

# RIT-D: Dock Area zone substation

**Non-network options report  
Notice of Determination under clause 5.17.4(c) of the  
National Electricity Rules**

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# 1 Summary

This document is CitiPower's notice of its determination that there are no credible non-network options to the proposed works for Docks Area (**DA**) Zone Substation. CitiPower's determination is made under clause 5.17.4(c) of the National Electricity Rules and is published pursuant to clause 5.17.4(d). In accordance with those provisions, CitiPower will not be publishing a non-network options report in relation to the proposed works at DA zone substation.

In summary, our reasons for this conclusion are:

- DA zone substation cannot be retired without compromising the reliability of supply for those customers currently served by that zone substation
- there is no opportunity to reduce the required assets and associated works at DA zone substation by partially reducing peak load through demand management
- an embedded generation option would not be cost effective.

CitiPower will now prepare and publish a draft project assessment report in relation to the DA zone substation project.

Any questions regarding this notice or requests for further information should be directed to:

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Andrew Dinning

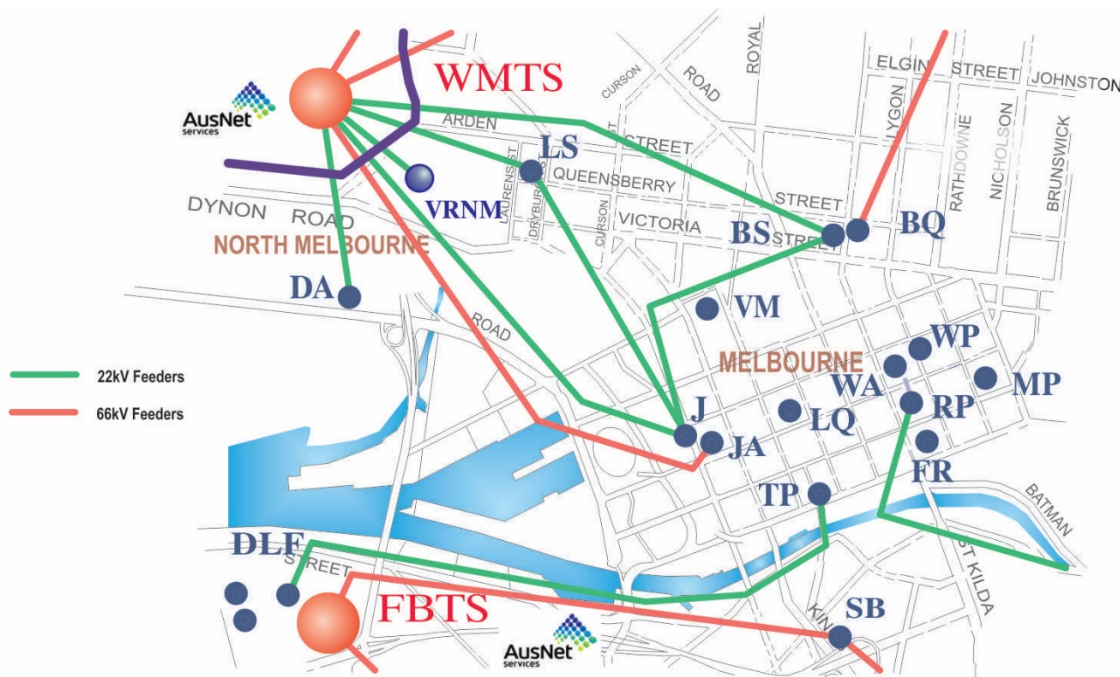
Powercor Australia Limited  
Locked Bag 14090  
Melbourne 8001

# 2 Identified need

The identified need is to maintain reliable supply of electricity to DA customers following the decommissioning of WMTS 22 kV assets.

CitiPower’s 22 kV sub-transmission network, which is supplied from the West Melbourne Terminal Station (WMTS) 22 kV System, includes zone substations at Bouverie Street (BS), Dock Area (DA), Spencer St (J) Lacons Street (LS) and a supply to Vic Rail (VR). The figure below shows the current WMTS 22 kV network.

Figure 2.1: Current WMTS 22 kV Network



CitiPower has a program across its network to replace the 22 kV sub-transmission network with a 66 kV sub-transmission network. This program is required because:

- many of the ageing 22 kV assets, including transformers and indoor switchboards are in poor condition
- some of the zone substations have secondary voltages of 6.6 kV, which limits network flexibility, has technical limitations and is inconsistent with the present 11 kV standard that applies in the CBD and inner suburbs.

In addition to the works required on CitiPower’s 22 kV network, AusNet Services’ WMTS redevelopment project is focused on rebuilding WMTS to address station assets that are ageing and in poor condition. Through joint planning, CitiPower and AusNet Services identified significant cost savings by coordinating and integrating the two projects. Specifically, decommissioning the entire WMTS 22 kV network would remove the need for AusNet Services to invest in any replacement 220/22 kV transformers and replacement 22 kV network equipment at WMTS.

