where a unit rate type approach is utilised in the development of the program of work. Typically these are high volume short cycle projects or projects that are compiled from repeatable units such as NAMP line items. In addition, standard estimates are established where there is a requirement for “high level” compilations requiring a more granular quantification of materials and contractor costs in terms of total dollars and total labour hours (e.g. benchmarking, AUGEX, pricing model). These are repetitive in nature, typically required on an annual basis only and may not be directly associated with project or program of work deliverables, more utilised for cost modelling and forecasting. As such the estimate format may not require the same level of structure or detail as required for project delivery (e.g. work break down structure, specifically quantified materials). In many cases, a single estimate covers the entire program of work activities (e.g. a REPEX program estimate may include compatible units specific for each NAMP line item used in the program).

3.3 Project Estimates

Project estimates provide consolidation of all direct and known project costs and effort (e.g. collated labour hours, materials, equipment and contractor costs derived from compatible units utilised in an estimate) and, where appropriate, unknown costs and uncertainty (risk based) allowances as defined by the scope of works for the project at that point in time.

Estimate structure supports project delivery through provision of a configuration that groups labour, material and contract requirements reflecting logical allocation and sequencing associated with project delivery. This structure is defined via organisational business rules, controlled by the estimate authorisation process.

An estimate consolidates:

- Labour costs and associated effort in hours by resource type per defined task/activity.
- Material quantities and associated costs per defined task/activity, including physical count of NAMP line items as required.
- Contractor costs per defined task/activity dollar amount
- Equipment costs directly attributable to the project
- Financing Costs.

The estimated structure facilitates the delivery of work through grouping estimate components in logical separable portions that match the intended allocation of resources and sequencing. Project estimates progressively increase in detail and target accuracy for a given project as it progresses through the project delivery lifecycle.

	Estimate Type		
	Strategic Planning	Project Approval	Assurance Check
Level of Scope Definition	Low	High	Very High
Estimate Basis	Scope based on style of project.	Well defined scope, materials, labour, assessed method of delivery.	Design, materials, labour, actual method of delivery.
End Usage	Concept/Program Assessment.	Budget Approval.	Construction Approval.
Expected Accuracy	±40%	±20%	±10%

Figure 3 – Project Estimate Lifecycle

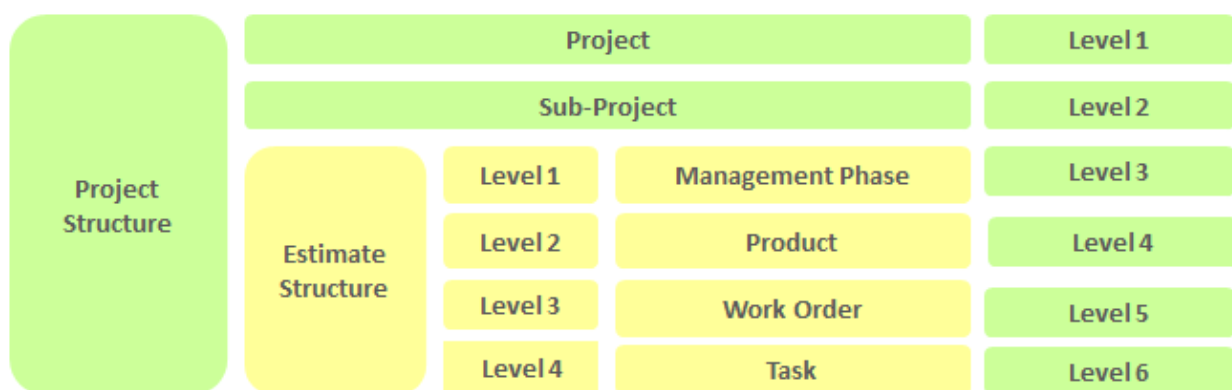


Figure 4 – Project & Detailed Estimate Structure

3.4 Standard Jobs

Repeated maintenance activities are programmed and initiated in Ellipse via maintenance scheduled task (MST). MST's range from periodic inspections to condition-based maintenance triggers across a wide range of network components and are often geographic or equipment specific.

Associated with each MST is a standard job, which includes a labour and contract estimate for the works triggered by the MST. There may be a one to one relationship between an MST and a standard Job, or many to one relationship, with many MST's associated with a single standard job.

Additionally, standard jobs may be used for capital works not triggered by a MST. These include high volume, low complexity frequently repeated standardised activities with single workgroup labour/contractor estimate requirements. In these instances, the use of a standard job to estimate the works and create works orders is the most efficient approach.

Note: Standard jobs do not contain materials. As required, these are estimated separately using appropriate compatible units in an associated estimate or are requisitioned directly from stores.

Standard jobs have been specifically developed to enable:

- The efficient initiation of works within the works management system for repeated activities undertaken by a single workgroup. In addition, updates or maintenance to the estimate requirements within a standard job automatically reflects in any subsequent work order where it's used.
- Direct creation of work orders and tasks, including associated work instructions, initiated by a MST for the activity.
- The provision of a 'template' of a work order and tasks, by recording the details of the tasks to be undertaken in a form that can be readily reproduced as often as necessary. This ensures the correct instructions are supplied with the job, including specific consumables requirement if any.

There are two key aspects associated with standard jobs which distinguish them from estimates:

1. Works orders generated from Standard Jobs include the details of the tasks to be undertaken, such as a work instruction regarding process steps associated with maintenance of a specific circuit breaker.
2. Standard jobs can only be used for the creation of a single works order, whereas estimates can be used to create as many work orders as required.

3.5 Feedback and Review

Project Estimates are reviewed through quarterly estimation accuracy reporting. This reporting provides feedback on the performance of the Estimation System to inform improvement programs.

Standard Estimates are reviewed on an as needed basis range of triggers that include:

- Ad-hoc reviews requested by stakeholders;
- Changes in construction standards or material contracts;
- Periodic reviews such as annually or quarterly. These would typically reflect overhead and on-cost rate change requirements for forthcoming financial year, or identified quarterly changes in trends associated with unit rate types of work;
- Changes driven by work practices, contract or materials impacts; and
- Improvement opportunities identified through estimate accuracy reporting.

Standard Jobs are reviewed annually as part of the NAMP review process.

3.6 Productivity and Efficiency Improvements

Energy Queensland has included a range of efficiency improvements in its proposals for the 2020-2025 regulatory period. This includes a 3% field productivity saving and a 10% indirect cost reduction. The combination of these efficiency savings will result in significant reductions in unit rates and project estimates in the 2020-2025 period. At this time, these efficiency gains have not been factored into forward unit rates, but this will be done each year prior to the formulation of budgets for the year ahead.

The 3% productivity saving is proposed to be achieved through the following initiatives:

- **ICT Programs**

These programs provide a platform to enable integrated systems across all regions, more responsive communication channels with customers and workers, using real time data to drive decisions, predictive analysis and performance. This will enable consistent processes for works management and in the field, plus it will reduce data processing and manipulation while providing consistent and rich performance information.

- **Process Changes** including

- A common operating model across the state,
- Centralised works programming coordinated with regional programming teams,
- Building collaboration across the State to enable coordinated resourcing decisions,
- Better program visibility and constructible work packages to support local scheduling decisions,
- Leadership development to enable greater support for front-line people.

The 10% indirect cost reduction is over and above the merger, savings achieved to date and these additional savings will be provided through further initiatives including:

- Process efficiency through ICT programs (in business cases),
- Harmonisation and process improvement,
- Purchasing better eg. contractors, fuels etc,
- Fleet efficiencies,
- More savings from current initiatives – eg. AP/AR,
- Ongoing structural efficiency eg management layers, span of control.