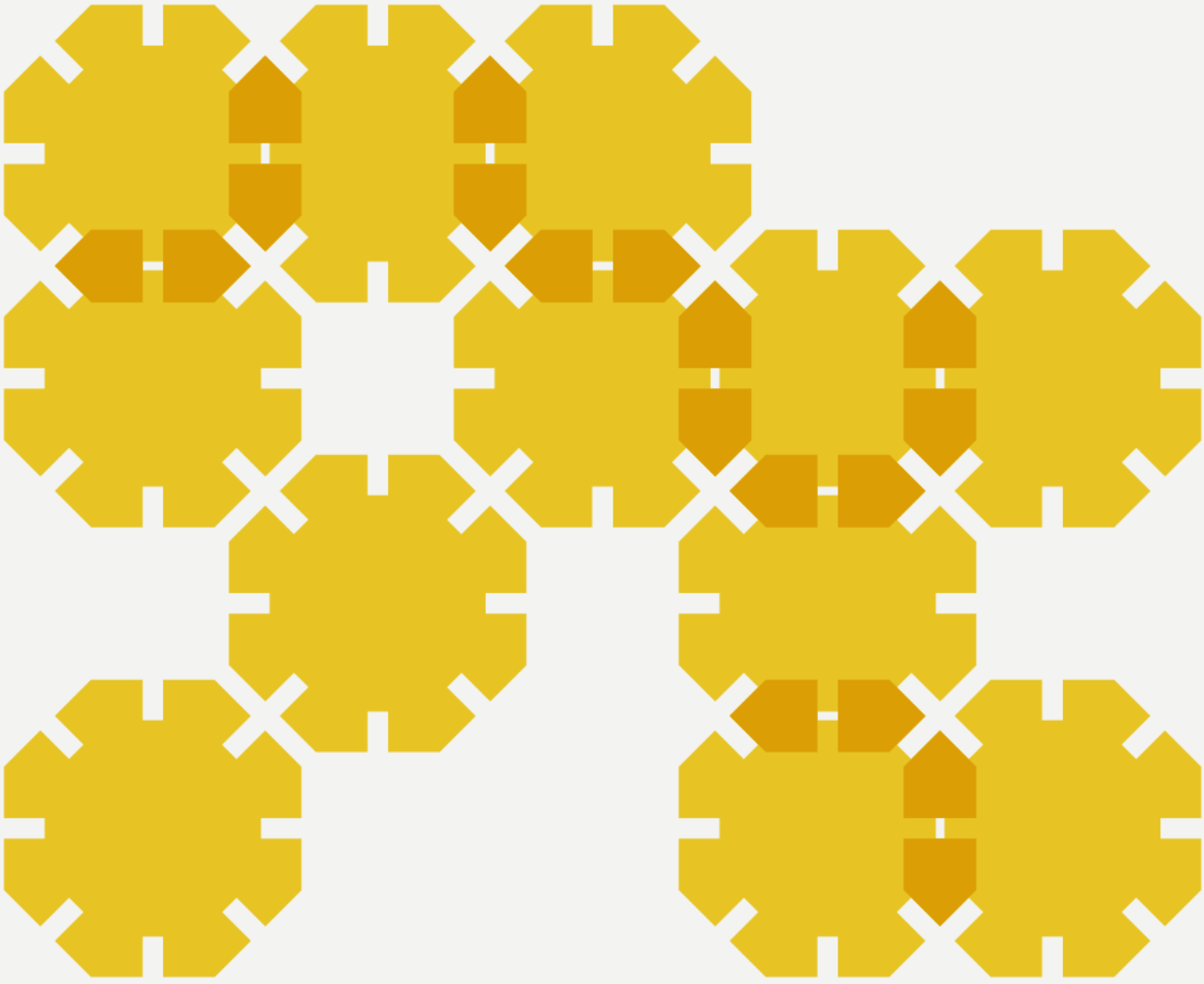
ITP Renewables

Submission

ITP Submission to the AER's Consultation Notice (Sept 2026)

Essential Energy islandable microgrids sandbox trial waiver application



November 2026

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ITP Renewables acknowledges Traditional Owners of Country throughout Australia and recognises the continuing connection to lands, waters, and communities. We pay our respect to Aboriginal and Torres Strait Islander cultures; and to Elders past and present.

This submission was prepared by ITP for EDP as part of the Braidwood Renewable Microgrid Project, with funding support from ARENA through the Regional Microgrids Program.