Following the completion of a joint planning process, CitiPower prepared a detailed business case for its WMTS 22 kV decommissioning project, which was submitted to the Australian Energy Regulator (AER) as part of the 2016-20 revenue setting process. The AER accepted CitiPower’s options analysis and the forecast capital expenditure for the preferred option. CitiPower’s project includes works to decommission and replace the 22 kV assets at the following zone substations:

- Bouverie Street zone substation (BS)

- Laurens Street zone substation (**LS**)
- Spencer Street zone substation (**J**)
- Tavistock Place zone substation (**TP**)
- Dock Area zone substation (**DA**)
- VicRail North Melbourne customer substation (**VRNM**).

The target completion date for CitiPower's WMTS 22 kV decommissioning project is the end of 2020. This timeframe will enable AusNet Services to begin the retirement of 22 kV assets from WMTS.

There is now an increased urgency for the completion of the DA component of the works, due to interactions with the Victorian Governments West Gate Tunnel Project. This major infrastructure project involves road works in close proximity to the DA zone substation, which require CitiPower to accelerate the works at that zone substation. CitiPower is currently discussing safety and logistical issues with the project contractor as these issues have the potential to impact the site and works proposed. Any additional costs imposed on the works at DA will be funded by the contractor.

# 3 Key issues being addressed by the project

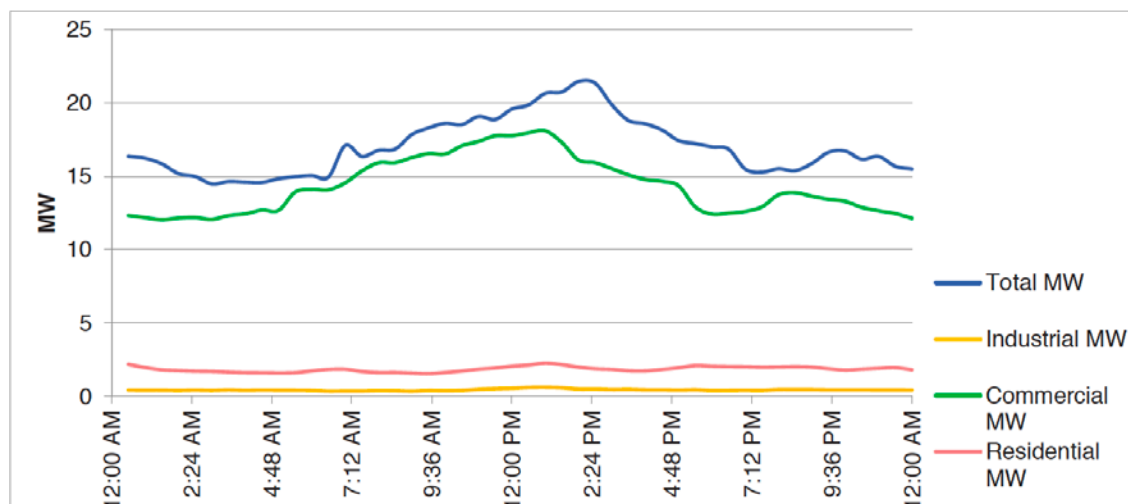
The transformers, circuit breakers, switchboards and associated equipment in the AusNet Services WMTS 220/22 kV switchyard and CitiPower’s 22 kV sub-transmission network supplied from WMTS are ageing and in poor condition. This leads to an increasing probability of asset failure which results in:

- deteriorating reliability performance, exposing customers to increased risk of supply interruption and higher costs
- deteriorating safety performance, putting at risk the health and wellbeing of the community and our staff
- increased risk of plant damage and environmental harm caused by asset failure
- increasing operating and maintenance costs.

As already noted, the proposed redevelopment of DA is part of the larger 22 kV decommissioning project that has been accepted by the AER as efficient and prudent.

The figure below shows the breakdown of peak day load at DA by industrial, commercial and residential customer sectors.

Figure 3.1: DA daily load profile



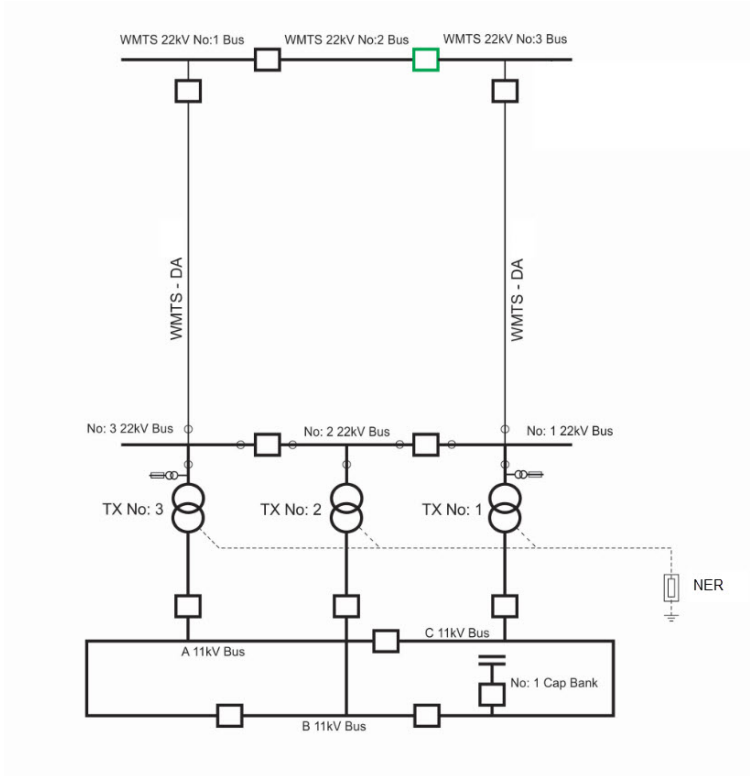
The load at DA is dominated by commercial customers, which include:

