Australian National University

ANU Centre for Energy Systems
College of Systems and Society
The Australian National University
Skaidrite Darius Building #108

Consumer Energy Resources Taskforce

Department of Climate Change, Energy, Environment and Water

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ANU response to DCCEEW's National Consumer Energy Resources (CER) Roadmap – consultation on technical priorities (T1)

We appreciate the opportunity to respond to the Department of Climate Change, Energy the Environment and Water's consultation on *Technical Standards for National Consumer Energy Resources (CER) Interoperability (T1)*.

Summary of submission – the consumer value we're enabling

Australia's CER future only succeeds if it works for consumers first. Interoperability should translate into real benefits consumers can feel: more choice (they can switch providers, products and tariffs), more value (access to smart services and better offers that meet their values and needs), more reliability (predictable device behaviour that meets both grid and customer needs without hassle), and no vendor lock-in (their devices keep working when brands or contracts change).

Energy market bodies in Australia have consistently linked interoperability to consumer benefit and switching as foundations of trust and competition (e.g., ESB, ECA, AEMO/AEMC).

Interoperability should protect choice, enable switching, and deliver durable value from household investments in solar, batteries, EV charging and flexible loads while supporting grid stability. We support the Taskforce's use-case-driven requirements and mapping to standards. Our overarching stance:

- **Maintain the customer-centric approach and ensure consumer switching is enabled and generates real value** across all pathways and devices, and are founded on a nuanced view of customer value drivers and aggregator value propositions
- **Enable mixed-brand interoperability** so consumers can combine products from different OEMs without being trapped in walled gardens
- **Apply a risk-based, phased approach** (proportionate to impact and maturity)
- **Maintain and strengthen industry engagement mechanisms**: open industry collaborations through the DER Integration API Technical Working Group maintain the CSIP-AUS profile, open conformance tests and reference tooling to ensure agility, collaborative development and industry buy-in

Insufficient industry engagement

In addition to the substance of our response, we also wish to register concerns regarding the approach taken to this consultation and the way the paper characterises several core topics—most notably in Section 7.

It appears sections of this consultation paper were prepared with limited input from the organisations currently building and operating CER interoperability in Australia—including networks, aggregators, OEMs, consumer bodies, and the various industry collaborative mechanisms currently contributing to the development of standards in Australia. This absence shows up in factual errors and framing choices (particularly around the origins, governance, and uptake of CSIP-AUS) and in a tendency to present “either/or” choices where the industry and relevant jurisdictional bodies have already demonstrated a commitment to technical solutions and outcomes. This matters: when key sections mischaracterise the current state of practice, it erodes confidence, risks duplicating existing work, and distracts from real standards gaps that consumers need us to close.

By contrast, the parallel consultation currently underway for Priority T2 has followed an open, iterative process—including significant engagement across jurisdictions and key industry stakeholders. The result is more accurate drafting, fewer surprises, and stronger buy-in from those who must deliver the outcomes. We encourage this Taskforce to adopt the same posture: co-design with the people building the system, document how feedback changes the text, and publish the reasoning behind major edits.

Section 7 is a case in point - the section downplays the history and purpose of CSIP-AUS, under-recognises its broad industry collaboration, usage and ongoing maintenance, and implies that future development should be “handed to Standards Australia” without sufficient evidence. Each of these points misreads how Australia has successfully progressed CER interoperability:

- CSIP-AUS did not start life as a single-purpose emergency mechanism; it arose to operationalise dynamic operating envelopes (flexible exports) and was subsequently utilised for backstop functions.
- CSIP-AUS is currently undergoing a national harmonisation process led by the ANU and is being actively deployed and maintained across multiple jurisdictions, with public test procedures, compliant-provider lists, and reference tooling.
- Standards Australia’s role is crucial and complementary, but limited SA maintains base standards, while the open industry collaborative (led by DEIP, the ISC and the DERIAPITWG) maintains the profile, tests and reference tools that turn those standards into predictable outcomes in homes. Moving all profile work into formal standards drafting would significantly slow the development and iteration process and increase the risk of industry rejection, buy-in and adoption.

We offer these concerns in the spirit of improving the process and the final outcome. We stand ready to assist however we can to help resolve the Section 7 issues quickly and to help align future options with what is already working in the field—so that the policy framework accelerates, rather than resets, consumer-centred interoperability and strong industry engagement.

Responses to consultation questions (T1)

Introduction

Australia's CER future only works if it works for consumers first. Interoperability is not a technical nicety – it's fundamental to ensure households and small businesses retain choice, avoid being locked into a single brand or provider, and can use, and create value from, their solar, batteries, flexible loads and EVs. The consultation paper appropriately recognises this: switching (R-9) is identified as a core requirement that promotes competition and protects consumers, and the paper outlines why enabling churn improves trust and unlocks better retail offers and services.

