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## Electricity Distribution Price Review FY2027 to FY2031 (EDPR 2026-31)

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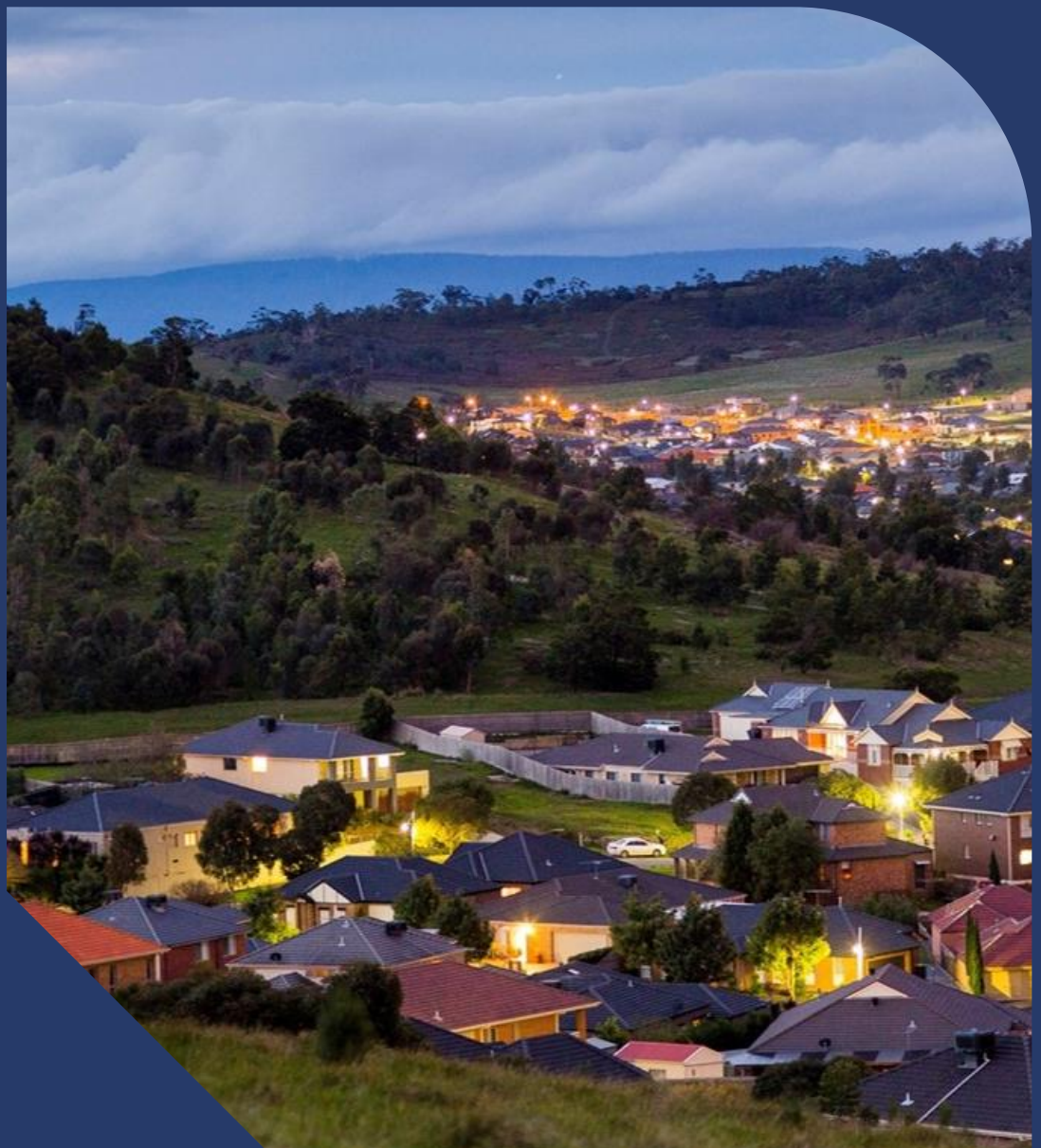
Business case: CER Enablement

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Revised Proposal

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Date: 1 December 2025



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# 1. Executive summary

This business case presents our investment plans to enable an efficient integration of consumer energy resources (CER) into our network, including by enabling efficient levels of export services to allow customers with the CER to import and export from the network in a way that unlocks value from their CER for themselves and all other energy consumers. In the context of the CER enablement program discussed in this section, CER includes customers' rooftop solar and battery systems—technologies that can generate electricity on the site and export into the grid. CER such as electric vehicle smart chargers and other smart devices, which do not generate or export electricity, are not considered as part of this program.

We have engaged extensively on CER enablement with our customers and EDPR stakeholders, including through our Future Network and Tariffs and Pricing panels. The consistent feedback we receive from our customers is that they value solar exports highly and that they do not want us to waste any generated solar energy. They are willing to pay more than the economic value for networks to enable more exports. Conversely, through engagement with our Future Network and Tariffs and Pricing panels, we have been encouraged to consider efficiency as the primary driver of investment, to limit any inefficient costs being passed onto all customers, particularly those that do not have CER.

We anticipate AusNet will have 60,000 new rooftop PV systems installed during 2026-31, reaching 39% of AusNet customers. Solar batteries are anticipated to increase by 30,000 during 2026-31, reaching 7% of AusNet customers. With the increasing penetration of rooftop solar, and a much smaller penetration of solar batteries, we anticipate continuing to experience network challenges from solar exports, including thermal constraints and voltage variations.

This business case outlines a program of work needed to economically reduce wasted or curtailed solar generation and exports from network constraints and voltage variations, using the Australian Energy Regulator's (AER) Customer Export Curtailment Value (CECV) and the AER's Value of Emission Reduction (VER). The program assumes all new solar customers are offered 'flexible exports' from 1 July 2026, with 70% taking it up. Flexible exports are an efficient way to allocate network capacity which can defer network augmentation.

The program is anticipated to enable 124GWh of renewable exports, putting downward pressure on wholesale electricity prices and reducing 26.8kt CO<sub>2</sub> per year, which benefits all AusNet customers and energy consumers. Without the planned program of work, exports would need to be constrained using zero export limits, or solar generation would be automatically curtailed or tripped in areas of over-voltages (requirement of the AS 4777.2:2020 inverter standard). This would result in a lost opportunity to reduce emissions and potentially higher wholesale prices.

The preferred planned program of work is a proactive program which is specifically targeted at addressing network limitation in areas of export value. Four options are considered:

- Do nothing—no expenditure on addressing network limitations that impact export capacity.
- Option 1—economic approach to unlocking export capacity.
- Option 2—economic voltage management approach to unlocking export capacity.
- Option 3—deterministic approach to unlocking export capacity.

AusNet proposes Option 2 at \$32 million (real, \$June 2024) over 2026-31, which represents a prudent and efficient network voltage management investment. Applying a discount rate of 5.56% per annum, this proposed program option has a net economic benefit of \$75.8 million (real, \$June 2024) over the 20-year assessment period as shown in Table 1.