- Swanson Dock
- Channel 7
- Etihad Stadium
- Pacific National Melbourne Freight Terminal
- Citywide Waste Management
- Melbourne Flower Centre (Melbourne Markets).

CitiPower’s on-going engagement with customers indicates that maintaining current levels of reliability is a key consideration for them. This feedback is important in considering the feasibility of non-network alternatives to the proposed works at DA zone substation.

The figure below provides a screenshot of the Single Line Diagram (SLD) of DA ZSS.

Figure 3.2: DA zone substation Single Line Diagram



As shown in the above figure, the DA zone substation currently consists of the following primary plant:

- 3 x 10/13.5 MVA 22/11 kV transformers
- 3 x 11 kV buses
- 16 x 11 kV feeders.

AusNet Services' WMTS works will include converting the existing 22 kV bus to 66 kV, so that supply to the new DA ZSS will be at 66 kV only. In the context of the broader WMTS redevelopment, the asset condition and risk issues at DA require:

- replacement of the existing 3 x 10/13.5 MVA 22/11 kV transformers with 2 x 20/27 MVA 66/11 kV transformers
- redevelopment of the substation to an ultimate design rating of 100 MVA
- continuation of a reliable supply to customers throughout the construction period.

CitiPower is currently working with the West Gate Tunnel Project contractor to find the lowest cost option that addresses the needs of electricity customers in terms of the impacts of any future roadway on supply reliability. However, the final road design and location of DA zone substation does not affect the conclusion of this notice, which is that there are no credible non-network alternatives to the proposed works at DA zone substation.



# 4 Consideration of non-network options

In the case of the identified need at DA zone substation, we have concluded that there are no credible non-network options for the following reasons:

- DA cannot be retired without compromising the reliability of supply for those customers currently served by that zone substation
- there is no opportunity to reduce the required assets and associated works at DA by partially reducing peak load through demand management
- embedded generation would not be cost effective.

Our reasons are based on a consideration of the following characteristics of the supply arrangements at DA zone substation:

- significant industrial and commercial loads are currently served by DA
- the industrial and commercial customers currently served by DA have high expectations regarding the reliability of electricity supply
- there are no economic options to transfer load from DA to an adjacent zone substation or substations
- there would be a reduction in supply reliability and increase in risk if the proposed number of transformers at DA were reduced from two to one
- as explained in further detail below, the costs of embedded generation options exceed the cost of the preferred network option, and there is, in any event, limited availability of land for implementing a local generation option.

In considering the feasibility of generation options, CitiPower prepared an indicative estimate of the cost of a hypothetical stand-alone gas-fired generator that would provide a level of supply reliability comparable to the preferred network option. It was found that the high level annualised capital cost of a stand-alone generation option would be approximately \$3.1 million per annum compared to \$1.8 million per annum for the preferred network option.

In reaching this finding, CitiPower assumed that:

- the capital cost of gas fired capacity at a notional site near the existing DA zone substation site would be \$800 per kW including all civil works, gas supply and electrical connections<sup>1</sup>
- the total installed gas capacity required would be of the order of 48 MW (that is, 4 x 12 MW units)
- the economic life of the gas-fired plant is 30 years, compared to 45 years for the preferred network option
- differences between the costs of the generation and network options in terms of operating, maintenance, fuel and upstream network costs would be broadly comparable, and can therefore be excluded from the cost comparison.

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<sup>1</sup> In a June 2014 report to AEMO (titled Fuel and Technology Cost Review) ACIL Allen Consulting estimated the capital cost of large scale (530 MW) open cycle gas turbines to be \$725 per kW. Our estimate of \$800 per kW is for small scale (12 MW) units and includes gas supply connections and electrical connections. The ACIL Allen report is available at: [https://www.aemo.com.au/-/media/Files/PDF/Fuel\\_and\\_Technology\\_Cost\\_Review\\_Report\\_ACIL\\_Allen.ashx](https://www.aemo.com.au/-/media/Files/PDF/Fuel_and_Technology_Cost_Review_Report_ACIL_Allen.ashx).

# 5 Determination

For the reasons set out in this notice, pursuant to clause 5.17.4(c) of the Rules CitiPower has determined that there are no credible non-network options to address the identified need at DA zone substation. Therefore, in accordance with clauses 5.17.4(c) and (d) of the Rules, CitiPower will not be publishing a non-network options report in relation to the proposed works at DA zone substation.

CitiPower will prepare and publish a draft project assessment report in relation to the DA zone substation project, in accordance with clause 5.17.4(i) of the Rules.