We support the Taskforce's focus on use-case driven requirements and a standards mapping that is honest about gaps. But getting from "standards on paper" to "predictable outcomes in homes" demands two complementary tracks: (i) formal, durable base standards; and (ii) a fast, open, development and implementation with living profiles, conformance tests and reference tooling so devices from different brands work together and customers can switch without losing core functionality. This section component must be done in close collaboration with industry and those who use the standards.

The following answers keep the consumer focus throughout. Where we disagree with the paper, it is primarily where the framing or content is incorrect, or risks slowing practical progress.

Question 1 - Should the capacity for consumers to switch energy service providers (churn) be prioritised and what are the impacts?

Yes — enabling consumers to switch between energy service providers (churn) should be treated as a core outcome of interoperability and a non-negotiable design principle.

A consumer-centric first principle

The integration of consumer energy resources (CER) into the grid must be guided by the principle of consumer empowerment, while ensuring grid security. Households and businesses are heavily investing in technologies that manage essential energy services. To protect these investments and build trust in the transition, consumers must be confident that they are not locked into a single provider, manufacturer, or contractual arrangement.

The Energy Security Board (ESB) has similarly emphasised that *"the fundamental benefit of interoperability flows to customers where it enables them to easily access and take up different products and services where they wish to do so"*[1]. This aligns directly with the need to make switching a baseline requirement.

Cost–Benefit Considerations

The consultation paper notes potential costs associated with enabling switching, such as incremental device capability or compliance obligations. However, these are modest when compared to the systemic benefits, including:

- **Dynamic efficiency and competition** - switching drives innovation, downward pressure on costs, and consumer access to better services
- **Avoidance of stranded assets:** - consumers can continue using devices when they change service providers
- **Lower system integration costs** - interoperability reduces duplication and simplifies orchestration across industry

Energy Consumers Australia has reinforced this balance, observing that *"choice and flexibility, enabled by interoperability, are critical in ensuring consumers' expectations of an affordable, accessible, and sustainable system are reflected in the energy transition"*[2].

Device interoperability

Interoperability doesn't just relate to switching energy service providers, but also to the interoperability *between* devices. A consumer should be able to buy a solar inverter from one company, a battery from another, and an EVSE from a third, and have confidence that all devices will operate seamlessly together.

Without brand and device-agnostic interoperability, consumers risk being trapped in "walled gardens" controlled by single vendors, limiting competition and reducing consumer agency. The

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[1] *1665556228-interoperability-policy-directions-paper-final.pdf*
[2] *https://energyconsumersaustralia.com.au/our-work/submissions/submission-to-the-energy-security-boards-interoperability-policy-consultation-paper*

Public Interest Advocacy Centre (PIAC) has highlighted this risk, noting that *"customers should not be unduly 'locked in' … based on manufacturers' design of their energy resources, or the business choices of those producers"*[3].

Genuine choices

Enabling consumers to switch is a valid and worthwhile goal. But if enabling consumers to choose devices and VPP relationships that best meet their needs is the goal, then standards must be grounded in the real needs and values of consumers. This ensures that consumers can mix devices and switch providers while still being able to use them in the way they want. There are two key questions that must be answered for this: What actions do consumers require for their products, and how may they be enabled; and what kinds of offerings are we expecting providers to offer consumers, and how might they be enabled in standards. This requires a greater understanding of the specific actions that customers desire, which go beyond simply making money as well as a better understanding of the potential landscape of value propositions service providers may offer.

Recommendation

We recommend that the capacity for switching (requirement R-9) be prioritised as a minimum device/system requirement, and that the use cases encoded in the standard be expanded to enable genuine choices.

This position is also consistent with AEMO and AEMC's reforms to consumer switching in the retail market, which stress that switching processes must be "simple, easy and timely" to protect consumers and ensure confidence in the energy market[4].

[3] *https://jec.org.au/resources/submission-to-esb-interoperability-policy-consultation-paper/*
[4] https://www.aemo.com.au/-/media/Files/Stakeholder_Consultation/Consultations/NEM-Consultations/2019/NEM-Customer-Switching/AEMO-NEM-Customer-Switching-Issues-Paper.pdf

Question 2 - What are your views on interoperability hierarchy via the vehicle and an EVSE? Do you think the EVSE should take precedence over the vehicle or vice versa?

