



2019/20 Summer New 22kV Feeder (DVY12) – Non Network Proposal Request

27.02.19



1. Summary

United Energy undertakes feeder augmentation works to address the capacity limitations in the distribution network when the expected overload risk posed by such limitation outweighs the cost of addressing it. In the absence of non-network solutions, United Energy utilises traditional augmentation options (network options) to alleviate the identified feeder limitations. The solution adopted for each site is based on an economic evaluation of costs and benefits.

This document has been prepared to invite proposals from non-network solution providers for alternative options to the proposed new 22kV feeder (DVG12) network project that is planned for summer 2019/20.

This document is in line with the minimum project evaluation requirements under the Demand Management Incentive Scheme for a request for demand management solutions. United Energy welcomes written submissions from interested parties to address the issues described in this request on or before 25th March 2019. United Energy also recommends engagement as early as possible in order to provide any further information required or to enable us to assist in developing proposals.

2. Background

2.1. Project Need

The primary need for this project is insufficient thermal capacity in 22kV feeders (DVG34, CRM21 and DVG24) limiting the ability of United Energy to supply the growing load in the Dandenong South / Lyndhurst / Carrum Downs area.

Both DVG34 and DVG24 22kV feeders supply large industrial and commercial customers in the Dandenong South and Lyndhurst industrial areas. DVG34 is forecast to exceed 100% of its rating in summer 2019/20 and DVG24 is expected to reach 86% utilisation. A large number of applications for new load connections in Lyndhurst Industrial Estate and Innovation Park have been received over the last few years. Some of the connections have recently been provided and demand is forecast to pick up as the occupants move in and commence their operations. One large customer, with requested capacity of 8MVA, has recently connected to DVG24. Both DVG feeders do not have sufficient capacity to supply the growing demand beyond 2020.

In addition the CRM21 feeder reached its capacity in 2011/12 summer and its utilisation has been managed through pre-summer load balancing since then. DVG24 is one of the host feeders of these load balancing transfers. New industrial and commercial developments along Boundary Road, Carrum Downs have recently been connected to CRM21 and it is forecast to exceed its rating in summer 2019/20 despite the load transfers.

Given the amount of vacant land available in Lyndhurst Industrial Estate and Innovation Park; and the level of connection activity, the growth in the area is expected to continue. Further, there is a significant potential for further developments in the Carrum Downs industrial area that is supplied from CRM21.

The customer base supplied from these two DVG feeders (predominantly industrial and commercial in general) is high demand and high volume by nature. Their demand is relatively less sensitive to the temperature compared to residential customers. Therefore, the capacity limitation in this part of the network is more or less throughout the year unlike residential areas where high demands occur only a few days a year during extreme hot weather.

2.2. Preferred network option

The preferred network option to address the identified need is to create a new DVY12 22kV feeder and to rearrange the distribution network in the area. This option will address the capacity issues associated with all three feeders, DVY34, CRM21 and DVY24. The estimated direct cost of this solution is \$887k.

2.3. Non-network alternatives

Historically, United Energy built new electricity infrastructure to meet the increasing demand for electricity by customers. This may involve augmentation of the network by, for example, installing new transformers and building new powerlines. These are generally referred to as 'network solutions'. The establishment of these assets is capital intensive and it may be more economical in some cases to implement a non-network option. Such non-network options may be temporary or permanent, but the aim is to be able to defer or replace the building of the network solution.

Non-network solutions are an important component for the effective operation of the network and can involve either the reduction of customer electricity demand at peak times (demand management) or the direct supply of electricity into the grid at the distribution level (generation and storage).

Effective and prudent use of non-network solutions can reduce the need for network augmentation and associated maintenance costs resulting in lower electricity bills for consumers.

3. Non-network Option Requirements

Embedded generation, storage or demand management schemes to reduce the magnitude of maximum demand within the DVY34 and CRM21 supply area could defer or avoid the proposed network augmentation.

The area covered by these two feeders is presented in **Figure 1**.

