

# INDICATIVE TRANSMISSION AUGMENTATION COSTS IN VICTORIA

PREPARED BY: TRANSMISSION SERVICES

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FINAL

## Version Release History

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## 1 Assumptions and Caveats

These estimates are provided by AEMO to assist parties wishing to enter the connection process. AEMO is not obliged to provide this information; rather, it does so to assist connection applicants in the assessment of viability of their proposed connection to the Victorian Declared Shared Network (DSN).

### 1.1 Accuracy

As at the release date of this document, the estimates are considered accurate to  $\pm 30\%$ , with the exception of costs associated with transmission line diversion, site establishment, and SCADA. Each of these may be subject to greater levels of cost variation, and may lead to total cost variation exceeding  $\pm 30\%$ .

### 1.2 Application

The estimates apply to connections to either new terminal stations or existing terminal stations, where there is sufficient space and appropriate infrastructure to accommodate the required additional equipment (see Section 1.3.2 of this document).

### 1.3 Cost Components

The estimates include only the costs described in the following sections.

#### 1.3.1 Bay Costs

The bay costs used in these estimates include design, procurement, installation, project management, testing and commissioning costs for the relevant electrical plant as well as foundations/civil costs associated with the footprint area of the bay.

#### 1.3.2 Site Establishment

Site establishment costs cover the site costs over and above the bay costs for a new terminal station with an assumed site area (other than costs excluded under Section 1.4 of this document).

Site establishment costs include:

- earthworks
- surfacing
- earth grid
- drainage and cable trenches
- switchyard roads
- security system
- lighting
- fencing
- buildings
- landscaping
- AC and DC electrical supply systems
- secondary system panels.

It should be noted that the assumed site area is representative only. The site area required for specific projects will vary significantly and this is likely to increase the variability of total connection costs beyond the  $\pm 30$  % accuracy of the estimates.

### **1.3.3 SCADA**

The estimates include the minimum cost to establish the SCADA system components within a new terminal station. The estimates do not make provision for the widely variable range of external equipment that may be required for communication with other terminal stations (e.g. microwave towers or optical ground wire links).

### **1.3.4 Transmission Line Diversion**

The estimates include indicative, high-level costing for transmission line diversion. This work is expected to be carried out by the incumbent transmission asset owner. Diversion costs are dependent on a range of factors, such as location and the extent of protection works and communications upgrades required. These costs are highly variable.

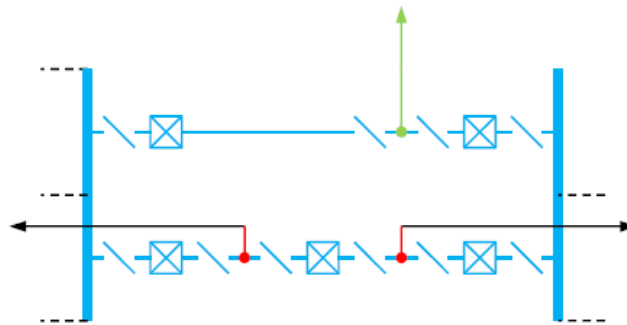
## **1.4 Exclusions**

The cost estimates provided do not include costs and charges other than those described in Section 1.3; however, additional costs and charges are expected to be associated with connections to the DSN. These additional, excluded costs are:

- land procurement costs;
- project finance charges;
- operation and maintenance charges following completion of construction;
- cost of additional works to meet unforeseen requirements or circumstances;
- unforeseen equipment price increases caused by equipment shortages or other external events;
- project delay costs;
- additional costs associated with construction at brownfield sites, such as access to equipment and rearranging assets;
- cost of engaging legal, technical and other advisers; and
- cost of compensation for reduction in the service reliability when an energised transmission line is taken out of service for the period of making a connection (i.e. outage rebates).