Authors

Rob Passey & Annie Ngo

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1. Introduction

ITP Renewables, on behalf of EDP Renewables (EDPR), strongly supports Essential Energy's application for trial waivers to deploy islandable microgrids.

This consultation is necessary because the National Electricity Rules (NER) have no dedicated framework for temporary stand-alone power systems (T-SAPS). These are sections of the interconnected network that island for extended periods, supplied by local generation and storage. Short islanding already happens in parts of the NEM, for periods of hours, for example at Mallacoota and the Bawley and Kioloa microgrid. Islanding for days or weeks falls between the interconnected-grid and SAPS regulatory frameworks.

Other barriers include DNSP-owned assets providing generation into T-SAPS, settlement and network tariff anomalies that may occur if islanding occurs for extended periods, the need to maintain reliability of supply and power quality, how network reliability standards should be applied, and maintaining customer protections.

The Australian Energy Market Operator (AEMO) will soon be submitting a Rule Change proposal to the Australian Energy Market Commission (AEMC) that seeks to establish a formal framework within the NER for T-SAPS. Associated with the Rule Change proposal are i) the development of thresholds for when T-SAPS activation is expected to occur and ii) detailed operational and procedural requirements for a T-SAPS. These latter two require input from real-life examples of trial T-SAPS. Essential Energy's proposed trials are the first in the NEM that would be islanded for a sufficient amount of time to provide useful data and experience.

EDPR is developing the Braidwood Renewable Microgrid Project on Essential Energy's network, funded through ARENA's Regional Microgrids Program. The project is a 5 MW solar farm and a 5 MW/10 MWh battery. It will be market-facing most of the time but able to supply an islanded section of the network. ITP is EDPR's technical consultant and is working with Essential Energy on network studies, switching and operational protocols. Apart from ring-fencing, Braidwood faces almost the same regulatory issues as Essential Energy's proposed T-SAPS, and so will also be able to contribute to real-life examples. EDPR is not seeking to be included in Essential Energy's waiver or trial T-SAPS.

We note that Essential Energy is currently in the process of developing the technical and control requirements for islanding and operating a T-SAPS themselves. These will also be required for any third-party T-SAPS but are unlikely to be developed if Essential Energy's waiver application is rejected.

Disclosure: Rob Passey of ITP wrote the regulatory section of the RACE2030 project *Community and Regulatory Perspectives on Microgrids*, which Essential Energy cites in its waiver application. This report was written as part of the UNSW project "Community & Regulatory Perspectives on Microgrids", funded by RACE2030, and with Essential Energy as the industry partner. One section of this project focuses on the regulatory barriers faced by temporarily islanding sections of the interconnected grid – now referred to as T-SAPS[1]. Rob Passey has also informally reviewed drafts of Essential Energy's waiver application and AEMO's Rule Change proposal.

Rob Passey is also the primary author of an UNSW submission to this consultation process. This ITP submission should be read in conjunction with the UNSW submission. Whereas the UNSW submission covers the issues more broadly, this submission focusses in particular on the technical issues that are most relevant to EDPR's proposed T-SAPS at Braidwood.

[1] Under the AEMC definitions, a microgrid is always islanded.

2. Responses to Questions

Question 1: *What regulatory and industry learnings could this trial generate regarding islandable microgrids as a network solution?*

Islanding already happens in the NEM for periods of hours, for example at Mallacoota (AusNet) and Bawley Point and Kioloa (Endeavour). This trial would show whether islanding for days, as part of normal business, can be managed within existing obligations.

The trials will also show how a low-inertia, inverter-dominated island could meet supply-quality obligations on long rural feeders. Inverter fault current of roughly 1.1 to 1.6 per-unit may not operate existing fuses, reclosers and overcurrent relays, so protection approaches proven in the trial will be widely useful.

Measuring how often settlement, metering and unaccounted-for-energy (UFE) anomalies occur, and how long and how material they are, will provide evidence for materiality thresholds that decide when T-SAPS-style market treatment should apply.

The trials will show how islanding events affect system average interruption duration index (SAIDI), system average interruption frequency index (SAIFI) and the service target performance incentive scheme (STPIS).

Allocating responsibility for islanding activation, resynchronisation and restoration under DNSP, third-party and hybrid models applies directly to third-party T-SAPS such as Braidwood, where control philosophy and an authority matrix are still to be agreed.

The trials will also provide experience in identifying the location of the microgrid boundary, and how this changes the operational outcomes. This will help clarify how much resilience a T-SAPS can actually deliver.