**Table 1: Economic Evaluation of CER Enablement Program Options (\$m, 30th June 2024 dollars)**

	FY27 to FY31 (undiscounted)			Full assessment period (discounted)			Comments
	Capex	Opex	Total cost	Total cost	Total benefits	NPV	
<b>Do Nothing</b>	0.0	0.0	0.0	0.0	0.0 <sup>1</sup>	0.0	This option does not address the identified need
<b>Option 1 – Economic approach</b>	41.6	1.0	42.6	(40.4)	141.2	100.9	
<b>Option 2 – Economic voltage management approach</b>	31.4	0.7	32.0	(30.0)	105.8	75.8	This is the preferred option as it is least cost
<b>Option 3 – Deterministic approach</b>	1,110.9	20.9	1,31.8	(1,043.6)	246.9	(796.7)	This is the most expensive option

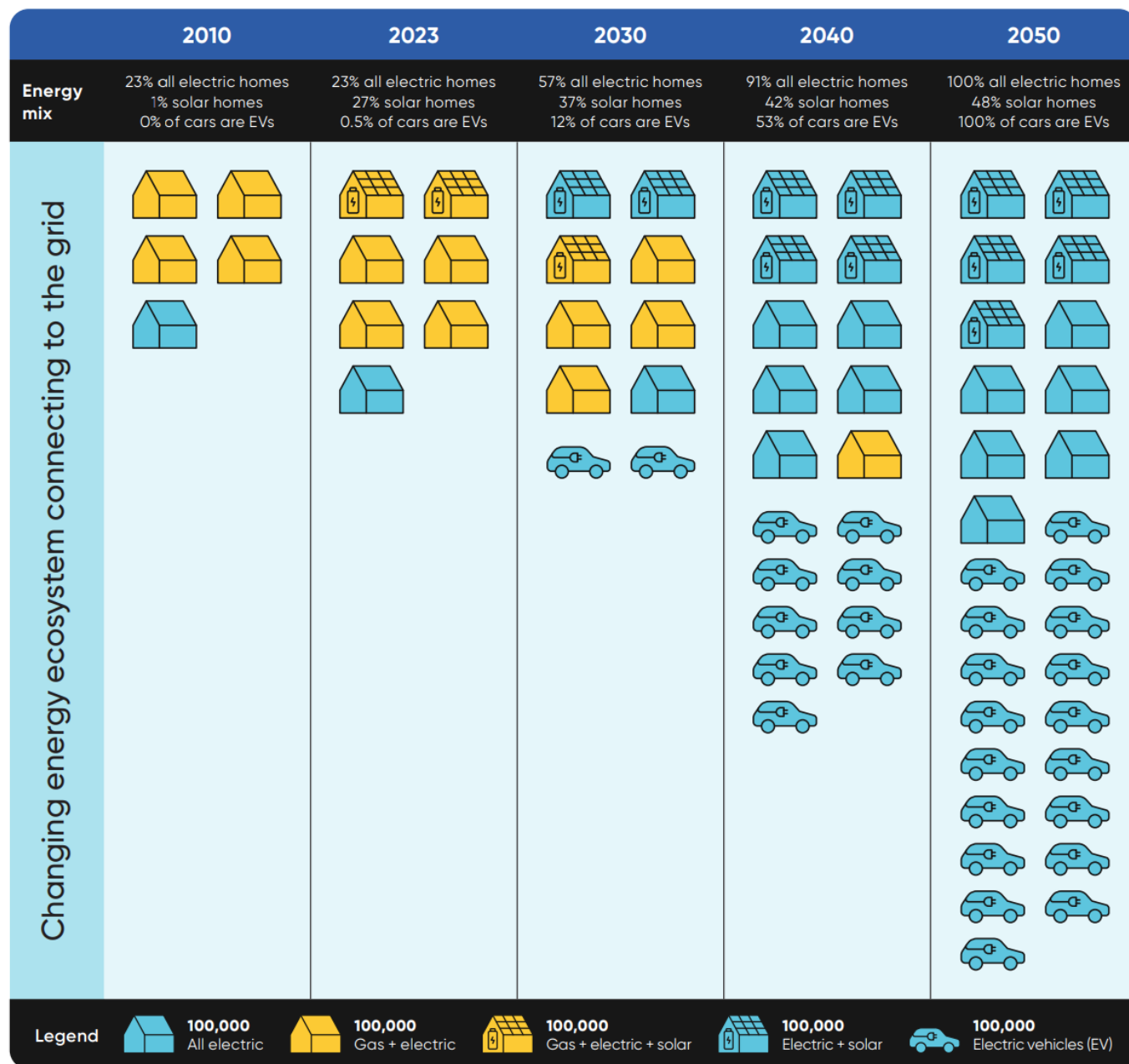
Source: AusNet analysis (relative to the base case of do nothing).

<sup>1</sup> The present value of total risk of greenhouse gas emissions, CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is valued at \$1,376 million over the analysis period (real 30th June 2024 dollars). Refer to Table 9.

## 2. Background

The growing penetration of CER is increasing the complexity of customer needs and the types of customers interacting with AusNet. The number of CER owned and used by AusNet customers is expected to grow from ~245,000 in 2025 (mostly rooftop solar) to ~630,000 by 2031, with a mix of rooftop solar, batteries and EVs. This is a material change in the number of factors and type of technologies distributors will need to plan for and integrate into the grid, which necessitates a foundational shift in how distributors operate and manage their customers' needs.

Figure 1 summarises historical and forecast customer trends in AusNet's network, from 2010 to 2050.



Source: AusNet.

**Figure 1: Historical and forecast customer trends in AusNet's network, 2010 to 2050**

The trends shown in Figure 1 are derived from independent sources including:

- Household number forecasts are based on the 2023 Victorian Government's Victoria in Future (VIF) five-yearly forecasts of population, using the 'Victoria in Future Small Areas' data set.
- All other forecasts are based on AEMO's 2024 ISP inputs for Victoria, extrapolated for AusNet's network.

## 2.1. Customer feedback

We have done extensive research with our customers on their needs and preferences related to rooftop solar, batteries and EVs, whether they have the technologies or not. We have also engaged extensively with our 2026-31 Electricity Distribution Price Review (EDPR) stakeholders on their views and preferences related to CER integration.

We have summarised the key themes from our customers and stakeholder related to CER integration below. At times, our customers' and stakeholders' views have differed. We indicate throughout this document where our approach was informed by customer or stakeholder feedback, and where we have relied on direction from our EDPR stakeholders even if their feedback may have differed to those of our customers. We have only done this in instances where we believe our stakeholders were able to weigh up the trade-offs between service levels, affordability and efficiency at a more holistic level compared to feedback received from customers.

On the following pages we summarise three key themes coming out of our research and feedback, while figure 2 provides a holistic view of how our customers' needs are changing, and the emergence of new customer types through the energy transition.

### Customers value solar exports and do not want them to go waste

Through our customer research, surveying and workshops, we have received consistent feedback that solar energy should not be wasted and that solar exports should be celebrated, both as renewable energy resources but also to allow neighbours to share in that energy. Our customers see beneficiaries of solar to be both those sharing excess solar, and those using clean energy generated by their neighbours. Customers also don't like the idea of 'wasting solar' and see better-utilising solar as a good way to bring down overall energy costs.

In our Quantified Customer Values research, customers put a high value on solar exports to be enabled through a customer willingness to pay (WTP).



Figure 2: Customer preferences around investment in solar exports

Notes: WTP = Maximum amount a customer is willing to pay for a service. This can vary based on factors such as income, preferences, perceived benefits, and market conditions; rebased WTP = the maximum amount a customer is willing to pay for a service determined by their willingness to pay for the entire bundle of services; willingness to accept (WTA) = Minimum compensation a customer would accept to lose a service. It depends on various factors such as the individual's valuation of the item, opportunity costs, and personal circumstances.