## 2 220 kV Connection Estimates

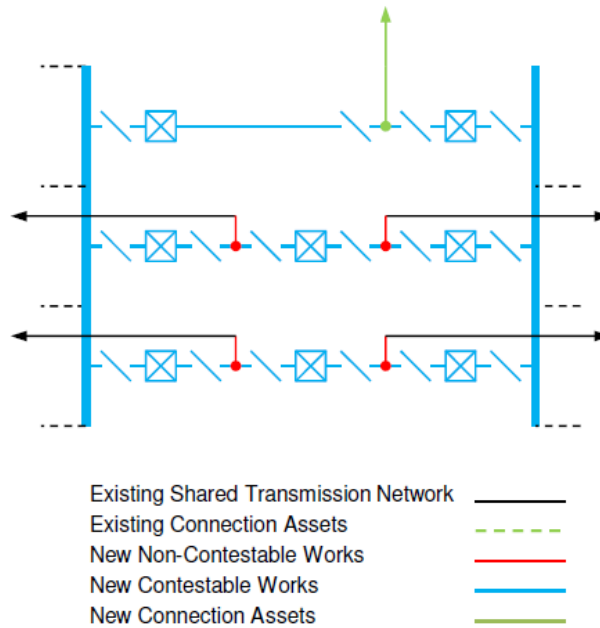
### 2.1 New Terminal Station – Single Circuit Connection



Item	Total Cost (\$ million)
220 kV 3 CB diameter bay with 3 CBs	3.2
220 kV 3 CB diameter bay with 2 CBs	2.4
SCADA	0.3
Site establishment (site area = 10,000 square metres)	9.6
<b>Total</b>	<b>15.5</b>

In addition to the costs in the table above, the cost of transmission line diversion for connecting into the terminal station could be in the range \$5–15 million.

## 2.2 New Terminal Station – Double Circuit Connection

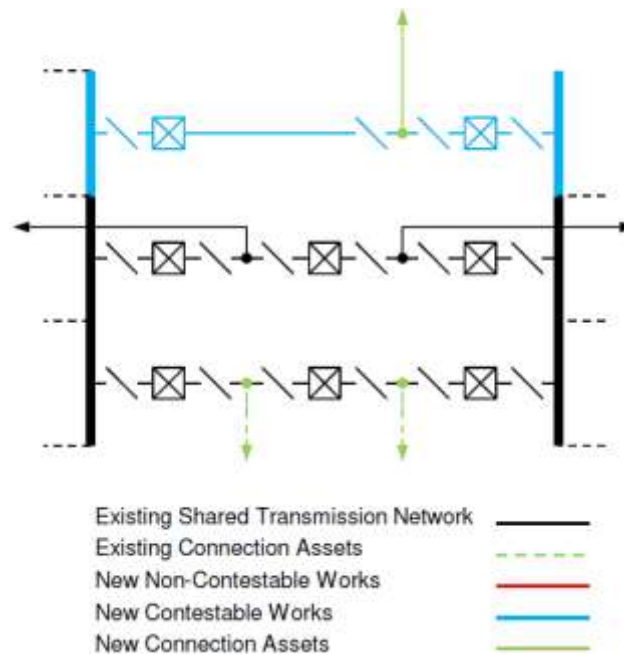


Item	Total Cost (\$ million)
220 kV 3 CB diameter bay with 3 CBs	6.3
220 kV 3 CB diameter bay with 2 CBs	2.5
SCADA	0.3
Site establishment (site area = 10,000 square metres)	9.6
<b>Total</b>	<b>18.7</b>

In addition to the costs in the table above, the cost of transmission line diversion for connecting into the terminal station could be in the range \$12.5–22.5 million.

