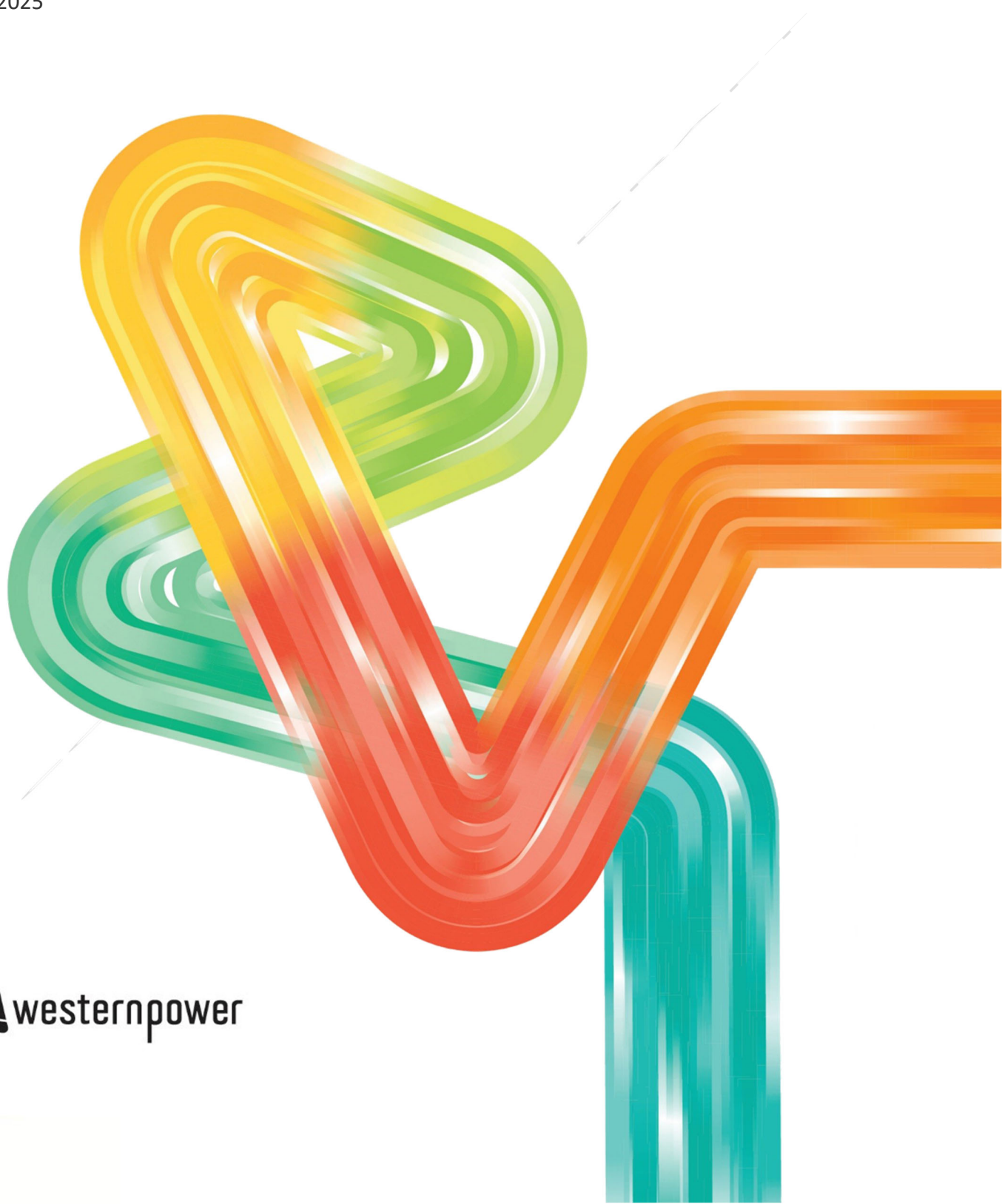


# Non-Co-optimised Essential System Services Trigger Submission

## Network Support Services for Byford Substation Submission to the Coordinator of Energy

23 July 2025



## NCESS assessment template

Organisation: Western Power	Date: 23 July 2025
<p><b>Summary of proposal:</b></p> <p>Western Power is seeking Network Support Services (NSS) to resolve a substation peak capacity issue at Byford substation. Byford substation has three power transformers with a total planning capacity of 77MW. Medium term demand forecasting shows the demand at Byford Substation significantly exceeding its planning rating ahead of planned capacity improvement works with a NSS active power requirement of 30MW and increasing to 45MW over the next 3 years. This service is expected to start from the 1<sup>st</sup> Dec 2026 and run till the 30<sup>th</sup> March 2029.</p> <p>The proposed procurement will continue to inform the development of Western Power’s internal Non-Cooptimised Essential System Services (NCESS) process for the procurement of NSS, and support Energy Policy WA (EPWA) with any amendments to the NCESS framework to facilitate the ongoing and efficient procurement of NSS through the framework. These activities form part of the DER Roadmap core actions (Action 24c) and will enable the foundational virtual power plant (VPP) service provision of NSS by 2025.</p> <p>The proposed procurement event reinforces Western Power’s commitment to developing its Distribution System Operator (DSO) capability and will help strengthen the process through which services will be provided as part of Western Power’s business-as-usual planning and operation. Western Power expects that procurement activities of this nature will expand in alignment with its internal capability and process development, including network visibility, the application and monitoring of Dynamic Operating Envelopes and the digital management of non-network contracts.</p> <p>Please refer to section 1.1 of this submission for further information.</p>	
<p><b>Trigger for assessment:</b></p> <p>Western Power has the location defined on the network where the identified capacity issue may be addressed through orchestrated DER, demand side management or commercial BESS solutions as an alternative option to major augmentation or new network facilities investment. Please refer to section 1.4 of this submission for further information.</p>	
<p><b>Formal assessment:</b></p> <p>Western Power is seeking expressions of interests from potential NCESS providers to determine the most cost-effective option to address the substation capacity issue at Byford substation. Please refer to section 1.4 and 1.5 of this submission for further information.</p>	
