Lower Mornington Peninsula Supply Area – Non Network Proposal Request

15.05.20

1. Summary

United Energy undertakes 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 limitations. The solution adopted for each site is based on an economic evaluation of costs and benefits.

In May 2016, United Energy published its Final Project Assessment Report (FPAR) relating to constraints in the Lower Mornington Peninsula area. This need for the project was primarily to address the voltage collapse risk which could lead to supply interruption to approximately 50,000 customers across the Mornington Peninsula.

The RIT-D assessment recommended a technically feasible and economic solution to mitigate the system constraints in the Mornington Peninsula sub-transmission network. The preferred solution was a combination of network and non-network options, namely:

- use of GreenSync's four year non-network solution, delivering up to 13MW of demand side response which commenced in summer 2018/19 at an estimated cost of $3.7 million (2015-16 dollars),
- followed by the construction of a new 54km sub-transmission line from Hastings (HGS) to Rosebud (RBD) zone substations at an estimated cost of $29.5 million (2015-16 dollars).

Delivery of the second last year of the four year GreenSync non-network support service commences this upcoming summer. With the existing demand management contract ending after summer 2021/22, and with slower demand growth than originally forecast in the RIT-D, United Energy is currently investigating the option of extending the use of the non-network solution to continue to defer the capex.

This document has been prepared to invite proposals from non-network solution providers to test the market for alternative options to the GreenSync non-network solution from summer 2022/23.

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 29th June 2020. 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.

2. Background

The lower Mornington Peninsula is supplied by three zone substations — Dromana (**DMA**), Rosebud (**RBD**) and Sorrento (**STO**). DMA is supplied by two 66kV sub-transmission lines from Tyabb Terminal Station (**TBTS**) and Mornington (**MTN**) zone substation. DMA supplies RBD and STO zone substations. This is illustrated in Figure 1 below.

There has been steady growth in residential electricity demand on the lower Mornington Peninsula. The number of permanent residents is increasing as holiday homes are being converted into permanent dwellings, residential developments and retirement villages. Further, the continued popularity as a holiday destination means the population rises from approximately 150,000 residents to more than 250,000 during the summer months. This is putting a strain on security of the electricity supply.