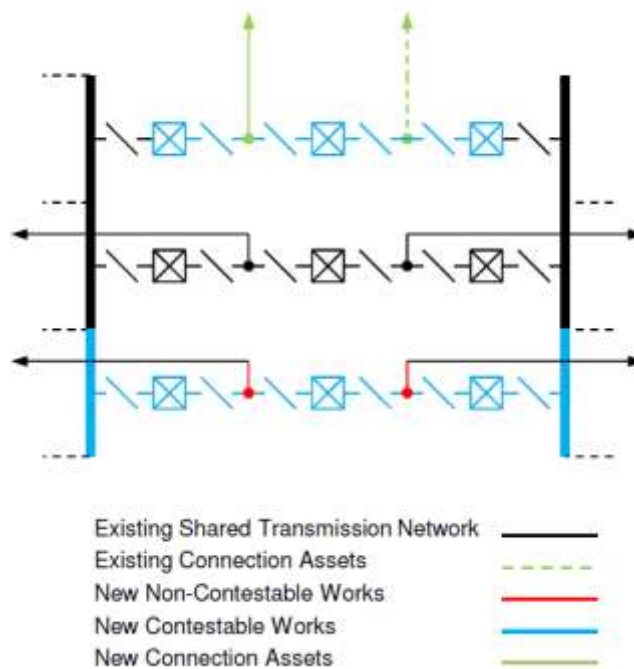


### 2.3 Existing Terminal Station Extension – Connection Only



Item	Total Cost (\$ million)
220 kV 3 CB diameter bay with 2 CBs	2.4
<b>Total</b>	<b>2.4</b>

## 2.4 Existing Terminal Station Extension – Single Circuit Connection

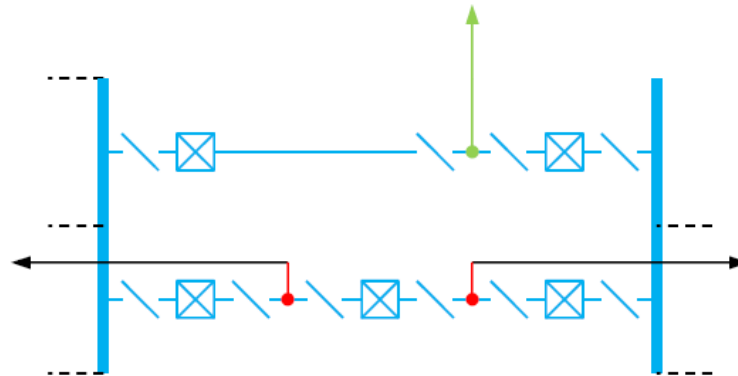


Item	Total Cost (\$ Million)
220 kV 3 CB diameter bay with 3 CBs	3.2
220 kV 3 CB diameter bay augmentation with 3 CBs	1.8
<b>Total</b>	<b>5.0</b>

In addition to the costs in the table above, the cost of transmission line diversion for connecting into the terminal station could be in the range \$5–15 million.

### 3 500 kV Connection Estimates

#### 3.1 New Terminal Station – Single Circuit Connection

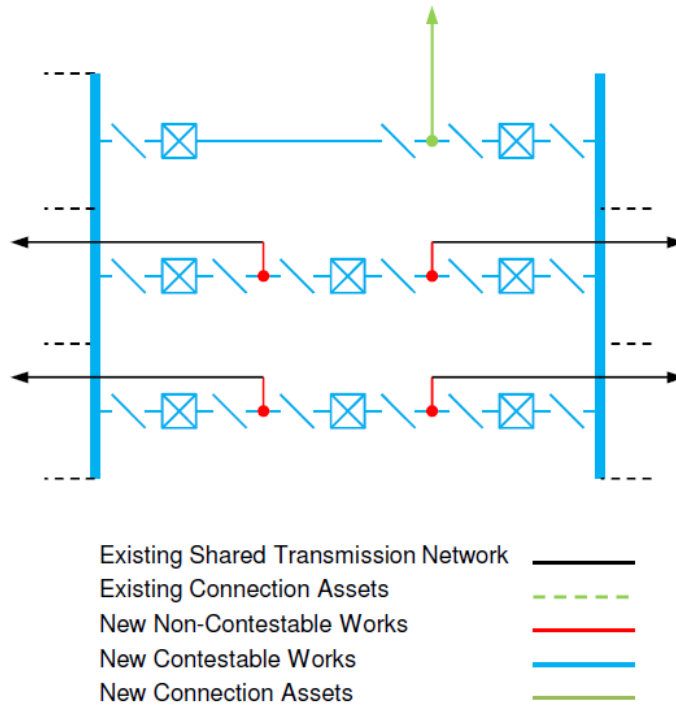


- Existing Shared Transmission Network —————
- Existing Connection Assets - - - - -
- New Non-Contestable Works —————
- New Contestable Works —————
- New Connection Assets —————

Item	Total Cost (\$ million)
500 kV 3 CB Diameter bay with 3 CBs	8.4
500 kV 3 CB Diameter bay with 2 CBs	6.9
SCADA	0.3
Site establishment (site area =25,000 square metres)	18.8
<b>Total</b>	<b>34.4</b>

In addition to the costs in the table above, the cost of transmission line diversion for connecting into the terminal station could be in the range \$15–25 million.