<p><b>Consultation:</b></p> <p>Western Power has consulted with EPWA and AEMO as required by clause 3.2.1 of the NCESS Guideline. Outcomes from this engagement have been included in this submission and this submission is made with the support of both EPWA and AEMO. Please refer to section 1.8 of this submission for further information.</p>	
<p><b>Services required:</b></p> <p>Western Power is seeking to procure NSS within the distribution area of Byford substation within Western Power’s distribution network. The proposed service is required for a minimum of 3 years, with the option for extension with the service being required during the hot period each year only, defined from 1<sup>st</sup> December to 1<sup>st</sup> April and starting from 1 Dec 2026. The service can be fulfilled through contracts covering different durations. The timing of commencement of the proposed services will be refined through this NCESS process, including through input from potential service providers. Please refer to section 1.4 of this submission for further information.</p>	
<p><b>Attachments:</b></p> <p>Not included.</p>	

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## 1. Network Support Services

### 1.1 Proposal

Western Power is provided guidance through the Access Code on how it procures and makes network investments. The DER Roadmap recognised that as network challenges resulting from Distributed Energy Resources (DER) intensify, and as innovative DER solutions emerge, the Access Code and network investment process must evolve to leverage new opportunities. On 18 September 2020, EPWA implemented a range of changes to the Access Code facilitating better procurement of non-network solutions to address network issues.

A NSS is a contracted service provided by a generator, retailer, or DER aggregator to the network operator/DSO (Western Power) to help manage or solve localised network constraints.

A NSS could alleviate distribution level peak electricity demand or reverse power flow and/or local voltage issues identified by the DSO at a cost that is less than traditional augmentation such as larger transformers, more 'poles and wires' or otherwise expanding capacity.

The past two years has seen delivery of several DER Roadmap achievements and milestones. Significant among them was the completion of the roll out of the end to-end VPP pilot, Project Symphony, and the maturation of the DER Orchestration Roles and Responsibilities. There is now clarity on the technical and regulatory infrastructure needed to enable DER integration and full market participation.

This NCESS process will enable VPPs or large use customers to provide network benefits for electricity consumers, the broader market, and assist in meeting WA's emissions reduction goals.

### 1.2 Trigger

Clause 3.11A.2 of the Wholesale Electricity Market (WEM) Rules requires Western Power to make this submission to request the Coordinator to determine whether to trigger an NCESS procurement process in accordance with section 3.11B of the WEM Rules.