Source: AusNet.

Overall, surveyed customers expressed the following perceptions:

- Customers view curtailed solar is wasteful and believe using electricity generated by rooftop solar offers overall benefits.
- Many customers see the ability to export solar energy as a right and a key part of the "solar value proposition" promoted by the government and solar installers.
- Some customers perceive AusNet curtailing solar as a failure of both AusNet and the government to work effectively behind the scenes.

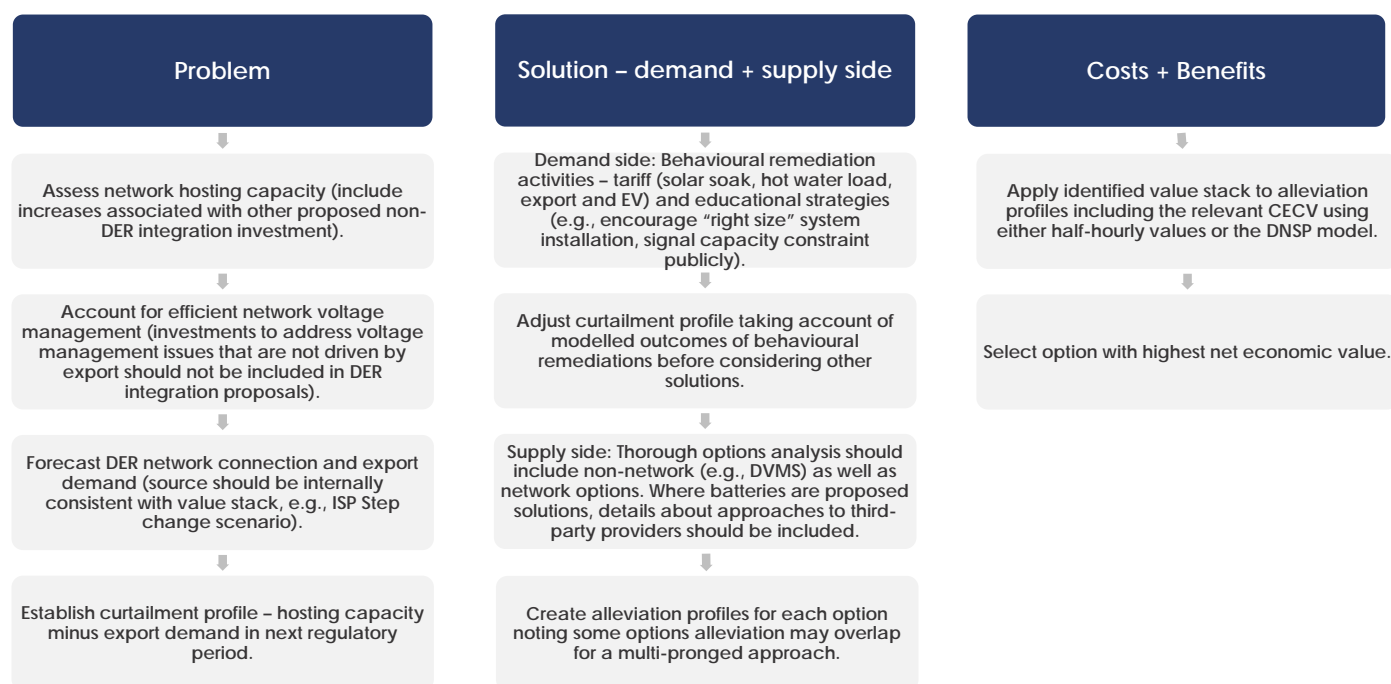
This was broadly consistent with customer workshop findings, where customers expressed willingness to pay extra for the network to enable solar exports, where approximately \$40 per year was seen as a reasonable extra cost.

We understand the customer sentiment on solar exports; however, we also need to consider whether there are unintended cross subsidies through enablement of exports at any cost. For that reason, we have engaged extensively on our export enablement proposal with our Future Expert Panel and our Tariffs and Pricing Panel. Our panel members are highly supportive of a move to Flexible Exports as a more efficient and more equitable way of managing exports in the future. They are also supportive of investment that unlocks efficient levels of expenditure based on the AER's customer export curtailment value (CECV) and value of emissions reduction (VER). We agree with this approach, and while customers typically would like to see all solar exports utilised, we consider it is important to maintain efficiency of our investment in the long-term interest of all consumers.



## 2.2. AER's DER integration guidance note, CECV and VER

Following the recognition of export services as a distribution service in 2021 through the AEMC's Access, pricing and incentive arrangements for distributed energy resources (DER) rule change, the AER published its DER integration expenditure guidance note and the first iteration of the customer export curtailment value (CECV) in 2022. The AER's proposed process for the development of CER/DER integration expenditure shown in Figure 3. The AER updated its CECV values in June 2025.



**Figure 3: AER's process for developing CER/DER integration investment proposals**

Source: AER, DER integration expenditure guidance note, June 2022, p. 5.

In May 2024, the AER published its guidance on applying values of emissions reduction (VER) including the VER to be used by distribution networks, shown in Table 2.

**Table 2: AER's VER, May 2024**

Year	Average IPCC & ACCU (AUD2023)	Year	Average IPCC & ACCU (AUD2023)
2023	66	2037	181
2024	70	2038	194
2025	75	2039	207
2026	80	2040	221
2027	84	2041	236
2028	89	2042	252
2029	95	2043	268
2030	105	2044	286
2031	114	2045	305
2032	124	2046	325
2033	135	2047	346
2034	146	2048	369
2035	157	2049	393
2036	169	2050	420

Source: AER, Valuing emissions reduction AER guidance and explanatory statement, May 2024.

## 2.3. Purpose and scope

The purpose of this business case is to describe the identified need in relation to enabling CER across the AusNet electricity distribution network, and to present credible options for programs of work that can address the identified need. This business case quantifies the:

- current and estimated future levels of identified CER hosting and export limitations across the network for each network asset.
- impact of network export limitations on CER customers in relation to
  - **imposing static export limits on CER customers** - AusNet's assets could be exposed to thermal overload beyond their technical rating, and AusNet's customers could be exposed to steady-state over-voltage beyond the EDCoP limits, if there are CER exports exceeding the network's technical capability; and
  - **voltage-curtailement of solar PV systems** (for a subset of options) - over-voltages cause tripping or reduction of solar PV inverter power output, preventing CER customers from generating and exporting electricity.
- increase in greenhouse gas emissions because of curtailed customer CER renewable generation
- costs and benefits of potential credible options to mitigate identified network export limitations
- forward looking programs of work for implementation in the 2026-31 regulatory control period that ensure that CER enablement is undertaken at least lifecycle cost.

The scope of this business case is for CER Enablement only. There are other related programs (with separate business cases) with different identified needs and objectives that may have identified identical augmentation projects. Therefore, AusNet has removed duplicated projects from this CER Enablement business case where an overlap has been identified, so as not to double-count expenditures (i.e., this business case takes a lower precedence). This includes removing programs identified in other proposed demand-driven augmentation projects.

The hierarchy we have applied in our model ensures the removal of duplicate projects from the programs of work is as follows:

- 1<sup>st</sup> priority — *Demand Driven Augmentation in the LV Network & Flexible Services*
- 2<sup>nd</sup> priority — *CER Enablement* (this business case).