We recommend an EVSE-first hierarchy as the preferred approach for ensuring interoperability, grid reliability, and consumer choice, while recognising that vehicles should retain limited override rights in defined circumstances.

The charger is the grid-facing device at the connection point, so it's the right place to enforce DOEs, demand response and backstop in a way that's predictable, auditable and consistent across mixed brands. This aligns with mainstream international practice (OCPP/ISO15118 ecosystems assume charger-anchored control), with Australian DNSP preferences for connection-point certainty, and with consumer protection. With this approach, customers get the same compliance behaviour and can still switch retailers/aggregators without falling into a proprietary "walled garden."

That said, the vehicle should retain narrow, explicit override rights. Safety, for example (thermal management, internal faults, emergency disconnect) and several other limited cases can be justified, such as battery health thresholds, consumer-set mobility minima, or V2G modes that need direct vehicle optimisation—provided overrides are transparent and logged at the EVSE/EMS and do not undermine site compliance or portability.

In this approach, EVSE enforces the network rules by default, the site EMS/HEMS (if present) coordinates across devices so the whole site behaves coherently, and the vehicle overrides are clearly defined and visible. This balance gives networks certainty, preserves consumer choice and switching, and leaves room for OEM innovation without fragmenting interoperability.

Question 3 - Should minimum device/system requirements apply to EV Level 1, Mode 1 and Mode 2 charging technologies?

Yes, but proportionate and functional. Level-1 chargers are simple devices with low grid impact, so they shouldn't be forced into "smart" stacks. A light, no-configuration baseline is sufficient, such as standard electrical safety plus a couple of simple behaviours that improve system resilience (for example, an under-frequency charge cut-off implemented in firmware). That preserves affordability and avoids burdening consumers with setup they don't need.

For Level-2, consider applying a capability-by-impact test rather than a blanket mandate. A wallbox configured to 15–20 A continuous draw can, in practice, pose no more grid risk than Level-1 and should be allowed to meet the same light baseline. Higher-impact cases (for example higher current settings, demand-responsive programs, or sites with multiple large CER) can then step up to additional capabilities where they add real value (site coordination, telemetry, or demand signals). None of this should stop OEMs offering features above the minimum, it simply ensures customers aren't paying for complexity they don't need, while those who do need richer functions can get them.

Question 4 - Should minimum device/system requirements apply to public EVSE?

Yes. Public chargers are the shared gateway to the EV ecosystem, so a national baseline is needed to deliver a predictable, easy experience regardless of operator or location and to avoid a patchwork of rules. Australia already has a practical template in the Commonwealth's Minimum Operating Standards for funded sites, which can be scaled nationally to lift reliability and consumer confidence while supporting the National EV Strategy.

The baseline should cover a few essentials, such as high uptime so drivers can rely on chargers, open payments and clear on-site kWh pricing so an app isn't mandatory, and live status data so drivers and apps can find working chargers. On interoperability, consider align the charger–platform link with OCPP 2.0.1 or OCPP 2.1 and the vehicle–charger link with ISO 15118, creating a path to roaming, Plug & Charge and future V2G. Embedding these expectations consistently across jurisdictions will also reduce integration and maintenance costs for operators.

Question 5 - Are any CER device types/use-cases not adequately captured in the 13 identified requirements?

The proposed set of CER device types and use-cases is close a good summary of the key grid-side requirements, however consideration should also be given but to:

- site-level coordination and identity in multi-dwelling/embedded networks
- ensuring EMS/HEMS behaviours are specified and testable, and
- making lifecycle cyber (issuance/revocation/key-rollover) explicit.

These refinements align with lessons from AEMO's Project EDGE, where household-level orchestration under Dynamic Operating Envelopes (DOEs) depended on clear roles, shared data, and consistent behaviours across devices and brands[5].

While the grid needs are well-covered we believe there is additional scope to consider consumer side requirements and how these may translate into additional standards requirements. For example:

- How may customer preferences and requirements should be encapsulated into use cases? For example, consumers may value the ability to signal the urgency of their usage of a device (for example, an EV charger may need to notify a site controller or DOE server of a need to charge or an impending trip)
- What kinds of value propositions might service providers be offering consumers, and how can they be integrated into use cases? If service provider switching is desirable, then to the maximum extent possible service provider value propositions need to be possible within the capabilities of standardised functions. For example, what other signals than price signals may form part of value propositions such as community energy schemes? How might consumers communicate to service providers in a standardised way special needs (such as a desire to self-consume)?

Question 6 – Are there any other standards that can support each identified requirement?

No other standards identified.

Question 7 — In the mapping exercise in Table 8, do you agree with the identified gaps? Are there existing standards that could fill these identified gaps?

