Demand Management Innovation Scheme Compliance Report

FY2019-20

Endeavour Energy

Contents

1. Summary

This submission of the Demand Management Incentive Scheme (DMIS) Compliance Report to the Australian Energy Regulator (AER) is made in accordance with the AER's DMIS dated December 2017.

This compliance report sets out Endeavour Energy's committed and eligible demand management (DM) projects and the expected benefits and costs of implementing those projects. Once assessed and approved by the AER the project incentive amount (accrued in *year t-2*) will be included Endeavour Energy's total annual revenue (year *t*).

Endeavour Energy notes that project incentive amounts cannot exceed the present value of net benefits expected from the project. Incentive amounts are also capped at 1% of total annual revenue. A summary of the incentive amount accrued during 2019-20 using the DMIS project incentive calculation is outlined in Table 1.

Table 1 - Total Financial Incentive Summary

Summary of Calculated Total Financial Incentive		
Determining Project Incentives		
Project incentive calculation	$PV\ incentive_i =< \max \{d_v \times E [\ PV\ DMcost_i - S_i\ ] , 0 \}$ Subject to the constraint: $d_v \times E [\ PV\ \ DMcosts_i\ ] =< E [\ NPV_i\ ]$	
Parameter values (for the 2020 DMIS Compliance Report)		
d_v	The cost multiplier	50%
$PV\ DMcost_i$	Present value of the project's demand management costs.	$460K
S_i	Total subsidies provided in connected with providing the demand management component of the project.	0
NPV_i	Net benefit of the project.	$1.5M
Financial Incentive Amount		
$230,000 based on the total expected cost of the Albion Park Zone Substation (ZS) Load Control Replacement Program		

In addition to reporting committed and eligible DMIS projects for the period 1 July 2019 - 30 June 2020, this report also identifies our previously proposed eligible project and future prospective demand management projects. Descriptions of these projects have been included to provide greater transparency in potential cost-effective non-network opportunities for upcoming projects. As our assessment of the feasibility of these non-network options progresses, it is possible they could be included as eligible and committed projects in future DMIS compliance reports.

2. Submission context and structure

2.1 AER requirements for reporting on demand management

This compliance report has been prepared in accordance with the AER publication covering the DMIS dated December 2017.

The detailed information provided in this compliance report includes information on the demand management measures, an estimation of the benefits and costs associated with the implementation of these measures and other the required information as outlined in clause 2.4 of the DMIS.

2.2 Summary of Endeavour Energy's demand management measures

Endeavour Energy actively considers demand management measures as part of its asset management and planning process. The consideration of demand management and non-network options are assessed by a cost-benefit analysis both in relation to preferred network options and the underlying base case of "no intervention" to accurately determine the cost-benefit of demand management measures.

For network options this includes: the expected capital cost; the ongoing operating and maintenance costs; the expected benefits in terms of avoided unserved energy; and avoided risk costs related to environmental impacts and safety risks (and other factors depending upon the individual network option under consideration).

For demand management and non-network options the cost-benefit assessment includes: the time-value of money benefit of deferring network options; the avoided unserved energy provided by the demand reduction; and the expected costs of delivering demand management measures and non-network options.

Endeavour Energy utilises the competitive market to source demand management measures and compares the cost-benefit of these to the preferred network option to ensure that the economic efficient option is selected. This helps to reduce the costs of providing network services and keep prices for our customers low.

The DMIS requires DNSPs to identify and report on network demand management measures as either committed or eligible projects for the purpose of determining project eligibility and incentive payments. In accordance with the AER's definitions, we report on the projects as follows:

- **Eligible project** - a demand management project which has been assessed as an efficient non-network option.

- **Committed project** - an eligible project which becomes a committed project during the reporting year and satisfies the requirements in 2.2.2 of the DMIS.

In Table 2 below, we provide an overview of committed and eligible projects which comply with the requirements in clause 2.2 of the DMIS. In addition, we also outline demand management projects that are currently being considered. These projects do not satisfy the requirements for an eligible or committed project for 2019-20 but may become eligible in future years.

