

Policy-led Sandboxing

Accelerating access,
deployment and orchestration
of distributed energy resources
through the regulatory sandbox

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Contents

1	Policy-led Sandboxing – the opportunity	1
1.1	Purpose of paper.....	2
1.2	Key policy questions	2
1.3	Principles	3
2	Conceptual trial buckets	4
3	Next steps	7
3.1	What we want	7
3.2	The role of each sandboxing agency	7
3.3	Follow-up – register your interest	8

1 Policy-led Sandboxing – the opportunity

The Australian Energy Regulator (**AER**) is interested in exploring and testing how the regulatory sandboxing framework can be used to accelerate our understanding of the different models to overcome barriers to access, deployment and orchestration of distributed energy resources (**DER**), including consumer energy resources (**CER**), or create incentives for it to occur, in a way that is both effective for, and protective of, consumer interests.

CER and DER already provide over 22GW of generation capacity in the National Electricity Market (**NEM**). The 2024 Integrated System Plan suggests this could rise to 133GW¹ by 2050, making it our largest source of generation capacity. However, at present not all consumers can access the benefits of DER and there are limited signals and mechanisms for the integration of these benefits into the energy system. Effective access, deployment and orchestration of DER is necessary to deliver a least-cost energy system for all consumers.

Policy work is underway on this issue. However, there is a significant opportunity to improve access to, and deployment and orchestration of, CER and DER by using our regulatory sandbox. This could support the market to meet renewable energy goals and emissions reductions targets, and encourage investment at the most efficient cost for consumer, and with the greatest benefits.

The Energy Innovation Toolkit is a regulatory sandbox run by the AER in partnership with the Australian Energy Market Operator (**AEMO**), Australian Energy Market Commission (**AEMC**), Essential Services Commission (of Victoria, **ESC**) and Australian Renewable Energy Agency (**ARENA**).

The existing Energy Innovation Toolkit can be described as a **demand or market-led sandbox**, and targets issues at a point in time, as raised by applicants on a case-by-case basis. This means that innovators can submit a sandboxing trial or enquiry at any time with us. This existing function is not changing.

However, we would like to augment it through a policy-led approach of identifying the need to accelerate access to, and deployment and orchestration of, DER and CER through large-scale, in-market trials.

Initiatives trialled in the sandbox can build on work already undertaken, including [ARENA-funded trials for CER](#), and AEMC's [Unlocking CER benefits through flexible trading](#) rule change. The initiatives pursued within the sandbox will inform lasting regulatory change, including through the Australian Government-led [CER Roadmap](#) and AEMC [pricing review](#).

Policy-led sandboxing provides the opportunity to move quickly to test things at scale and in market (rather than just as a desktop study or a study in a non-grid-connected setting). It is this in-market nature that allows these trials to accelerate thinking by contributing meaningful

¹ Including 86GW of rooftop and other distributed solar, 44GW of CER storage and 3GW of demand-side participation.

evidence to policy and regulatory work. The AER's approach to this has been welcomed by Energy and Climate Change Ministerial Council.²

1.1 Purpose of paper

The purpose of this paper is to outline the policy questions we aim to have answered, the principles to guide trial concepts, and the proposed focus areas that we would like to see explored in trials. We want to enable proponents to understand the types of proposals we are interested in receiving and how these could be targeted.

In November 2024, the AER Chair, Clare Savage, convened two brainstorming workshops on how policy-led sandboxing could be used to accelerate CER and DER access, deployment and orchestration. We met with participants, including a range of government agencies, retailers, networks, universities, industry representatives, consumer advocacy groups, innovators, and consultants to support discussions around the regulatory sandboxing framework and its potential role in accelerating access to, orchestration and deployment of, CER and DER.

In the first workshop we received incredibly useful feedback which helped us refine the problem definition, policy issues and key principles. The second workshop focused on unpacking the exact policy questions we want solved and the principles to guide policy-led sandboxing trial design.

This paper has been developed by the AER subsequent to both workshops, and reflects feedback obtained during these discussions, as well as that obtained through discussion with project partners and during the operation of the Energy Innovation Toolkit to date.

1.2 Key policy questions

We would like to see trials that help explore the following policy questions:

- 1) What types of relationships (between distributors, retailers, co-operatives, embedded networks, third parties and customers) and/or ownership models for DER/CER could better enable access to, and deployment and orchestration of, DER/CER?
- 2) How might the benefits of deployment and orchestration of DER/CER be valued, and that value accrued and distributed, to deliver a least-cost energy system? What role could a Distribution System Operator play?
- 3) Which model(s) for access to, and deployment and orchestration of, DER/CER build consumer trust and social licence for mass adoption and orchestration of DER/CER?