The data dictionary/lexicon gap and EMS/HEMS conformance gap are relevant, because customers experience them as inconsistent behaviour and "it doesn't work with my brand" moments. AEMO's DOE work and Project EDGE knowledge sharing consistently highlight the need for standardised data and roles to coordinate flexible exports reliably at the household[6][7]

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[5] https://arena.gov.au/knowledge-bank/aemo-project-edge-final-report/
[6] https://www.aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/der-demonstrations/project-edge/project-edge-reports/dynamic-operating-envelopes
[7] https://arena.gov.au/knowledge-bank/aemo-project-edge-final-report/

Question 8 — Do you have views on the prioritisation of further standards work to address the identified gaps?

We recommend further standards work should concentrate on flexible loads. The practical gaps are about how non-inverter assets—hot water, HVAC, pool pumps, basic EV charging modes—receive signals, expose simple capabilities, and demonstrate predictable behaviour on site. For communications, AS 5385 (IEEE 2030.5) is a reasonable candidate, but it was shaped around inverter use cases and may not be fit-for-purpose and further consideration of its applicability for flexible loads should be given. In parallel, it would be sensible to scope AS 5438 to explicitly include flexible loads so mixed assets can be coordinated locally under the same methods.

On device expectations, it's prudent not to default automatically to AS 4755 across all flexible loads. Some asset classes may align well, however others may need a lighter capability set or different semantics. The draft National Technical Regulatory Framework points in the right direction: start with an international-first scan, adopt or adapt established profiles where they already express the behaviours we need, and only then consider an Australian-specific requirement where clear gaps remain. This sequence keeps work proportionate, avoids unnecessary divergence, and aligns Australia internationally where possible, improving competition.

Question 9 — How can Australia align with international standards while maintaining flexibility for local conditions

We recommend focusing on adoption international cores and refining these for Australia via living guides. Australia already does this with CSIP-AUS, which is an IEEE 2030.5 profile tuned to Australian DNSP/customer needs for dynamic exports and emergency backstop. This model keeps us globally compatible while encoding local roles (retailer/aggregator/DNSP) and DOE semantics customers depend on[8]

[8] https://www.csipaus.org/about

Question 10 — Are there any risks associated with the identified requirements, such as remote updating of device settings?

Customer concerns are security, misuse, and loss of agency. The practical response is trusted communications, clear authorisation/audit, human-understandable defaults with override, and visible change logs. Australia's Code of Practice: Securing the Internet of Things for Consumers sets out a baseline approach (aligned with international good practice) that can be applied proportionately where devices are connected[9]

External corroboration: The Government's recent cyber security reforms papers argue the voluntary approach has been fragmented and emphasise alignment to ETSI-style baselines for smart devices—supporting uplift when connectivity is present[10]

Question 11 — Modulating power in response to grid conditions or an external signal can be implemented through zero generation or zero export. Is there a preference for either of these approaches or both?

Both are needed, but prefer zero export where it can meet DOE/backstop needs so customers keep self-consuming/charging; use zero generation as a last resort (safety/emergency or where export control can't assure compliance). This preserves customer value while meeting system limits, consistent with the DOE approach tested in Australia[11]

Question 12 — What are the risks of supplier (OEM) lock-in under current standards, and how might these be mitigated?

Service and product lock-in is a direct threat to consumer choice and durable value. ESB warned that without a minimum level of open interoperability, customers may have their DER *"locked-in to certain providers,"* limiting future choices and service benefits. Our position: core grid-relevant functions must not depend on a single vendor's proprietary cloud or gateway. Devices must expose

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[9] https://www.homeaffairs.gov.au/reports-and-pubs/files/code-of-practice.pdf
[10] https://www.cisc.gov.au/resources-subsite/Documents/cyber-security-security-standards-for-smart-devices-explanatory-document.pdf
[11] https://www.aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/der-demonstrations/project-edge/project-edge-reports/dynamic-operating-envelopes

a native, standardised interface (device or site controller) so switching remains practical over the device life—and conformance should test switching in practice, not only protocol syntax[12]

Question 13 — What are costs and benefits for alternative applicable technical standards and how does this impact networks, suppliers and consumers?

Moving to open, widely adopted stacks has transition costs (legacy upgrades, certification) but pays back through lower integration effort, predictable behaviour, easier roaming/switching, and larger harmonised markets—benefits that flow through to customers as reliability and choice. Australia's networks are already pushing national harmonisation of EVSE connections/SIRs to realise these efficiencies; OCPP 2.0.1's codification as IEC 63584 indicates where the global baseline is heading for public and private charging.