Table 2 - Endeavour Energy's committed, eligible and upcoming DM Projects

Committed Projects in 2019-20	
Project	**Description**
Albion Park Zone Substation (ZS) Load Control Replacement Program	The Albion Park ZS load control equipment has become overloaded due to the continued load growth within the local area. The existing equipment has reached its thermal capacity and requires augmentation to continue to provide service and to avoid failure of the load control equipment. Peak demand will increase substantially on failure of load control equipment exceeding the network capacity by 6 MVA. The existing 11kV network and surrounding ZS do not have the capacity to offload Albion Park ZS by the required quantity. Network options to address this limitation include replacing the load control equipment or alternatively replacing every load control relay on customers switchboard with a time clock. A non-network option report was issued on 29 July 2019 and three submissions were received. The preferred proposal was based on replacing the load control relay and basic meters with a smart meter with load control functionality. An agreement to carry out the meter replacement at approximately 2500 customer sites was concluded in late 2019 and the replacement work commenced in early 2020 and will continue into FY21. At 30 June 2020, costs of the equipment replacement was $209,000 with an expected total project cost of $460,000.
Eligible Projects in 2019-20	
Project	**Description**
Albion Park Zone Substation (ZS) Load Control Replacement Program	The Albion Park Load Control program became an eligible project in 2019-20 following our decision to proceed with a non-network DM solution that provided the highest net benefit as the preferred option.
Other Eligible Projects	
Project	**Description**
South Erskine Park DM Program This program was a proposed eligible project in 2018-19. It remained an eligible project during 2019-20.	The Oakdale industrial development is a mixture of light and heavy industrial and warehouse facilities with demand increasing to an estimated 33.2 MVA by 2027. The existing 11kV network and surrounding zone substations (ZS) do not have the capacity to supply this load. The network option to address this limitation is the construction of the proposed South Erskine Park ZS. A non-network option report was issued in June 2018 and one response was received. The proposal is based on conducting energy audits with major customers to identify demand reducing initiatives and provide customers a financial incentive to assist implement the approved initiatives.

	At the end of FY20, 13 energy audits have been conducted, with the following breakdown across the financial years: • 18-19: 5 Energy Audits with 0.930 MVA of demand reductions identified with $9,750 ex GST paid for the audits. • 19-20: 8 Energy Audits with 1.855 MVA of demand reductions identified with $45,237.70 ex GST paid for audits. These energy audits were presented to the customers for their review and consideration to provide demand reductions in return for an incentive payment from Endeavour Energy. Three audited customers were considering the initiatives at the end of FY20. It should be noted that COVID-19 has interrupted the progress of the demand management program particularly as we have not been able to make any appointments for on-site energy audits since February 2020.
Upcoming DM Projects	
Project	**Description**
Stand Alone Power Supply (SAPS) – Kandos	Within the Kandos area there is 6km section of steel mains that have reached the end of its serviceable life. The network option is to replace the steel mains with aluminium steel reinforcement conductor. The alternative option of installing a SAPS was considered in a business case to identify more cost-effective alternative options. The analysis has identified that a SAPS is a feasible and cost-effective solution. A Request for Proposal for Demand Management Services for the SAPS was issued in April 2020 and closed at the end of May 2020. This request for proposal included the design, installation, operation and maintenance of the SAPS. The proposals received from the RFP are currently being evaluated to determine a preferred option stand-alone power supply and compare it to the network option in terms of cost-benefits analysis and risk profile. At the end of FY20, no preferred option had been identified and the evaluation process will continue into FY21.
Luddenham ZS Load Control Replacement Program	Due to load growth in the Luddenham area due to the development of the Western Sydney Aerotropolis area, an additional distribution feeder is required to serve the growth area. We are currently examining the feasibility of converting the customers in the Luddenham ZS catchment area to smart meter control of their off-peak hot water heating, this will free space within the substation floor plan to allow for development of additional distribution feeder capacity to supply the load growth and connection of new major customers . We are examining the number of impacted customers, the estimated cost of network options to augment Luddenham ZS to cater for the additional demand. It is likely that we will produce a non-network options report and a request for proposal for this requirement.
Box Hill Development Area	The Box Hill Development Area, located within the North West Priority Growth Area comprised of Box Hill, Box Hill Industrial and Box Hill North precincts, will deliver 14,000 new homes, a town centre, three village centres and 133 hectares of employment land. The demand in the development area is expected to grow by 45.5 MVA by 2027. The existing 11kV network and