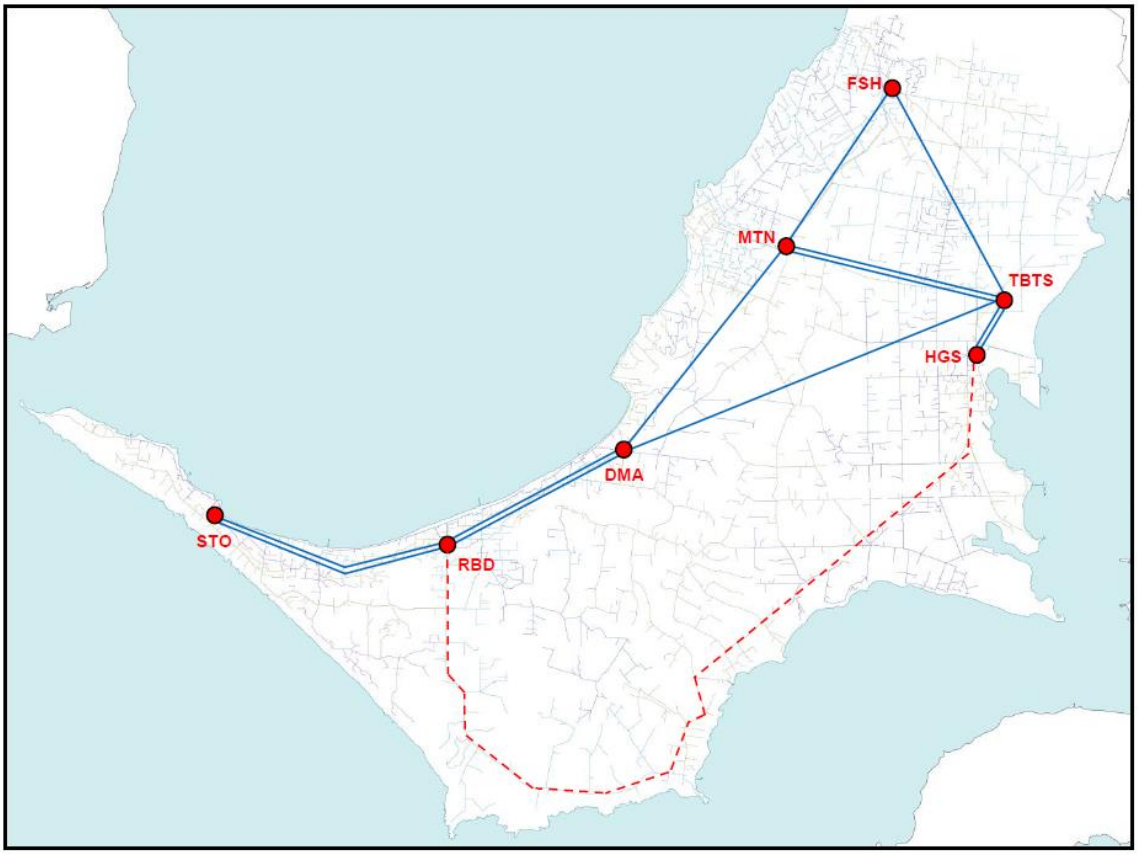

Figure 1: Existing network in the Mornington Peninsula and potential future Rosebud to Hastings line

In May 2016 we completed a RIT-D, which identified a need to invest to maintain supply security to the lower Mornington Peninsula. This was needed because:

- Expected unserved energy due to voltage collapse limitation—an unplanned outage on either of the incoming 66kV sub-transmission lines to DMA during summer maximum demand could cause voltage in the lower Mornington Peninsula to drop uncontrollably, leading to supply interruption to the entire region. Load must be reduced during system normal conditions for us to remain compliant with the system stability requirements in the National Electricity Rules.[1]
- Expected unserved energy due to insufficient thermal capacity in the sub-transmission network—five sub transmission lines in the region are forecast to have maximum demands that exceed their respective N-1 thermal ratings, and load transfer capability in the region is limited. Load must be reduced during post-contingent conditions to enable equipment to be operated within its thermal ratings.

The RIT-D assessment recommended a technically feasible and economic solution to mitigate the system constraints in the Mornington Peninsula sub-transmission network. The preferred solution was a combination of network and non-network options, namely:

- use of GreenSync's four year non-network solution, delivering up to 13MW of demand side response which commenced in summer 2018/19 at an estimated cost of $3.7 million (2015-16 dollars),
- followed by the construction of a new 54km sub-transmission line from HGS to RBD zone substations at an estimated cost of $29.5 million (2015-16 dollars).

Please refer to the attached appendix the Final Project Assessment Report (FPAR) for more details.

1 National Electricity Rules, S5.1a.3(c).

3. Non-network Option Requirements

Non-network service providers would need to be able to reduce peak demand (via demand-side or generation solutions) in the lower Mornington Peninsula to avoid the network limitations as discussed above and in the attached FPAR paper.

Non-network solutions must be provided in the Sorrento, Rosebud and/or Dromana supply areas beginning summer 2022/23. The area covered by these zone substations is presented in the Figure below and in the attached google maps provided as an appendix.

Figure 2: Geographic coverage of the constrained area

The solution must be capable of reducing demand during summer holiday periods (typically from December to January inclusive) and is required to be pre contingent in order to mitigate the voltage collapse constraint. The load curve in Figure shows that the demand in the lower Mornington Peninsula remains high over the hours from 4:00 pm to 9:00 pm. Any non-network solution will therefore need to be capable of operating continuously over this period, until the demand declines.