Section 7—introduction to responses

As set out in the introduction to this consultation response, Section 7 of this consultation paper appears to have been prepared with limited input from the organisations currently building and operating CER interoperability in Australia. While the ANU was engaged to develop the supporting 'Technical and Interoperability Standards for CER' report, it was not consulted on the development of the consultation paper itself, despite leading development of CSIP-AUS and enabled the various collaborative activities for several years, including the Interoperability Steering Committee and the DER Integration API Technical Working Group, a collaborative industry body with over 110 engaged members.

This significant omission shows up in factual errors and framing choices (particularly around the origins, governance, and uptake of CSIP-AUS) and in a tendency to present "either/or" choices where the industry and relevant jurisdictional bodies have already demonstrated a commitment to technical solutions and outcomes. This matters: when key sections mischaracterise the history and current state of practice, it erodes confidence, risks duplicating existing work, and distracts from real standards gaps that consumers need us to close.

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[12] https://www.energy.gov.au/sites/default/files/2021-12/ESB%20Interoperability%20Policy%20-%20final%20for%20consultation%20-%20December%202021.pdf

The consultation paper suggests that CSIP-AUS was created for a single "emergency backstop" use-case. This is not correct. The standard grew out of the practical need to operationalise dynamic operating envelopes (DOEs) – the "flexible exports" model pioneered with SA Power Networks and partners (and supported by ARENA) – to enable SA Power Networks to manage an increased penetration of solar while offering households greater choice and benefits. The backstop mechanisms came after and utilised the same communications protocols. Public materials on this are explicit: the SAPN/ARENA Flexible Exports work describes DOE set-points issued to inverters, and more recent summaries explain how exports rise and fall with hosting capacity over time. That's the flexible export use-case, not a one-off contingency tool[13][14][15].

CSIP-AUS also has broad governance and industry usage and support, being adopted and maintained across Australia. Multiple DNSPs have embedded CSIP-AUS into connection processes and grid stability measures. Queensland's Energex/Ergon publish a SEP2 (CSIP-AUS) Client Handbook[16] and maintain a public list of compliant providers that explicitly references the national CSIP-AUS test procedures. Jemena publishes a CSIP-AUS commissioning test procedure for installers in Victoria[17]. All Victorian DNSPs are mandated to utilise CSIP-AUS for emergency backstop mechanism in that jurisdiction and many are preparing to utilise it for dynamic connections (another term for flexible exports). While inconsistencies in adoption have occurred, primarily caused by an urgent need to deploy emergency backstop capabilities in various regions, the ANU, with funding from ARENA and support from industry via the DERIAPITWG, is leading a program to harmonise the testing and certification of CSIP-AUS across Australia and ensure a clear roadmap for future enhancements is established.[18] Thanks to this work, the CSIP-AUS program itself now includes versioned client and utility-server conformance test suites and a reference utility server.

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13 https://arena.gov.au/assets/2024/01/SA-Power-Networks-Flexible-Exports-for-Solar-PV-Trial-Final-Report.pdf
14 https://ieefa.org/sites/default/files/2024-12/BN_How%20rapid%20implementation%20of%20flexible%20exports%20could%20maximise%20rooftop%20solar%20_Nov24.pdf
15 https://www.sapowernetworks.com.au/industry/flexible-exports/
16 https://www.energex.com.au/__data/assets/pdf_file/0007/1072618/SEP2-Client-Handbook-13436740.pdf
17 https://www.jemena.com.au/siteassets/asset-folder/documents/electricity/embedded-generation/installer-csip-aus-commissioning-test-procedure_public_22052024.pdf
18 https://www.csipaus.org/certification

CSIP-AUS is now also being piloted for market-focused activities, including SA Power Networks' 'Market Active Solar' trial with Engie and AGL (utilising CSIP-AUS to enable PV control for market benefit)[19], and Synergy's battery program[20], which is the first pilot to explore utilising battery commands via CSIP-AUS.

None of this suggests an uncoordinated or unsuccessful approach, it displays an implementation ecosystem doing exactly what consumers need: establishing standards dynamically when necessary to enable predictable, consistent and successful technological outcomes.

The consultation paper suggests that all future management of CSIP-AUS should be handed to Standards Australia. We believe that while Standards Australia has a critical, complementary role in the formalisation of standards, "handing everything to Standards Australia" is the wrong approach.

Standards Australia itself has stated that Australia is moving toward CSIP-AUS as the DER communications approach and has worked collaboratively with DEIP and the ISC to ensure CSIP-AUS is appropriately formalised to enable jurisdictional take-up.