Question 2*: What are stakeholders' views as to the proposed benefits of this trial?*

ITP sees many benefits from the proposed trials.

- One of the proposed sites, Tibooburra, has about 160 customers on a single 310 km 33 kV feeder and has around seven outages a year averaging seven hours. Essential Energy expects the microgrid to cover up to 90% of historical outages.
- Essential Energy's ARENA-funded projects avoid power loss for an average of 11.8 hrs at Wilcannia, 11 hrs at Sunset Strip and 7.3 hrs at Bendick Murrell. These are material gains for remote communities, including First Nations communities.
- Replacing reactive diesel and portable generation with solar and battery-led islanding reduces fuel-supply risk during extended outages, supporting the fuel-security benefits the AER has identified.
- The learnings benefit other stakeholders. EDPR's Braidwood project is funded through the same ARENA Regional Microgrids Program and will directly benefit from published protocols and evidence.

- The trial can show whether seamless (closed-transition) reconnection is practical, and how customers value islanding overall.

***Question 3**: Do stakeholders consider that the trial may impact the operation of the national electricity system and market, including AEMO's role as the system and market operator? If so, how?*

One of the main aims of the proposed trials is the minimisation of any impacts that may occur when a section of the interconnected grid transitions to a SAPS and back again. Thus, impacts on the national electricity market are likely to be small. Deployments are limited, sit at the fringe of the grid, and islanding is temporary. Essential Energy has noted that AEMO has reviewed and commented on their waiver application.

While a section is islanded, meter data still flows to AEMO and is settled at spot prices even though the section is physically separate. Settlement anomalies are unlikely to be material for islanding periods of hours but may become material for longer events.

AEMO's proposed rule change would exclude islanded sections from central dispatch and forecasting and apply SAPS-style settlement. Trial evidence on how long and how often islanding occurs will help calibrate when these arrangements should start. We recommend a protocol for notifying AEMO, retailers and Financially Responsible Market Participants (FRMPs) when islanding starts and ends, at least when islanding lasts longer than a defined period.

***Question 4**: What are stakeholders' views on potential risks of the trial? How might such risks be mitigated with conditions? Which conditions do stakeholders think will be appropriate to manage these risks?*

This submission focuses on the technical risks of the trials. The quality of supply and power quality conditions must be met using a low-inertia, inverter-dominated system supplying long rural feeders from a single injection point. It will also require coordination of local CER.

- **Protection:** Once islanded, inverter-based sources may supply only about 1.1 to 1.6 per-unit fault current. This is often not enough to operate existing fuses, reclosers and overcurrent relays, or to coordinate with them. A fault inside the island could then collapse it entirely. Options include multiple protection settings groups, directional or voltage-controlled overcurrent elements, or a smaller island as a last resort.

- **Earthing:** The microgrid loses its high voltage (HV) earth reference when it separates from the grid. An earthing transformer, potentially with a neutral earthing resistor, may be needed at the microgrid source. It would provide a zero-sequence path so earth-fault protection works, and limit temporary overvoltage on unfaulted phases. Its switching must be built into the switching plan.

- **Black start and cold load pickup:** After an unplanned loss of grid supply, the island must restart with all customers connected. Transformer energisation transients challenge inverter-based generation. Cold load pickup can reach 2–4 times steady-state demand as air conditioning, hot water, refrigeration and irrigation pumps restart together. This may determine the required battery power rating (not the normal peak demand). Staged, re-energisation of different sections may help.

- **Customer inverters:** When the island separates, customer solar inverters trip on AS/NZS 4777.2 anti-islanding protection and reconnect after about 60 seconds. The battery must ride through the loss and then absorb the returning generation. Midday solar export can also fill the battery with nowhere to send the energy, so load banks or dynamic export control may be needed.

Each deployment's protocol should be supported by studies addressing these potential issues.

1. Suggested condition: an approved islanded-mode technical and operational protocol, covering protection settings, earthing arrangements, re-energisation sequence and resynchronisation, must be in place before a deployment relies on the waiver.

2. Suggested condition: Essential Energy keeps an islanding event log covering cause, duration, NMIs affected, energy supplied and anomalies, and reports it annually, in line with its ARENA reporting where practicable.

3. Customer communication and outage notification processes designed for the grid-connected network may not translate directly to islanded operation. Suggested condition: arrangements for life-support and vulnerable customers are confirmed before a site first islands.