We note that our original proposal included a proactive voltage compliance program which we have not re-proposed in our Revised Proposal. Voltage Compliance was the 1<sup>st</sup> priority in our original proposal model. Since it has been removed, some of the projects originally scoped to be address voltage non-compliance would have been picked up in our revised CER Enablement program, where they are economic based on the CER enablement benefits.

### 3. Identified need

Table 3 through to Table 7 illustrates AusNet's forecast hosting capacity, estimated CER generation and export levels, estimated voltage curtailment levels, and CER generated energy at risk, aggregated at each level of the network. This forecast is based on a do-nothing investment scenario over the 2026-31 regulatory control period.

Table 3: AusNet aggregated forecast hosting capacity and network limitations – sub-transmission level

AusNet Sub-transmission hosting capacity and limitations				
Year	Gross hosting capacity (MW)	Net export hosting capacity (MW)	Inverter voltage curtailment (GWh pa)	Risk of export limiting (GWh pa)
2027	2195	1371	8	143
2028	2188	1353	8	189
2029	2174	1330	8	235
2030	2168	1317	8	279
2031	2152	1296	8	326

Table 4: AusNet aggregated forecast hosting capacity and network limitations – zone substation level

AusNet Zone Substation hosting capacity and limitations				
Year	Gross hosting capacity (MW)	Net export hosting capacity (MW)	Inverter voltage curtailment (GWh pa)	Risk of export limiting (GWh pa)
2027	1031	216	12	141
2028	1041	217	15	187
2029	1047	218	19	233
2030	1050	219	26	277
2031	1054	219	30	317

Table 5: AusNet aggregated forecast hosting capacity and network limitations – HV distribution feeder level

AusNet High-Voltage Distribution Feeder hosting capacity and limitations				
Year	Gross hosting capacity (MW)	Net export hosting capacity (MW)	Inverter voltage curtailment (GWh pa)	Risk of export limiting (GWh pa)
2027	1146	435	8	553
2028	1154	429	9	653
2029	1160	422	9	851
2030	1163	416	9	1019
2031	1164	409	10	1184



**Table 6: AusNet aggregated forecast hosting capacity and network limitations – SWER level**

AusNet Single Wire Earth Return (SWER) hosting capacity and limitations				
Year	Gross hosting capacity (MW)	Net export hosting capacity (MW)	Inverter voltage curtailment (GWh pa)	Risk of export limiting (GWh pa)
2027	33	23	1	1
2028	33	23	1	1
2029	33	23	1	1
2030	33	23	1	2
2031	33	23	1	2

**Table 7: AusNet aggregated forecast hosting capacity and network limitations – distribution substation and LV level**

AusNet Distribution Substations and Low-Voltage hosting capacity and limitations				
Year	Gross hosting capacity (MW)	Net export hosting capacity (MW)	Inverter voltage curtailment (GWh pa)	Risk of export limiting (GWh pa)
2027	4623	4233	8	60
2028	4633	4226	8	71
2029	4642	4221	8	83
2030	4649	4216	8	95
2031	4656	4213	8	106

Over the 2026-31 regulatory control period, for a do nothing investment scenario, the amount of CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is expected to rise by 1,059 GWh pa, a 113% increase.

## 3.1. Key inputs and assumptions

Key inputs, calculations and assumptions used in this business case are described in detail in AusNet's *Hosting Capacity, Electrification and CER Enablement Methodology* document. Other key assumptions used in this business case are summarised in Table 8

**Table 8: Key assumptions**

Parameter	Value	Comments
Discount rate	5.56%	Average of our forecast of pre-tax WACC (3.91%) and AEMO's 2023 IASR central case (7.00%)
Evaluation period	20 years	Benefits calculated for the first 10-years, then maintained from years 11 to 20. No benefits assumed beyond year 20.
CECV	2025 CECV – VIC, June 2025	Used for inverter voltage curtailment and export limiting of CER.
Emissions Intensity profile	Emissions Intensity profile – VIC, June 2025	Used for inverter voltage curtailment and export limiting of CER.
VER	AER - Valuing emissions reduction - Final guidance and explanatory statement - May 2024	Used for inverter voltage curtailment and export limiting of CER
Flexible export uptake rate	70% of new CER customers per annum	Our modelling assumes that Flexible Export services are taken up by the majority of new CER installations.
Unit Rates	Budget estimates	Based on average budget estimates from past projects, adjusted for inflation where applicable.  Note that augmentation costs are higher than replacement costs due to additional design requirements and necessary upgrades to supporting structures and connected upstream and downstream assets (e.g., fuses, poles, conductors).

Source: AusNet analysis

## 4. Options assessed

### 4.1. Credible solutions

In developing the options for this business case, we have considered a range of credible solutions, that are able to address the network export limitations identified, and the voltage-induced CER curtailment that is likely to be occurring. To identify which solutions are least-cost technically feasible to resolve the nature of the identified limitations, a set of decision rules are applied to each asset (at each network level) using the measured actual and forecast operating conditions and limitations.

The range of credible solutions considered are as follows:

- Dynamic Voltage Management (DVM)
- Network augmentation:
  - Switched reactors
  - Transformer upgrades (larger rating and/or lower impedance) and replacements (with wider tapping ranges)
  - New transformers
  - New feeders and circuits
  - Splitting or reconfiguring circuits
  - Tap changes
  - Float voltage setting changes and line drop compensation
  - Phase balancing
- Non-network alternatives (including storage, and inverter support).

These solutions are discussed in further detail below.

#### 4.1.1. Dynamic Voltage Management (DVM)

Like other Victorian distributors, AusNet is ideally placed with its ubiquitous availability of Advanced Metering Infrastructure (AMI) smart meters to adopt DVM as a credible solution to addressing voltage-related network export limitations and voltage-induced CER curtailment. AMI to date has given us greater visibility of steady-state voltage performance through a suite of analytical tools which has enabled the business to understand, monitor, report on, and act upon voltage compliance issues within the network, yet AusNet has not used to date AMI for near real time voltage control.

As such, AusNet is now embarking on, in the current regulatory control period, using the AMI smart meter voltage data for near real-time operational voltage control for a trial adopting DVM capability at several of our zone substations with high penetrations of CER. We intend (at the conclusion of this trial) to transition to a more widespread use of DVM which provides a more advanced, data-driven way to manage both HV and LV voltages over network augmentations, eliminating the need for voltage drop assumptions, and having the capability to dynamically respond to changes in CER operation in near-real-time to accommodate more exports and less curtailment.

Whilst this solution can be used to address voltage-related network export limitations and voltage-related generation curtailment of CERs, it cannot address any thermal overload related limitations resulting from reverse power flows exceeding the assets' export ratings. For thermal export limitations, a network augmentation solution or non-network solution is required to address the need.

We have assessed the deployment of this new DVM capability against other network augmentations and other non-network alternatives in this business case, to develop a CER Enablement Program that achieves the maximum enablement of CER at least cost.

### 4.1.2. Network augmentations

It should be noted that DVM acts on a population basis (per HV voltage control zone) rather than act to achieve satisfactory voltage for any individual CER customer. Hence, whilst DVM capability can act to alleviate much of the voltage-related export limitations and voltage-induced curtailment, addressing limitations for individual customers would need to continue to be undertaken at the localised level using more network solutions.