The trigger submission must include sufficient information and analysis to allow the Coordinator to consider the following factors outlined in clause 3.11A.7 of the WEM Rules:

- (a) the extent to which an NCESS will address the issue;
- (b) the extent to which an NCESS will minimise costs in the WEM;
- (c) the relative merits between procuring an NCESS or augmenting the network;
- (d) whether it is suspected that there is a potential exercise of market power;
- (e) whether the procurement of an NCESS is consistent with the State Electricity Objective; and
- (f) whether procurement of an NCESS will be in the long-term interests of consumers.

Western Power considers it likely that the proposed NCESS procurement will enable service providers to deliver services that benefit the wider Wholesale Electricity Market. This trigger submission summarises Western Power's assessment of the need for additional non-network services to be located in the Byford substation load area as an alternative option to major augmentation or new network facilities investment.

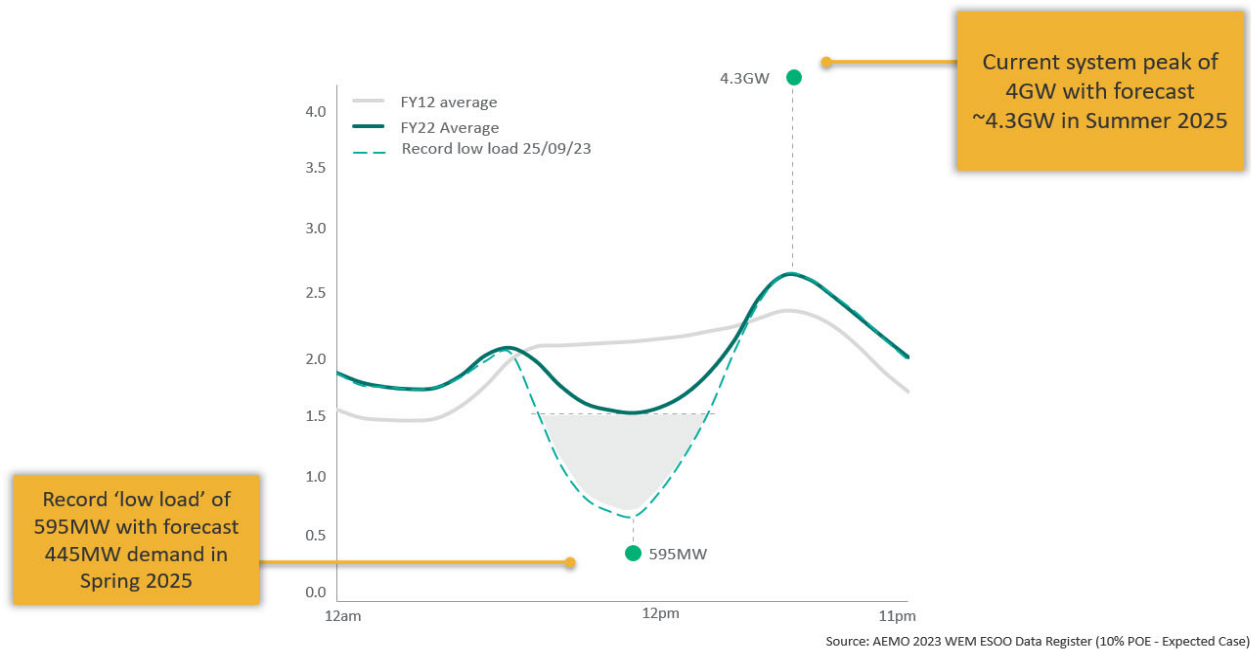
### 1.3 Background

Western Power continues to maintain its transmission and distribution networks to ensure reliable supply to the community over the near-term summer peaks. Many distribution feeders are now exceeding the planning limits<sup>1</sup> set

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<sup>1</sup> The planning limit is set at 80% to reserve sufficient capacity to manage planned and unplanned contingency events. In the event of a feeder fault, it is assumed that up to four other feeders are able to backfeed the load from the faulty feeder.

in line with the established planning rules, elevating the risk of customer outage due to capacity constraints above an acceptable level. This overloading is a direct result of a rapid increase in peak demand across the SWIS forecast to continue, based on current planning.



Failure to address high levels of utilisation will lead to the increased risk of customer outages as well as non-compliance with the current Technical Rules under the Access Code. Following the 2021-22 summer heatwave, Western Power has accelerated its short-term capital investment on the distribution network to manage feeder overutilisation and maintain supply reliability.

Western Power is required to seek the most prudent and efficient solution to resolve any network risks or constraints. As a result, Western Power assesses a range of non-network and network options, including whether these options can meet the scale and timing of identified capacity shortfalls.