4. Competition risks appear adequately managed for a trial of this scale. Essential Energy keeps its obligations under ring-fencing clauses 3.2 (cost allocation), 4.1 (non-discrimination) and 4.3 (information access), and procures contestable components competitively.

Question 5: *Is a program-level waiver framework appropriate for this trial? What deployment-specific information should be available before the waiver can be relied on (e.g. should individual deployments require AER approval or notification; to what extent should sites be able to be added or substituted over time; and what should constitute a material change requiring further assessment?)*

A program-level waiver avoids the need to go through an extended waiver application process for each site. This provides the flexibility required to move sites if particular sites prove unworkable. EDPR's experience with the proposed Braidwood microgrid confirms that microgrids evolve as technical, cost and customer factors are assessed. Therefore, substituting sites is reasonable, provided the new site meets all eligibility criteria and guardrails, stays within the cap, and the AER is notified.

Essential Energy could notify the AER when a site has reached the go/no go stage. The notification would include a summary of the network need, the island boundary, configuration, waivers relied on, operating model, islanding protocol and community engagement outcomes.

Question 6*: Does this trial raise any other regulatory or operational barriers that need to be considered? Are there any further waivers required in addition to the ones identified by Essential Energy?*

We agree with Essential Energy's categorisation. Settlement, metering, tariff and reliability-incentive issues don't need waivers to start the trial, and are better addressed through evidence.

Islanded operation doesn't relax existing obligations. These include AS 60038 voltage limits, the NER Chapter 5 and AS/NZS 61000 power-quality limits, the NSW licence conditions and Guaranteed Service Levels. The AER may wish to confirm whether NSW regulators need to be engaged about how islanding events are treated.

We understand that DNSP-owned generation used for network support may not have the NEM-compliant metering that could be needed if SAPS-style settlement applies while islanded. This should be identified when each deployment is designed.

The application describes engagement with the jurisdictional safety regulator as "not applicable". The AER may wish to confirm this, given the safety implications of islanded operation.

Question 7: *What are stakeholders' views as to Essential Energy using a mix of self-owned and third-party owned and operated microgrid assets? What further information should the AER take into account when deciding whether to grant the trial waivers?*

We support Essential Energy's technology- and ownership-neutral approach. Testing several models gives better evidence for durable, model-neutral rules. A staged approach, starting with integrated ownership and adding third-party models as experience grows, is a reasonable way to manage risk for first-of-a-kind deployments.

Under any model, the DNSP will have to keep ultimate operational authority over its network. The AER should seek clarity on how each model allocates control philosophy, authority, and responsibility for islanding, resynchronisation, restoration and liability.

By using a mix of self-owned and third-party owned generation, the trials will help inform the development of bilateral contracts under which responsibility for supply quality and reliability metrics while islanded could pass to third parties. Nothing has been agreed. Trial learnings on similar arrangements would be valuable.

Including a third-party-operated deployment, such as the proposed White Cliffs model, within the trial period would strengthen the evidence on how DNSPs and third parties interface.

Question 8: *What are stakeholders' views as to the operational arrangements outlined in Essential Energy's application that would need to be in place before a site is allowed to island? What should be the parameters around islanding?*

In addition to obtaining the required regulatory approvals, these arrangements can be divided into community and technical.

Community and other stakeholders

The affected community must be fully aware of the T-SAPS and what it means for them (the current proposal is that customers can't opt out). The boundary of the T-SAPS should be well defined, as should the ability of the T-SAPS generation to maintain power, and for how long, during different seasons and under different weather conditions.

Notification arrangements for AEMO, retailers, FRMPs, metering parties and life-support customers, and the method for reconnecting to the grid (open or closed transition), should be agreed before the first islanding event.

Technical

Before a site islands, it should have the following in place:

- Protocols that cover black start, transformer energisation and cold load pickup. Staged, sectionalised re-energisation based on existing network topology may reduce the battery power rating required.
- Protection and earthing arrangements should be confirmed. Options include multiple protection settings groups, directional or voltage-controlled overcurrent elements, and integrating earthing-transformer switching into the switching plan.
- Customer solar and batteries need specific treatment. Inverters trip on anti-islanding protection and reconnect after about 60 seconds, and midday solar export can fill the battery. Load banks or dynamic export control may be needed.

Question 9: *Do stakeholders have concerns with the possibility to exceed 10 deployments? What possible conditions could be imposed to ensure trial deployments are appropriately identified and managed?*

We have no significant concerns, provided additional deployments independently meet all eligibility criteria and guardrails, use only the relief already approved, and are notified to the AER, as Essential Energy proposes. More deployments would improve the evidence base by covering a wider range of network conditions and delivery models.