The extent that an automated DVM system would cease to be effective from a population basis for addressing voltage-related limitations would arise under two conditions:

- an excessive (greater than 37 V) LV voltage distribution spread (per HV voltage control zone) at times of maximum demand (usually on days of extreme ambient temperature) where LV voltage distributions may be so broad, preventing DVM from addressing the voltage-related network export limitations and curtailments, in which case some network augmentations would be required to enable a DVM solution; and
- running out of available taps (on a zone substation transformer) at times of minimum daytime demand where voltage distributions are pushed so far towards the higher end of the regulatory limits by exports that there is no ability to lower voltages to resolve the network export limitations and curtailments, in which case a transformer replacement (with wider tapping range) or switched reactor would be required with a DVM solution.

The typical work undertaken under network augmentation solutions include:

- **Switched reactors** – these are used to draw more reactive power through the network to create a voltage drop which will result in transformers operating on more nominal taps during times of minimum demand, rather than at their extreme buck tap. This solution, however, does not address thermal overload limitations.
- **Transformer upgrades (lower impedance, higher rating) and replacements (with wider tapping ranges)** – to cater for voltage limitations that are caused by low short-circuit levels, or a lack of available buck taps during times of minimum demand. This solution also addresses thermal overload limitations using a higher rating transformer.
- **New transformers and new circuits** – to cater for voltage limitations that are caused by long or high impedance circuits, by splitting up and reconfiguring the network with shorter circuits and fewer customer per circuit. This solution also addresses thermal overload limitations by increasing the capacity of the network with the new assets.
- **Tap changes** – to allow the voltage to be dropped when the voltage is elevated across all operating conditions. Many of AusNet's legacy transformers are operating at their extreme buck tap and cannot be tapped down any further without a transformer replacement. This solution does not address thermal overload limitations.
- **Float voltage setting changes** – this has been completed across many of AusNet's sites already.
- **Phase balancing** – targeted at sites where there is significant unbalance at maximum demand causing a wide voltage spread across phases. This solution can also address thermal overload limitations if balancing is undertaken for minimum demand, provided such action does not adversely create a balancing limitation at maximum demand.

### 4.1.3. Non-network alternatives

Battery energy storage and CER inverter settings could be used to support network voltage and therefore alleviate voltage-related network export limitations and curtailments. This solution also addresses thermal overload limitations triggered by reverse power flows exceeding the assets' export rating.

We have already mandated the use of Volt-Watt and Volt-VAR settings on CER inverters to allow the voltage to be lowered by either drawing reactive power through the network impedance, or curtailing the generation output of the inverter, to the extent that the inverter is able to achieve this. It is expected that as more customers apply the settings, the active and reactive power support would enable more solar customers to be connected to the network with reduced levels of non-compliance.

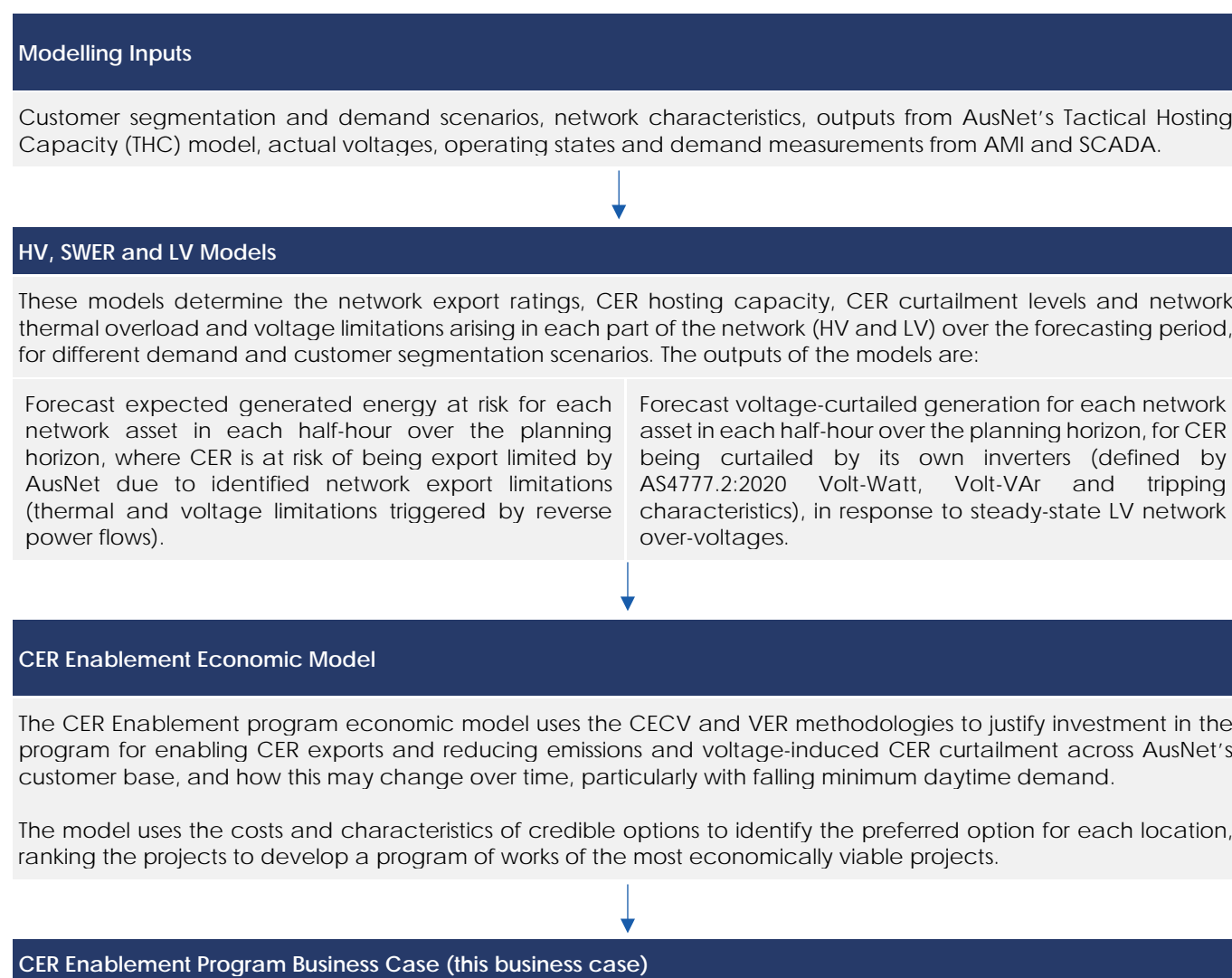
The opportunity lies with storage in being able to defer or displace a network augmentation by charging during minimum demand and utilising its inverter for voltage support. The opportunity to adopt storage as a non-network alternative will be assessed on a case-by-case basis.

## 4.2. Assessment approach

### 4.2.1. Assessment methodology

The regulatory framework facilitates quantifying a prudent level of CER enablement investment through the AER's CECV and VER. AusNet has adopted these as an economic approach to valuing the impact of network limitations on CER exports, with the aim of enabling exports<sup>2</sup> and reducing emissions and voltage-induced curtailment<sup>3</sup> for CER customers.

To identify the limitations and economic viability of the projects which make up the CER Enablement Program, AusNet has developed a detailed model that maximises the use of its AMI data and other measurement data, to determine the network performance and its characteristics, in-lieu of power system simulation and modelling assumptions. Figure 4 identifies the modelling components of AusNet's CER Enablement Program that identify and economically justify expenditure on this program for the 2026-31 regulatory control period, based on forecast network export limitations and CER voltage-related curtailments.