Western Power recognises the medium to longer term need to support the emerging NSS market in a way that enables the vision of unlocking DER capability and value in the Southwest Interconnected Network (SWIS) through Western Power’s role as the DSO.

The importance of unlocking DER capabilities in mitigating the network capacity risk has been reinforced as a high priority as for Western Power these capabilities may:

- offer more cost-effective alternate solutions
- buy time for longer lead network investment, lowering network outage risks, and
- complement network investments, reducing their scale and cost.

This procurement event is in line with Western Power’s commitment to the DER Roadmap with the objective of NSS to help test and strengthen the process through which services will be provided through the NCESS process as part of Western Power’s business-as-usual planning and operation. DER Roadmap Action item 24c states that by the end of 2025 Western Power will have developed its internal NCESS process for the procurement of NSS delivered by aggregated DER with consideration of criteria to procure and standardise services.

Western Power expects that procurement activities of this nature will grow in alignment with Western Power’s internal capability and process development, including network visibility, the application and monitoring of Dynamic Operating Envelopes and the digital management of non-network contracts as Western Power build its DSO capability.

## 1.4 Services required

Western Power seeks to procure, if the Coordinator decides to trigger an NCESS procurement process, a NSS for Byford substation, within Western Power’s distribution network. The required service is for the provision of peak capacity / decrease in withdrawal to be provided at times when Byford substation is forecast to exceed its capacity planning limits. There is no requirement for facilities to be registered to provide this service.

The proposed service is required from 1 December 2026 to 30 March 2029 for availability during the hot periods each year (1 Dec to 1 April). Western Power will seek to gain industry feedback through the expressions of interest step on any benefits associated with a different contract duration or a change to the commencement date.

The quantity of service will align to the forecast capacity peaks within the hot periods of the contract term, as listed in **Error! Reference source not found.1.1.**

The proposed service will be activated between the hours of 4:30PM to 8:30PM AWST. The service will need to be available for any day during the activation period, with NSS being called on as a priority to any other services contracted. The contracted service will be called upon no more than 30 times each year for a duration up to a maximum of 4 hours in accordance with the below profile. Multiple providers will be considered for both the quantity and duration of the service.

As of 18<sup>th</sup> June 2025, BYF has a total of 33.40 MW additional load in pipeline from customer funded distribution projects, most of which relate to land development<sup>2</sup>. This has been added to the PoE10 forecast curve in stages, which results in a sharp increase in the forecast from 2026 onward. Currently, BYF has been operating above planning capacity (77 MW) and is forecasted to see an increase in demand as shown in table 1.1. Based on this the active power requirement of the NSS is 30MW from Dec 2026 increasing to 45MW in 2029.

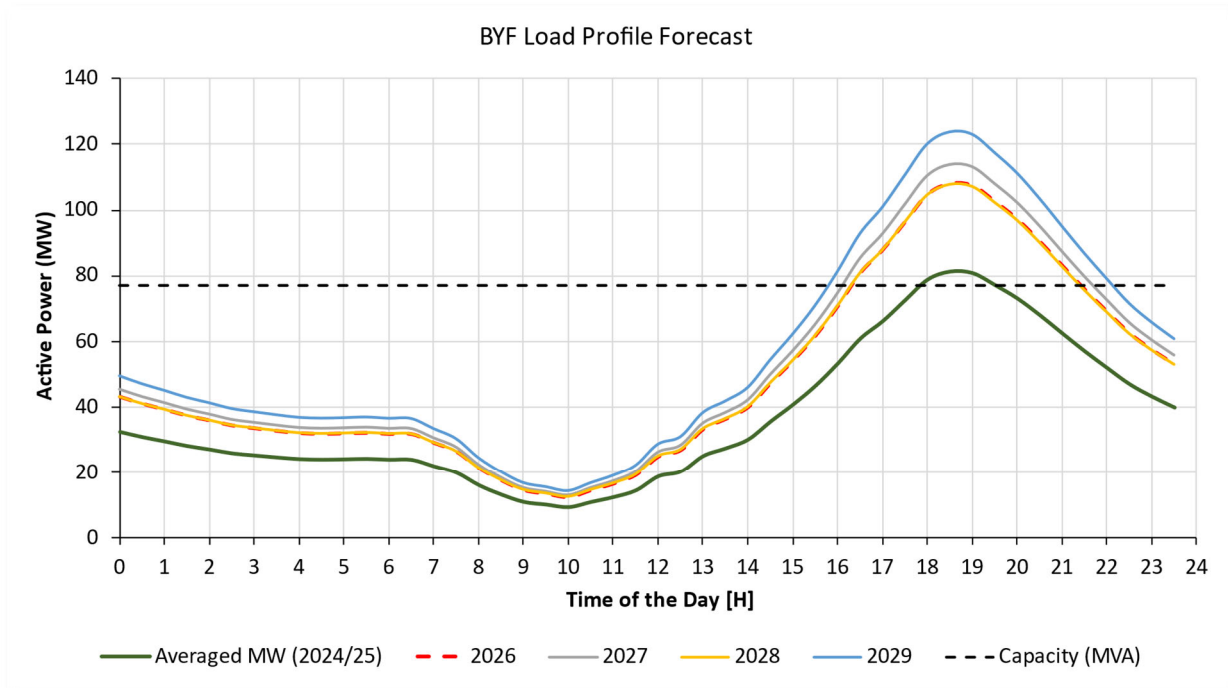
Table 1.1: BYF PoE10 Demand Forecast Table