	surrounding ZSs do not have the capacity to supply this load. The network option to address this limitation is the construction of the proposed Box Hill ZS. A non-network option report for this project was released in April 2020 and closed for submissions after the end of FY20. After the close of the reporting period, it was determined that two submissions were received and we are currently in the process of evaluating the feasibility of the proposed non network options in their ability to meet the growth requirements in the area.
Westmead Health and Allied Services Development Area	This area is undergoing development with demand forecast to exceed the existing capacity of the Westmead ZS in FY22. The existing capacity of Westmead ZS is 35MVA and the latest forecast has the demand at 35.2MVA in November 2022. Possible network options include an additional transformer and additional transmission supply, load transfer to adjacent zone substations and demand management or non-network solution to defer or avoid the network options. The project requirements will continue to be reviewed and analysed in FY21 and a non-network solution may be pursued by the release of a non-network options report with detailed requirements.
Southern Macarthur Subtransmission Network	The sub-transmission network supplying the Southern Macarthur area is limited in its capacity. The network supplies four Endeavour Energy ZSs and eight major customer substations. There exists embedded generation connected to the network with output that varies according to production. This poses a risk to network security and quality. Growth in demand is from the residential development area and major customer activity. There is no transfer capacity available to help manage peak demand. The network option to address this limitation is the construction of a third 66kV sub-transmission feeder into the area. A screening test has identified that a non-network option may be feasible. We continue to monitor the demand forecast for the area and the activity of major customer connections in the area in determining the timing of release of a non-network options report and a request for non-network proposals.
Penrith Supply Area	The Penrith area is supplied by the Penrith 11kV and Kingswood ZS as well as other surrounding ZSs. The Penrith area is a brownfield site but contains new developments within the commercial, industrial and residential sectors. There is limited transfer capacity available to manage peak demand. This will be enhanced by installing network automation scheme. The demand of the area is increasing and is forecast to exceed the capacity of the two ZSs and the 11kV network by summer 2022. The network automation scheme will defer the network limitation by one to two years. A screening test has identified that a non-network option may be feasible. We continue to monitor the demand forecast for the Penrith Supply area including the rate of property development related network connection requests.

3. PART A – Committed projects

In Part A of this report we provide the required information as specified in clause 2.4(4) of the DMIS. This requires us to include the following information for each committed project:

- the volume of demand management delivered by the project during 2019-20;
- Endeavour Energy's estimate of the benefits realised from the demand management delivered by the project in 2019-20; and
- the total financial incentive that Endeavour Energy has assessed it is able to be claim in 2019-20 in accordance with the scheme.

During 2019-20, one demand management project became a committed project. This represents Endeavour Energy's first committed project under the DMIS.

3.1 Albion Park ZS Load Control Replacement Program

3.1.1 Description of need

Albion Park ZS is located south of Wollongong and supplies a mainly a residential customer base of approximately 9,000 customers. Of these customers, approximately 3,000 have off-peak load control relays on their switchboard which are controlled by audio frequency injection cell (AFIC) systems at Albion Park ZS. These relays allow customers to access the controlled load tariff for their off-peak hot water heating. The controlled load is estimated to be 6MVA of coincident demand after diversity is taken into account.

The AFIC system is currently overloaded and is at risk of a failure. If the AFIC system were to fail it would result in significant additional load on Albion Park ZS which is near capacity. Therefore, a failure of the load control system could lead to material and ongoing loss of supply events due to overloading.

With continued load growth within the Albion Park ZS supply area, the overloaded AFIC systems require network investment. Without the existing controlled load being replaced, there is a high risk of the AFIC equipment failing with the residual risk of exceeding existing capacity at the Albion Park Zone Substation from summer FY20 onwards leading to unserved energy/load.