**Figure 4: CER Enablement Program Modelling**

The methodology applied is described in detail in AusNet's *Hosting Capacity, Electrification and CER Enablement Methodology* document, with the quantification of the identified needs and economic evaluation approach summarised from this document below.

<sup>2</sup> Avoiding CER export limiting that may otherwise be needed to address thermal overload and voltage limitations in the network as a result of reverse power flows.

<sup>3</sup> Avoiding CER generation curtailment associated with inverters responding to network over-voltages through the action of their mandated AS4777.2:2020 inverter Volt-Watt and tripping settings.

### 4.2.2. Valuing exported energy and over-voltage curtailed energy

This CER Enablement business case utilises the CECV methodology and the CER assessment guideline. The AER published the most recent CECV on 30 June 2025.<sup>4</sup> These values have been used verbatim (copied directly from the AER workbook, as values) into the CER Enablement models, filtered for the Victorian region. They cover every half hour period from 1/7/2025 to 30/6/2045 and are expressed in Australian dollars per MWh (\$2024, real).

The assessment approach in this business case applies CECV to the exporting of CER generation that causes minimum net demand to fall to levels that exceed the export rating of each network asset under assessment. This is referred to as the *expected generated energy at risk*, because the CER contributing to these network export limitations is at risk of having export limits imposed by AusNet.

The steps taken to do this included

- comparing the annual load profile (based on customer segmentation, maximum and minimum demand forecasts) with the calculated export rating, for each asset under assessment
- identifying the *generated energy at risk* at times when the annual load profile breaches the asset's export ratings
- weighting the results by the 10POE and 50POE demand scenarios to get an *expected* value
- multiplying the *expected generated energy at risk* calculated from this process with the escalated CECV for each half hour of the analysis period.

The assessment approach in this business case also applies CECV to the voltage-induced curtailment of generation from the action of Volt-Watt control in AS4777.2:2020 solar PV inverters at that location. To estimate the level of voltage-induced curtailment on inverters, it is necessary to understand the gross level of solar PV generation being produced during the year and its profile during the day, and the voltage levels that are being experienced by the inverter which may trigger the operation of the Volt-Watt or inverter tripping functions in solar PV inverters.

The steps taken to do this included

- identifying a seasonal gross generation equation for a typical solar PV system located in outer eastern Melbourne, being representative of the heartland of AusNet's residential solar PV customer population.
- identifying an equation that describes the curtailment of the gross generated energy from the action of the Volt-Watt and tripping settings that occurs from the inverter responding to steady-state over-voltages.
- netting out the impacts of shading and cloud cover that can change across different seasons.
- multiplying the net curtailed energy calculated from this process with the escalated CECV for each half hour of the analysis period.

### 4.2.3. Valuing emissions reduction

The CER enablement program is also supported by the quantification of greenhouse gas emissions reductions. The curtailment of CER generation could result in higher emissions of greenhouse gasses if additional fossil-fuel generation is dispatched to meet the increased demand. The AER has released final guidance on applying value of emissions reduction for network capital investments utilising a Value of Emissions Reduction (VER) Methodology<sup>5</sup>, as well as forecasts VER for use by DNSPs in economic evaluations.

Since our initial proposal, we have updated our approach to calculate emissions reduction to align with the AERs emissions intensity profile for Victoria published alongside the updated CECVs in the 2025 update<sup>6</sup>. The result of this update is larger emissions benefit than originally assumed in our proposal, indicating that our less granular estimate was conservative.

<sup>4</sup> <https://www.aer.gov.au/documents/2025-cecv-vic>

<sup>5</sup> <https://www.aer.gov.au/industry/registers/resources/guidelines/valuing-emissions-reduction-final-guidance-may-2024>

<sup>6</sup> [https://www.aer.gov.au/system/files/2025-06/Emissions\\_intensity\\_profile\\_VIC.csv](https://www.aer.gov.au/system/files/2025-06/Emissions_intensity_profile_VIC.csv)



#### 4.2.4. Economic evaluation approach

The proposed program expenditure is derived from an assessment approach that aims to maximise the net economic benefit to customers as follows:

- Using the costs and avoided risks (calculated from the do nothing risks above) of the identified credible solutions, the net present value (NPV) of the solution at each asset location is calculated.
- The site NPVs are ranked to develop a program of works of the most economically viable projects, comprising only NPV positive projects.
- The optimum timing for each project occurs when the annualised avoided risk exceeds the annualised cost of the project.

The present values are calculated using a discount rate over a 20-year planning horizon, keeping forecasts of risk and benefits beyond 10-years constant at the year 10 value. We consider this assumption remains appropriate given the expected increase in export constraints due to growing solar which will offset the decline in grid emission intensity (and the resulting CECV and emission benefits). However, we note our preferred option is beneficial based on the calculated 10 year benefit using the AERs CECV and emissions reduction values. We consider this addresses the concerns raised by the AER on benefits beyond 10 years raised in their draft decision.

An expenditure profile is developed based on the list of economically viable sites and their optimum timing forming a programme of works.

Two program options were considered, with Option 1 following the economic approach. Option 2 applies a similar approach to Option 1 considering multiple solutions to remove constraints in the low voltage and the 22 kV network to allow for zero constraints, however the preferred solution does not necessarily deliver the most positive net benefit to all customers. Instead, it is focussed on delivering the largest improvement in CER enablement at least cost.

## 4.3. Do nothing

The do nothing (counterfactual) option assumes that AusNet would not undertake any proactive investment in CER enablement—that is, none of the CER Enablement Programs are adopted. Since this option assumes no investment outside of the normal operational and maintenance processes, this is a zero incremental investment cost option.

In response to the AERs feedback in their draft decision, we note a do-nothing scenario is an accurate counterfactual. Our BAU approach for CER enablement should be reflective of current obligation to enable export capacity and therefore does not include investments such as tap changes and phase balancing, given these are incremental discretionary investments to enable exports where they are preferred over capex investments. Additionally, we note our model is designed to solve for these opex based solutions as well as capex solutions, which we would implement and fund within our opex allowance where opex solutions are preferred. Therefore, we consider that comparing benefits of investment to a do-nothing BAU scenario is reflective of our BAU investment drivers and does not overstate benefits.

Over the 2026-31 regulatory control period, for a do nothing investment scenario, the amount of CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is expected to rise by 1,059 GWh pa, a 113% increase.

The present value of total risk of greenhouse gas emissions, CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is valued at \$1,376 million over the analysis period (real 30th June 2024 dollars). Table 9 shows the undiscounted risk values.

**Table 9: Do nothing risk (\$m, undiscounted, 30th June 2024 dollars)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
<b>Avoided export limits</b>	5.0	7.4	18.9	18.7	23.4	<b>73.4</b>	<b>255</b>	<b>609</b>
<b>Avoided generation curtailment</b>	0.13	0.16	0.24	0.17	0.21	<b>0.9</b>	<b>4</b>	<b>10</b>
<b>Emissions reduction</b>	13.1	16.6	20.2	24.2	32.8	<b>106.9</b>	<b>346</b>	<b>757</b>
<b>Do Nothing Risk</b>	<b>18.3</b>	<b>24.1</b>	<b>39.4</b>	<b>43.1</b>	<b>56.5</b>	<b>181.2</b>	<b>605</b>	<b>1,376</b>

Source: AusNet analysis

The incremental investment cost of do nothing is zero.

The do-nothing risk represents an upper limit of the pool of potential benefits that are available to credible options that can address the identified need, as detailed below.