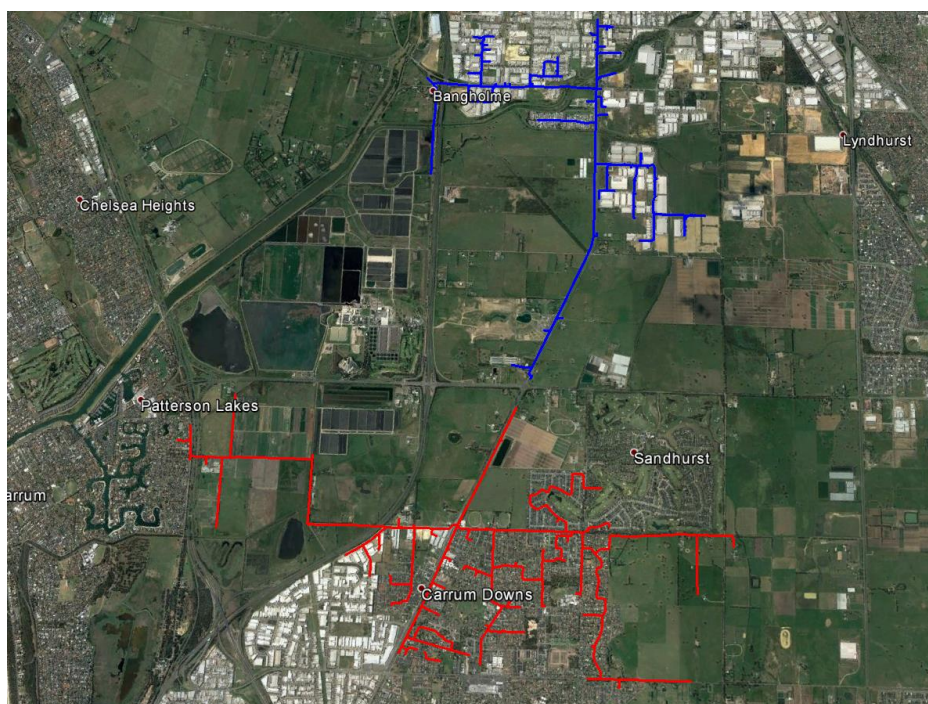


Figure 1: Geographic coverage of the constrained area.

The DVY34 feeder supplies part of the Dandenong South industrial area. Given the nature of industrial and commercial operations, DVY34 demand is relatively less temperature sensitive and consistent over the year compared to residential demand. The CRM21 feeder supplies part of the Carrum Downs industrial area and, part

of the residential customers in the Sandhurst and Carrum Downs areas. The maximum demand of CRM21 is driven by the residential demand and has a higher temperature sensitivity. A typical load profile for these two feeder are presented in Figure 2 and Figure 3.

Given the demand patterns of the two feeders, United Energy anticipates an eight hour window (7:30-15:30) for demand management on DVY34 and, five and half hours (16:00-21:30) for CRM21. DVY34 demand is steady over the working days and the maximum feeder demand can be triggered by a change in operations (consumption behavior) of a few of the larger connected customers. Given the CRM21 demand is temperature sensitive, the capacity limitation is likely to occur on hotter days having maximum temperature greater than 35°C.