We determined that a demand management solution delivered via load control could be a credible non-network option to overcome this constraint in the Albion Park network. A Request for Proposal Demand Management Solutions was subsequently issued in July 2019. A description of the responses received and our analysis which identified the efficient non-network demand management option (i.e. eligible project) is provided in Part B of this report.[1]

We entered into an agreement with Intellihub Australia for provision of the demand management solution for Albion Park in November 2019. The DM solution is based on using smart meters to provide the load control services and to facilitate the changeover of existing AFIC relays with smart meters at each of the customer premises.

[1] The Albion Park ZS Load Control Replacement Program became both an eligible and committed project during 2019-20. Therefore, information pertaining to this project is provided separately in Part A and Part B of this report in accordance with clauses 2.4(4) and 2.4(5) of the DMIS.

3.1.2 Committed project information

Demand management delivered

The demand management solution involves the replacement of the load control relays with smart meters and was still being progressed at 30 June 2020 with no demand management delivered. Installation of meters is expected to be completed in January 2021 with demand reductions anticipated during the final months of FY21.

The solution has required the provider (on Endeavour Energy's behalf) to negotiate the proposed arrangements with affected customer's retailers. These discussions have taken longer than initially expected partly because of the large number of retailers involved and the impact on the customer's energy offer as a result of the change of meter from a basic meter to an interval meter. Discussions have also occurred with the AER on the process by which the meter changes would occur.

Estimate of benefits delivered

No benefits were delivered in 2019-20.

Benefits will be delivered following the installation of smart meters. Once completed, benefits the project is predicted to deliver include:

- A lower investment cost compared to replacing the load control system.
- Reduced operational costs associated with maintaining the load control system and call outs associated with a potential failure of the load control system to serve customers.
- Avoided unserved energy should the AFIC fail and load from the hot water heating coincide with the peak demand on the Albion Park ZS.
- Improved metrology will allow retailers to offer cost reflective pricing structures and support greater customer control over their bills.

Access to smart meter data will also help Endeavour Energy understand the load profile and pattern of use of these residential customers to improve management of the local network and service offerings for load control in the future.

Financial incentive

This demand management project is expected to cost $460,000. The expected net benefit of the demand management initiative compared to the base case of "do nothing" base case is $1.5M. Applying the DMIS project incentive calculation with a cost multiplier of 0.5, we calculate the financial incentive for the project to be $230,000.

4. PART B – Eligible projects

In Part B of this report we provide the required information as specified in clause 2.4(5) of the DMIS. This requires us to include the following information for each eligible project identified as a preferred project in 2019-20:

- The expected costs and benefits (in present value terms) that the project would deliver to consumers.
- A description of the responses received to the request for demand management solutions (or alternatively a RIT-D) under the minimum project evaluation requirements. For each response this includes:
    - a short description of the proposed project;
    - the proposed costs and deliverables put forward; and
    - for any response that proposed a potential credible option, an estimate of that project's relevant net benefit
- If it is to proceed as a committed project, specify whether it will occur via a demand management contract or via a demand management proposal.
- The expected costs of delivering the demand management solution.
- The kVA per year of network demand that could be called upon and expected to be called upon (based on a probabilistic assessment of future demand).

During 2019-20, one demand management project became an eligible project.

4.1 Albion Park ZS Load Control Replacement Program

4.1.1 Description of need

A description of the identified need is provided in section 3.1 of this report.

4.1.2 Request for demand management solutions

Endeavour Energy has performed an economic analysis and business case for network options, which included a consideration of the load at risk and probability of contingency capacity at the Albion Park ZS. This analysis demonstrated that network investment is justified (NPV positive) to manage the constraint through a new upgraded AFIC system or alternative network owned control means.

Demand management solutions would need to be technically viable and deliver a better NPV outcome compared to the network option for it to be considered the preferred option (i.e. efficient non-network option). To facilitate responses for credible and efficient non-network proposals and in accordance with the minimum project evaluation requirements in clause 2.2.1 of the DMIS, we provided a description of the constraint and technical guidance in our Request for Proposal Demand Management Solutions (RFP) in July 2019.

The RFP included setting out the identified need that proposed solutions were required to address and supporting technical information of the load at risk and load profile information. Information on the geographical area and the nature of the customer base were provided to assist in the development of feasible solutions. The RFP was issued to registered parties in the demand side engagement register, issued to various other parties via Tenderlink and was posted on the Endeavour Energy website.