## 4.4. Option 1 – Economic approach

This option is a proactive CER Enablement Program which is specifically targeted at following the economic approach to minimise the impact of network limitations on CER exports from the imposition of static export limits, *including* addressing voltage-curtailed generation for customers with over-voltage, noting that this option has removed projects that have been identified in Option 1 of the *Demand Driven Augmentation in the LV Network & Flexible Services* business case. This option assumes all new solar customers are offered flexible solar exports with 70% uptake.

The sites which have been identified under this option for targeting CER enablement solutions are shown in Table 10. All projects in this list are NPV positive, all considering the benefits of the avoided risks of imposing static export limits and avoided voltage-curtailed generated energy. The NPV analysis is shown in Table 11.

**Table 10: Option 1 projects**

Optimum project type	Identified sites
Zone substation reactor & DVM	DRN, WN, OFR
Dynamic Voltage Management (DVM)	CRE, EPG, WOTS, RWN, ELM, LYD, WGL, WYK, BDL, MBY, BN, NLA, LLG
HV distribution feeder regulator & DVM	CRE33, WGL21, RWN26, LDL13, CPK12, BWN14, RWN22, BGE23, CRE22, RWN31, BRA14, WYK13, RWN24, LDL23, ELM26, ELM32, CYN33, ELM24, ELM34, BRA21, ELM23, KMS12, WGL11, WYK23, MYT12, BDL32, WN5, MJG11
HV distribution feeder augmentation	HPK21, PHI12, TGN31
Distribution substation and LV circuit augmentation	FISHERMAN STREAM, COMMERCIAL LONGVIEW, EVERTON UPPER 7E
Distribution substation transformer replacement	24 sites
Distribution substation tap down	
Distribution substation phase peak load balance	34 sites
Distribution substation tap up	

Source: AusNet analysis

**Table 11: Option 1 (\$m, undiscounted, 30th June 2024 dollars)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
Cost	(13.3)	(11.0)	(7.9)	(1.8)	(8.7)	(42.6)	(38.5)	(40.4)
Benefits	0.0	1.7	3.3	4.7	6.3	16.0	60.6	141.2
NPV (discounted)	100.9							

Source: AusNet analysis (benefits are relative to do nothing, representing reduced do-nothing risk)

## 4.4.1. Cost

### 4.4.1.1. Capital expenditure

Table 12 represents the forecast capital expenditure that is economically prudent for AusNet to be investing in the network to enable CER exports, and to facilitate reduced CER curtailment.

**Table 12: Option 1 capital expenditure (\$m, undiscounted, \$June 2024)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31
<b>Capex</b>	(13.3)	(10.7)	(7.7)	(1.5)	8.3	<b>(41.6)</b>

Source: AusNet analysis

### 4.4.1.2. Operating expenditure

Table 13 represents the forecast incremental operational expenditure that is economically prudent for AusNet to be investing in the network to enable CER exports, and to facilitate reduced CER curtailment.

**Table 13: Option 1 operating expenditure (\$m, undiscounted, \$June 2024)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period (discounted)
<b>Opex</b>	(0.0)	(0.1)	(0.2)	(0.3)	(0.3)	<b>(1.0)</b>	<b>(4.0)</b>

Source: AusNet analysis

## 4.4.2. Benefits

Over the 2026-31 regulatory control period, the amount of CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is expected to fall by 169 GWh pa, a 18% reduction (compared to a 36% increase with flexible exports only and 113% increase for the do nothing investment scenario).

**Table 14: Option 1 benefits (\$m, undiscounted, \$June 2024)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
Avoided export limits	-	0.5	1.2	1.4	1.7	<b>4.9</b>	<b>14.7</b>	<b>33.0</b>
Avoided generation curtailment	-	0.01	0.03	0.02	0.02	<b>0.1</b>	<b>0.4</b>	<b>0.8</b>
Emissions reduction	-	1.2	2.2	3.4	4.7	<b>11.5</b>	<b>45.5</b>	<b>107.4</b>
<b>Total</b>	<b>-</b>	<b>1.7</b>	<b>3.5</b>	<b>4.9</b>	<b>6.4</b>	<b>16.5</b>	<b>60.6</b>	<b>141.2</b>

Source: AusNet analysis (benefits are relative to do nothing, representing reduced do-nothing risk)

## 4.5. Option 2 - Economic Voltage Management Approach

This option is a proactive CER Enablement Program which is specifically targeted at following the economic approach to minimise the impact of network limitations on CER exports from the imposition of static export limits, *including* addressing voltage-curtailed generation for customers with over-voltage, noting that this option has removed projects that have been identified in Option 2 of the *Demand Driven Augmentation in the LV Network & Flexible Services* business case. This option assumes all new solar customers are offered flexible solar exports with 70% uptake.

Option 2 differs from Option 1 in that it focuses exclusively on high-voltage (HV) network capital expenditure projects that deliver voltage management capabilities. Compared to Option 1, this approach excludes HV feeder capacity augmentation and distribution substation projects.

The sites which have been identified under this option for targeting CER enablement solutions are shown in Table 15. All projects in this listing are NPV positive, all considering the benefits of the avoided risks of imposing static export limits and avoided voltage-curtailed generated energy. The NPV analysis is shown in Table 16.

Table 15: Option 2 projects

Optimum project type	Identified sites
Zone substation reactor & DVM	DRN, WN, OFR
Dynamic Voltage Management (DVM)	CRE, EPG, WOTS, RWN, ELM, LYD, WGL, WYK, BDL, MBY, BN, NLA, LLG
HV distribution feeder regulator & DVM	CRE33, WGL21, RWN26, LDL13, CPK12, BWN14, RWN22, BGE23, CRE22, RWN31, BRA14, WYK13, RWN24, LDL23, ELM26, ELM32, CYN33, ELM24, ELM34, BRA21, ELM23, KMS12, WGL11, WYK23, MYT12, BDL32, WN5, MJG11

Source: AusNet analysis

Table 16: Option 2 (\$m, undiscounted, 30th June 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
Cost	(10.8)	(3.2)	(7.8)	(1.8)	(8.6)	(32.0)	(28.6)	(30.0)
Benefits	-	1.2	1.7	3.0	4.0	9.9	43.2	105.8
NPV (discounted)	75.8							

Source: AusNet analysis (benefits are relative to do nothing, representing reduced do nothing risk)

## 4.5.1. Cost

### 4.5.1.1. Capital expenditure

Table 17 represents the forecast capital expenditure that is economically prudent for AusNet to be investing in the network to enable CER exports, and to facilitate reduced CER curtailment.

**Table 17: Option 2 capital expenditure (\$m, undiscounted, \$June 2024)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31
<b>Capex</b>	10.8	3.1	7.7	1.5	8.3	<b>31.4</b>

Source: AusNet analysis

### 4.5.1.2. Operating expenditure

Table 18 represents the forecast incremental operational expenditure that is economically prudent for AusNet to be investing in the network to enable CER exports, and to facilitate reduced CER curtailment.

**Table 18: Option 2 operating expenditure (\$m, undiscounted, \$June 2024)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period (discounted)
<b>Opex</b>	-	0.1	0.1	0.2	0.2	<b>0.7</b>	<b>3.0</b>

Source: AusNet analysis

## 4.5.2. Benefits

Over the 2026-31 regulatory control period, the amount of CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is expected to fall by 124 GWh pa, a 13% reduction (compared to a 36% increase with flexible exports only and 113% increase for the do nothing investment scenario).