In our stakeholder workshops we canvassed a range of other potential questions. While some participants were drawn to different ones, there was a general recognition of the value of converging on a few critical policy areas to move forward. We consider the three selected questions enable us to do that, and give scope to examine detailed issues within trial design.

² Energy and Climate Change Ministerial Council. [Meeting Communiqué](#). Friday 6 December 2024

1.3 Principles

We consider that the principles below would helpfully guide the design and evaluation of trials that explore the policy questions above.

Table 1 – Principles

Principle	Detail
Equitable access to CER/DER	Does the sandbox proposal facilitate different ways for consumers and their communities to access CER/DER and does it share the benefits equitably?
Facilitating deployment and orchestration	Does the sandbox proposal help facilitate CER deployment and orchestration?
Lowest whole-of-system cost	Does the sandbox proposal promote reduced whole-of-system cost?
Meeting consumer needs	Does the proposal contribute to meeting diverse consumer needs, including by providing flexibility as those needs change?
Scalability and replicability	Can the proposal demonstrate potential to be reliably and efficiently scaled and replicated?
System challenges	Does the sandbox proposal contribute to addressing system challenges such as minimum load, network congestion and resilience?

Input from our workshop participants was particularly useful in shaping these principles and we have incorporated many of their ideas in refining them. Participants generally supported where we have landed with these principles and encouraged us not to be so rigid in their application that it stifles innovation or prevents trials from getting to market. We agree with this approach and consider the principles are useful guides for trial design that will inform the feedback we provide to trial proponents, but are not binding criteria.

These principles are also complementary to, but do not replace, the existing eligibility criteria and innovative trial principles set out in the National Electricity Rules and National Energy Retail Rules that we are required to consider in assessing applications. The AER takes a holistic approach to trial waiver applications and considers projects on a case-by-case basis. Additionally, the [Trial Project Guidelines](#) will continue to apply to all policy-led sandboxing applications.

2 Conceptual trial buckets

The “buckets” below reflect high-level concepts that would be useful to explore through trials.

These buckets are designed to be broad, allowing innovators to propose ideas that support the objectives of multiple buckets without being constrained by overly detailed requirements. They reflect feedback the Energy Innovation Toolkit has received from innovators and other participants since its launch, and feedback from workshop participants. These six buckets deliberately target different areas of the regulatory framework and established energy industry practices, and are designed to enable some diametrically opposed approaches to be tested. The intention of these buckets is to trial a broad range of options with a degree of scientific rigour to ensure we are as informed as possible as to future directions for the regulatory framework.

Knowledge-sharing and policy change are the ultimate goals of regulatory sandboxing. A number of the buckets below are likely to complement existing policy and reform projects, including work on the distribution system operator model, network data visibility, and tariff reforms. These buckets are therefore designed to generate insights to support these and other projects.

Table 2 – Sandboxing Buckets

Trial Ideas	Detail
Network-led orchestration or coordination	Can, and should, Distribution Network Service Providers (DNSPs) enable access to, and deployment and orchestration of, DER/CER? <ul style="list-style-type: none"> • <i>Test different models of DNSP-led CER access, deployment and orchestration.</i>
Targeted principles: All	<ul style="list-style-type: none"> • <i>Test price signals versus direct control to drive DNSP-led CER orchestration.</i> • <i>This could help test the benefits and risks of the relationships involved in this model, how value can be shared and what the consumer response is, including in terms of trust.</i>
Network data visibility as an enabler	How can we better improve access to network data to facilitate the effective orchestration of targeted CER by non-network participants? <ul style="list-style-type: none"> • <i>Use network data to deploy and orchestrate or coordinate CER.</i>
Targeted principles: All	<ul style="list-style-type: none"> • <i>Test different commercial models for CER orchestration. This could help test an entirely different set of relationships to the network-led bucket and would provide an important point of comparison. It would also test how value can be shared and the consumer response.</i>
Flexible metering and EV charging	Can the metering regulations better accommodate CER and electric vehicle (EV) Charging? <ul style="list-style-type: none"> • <i>Solutions that allow EV customers to pay one dedicated retailer remotely (rather than multiple charge point operators).</i> • <i>Other technical metering trials to lower the costs of installation and incentivise greater uptake.</i>
Targeted principles: All, particularly 2 and 3	<ul style="list-style-type: none"> • <i>This could help test how to target EVs and other sources of CER/load with potentially the greatest bang for buck in terms of impact because of their size or flexibility.</i>