Endeavour Energy also indicated in the RFP it was able to offer the following incentive caps as once-off payments for demand management solutions:

- $160 per customer load control service accessed on a “first to swap basis”. This only applies to solutions based on an equivalent controlled load service through smart metering; or
- $91 per kVA of permanent peak demand reduction (accounting for diversity), or $545k for 6MVA of permanent peak demand reduction. This applies to all demand management solutions with exception of equivalent controlled load control services through smart metering.

4.1.3 Expected costs and benefits

The following table shows the expected costs and benefits for each of the credible options. It demonstrates that installing meters with AFIC load control functionality was expected to deliver the highest net economic benefit. The cost-benefit analysis included consideration of the market benefits to customers as a whole due to avoided unserved energy in the event that the existing AFIC system were to fail and the hot water heating load would become uncontrolled and potentially lead to the capacity at the zone substation being exceeded.

This being based on the value of customer reliability applicable to the area and the class of customers. The CBA also included the value of avoided operating and maintenance costs of the AFIC unit under the DM options and the value of the interval metering data to assist in further analysis of customer load profile to better understand customer needs for the future.

Table 3 – NPV of credible network and non-network options

Credible option	Description	PV of benefits ($)	PV of costs ($)	NPV/net benefits ($)
Network option	AFIC Replacement – Installation of a replacement motor-generator AFIC unit	1.6M	0.7M	0.9M
DM option 1	Avoid the replacement of the AFIC with time clocks at customer’s premises	1.6M	0.4M	1.2M
DM option 2	Avoid the replacement of the AFIC with smart meters at customer’s premises	1.8M	0.5M	1.3M

4.1.4 Summary of responses received

Three submissions were received in response to the RFP. A summary of the responses is provided below.

Table 4 – Summary of submissions

Demand Management Solution	Description	Cost	Deliverables	Assessment
Submission 1 - Intellihub	Replace existing load control relays with smart meter-based load control functionality.	$460K	Installation of smart meter and removal of existing load control relays. Customer premises work and retailer engagement.	Feasible solution in terms of technical load control and customer impact. Cost-benefit analysis showed a benefit of $1.5M in comparison to the base case.
Submission 2 - [redacted]	Demand reduction by energy efficiency, solar PV system with battery backup and conversion of electric water heating to hybrid solar thermal with gas supplement.	[redacted]	Customer appliance conversions and installation of new home energy systems.	Not feasible due to the likely cost of the solution including customer appliances, complexity of implementation and potential customer impact.
Submission 3 - [redacted]	control with similar technology.	[redacted]	Conventional network asset replacement of load control equipment.	Technically feasible solution, however providing no benefits greater than the network option.

4.1.5 Efficient non-network option

The non-network option provides an innovative alternate solution to the identified need to augment the AFIC equipment for load control of off peak hot water heating due to load growth in the Albion Park area. It provides the load control capability of customer's hot water heating via a smart meter rather than via the existing audio frequency control from the centralised motor generator unit located in the zone substation. It avoids possible unserved energy and service interruptions to the local customer base.

The network option would involve the replacement of the existing unit at a higher cost than the non-network option. The project also provides the opportunity to develop the process with customers and retailers for similar future projects as AFIC is used in many areas and zone substations in the Endeavour Energy area and could provide greater efficiency gains if widely adopted as a non-network option for other areas where the AFIC units approach end of life and where hot water heating is provided by the network and not by a gas fuel option.

As explained in section 3.1.1, Endeavour Energy has decided to proceed with this project via a demand management contract with Intellihub Australia. A copy of the contract is provided in accordance with clause 2.2.2(1) of the DMIS. The expected cost of this project is expected to be $460,000.

When fully implemented in FY21 the project will produce 6MVA of demand management based on the number of customers involved and the average hot water appliance installed. There are approximately 3,000 customers in this load control program at Albion Park.