**Table 19: Option 2 benefits (\$m, undiscounted, \$June 2024)**

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
Avoided export limits	-	0.3	0.5	0.7	0.9	<b>2.4</b>	<b>8.7</b>	<b>21.3</b>
Avoided generation curtailment	-	0.01	0.02	0.02	0.02	<b>0.1</b>	<b>0.3</b>	<b>0.7</b>
Emissions reduction	-	0.9	1.2	2.2	3.1	<b>7.4</b>	<b>34.2</b>	<b>83.8</b>
<b>Total</b>	-	<b>1.2</b>	<b>1.7</b>	<b>3.0</b>	<b>4.0</b>	<b>9.9</b>	<b>43.2</b>	<b>105.8</b>

Source: AusNet analysis (benefits are relative to do nothing, representing reduced do nothing risk)



## 4.6. Option 3 – Deterministic approach

This option is a proactive CER Enablement Program which is specifically targeted at following the deterministic least cost approach to remove all static export limits and voltage-curtailed generation, noting that this option has removed projects that have been identified in Option 3 of the *Demand Driven Augmentation in the LV Network & Flexible Services* business cases. This option also assumes all new solar customers are offered flexible solar exports with 70% uptake.

The sites which have been identified under this option for targeting CER enablement solutions are shown in Table 20. All projects in this listing have benefits but are not necessarily NPV positive to achieve a full CER export and no curtailment outcome. Project solutions are based on least cost. The NPV value is shown in Table 21.

Table 20: Option 3 Projects

Optimum project type	Identified sites (NPV > 0)	Identified sites (NPV ≤ 0)
Sub transmission augmentations	0 sites	9 sites
Zone substation augmentations	0 sites	CLN, WGI
Zone substation DVM	20 sites	15 sites
Zone substation reactor & DVM	DRN, WN, OFR	16 sites
HV distribution feeder regulator & DVM	7 sites	26 sites
HV distribution feeder augmentation	HPK21, PHI12, TGN31	MOE13, CRE31
DVM on regulators	24 sites	158 sites
SWER augmentation	0 sites	6 sites
Distribution substation and LV circuit augmentation	3 sites	79 sites
Distribution substation transformer replacement	24 sites	1,233 sites
Distribution substation tap down		
Distribution substation phase peak load balance	34 sites	129 sites
Distribution substation tap up		

Source: AusNet analysis

Table 21: Option 3 (\$m, undiscounted, 30th June 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
Cost	(185.4)	(239.9)	(241.4)	(241.4)	(223.6)	(1,131.8)	(996.4)	(1,043.6)
Benefits	0.0	2.7	4.5	7.1	9.5	23.7	100.6	246.9
NPV (discounted)	(796.7)							

Source: AusNet analysis (benefits are relative to do nothing, representing reduced do nothing risk)

## 4.6.1. Cost

### 4.6.1.1. Capital expenditure

Table 22 represents the forecast capital expenditure that is a deterministic removal of all export constraints.

Table 22: Option 3 (\$m, undiscounted, 30th June 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31
<b>Capex</b>	185.4	238.1	237.4	235.1	214.9	<b>1,110.9</b>

Source: AusNet analysis

### 4.6.1.2. Operating expenditure

Table 23 represents the forecast incremental operational expenditure related to a deterministic removal of all export constraints.

Table 23: Option 3 (\$m, undiscounted, 30th June 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	Full assessment period (discounted)
<b>Opex</b>	-	1.9	4.1	6.3	8.7	<b>20.9</b>	<b>99.2</b>

Source: AusNet analysis

## 4.6.2. Benefits

By the end of the 2026-31 regulatory period, the amount of curtailment and export limiting needed to manage the network should be minimal.

Table 24: Option 3 (\$m, undiscounted, 30th June 2024 dollars)

	FY27	FY28	FY29	FY30	FY31	Total FY27-31	10 years (discounted)	Full assessment period (discounted)
Avoided export limits	-	0.8	1.6	2.1	2.6	<b>7.0</b>	<b>24.1</b>	<b>57.4</b>
Avoided generation curtailment	-	0.02	0.03	0.03	0.03	<b>0.1</b>	<b>0.5</b>	<b>1.3</b>
Emissions reduction	-	1.9	2.9	5.0	6.9	<b>16.6</b>	<b>76.0</b>	<b>188.2</b>
<b>Total</b>	<b>0.0</b>	<b>2.7</b>	<b>4.5</b>	<b>7.1</b>	<b>9.5</b>	<b>23.7</b>	<b>100.6</b>	<b>246.9</b>

Source: AusNet analysis (benefits are relative to do nothing, representing reduced do nothing risk)

## 5. Preferred option and sensitivity testing

Option 2 is the preferred option at a total cost of \$30 million (real, \$June 2024) over the 2026-31 regulatory period, which represents a prudent and efficient network augmentation investment to enable CER. Applying a discount rate of 5.56% per annum, this proposed program option has a net economic benefit of \$76 million (real, \$June 2024) over the 20-year assessment period as illustrated in Table 25.

**Table 25: Economic evaluation of CER enablement options (\$m, \$June 2024)**

	FY27 to FY31 (undiscounted)			Full assessment period (discounted)			Comments
	Capex	Opex	Total Cost	Total Cost	Total Benefits	NPV	
<b>Do Nothing</b>	0.0	0.0	0.0	0.0	0.0 <sup>7</sup>	0.0	This option does not address the identified need
<b>Option 1 – Economic approach</b>	41.6	1.0	42.6	(40.4)	141.2	100.9	
<b>Option 2 – Economic voltage management approach</b>	31.4	0.7	32.0	(30.0)	105.8	75.8	This is the preferred option as it is least cost
<b>Option 3 – Deterministic approach</b>	1,110.9	20.9	1,131.8	(1,043.6)	246.9	(796.7.5)	This is the most expensive option

Source: AusNet analysis

Over the 2026-31 regulatory period, for an Option 2 investment, the amount of CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is expected to fall by fall by 124 GWh pa, a 13% reduction (compared to a 36% increase with flexible exports only and 113% increase for the do nothing investment scenario). Despite the increases in CER connections expected over the period, this Option 2 investment program effectively delivers an improved CER export performance outcome for CER customers. Table 26 compares the costs and benefits of the program options for credible variations in input variables.

**Table 26: Sensitivity of CER Enablement Program NPV (\$m, \$June 2024)**

	Central assumptions	4.11% discount rate	15% reduction in capital costs	5% increase in demand	7.00% discount rate	15% increase in capital costs	5% reduction in demand	Comments
<b>Do nothing</b>	0.0							This option does not address the identified need
<b>Option 1</b>	101	138	108	98	80	94	107	This option has the highest NPV
<b>Option 2</b>	76	105	81	75	60	71	81	This is the preferred least cost option
<b>Option 3</b>	(798)							This is the most expensive option

Source: AusNet analysis

This table illustrates that the decision to select Option 2 as the preferred option remains robust, being the option with the optimal NPV and remaining positive under the majority of credible sensitivities.

<sup>7</sup> The present value of total risk of greenhouse gas emissions, CER generation needing to be curtailed through either static export limits to manage network export limitations, or voltage-curtailed generation being experienced by customers due to higher network voltages from exporting CER, is valued at \$1,376 million over the analysis period (real 30th June 2024 dollars). Refer Table 9.

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