Figure 2: Typical load profile of DVY34 feeder on a high demand day

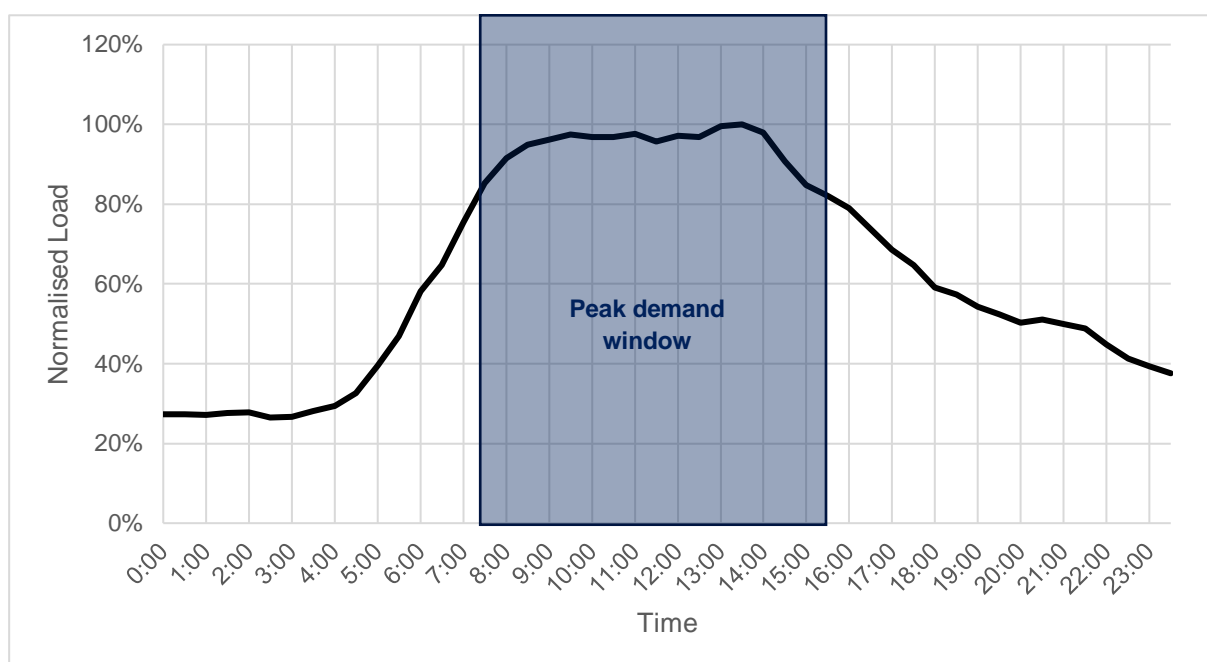
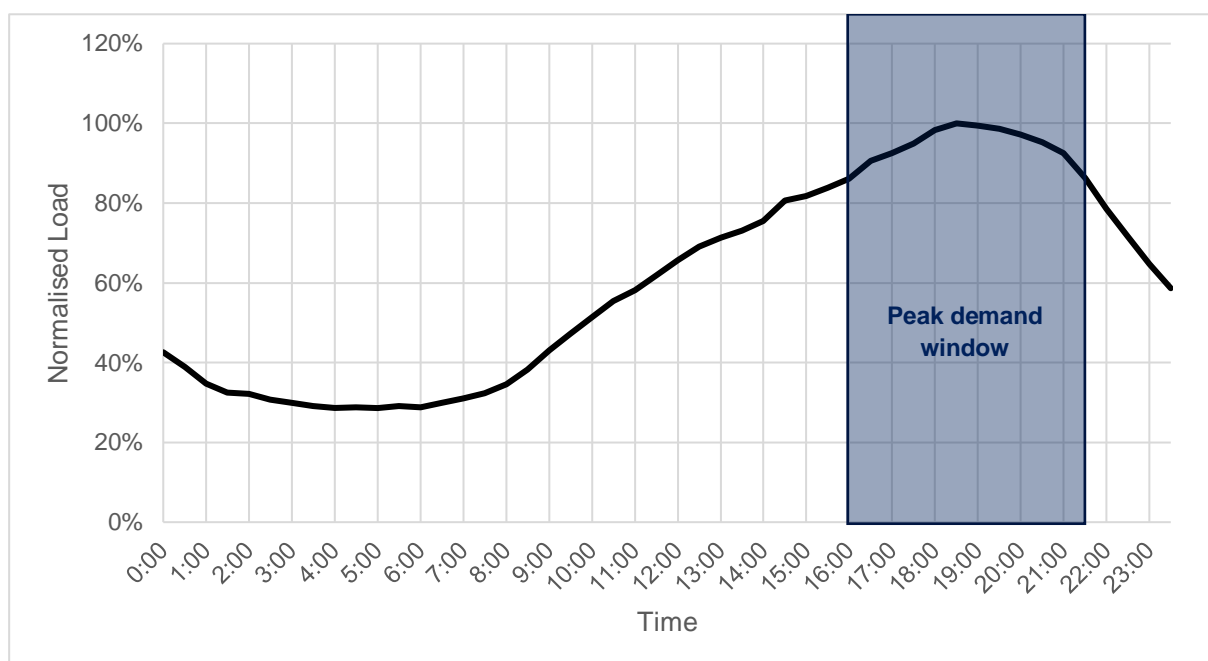




Figure 3: Typical load profile of CRM21 feeder on a high demand day





The estimated non-network support under a 1-in-10 year weather condition is summarised in Table 1.