We recommend that the current 'dual-track model' continues to be supported in the context of the National Technical Regulator for CER to ensure industry engagement and collaboration is maintained and strengthened, and the dynamic and fast approach standards development is not lost. In this approach, the industry collaborative (DEIP/ISC/DERIAPITWG)[21] develops and refines standards, publishes tests and reference tooling, and iterates quickly in response to field experience, and Standards Australia facilitates the adoption through its formalisation process. Shifting CSIP-AUS development wholly into Standards Australia committee processes would significantly slow iteration and reduce agility, while risking industry contributions and buy-in for the uniquely Australian Standard. The better balance is:

- formal base standards via SA,
- agile profile-and-testing via ISC/DEIP, and
- referenced by utilities and regulators.

This industry-focused approach aligns with a well-trodden path internationally. The major interoperability schemes globally began (and largely remain) as industry collaborations: OCPP and

[19] https://www.sapowernetworks.com.au/future-energy/market-active-solar-trial/
[20] https://www.synergy.net.au/Our-energy/Pilots-and-trials/Virtual-Power-Plant
[21] https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/interoperability-steering-committee/

OpenADR are stewarded by their alliances even when mirrored by SDOs, Matter is driven by a broad consortium, and while Zigbee SEP2 ultimately became IEEE 2030.5, it spent years as an industry profile before it was stable enough for full SDO adoption. The lesson is consistent: interoperability needs agility - rapid iteration, shared test artefacts, and quick feedback from field deployments - at a pace that formal standards bodies rarely permit and when they do, they are slow and cumbersome. Keeping CSIP-AUS under the collaborative stewardship of ISC/DEIP/DERIAPITWG (with Standards Australia maintaining the base standards) mirrors these successful international models and is the best way to deliver reliable, industry-supported and switching-friendly outcomes while the ecosystem continues to mature.

Question 14 — What's the fastest credible pathway to develop and modify these standards?

To ensure the fastest credible pathway to develop and modify these standards, the current collaborative and agile approach is maintained, with Standards Australia and DEIP both retained and utilised where they have comparative-advantages. Standards Australia can continue to support formalisation of standards, while DEIP runs an agile and collaborative industry engagement and development program for the development and maintenance of CSIP-AUS profile, conformance tests, and reference server, updating them as utilities and OEMs learn in the field. This approach has proven to enable accelerate adoption: the national client and utility-server test procedures, plus reference tooling, give vendors and DNSPs a repeatable path to interoperability. A wholesale move to Standards Australia for all profile work, as suggested by the consultation paper would, significantly slow development, industry engagement, feedback loops and reduce testability.

Question 15 — The design of CSIP-AUS has 4 possible pathways (native, gateway, cloud, cloud/gateway). Only the native pathway enables customers to switch providers. Do you have views as to the merit of the alternative pathways for CSIP-AUS?

We disagree with the premise of the question. It asserts that "*only the native pathway enables customers to switch providers*", then invites comment on whether the other pathways nevertheless have merit. This framing is inaccurate and risks steering the consultation toward a false choice. In reality, all four CSIP-AUS pathways — native, gateway, cloud, and cloud/gateway — can support consumer switching. Figure 3 shows four example connectivity models (native, gateway, cloud, cloud/gateway), but many variations exist—and all CSIP-AUS pathways can support switching. Treating "native" as the only route to churn conflates issues and risks a false choice.

In addition, it is important to understand the different communication layers. At the organisation-to-site layer (the scope of CSIP-AUS), any conformant CSIP-AUS client should be able to point to any utility/market server that uses CSIP-AUS, regardless of whether the client is implemented natively in the device, via an on-site gateway, or via an OEM cloud. In every pathway the manufacturer has responsibilities for establishing connectivity (such as out-of-band server discovery, provisioning and managing PKI credentials, and ongoing support etc) so switching is feasible across the board. The risks to switching under some pathways relate to continuity (avoiding stranded assets), which depends on design rules and commercial terms, not the pathway.

Although the consultation paper suggests otherwise, IEEE 2030.5 is not a "US-only" artefact and the aggregator construct was introduced by the Common Smart Inverter Profile (CSIP) for California Rule 21, which leveraged 2030.5 as the protocol. CSIP-AUS is Australia's profile of 2030.5 for local needs (e.g., DOEs), not a different technology, and switching at the org-to-site layer is supported in all four deployment patterns when profiles and credentials are handled correctly.

Separate to that is device-to-device interoperability on the premises. This is where a local open interface matters so different CER "plug-and-play" with each other and with a site gateway. AS5438 is aimed at this layer and keeps a local control/visibility path available to the customer even if a supplier exits or an OEM cloud is withdrawn.