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
<b>PoE10 Forecast + Load in Pipeline (MW)</b>	96.59	107.93	113.97	107.81	123.75	126.09	128.43	130.77	133.11	135.45
<b>Planning Capacity (MW)</b>	76.96	76.96	76.96	76.96	76.96	76.96	76.96	76.96	76.96	76.96
<b>Active Power Required (MW)</b>	19.63	30.97	37.01	30.85	46.79	49.13	51.47	53.81	56.15	58.49
<b>Active Energy Required (MWh)</b>	47.45	94.11	122.39	93.58	172.40	185.12	197.84	210.56	223.28	236.97

Using half-hourly real-time MW of BYF transformers, the averaged load profile is constructed by taking the mean of top 10 hottest days in summer 2024/25. The profile is scaled up for the future years so that the evening peak matches the peak demand forecast in 1.1

<sup>2</sup> DQM load pipeline - DQM Substation & Feeder Load pipeline | Sheet - Qlik Sense

Figure 1.1: BYF Averaged Load Profile from Top 10 Hottest Days in 2024/25, and Scaled for Future Years



If the Coordinator decides to trigger an NCESS procurement process, the draft NCESS Service Specification, released alongside a call for expressions of interest, would outline the full requirements for this service.

### 1.5 Analysis

There are two previously approved investments that will support the load growth in the area by:

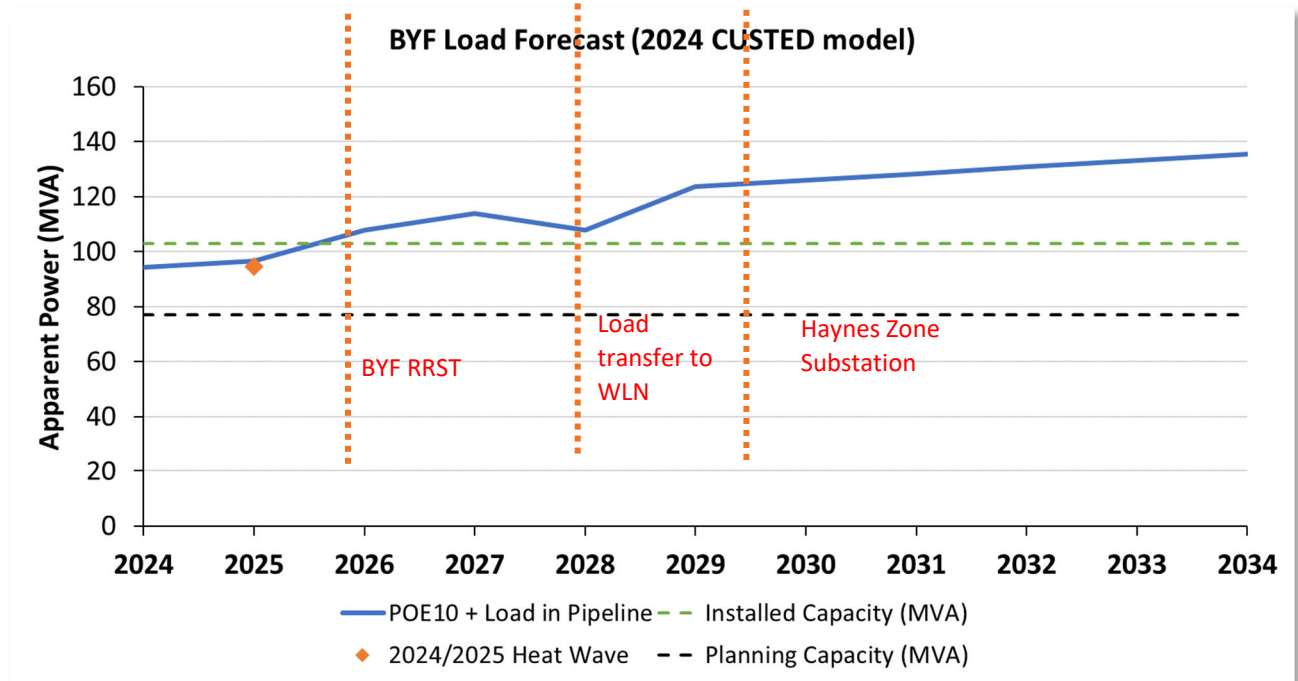
- Adding an additional transformer at Southern River zone substation (SNR)
- Adding an additional transformer at Willetton zone substation (WLN)