Table 1: Summary of non-network support requirement.

Description		2019	2020	2021	2022	2023
Expected energy at risk (MWh)		4.9	5.7	8.1	13.7	22.8
Value Expected energy at risk (\$k)		206.8	240.5	341.8	578.1	962.2
DM Required (MW)-Min ¹	DVY34		0.1	0.7	1.6	2.5
DM Required (MW)-Max ²			0.7	1.3	2.3	3.1
DM Required (MW)-Min	CRM21		0.3	0.7	1.1	1.5
DM Required (MW)-Max			0.9	1.2	1.7	2.1
Net DM Required (MW)-Min			0.4	1.4	2.8	4.1
Net DM Required (MW)-Max			1.6	2.6	4.1	5.4

The maximum available deferment benefits for a non-network alternative is estimated to be approximately \$35k per annum³.

3.1. Data requirements from non-network service providers

Non-network service providers interested in providing submissions to alleviate the network constraints outlined should contact United Energy as soon as possible. A detailed proposal including the information listed below should be submitted by the requested date. Details required include:

- Name, address and contact details of the person making the submission.
- Name, address and contact details of the person responsible for non-network support (if different to above).
- A detailed description of services to be provided including:
 - Size (MW/MVA)
 - Location(s)
 - Frequency and duration
 - Type of action or technology proposed
 - Proposed dispatching arrangement
 - Availability and reliability performance details
 - Period of notice required to enable the non-network support
 - Proposed contract period

¹ This is equivalent to demand at risk above N capacity.

² This is equivalent to demand at risk above N-1 capacity.

³ Calculated based on an estimated cost of \$887k and a discount rate of 3.96%.



- Proposed staging (if applicable)
 - Proposed timing for delivery (including timeline to plan and implement).
- High-level electrical layout of the proposed site (if applicable).
- Evidence and track record proving capability and previous experience in implementing and completion of projects of the same type as the proposal.
- Preliminary assessment of the proposal's impact on the network.
- Breakdown of lifecycle cost to providing the service, including:
 - Capital costs (if applicable)
 - Annual operating (i.e. set up and dispatch fees) and maintenance costs
 - Other costs (e.g. Availability, Project Establishment costs etc.).
- Where appropriate, evidence of a planning application having been lodged.
- A method outlining measurement and quantification of the agreed service, including integration of the proposed solution with the United Energy network.
- A statement outlining that the non-network service provider is prepared to enter into a Network Support Agreement (NSA) with United Energy (subject to agreeing terms and conditions).
- Letters of support from partner organisations.
- Any special conditions to be included in an NSA with United Energy.

All proposals must satisfy the requirements of any applicable laws, rules and the requirements of any relevant regulatory authority. Any network reinforcement costs required to accommodate the non-network solution will typically be borne by the proponent of the non-network options.

For further details on United Energy's process for engaging and consulting with non-network service providers, and for investigating, developing, assessing and reporting on non-network options as alternatives to network augmentation, please refer to the United Energy Demand Side Engagement Document at the link below.

<https://www.unitedenergy.com.au/wp-content/uploads/2015/09/Demand-Side-Engagement-Document.pdf>

4. Enquiries and submissions

Final written submissions from interested parties to address the network capacity constraints described in this document are due by 25th March 2019. United Energy recommends engagement as early as possible in order to provide any further information required, or to enable us to assist in developing proposals.

All enquiries and submissions should be directed to the United Energy Manager Network Planning & Strategy at planning@ue.com.au.