Do not pre-emptively exclude non-native pathways. All four can deliver switching if we insist outcome-based safeguards are maintained (such as data/credential portability, local execution of grid-relevant controls, and no loss of core functions on churn) so consumers aren't stranded by a particular gateway or cloud.

Question 16 — What are the benefits or disadvantages of facilitating control of a physical device via the cloud?

Cloud orchestration adds value (fleet analytics, optimisation), but grid-relevant controls must exist locally at the device/site, so they work with or without a proprietary cloud in the loop. That's how flexible exports are actually delivered today: utilities send limits and compliant devices enforce them at the connection point, with the cloud as an enhancement, not a prerequisite.[22][23]

The advantages of the cloud should be leveraged, but essential controls enabled locally (at the device or site EMS/HEMS) so the system remains safe, compliant and usable even when the internet or a vendor cloud isn't available.

From a consumer perspective the question is simple: *does my equipment still do the essentials I paid for if my connection drops or I change provider?* When limits and safety behaviours are executed at the connection point, outcomes are deterministic and auditable, households aren't stranded by an outage or account issue, and mixed-brand homes keep working as intended after a provider change. This is also what networks are seeking – predictable behaviour at the meter in real time, independent of upstream conditions.

That said, cloud capability should be facilitated. At fleet scale, the cloud enables better optimisation against tariffs, faster feature delivery and security updates, richer diagnostics, and improved planning signals. All of which are benefits customers by resulting in lower bills and fewer truck rolls.

We suggest the best architecture is "cloud sends intent, edge enforces": the cloud provides constraints, schedules or prices with validity windows; the site applies them locally, resolves conflicts consistently, and keeps a simple record of what it did and why. You get the scale and smarts of the cloud without making basic compliance contingent on wide-area connectivity or a single vendor's platform.

Each approach has trade-offs:

- **A local-first design** can increase capability expectations on devices and reveal heterogeneity across brands unless we back it with clear implementation guidance and straightforward logging.
- **A cloud-first design** can move fast but concentrates risk. Outages and latency can delay critical actions, proprietary chokepoints can become an issue if not managed appropriately, and centralising granular household data raises privacy and sovereignty concerns.

[22] https://www.sapowernetworks.com.au/industry/flexible-exports/
[23] https://arena.gov.au/assets/2024/01/SA-Power-Networks-Flexible-Exports-for-Solar-PV-Trial-Final-Report.pdf

We believe an edge-anchored, cloud-augmented pattern is the most reliable, consumer-centred and scalable way to run CER in mixed-brand Australian homes.

Question 17 — What are the benefits and disadvantages of applying interoperability standards at a site versus a device level?

Customers need both, but with clear roles. A DNSP's obligations attach at the connection point, yet the behaviours that make a site predictable and portable are implemented by devices. Interoperability should therefore set a device-level foundation and a site-level orchestration layer that work together.

Device-level capability is what makes mixed-brand homes viable and switching practical. When every inverter, battery, EVSE or controllable load can *natively* register, receive limits and events, apply them safely, and expose simple, standard status/logs, a customer can replace a product or change provider without re-engineering the whole home. Device-level obligations also keep essential safety and compliance close to where power flows, which is crucial during outages or when an upstream platform changes.

Conversely, site-level interoperability solves a different, equally important problem – the hierarchy of control and coordination. A household with solar, a battery, an EV and hot water are likely to frequently face overlapping signals (retailer event, DNSP DOE, user preferences, tariff windows). Without a site brain (EMS/HEMS or equivalent) devices "compete" for headroom, export limits get breached, or value is left on the table. A well-defined site role can arbitrate conflicts, allocate limited export/import capacity, respect household priorities (e.g., EV charge minimums), and present a single source of truth (and control) at the meter.

Each level on its own has pitfalls. A device-only approach creates competing conditions and inconsistent outcomes as more assets are added behind-the-meter. A site-only approach turns the home into a black box. It risks lock-in (if the site controller is proprietary), creates a single point of failure for compliance, and hides whether individual devices actually meet baseline behaviours. The right balance is to require non-negotiable basics in the devices (such as registering, enforcing limits/backstop, safe states, minimal telemetry) while the site layer handles orchestration across assets using a published hierarchy and straightforward semantics.

In practice this allows the site controller (when present) to coordinate and optimise rather than compensating for missing device capabilities and devices can remain independently usable and portable. Responsibilities are explicit so installers and consumers know *which* component enforces *what*, and portability is preserved at both layers so a customer can change a device, a controller, or a service provider without losing core functions.