5. Changes in previous demand management decisions

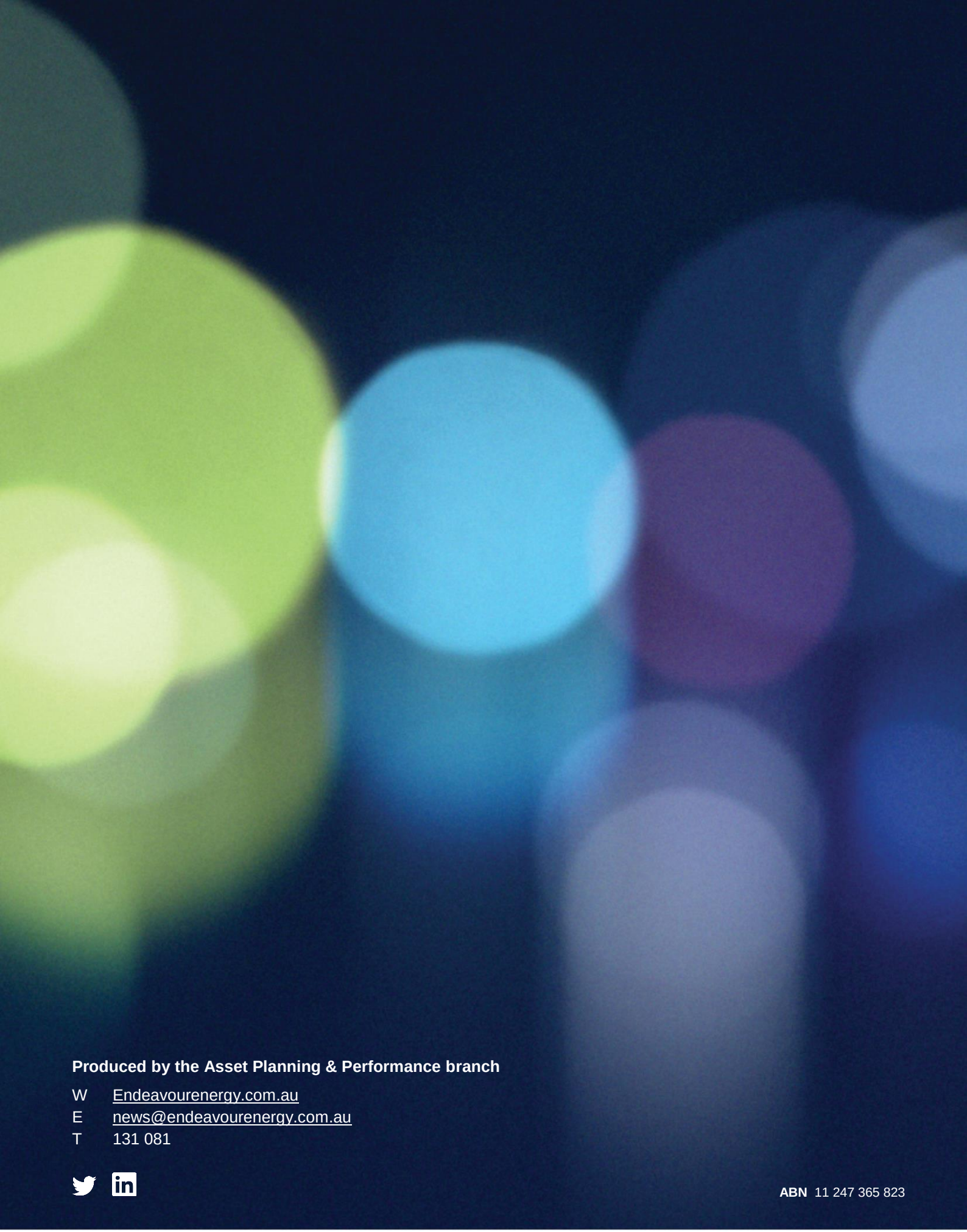
Clause 2.4(6) of the DMIS requires Endeavour Energy to declare where a decision has been made to defer or not proceed with a previous decision to proceed an eligible project as a committed project.

No such decision has been made noting Endeavour Energy has not previously proposed a committed project.

Clause 2.4(7) of the DMIS requires Endeavour Energy to declare where a decision has been made to proceed with a network option to meet an identified need where a decision was previously made to meet it via a committed project.

No such decision has been made noting Endeavour Energy has not previously proposed a committed project.

Attachment A – Copy of the Committed Project Control for Demand Management Services



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