Defining 'materially exceeds' in terms of cumulative NMIs, installed capacity or number of sites would make Essential Energy's proposed notification trigger clearer.

Question 10: *We are interested in stakeholders' views on the boundaries between contestability and competition. What constraints or other conditions could be placed on Essential Energy's ownership and operation of the microgrids to support efficient outcomes for customers regarding affordability and reliability of their electricity supply?*

The proposed safeguards appear proportionate for a trial. There is no relief from cost-allocation, non-discrimination or information-access obligations, and contestable components are procured competitively. Relief from the functional-separation clauses (4.2.1–4.2.3) is limited to cases where existing regional-office exemptions don't apply, which keeps it targeted.

Publishing the procurement approach and outcomes, and the terms of any third-party rights to use Essential Energy-owned storage under clause 3.1(d)(i), would help confirm arrangements are at arm's length.

Third-party market-facing T-SAPS, such as proposed by EDPR for Braidwood, offer a complementary model. AEMO's proposed rule change covers both DNSP- and third-party-initiated T-SAPS, and trial learnings should inform how the two can co-exist.

Question 11: *What are stakeholders' views as to the appropriate RAB and revenue treatment of the microgrids and their assets?*

We support allocating to the regulated asset base (RAB) only the portion needed to meet the identified network need, consistent with the Shared Asset Guidelines and the treatment of net positive generation

revenue from regulated SAPS. Reporting the RAB and non-RAB funding split for each deployment would improve transparency. Essential Energy notes about $2.6 million of the $23.8 million program would be RAB-funded.

The administrative cost of calculating net generation revenue for short islanding periods may exceed the revenue returned to customers. The trial could quantify this and inform a materiality threshold. Clear rules that revenue offsets apply only to RAB-funded shares help keep commercial incentives for third-party operators and investors, which the program depends on.

Question 12: *What impacts could there be on third parties? How could these be managed appropriately? What conditions might need to be imposed to help manage any impacts on third parties?*

As stated in our response to Question 3, one of the main aims of the proposed trials is the minimisation of impacts on the national electricity system and market, including on AEMO's role as the system and market operator. However, during the trials, some issues could arise.

1. Retailers and FRMPs may see settlement anomalies during islanding, although these are unlikely to be material for short events. Notification and event-level reporting will allow materiality to be assessed and used to inform AEMO's proposed Rule Change.

2. Metering coordinators and metering data providers may need to know which NMIs were islanded so meter data can be interpreted correctly. This should form part of the notification protocol.

3. Customers' rooftop solar and batteries trip and reconnect on separation and can export surplus energy into the island. Their quantity and distribution should be assessed for each deployment, and they should comply with Australian Standards and Essential Energy's connection requirements.

4. Third-party developers on Essential Energy's network, including EDPR, would benefit from published islanding protocols and lessons. We support Essential Energy's commitment to engage affected parties where material implications arise.

Question 13: *What do stakeholders think about this exit strategy?*

We support the proposed exit strategy of moving each deployment to the most suitable enduring arrangement, including a future T-SAPS framework. We recommend that trial protocols should align with AEMO's proposed Rule Change as much as possible. It proposes to move affected NMIs to SAPS-style market treatment, apply administered pricing, and keep customer protections.

For third-party proponents such as EDPR, the rule change, together with associated AER guidance and AEMO procedures, may remove the need for separate waivers. Timely trial evidence supports that outcome. A mid-trial review would let the AER and Essential Energy check progress on enduring reforms and plan transitions before the waiver expires.

Question 14: *Do stakeholders have concerns around decommissioning, transition costs or impacts on customers' energy supply arrangements?*

We believe the risks to customers appear low because the assets used in a decommissioned T-SAPS can subsequently be used to provide network support. Retail and connection arrangements also stay unchanged throughout the trial.

However, if no enduring framework exists at expiry, protection settings, metering or registration may need to change. We expect that designing deployments with likely enduring requirements in mind would reduce transition costs. Customers should of course be told if a site's islanding capability changes or ends, because they may come to rely on it.

Question 15: *Do stakeholders have any other comments about the trial?*

No other comments.



ITP Renewables

Office:
Level 1, 19-23 Moore St
Turner ACT 2612

Postal:
GPO Box 1553
Canberra ACT 2601
Australia

info@itprenewables.com
+61 (0) 2 6257 3511

itprenewables.com

ITP Renewables