<p>Social retailing</p>	<p>Can customers, local government and communities own or control their own energy service arrangements to deliver the cleanest, lowest cost energy system for the community?</p> <ul style="list-style-type: none"> • <i>Solar installation on all viable roof space, irrespective of the load behind the meter.</i> • <i>Efficient deployment of storage to smooth out generation, demand & network utilisation, including during periods of low solar generation.</i> • <i>Participation of generation, storage and flexible loads to be orchestrated to make best use of local generation and existing network capacity.</i> • <i>The usage of zero marginal cost solar electricity through increased electrification of heating, hot water, transportation and cooking.</i> • <i>Increased transparency of the state of the local network and the underlying price of electricity.</i>
<p>Targeted principles: All</p>	
<p>Tariff innovation</p>	<p>Alternative retail pricing models for managing network tariff signals.</p> <ul style="list-style-type: none"> • <i>Test retailer innovations to manage network tariff signals and how these could be aligned with network tariff design and processes.</i> • <i>Evaluate consumer responses to alternative pricing and billing models.</i> • <i>This could help test alternative tools of orchestration and the consumer response, including the impact on trust and social licence.</i>
<p>Targeted principles: All, particularly 2, 3, 4 and 6</p>	
<p>Virtual Power Plant (VPP) aggregation incentives</p>	<p>Testing consumer appetite for different levels of control and different commercial models.</p> <ul style="list-style-type: none"> • <i>Test the use of price signals versus direct control to drive CER orchestration.</i> • <i>Assess consumer appetite for third-party direct control of CER.</i> • <i>This could help test the benefits and limitations of this type of service model, including what the consumer response is.</i>
<p>Targeted principles: All, particularly 4, 5 and 6</p>	

The key policy questions outlined in section 1.2 were fundamental to the development of these buckets. These cover a broad range of models, roles and responsibilities and technical CER solutions that all support the strategic direction outlined above.

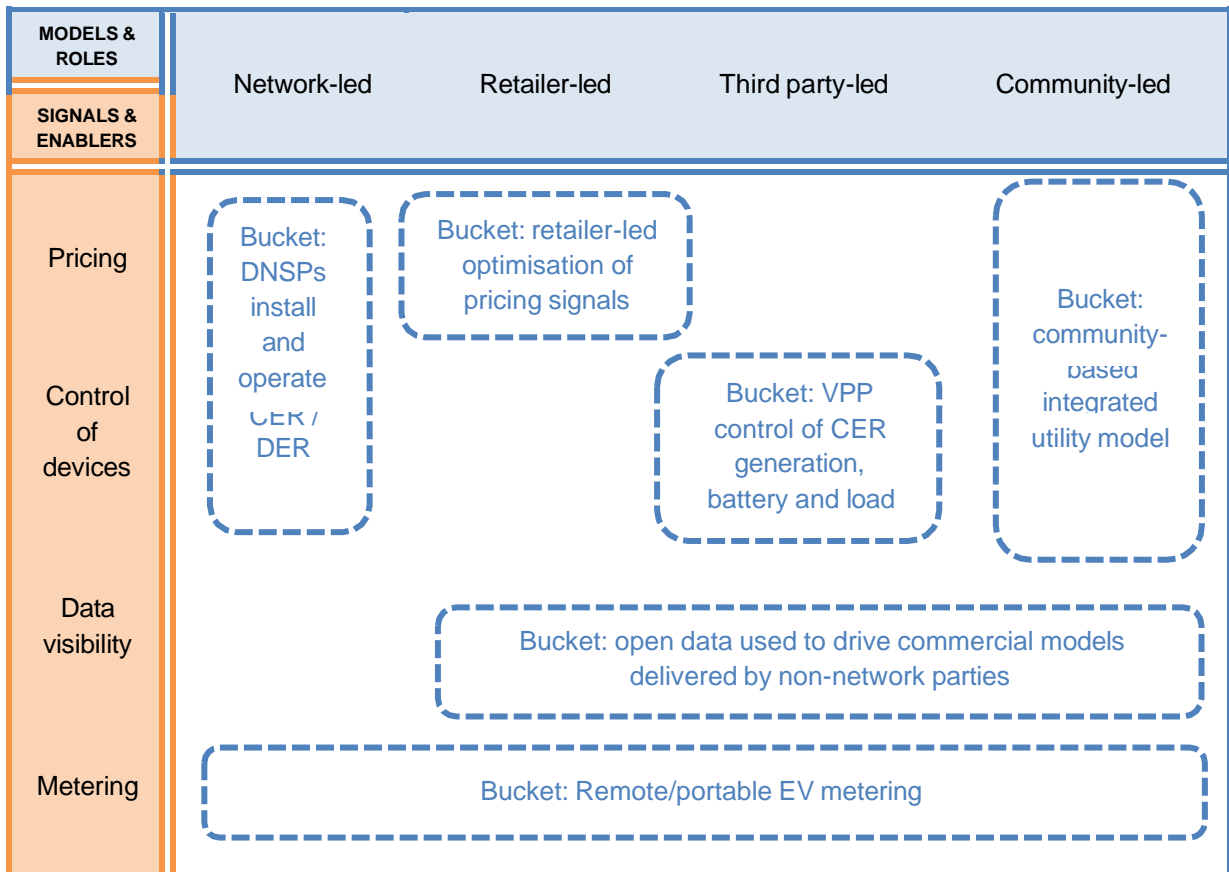
We have also considered the above buckets against concepts such as network vs non-network led projects, projects which involve technical changes and those which involve changes to commercial models and customer relationships. We have deliberately targeted buckets which capture as broad a range of CER/DER access, deployment and orchestration models as possible while still prioritising the needs of consumers. We consider this spread, and the general concept of buckets, will enable us to explore a suite of trials that collectively informs policy development, regulatory reform and the rollout of new models.