The flexible-exports experience shows this two-layer model working in practice. Device conformance plus site orchestration produces coherent, customer-visible outcomes[24].

Question 18 — What lessons can be drawn from the current approach to CSIP-AUS in terms of testability and conformance?

The CSIP-AUS model is an open, collaborative program of activity that publishes a living profile, reference tooling and conformance artefacts, iterates in public, and is tightly aligned to what networks and vendors are actually seeking and deploying from a standard.

From a consumer perspective, conformance is about trust: devices from different brands should behave the same way in the same circumstances, keep working when the internet is down or a provider changes, and never drop essential functions like flexible exports or emergency backstop.

CSIP-AUS approach has shown how to enable this well: publish clear documentation and provide open test procedures that OEMs can undertake themselves before they seek compliance. The result is faster onboarding, fewer ambiguous interpretations, and fewer disputes when something goes wrong.

For industry, the lesson is speed with discipline. Open, versioned artefacts (profile, tests, certification) let OEMs self-serve and shorten integration cycles, a public refinement and enhancement process, and a public register of conformant implementations reduces transaction costs across the whole market. Importantly, iteration needs to flow both ways: field experience should feed-back quickly into the profile and tests, and those updates should be visible to everyone—not just the parties in a bilateral integration. Open industry collaboration allows for this.

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[24] https://arena.gov.au/assets/2024/01/SA-Power-Networks-Flexible-Exports-for-Solar-PV-Trial-Final-Report.pdf

For DNSPs and regulators, conformance enables predictability and auditability. When conformance focuses on observable outcomes at the meter (limits applied, overrides recorded, priorities resolved consistently) compliance becomes simpler to verify and less dependent on the internals of any one vendor's cloud. It also supports mixed-brand sites: if each device meets a clear baseline and a site controller (where present) coordinate to published rules, the aggregate behaviour is predictable.

We believe that a "standards-only" route, without shared test artefacts and a reference stack, invites divergent interpretations and slow, bespoke troubleshooting. Conversely, over-engineering conformance can impose cost without consumer benefit. The middle ground is proportionate testing of behaviours that matter to households and DNSPs. In addition, continuity through outages and churn, consistent treatment of overlapping signals and transparent logging kept current through open governance.

We therefore recommend keeping and strengthening the CSIP-AUS method. Maintain base standards through Standards Australia, but continue to run an open, industry-led conformance stream that publishes profile updates, reference tooling and practical tests. The ANU is already running an improvement program for CSIP-AUS, establishing a nationally consistent harmonised testing and certification service. That is how we scale predictable, switching-friendly outcomes across mixed-brand Australian homes, while giving networks and regulators the confidence they need in day-to-day operation.

This approach would be further strengthened with the national technical regulator with remit and funding to oversee standards development will help ensure national consistency and harmonisation in the development, interpretation and deployment of standards. In the absence of this body, ARENA and the ANU is filling the gap by establishing a national testing and certification service. We strongly recommend backing this as an interim home while the technical regulatory framework is stood up as the enduring governance for conformance.

Question 19 — What are the net benefits and costs of adopting different standards pathways (e.g. native vs adapter/HEMS-based)?

Net impacts vary by use case, asset type and the entity that operates it. Cloud-aggregator models can adapt quickly as standards evolve, but they introduce overhead by double-handling control and telemetry, which can add cost and latency. As the profile stabilises and the pace of change slows, we expect more manufacturers to embed capability natively and make better use of the edge compute already present in modern devices—reducing dependencies and lifetime integration cost. Adapter/HEMS approaches are useful to bring legacy fleets and complex sites into scope, but they add components and can become chokepoints if portability isn't designed in.

Rather than prescribing a single architecture, we recommend adopting an outcomes-based approach with clear performance expectations. This will create transparent benchmarks for any pathway and may pull solutions toward native implementations where they deliver better cost and reliability, while still leaving room for innovation and avoiding technology-specific mandates.

Q20 — Should EVSE be required to support OCPP 2.0.1 and ISO 15118-20 (incl. V2G)?

For public EVSE, a national baseline that includes OCPP 2.0.1 (now IEC 63584) makes sense and aligns with Commonwealth practice in funded networks, add ISO 15118-20 where V2G/Plug-and-Charge are intended. For residential EVSE, we recommend mandating proportionately, i.e. start with OCPP 2.0.1 where an EMS/CPO interface is required and then phase in ISO 15118-20 as V2G markets mature to avoid front-loading costs that don't yet deliver household value. This keeps consumer costs proportionate while tracking international consensus.