The above projects will transfer some load away from Byford substation to the above-mentioned substations by mid to late 2027

In addition, there is a third investment in the scoping phase that proposes a new Zone Substation at Haynes however there have been delays in land acquisition giving a forecast completion of early 2030. Once this substation has been established it is expected the demand profile for Byford to be back within planning limits by transferring substantial load to the new Haynes substation.

This creates a high network risk at BYF where it is envisaged that load will increase above its available installed capacity for the next two summer periods and beyond. This NSS aims to resolve the unserved demand with respect to the 77 MW planning capacity of three transformers, by providing an active power service or a reduction in demand from 30MW in Dec 2026 increasing to 45MW by 2029.

Figure 1.2: BYF Peak Demand Forecast



### 1.6 Merits of a non-network solution versus network build

Western Power considers a non-network solution for Byford substation may be the most suitable and cost-effective option to address the maximum demand issue in the short to medium term, specifically:

- a non-network solution that aggregates behind the meter DER to provide peak capacity / decrease withdrawal.
- a non-network solution from commercial BESS providing peak capacity.

The ultimate network solution is establishing a new zone substation in Haynes suburb by October 2029. The estimated net present cost (NPC) for a three-transformer 132 kV / 22 kV zone substation is approximately \$61 Million. This means BYF remains at risk for the next 3-4 years. To address this temporary capacity shortfall and maintain network reliability, the short-term support through a NSS service is required until the ultimate network solution is delivered.

### 1.7 Other Factors for Consideration

This section presents relevant analysis to enable the Coordinator to consider the extent to which an NCESS will meet factors under clauses 3.11A.7(c) – (f) of the WEM Rules:

- the relative merits between procuring an NCESS or augmenting the network;
- the outcome of any investigation of behaviour that reduces the effectiveness of the market, including behaviour related to market power;
- whether the procurement of an NCESS is consistent with the State Electricity Objective; and
- whether procurement of an NCESS will be in the long-term interests of consumers.

#### 1.7.1 Considerations under 3.11A.7(c)

The relative merits between procuring appropriate market services and relevant network augmentation options are considered in section 1.6 of this submission.

### **1.7.2 Considerations under 3.11A.7(d)**

Western Power is not aware of any market power aspects relating to the identified trigger.

### **1.7.3 Considerations under 3.11A.7(e)**

Western Power considers that the mitigation of the issue identified in this submission is consistent with the State Electricity Objective, specifically:

- a service specification can be developed such that the services can be delivered by a range of technologies, meeting the State Electricity Objective in clauses 1.2.1(a).
- the NCESS procurement process will ensure the cost of the service is as efficient as possible, meeting the State Electricity Objective in clauses 1.2.1(a) and (b).

### **1.7.4 Considerations under 3.11A.7(f)**

Western Power considers that the mitigation of the issue identified in this submission is in the long-term interest of consumers as the service will ensure reliable and secure supply as required by the minimum reliability standards.

## **1.8 Consultation**

Western Power has consulted with EPWA and AEMO as required by section 3.2 of the NCESS Guideline (published in accordance with clause 3.11A.2A of the WEM Rules) and met the requirements of clause 3.11A.2(f) of the WEM Rules. This submission is made with the support of both EPWA and AEMO and reflects the consultation outcomes.

## 2. Schedule 1 – Redacted