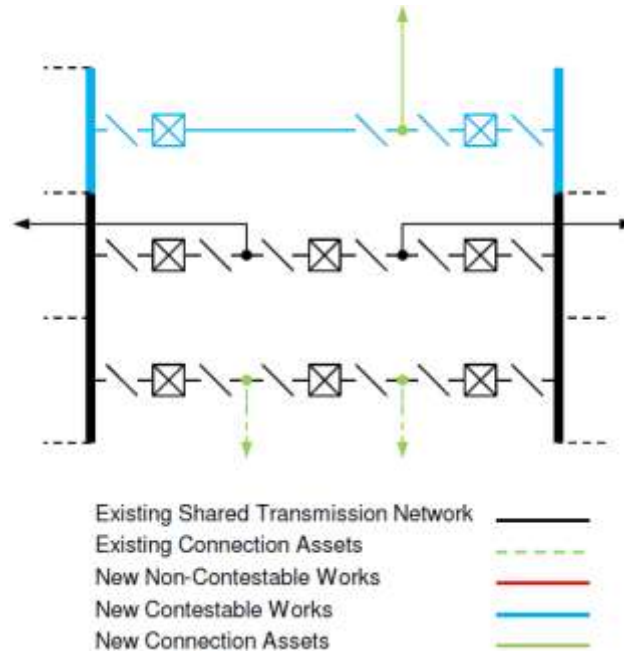
### 3.2 New Terminal Station – Double Circuit Connection



Item	Total Cost (\$ million)
500 kV 3 CB diameter bay with 3 CBs	16.8
500 kV 3 CB diameter bay with 2 CBs	6.9
SCADA	0.3
Site establishment (site area = 30,000 square metres)	21.9
<b>Total</b>	<b>45.9</b>

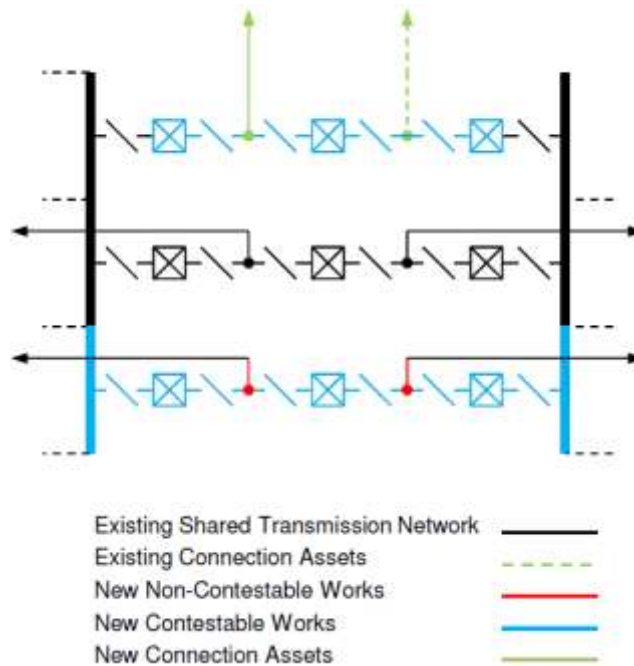
In addition to the costs in the table above, the cost of transmission line diversion for connecting into the terminal station could be in the range \$30–40 million.

### 3.3 Existing Terminal Station Extension – Connection Only



Item	Total Cost (\$ million)
500 kV 3 CB diameter bay with 2 CBs	6.9
<b>Total</b>	<b>6.9</b>

### 3.4 Existing Terminal Station Extension – Single Circuit Connection



Item	Total Cost (\$ million)
500 kV 3 CB diameter bay with 3 CBs	\$8.4
500 kV 3 CB diameter bay augmentation with 3 CBs	\$2.9
<b>Total</b>	<b>\$11.3</b>

In addition to the costs in the table above, the cost of transmission line diversion for connecting into the terminal station could be in the range \$15–25 million.