We have considered the buckets also in the context of the principles in section 1.3 and have outlined in the table above which of these principles each bucket seeks to meet.

An additional way to think about these buckets is that they enable us to test the policy questions by exploring two key dimensions:

- 1) Different roles that may be played by participants in deploying and owning resources
- 2) Different signals and enablers

The diagram below illustrates how the six buckets above enable us to test an array of approaches across these two dimensions. As trial proposals come forward, we can use this conceptualisation to ensure we are testing a sufficient range of approaches across the trial program.



3 Next Steps

We encourage innovators to get in touch with us to discuss their own trial ideas.

The Energy Innovation Toolkit supports energy participants to navigate complex regulatory frameworks and trial new products and services that will deliver greater choice and cheaper energy options for consumers.

We provide fast and frank staff level feedback on all trial applications through our free Innovation Enquiry Service that offers regulatory guidance on entering the market. We have heard from innovators, individuals, established market participants and peak bodies that navigating the complexities of the regulatory framework can be a significant barrier to projects entering the market, and have designed our function to be as helpful as possible.

While the AER Board is the independent decision-maker for trial waiver applications, AER staff provide this model of “fast and frank” feedback based on our expertise and experience. This guidance is not binding on the AER more broadly, but this allows us to be candid in our guidance. Through this process we also engage our sandbox partner agencies in trial ideas.

Come and talk to us as soon as you have an idea that you are ready to trial in-market. You can contact the team by visiting the contact us page on the [Energy Innovation Toolkit website](#) or by email at RegulatorySandbox@aer.gov.au.

3.1 What we want




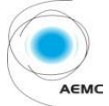

The following is what we look for in a trial proposal. If your idea does not meet these criteria, then you should use our fast, frank Innovation Enquiry Service to get free guidance and regulatory steers on how to proceed.

- 1) Projects where the who, what, when, where and why are settled. This includes all parties who will be receiving the waiver being **parties to the application**.
- 2) Projects that can be replicated and would benefit the whole market if they were replicated.
- 3) Projects that will generate learnings that can be shared with the whole market and can directly lead to regulatory change.
- 4) Projects where the potential benefits outweigh the potential risks, and consumers are protected.
- 5) Projects with a strategy for completion – a plan for after trial completion for how to return to compliance with the regulatory framework or to effect a permanent rule, law or regulation change to benefit the whole market (e.g. can inform a future AEMC rule change).

The existing demand-led sandbox will **remain open**, allowing proponents to apply for and discuss trials with other focuses while we also add this policy-led approach.

3.2 The role of each sandboxing agency

Each sandboxing agency works together to assess and facilitate on-market trials.

	Administers the Energy Innovation Toolkit, issues and monitors trial waivers and monitors trial rule changes.		
	The AER consults with AEMO on system and market impacts.		Assesses and issues trial waivers for Victorian projects and provides advice to the AER on Victorian enquiries.
	Responsible for assessing trial rule change requests and making trial rules.		ARENA provides advice and directs innovators to the Energy Innovation Toolkit.

3.3 Follow-up – Register your interest

If you would like to register your interest for receiving future policy-led sandboxing updates, or information about how to apply for a trial, please email RegulatorySandbox@aer.gov.au.

We encourage engagement by all energy sector participants and stakeholders. The decisions we make and the actions we take affect a wide range of individuals, businesses and organisations. Hearing from those affected by our work helps us make better decisions, provides greater transparency and predictability, and builds trust and confidence in the regulatory regime.