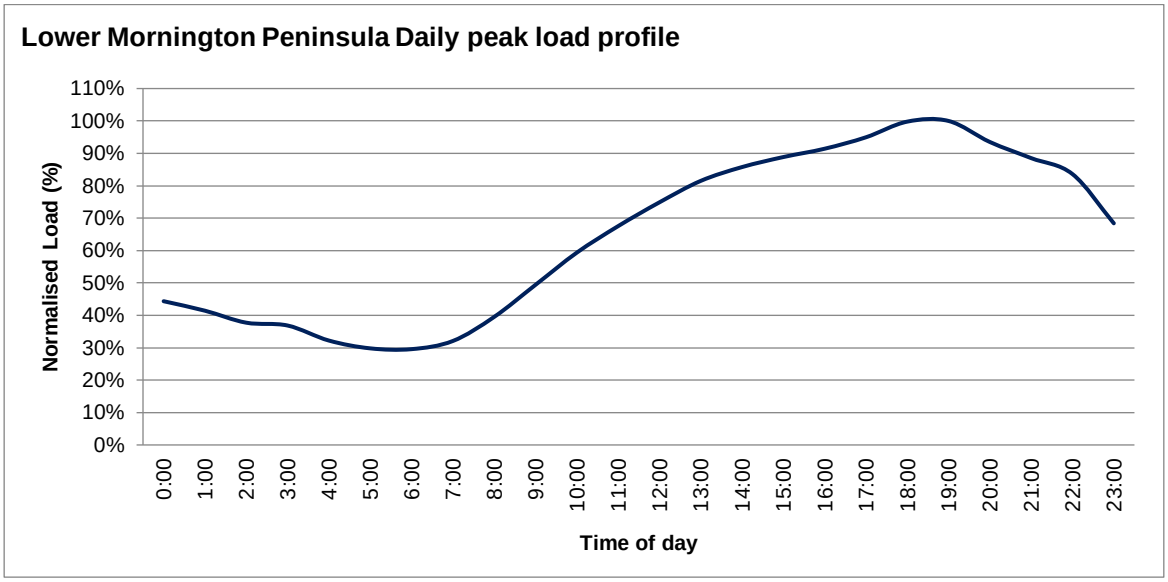

Figure 3: Typical load profile of Lower Mornington Peninsula peak load day

The non-network support requirements to provide the equivalent of the current GreenSync non network solution level, and the level to remove all voltage collapse risk for the current load forecast under 1-in-10 year weather conditions is summarised in Table 1 below. United Energy is seeking proposals for up to 5 years in length with shorter periods preferred to allow for flexibility and options to be reassessed given the current uncertainty in demand growth in the area.

Table 1 - Summary of non-network support requirement

Summer	2022/23	2023/24	2024/25	2025/26	2026/27
Load at Risk (MVA) - 10% POE	20.3	21.7	23.3	26.2	27.7
Expected Hours at Risk - 10% POE	5-7	5-7	6-8	7-10	7-10
Expected Days with hours at Risk - 10% POE	2-3	2-3	2-3	2-3	2-3
Expected unserved energy (MWh)	34.6	39.7	46.0	59.1	66.4
Value Expected unserved energy ($k)	$1,409	$1,618	$1,872	$2,407	$2,703
DM Required (MW)[2]	**13.1**	**13.1**	**13.1**	**13.1**	**13.1**
Max DM Required (MW) – Voltage Collapse[3]	**20.3**	**21.7**	**23.3**	**26.2**	**27.7**

The maximum available deferment benefits for a non-network alternative is estimated to be approximately $1.4M per annum. Note that any solution will also be competing with the GreenSync solution and any other proposals as well as the augmentation solution.

[2] Equivalent to the existing summer 2021/22 demand reduction contract. This removes the majority of the expected unserved energy over the next 5 years.
[3] This is equivalent to maximum demand required to remove all risk above the voltage collapse limit of 120MVA.

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
    - 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/2019/07/UE-PL-2202-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 29th June 2020. 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.