



**ENERGY SECURITY BOARD
INTEROPERABILITY POLICY
FOR CONSULTATION**

Stage 1: Inverter based resources

DECEMBER 2021



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Abbreviations and Technical Terms

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
API	Application Programming Interface
ARENA	Australian Renewable Energy Agency
CBA	Cost Benefit Analysis
CIC	Customer Insights Collaboration
CSIP	Common Smart Inverter Protocol
DCA	Dedicated Connection Assets
DEIP	Distributed Energy Integration Program
DER	Distributed Energy Resources
DNA	Designated Network Assets
DNSP	Distributed Network Service Provider
DOE	Dynamic Operating Envelopes
ECA	Energy Consumers Australia
EV	Electric Vehicle
ESB	Energy Security Board
IEEE	IEEE Standards Association
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
NEO	National Energy Objective
NERO	National Energy Retail Objective
PV	photovoltaic
SO	System Operator

Executive Summary

In October 2021, Ministers endorsed the Energy Security Board (ESB) Post-2025 Market Design recommendations and tasked the ESB with delivery of a DER Implementation Plan over the next three years to support the effective integration of DER and flexible demand.

As part of the DER Implementation Plan, the ESB outlined the immediate need to move towards mandates for technical standards for active DER, primarily due to the continued rapid uptake of rooftop solar and, in parallel, to progress the development of accompanying policies that can ensure these standards work in customers best interests.

For customers to have access to a wide range of energy providers and plans to enable choice in how they use their assets, providers will require the ability to communicate with and operate these devices. This refers to the 'interoperability' of devices.

Without a minimum level of 'open' interoperability functionality within the device, customers may have their DER assets locked-in to certain providers or offerings. This would limit future choices for customers as well as limiting the ability for contracted service providers to use those assets to maximise the benefits for the customer under an energy plan. It will also limit the ability of new aggregators or retailers to enter the market and stimulate competition and innovation as they will not be able to communicate and compete for the existing fleet of customer devices, without additional cost and installation of extra equipment at the premises. Enabling providers with technical standards and processes for interoperability will see more value flowing back to customers, and a more flexible and lower cost system.

In the final Post-2025 advice, the ESB identified the need for technical standards to support security for the grid system as the penetration of DER devices in homes and businesses and high variable renewable energy resources continues to rapidly progress. Effective standards will also enable customers to make choices to take up new products and services and unlock greatest value to customers from their flexibility.

Policy advice regarding the application of relevant features within these standards, is important to ensure they are applied weighing up factors in the overall interests of consumers (consistent with the National Energy Objective, 'NEO', and the National Energy Retail Objective, 'NERO'). Policy advice regarding application of the standard will also provide benefits of forward visibility to product vendors and service providers in the market. This will assist forward planning and support future readiness for new capabilities.

Building on work underway

Work to progress the development of relevant technical standards has been taken forward via the Distributed Energy Integration Program (DEIP), facilitated by ARENA,¹ including development of the interoperability standard 'CSIP-Aus', which has adapted an international standard applied in California to consider needs within the NEM.² The CSIP-Aus relates to inverter settings within solar PV and battery storage devices.

¹ The ARENA facilitated Distributed Energy Integration Program has established an industry led steering committee on technical standards, referred to as the Interoperability Steering Committee, with wide representation across the sector.

² CSIP-Aus (Common Smart Inverter Protocol) is the Australian derivation / implementation of the IEEE 2030.5 standard that has been mandated for inverter based resources in California.

The purpose of this paper is to seek input from stakeholders on how this interoperability standard ('CSIP-Aus') should be applied in the NEM.

This paper considers the following:

- **Development of an assessment framework.** This framework is intended to support assessing the merits of introducing technical 'feature sets' within standards, and whether / when it may be in customers interests for these features to be introduced as a mandatory requirement.
- **Relevant considerations for assessing trade-offs.** In applying the framework to assess 'feature sets' within the CSIP-Aus, there are a number of factors to consider. This paper seeks stakeholder input on these considerations to inform the assessment process.
- **Applicability of CSIP-Aus for the NEM.** The paper is not considering the standard itself, but rather how features within the CSIP-Aus standard should be applied to support outcomes for consumers.

To support this work, FTI Consulting were engaged to assist ESB in the development of a proposed assessment framework. This framework is intended to support development of ESB policy advice regarding the applicability of different feature sets within the CSIP-Aus interoperability technical standard.

In preparing the framework, FTI has considered a number of feature sets within the CSIP-Aus standard, setting out for discussion and illustrative purposes relevant trade-offs to be considered across each of the assessment criteria. The FTI assessment framework is published as an accompanying paper to this consultation.

Next steps

The ESB invites feedback from interested parties in response to this consultation paper by **3 February 2022**. The ESB intends to hold a workshop with stakeholders and interested parties on the material covered in this paper on **Thursday 17 February 2022, 10am-12pm**.

Interested parties are invited to register their interest by email to info@esb.org.au.

1. Introduction

The Energy Security Board (ESB) was tasked by the former COAG Energy Council to deliver a market design for the National Energy Market (NEM) to meet the needs of the energy transition and beyond 2025. In its final advice to Ministers for Post-2025 Market Reforms, the ESB recommended a Distributed Energy Resources (DER) Implementation Plan to support the effective integration of DER and flexible demand.³

In October 2021, Ministers endorsed ESB recommendations and tasked ESB with delivery of the DER Implementation Plan over the next three years. As part of the DER Implementation Plan, the ESB outlined the immediate need to move towards mandates for technical standards for active DER, primarily due to the continued rapid uptake of rooftop solar and, in parallel, to progress the development of accompanying policies that can ensure these standards work in customers best interests.

Work to progress the development of relevant technical standards has been progressed via the Distributed Energy Integration Program (DEIP), facilitated by ARENA,⁴ including development of the interoperability standard 'CSIP-Aus', adapting an international standard applied in California to consider needs within the NEM.⁵ The CSIP-Aus relates to inverter settings within solar PV and battery storage devices.

The purpose of this paper is to seek input from stakeholders on how this interoperability standard ('CSIP-Aus') should be applied in the NEM.

This paper considers the following:

- **Development of an assessment framework.** This framework is intended to support assessing the merits of introducing technical 'feature sets' within standards, and whether / when it may be in customers interests for these features to be introduced as a mandatory requirement.
- **Relevant considerations for assessing trade-offs.** In applying the framework to assess 'feature sets' within the CSIP-Aus, there are a number of factors to consider. This paper seeks stakeholder input on these considerations to inform the assessment process.
- **Applicability of CSIP-Aus for the NEM.** The paper is not considering the standard itself, but rather how features within the CSIP-Aus standard should be applied to support outcomes for consumers.

This paper also sets out the process the ESB, together with colleagues from across the market bodies, will undertake develop the policy advice.

The ESB welcomes the work undertaken by the ARENA facilitated DEIP Interoperability Steering Committee and associated working groups as a key input into this process.

³ ESB, Post-2025 market design: Final advice to Energy Ministers - Part A. Available at: <https://www.datocms-assets.com/32572/1629944958-post-2025-market-design-final-advice-to-energy-ministers-part-a.pdf>.

⁴ The ARENA facilitated Distributed Energy Integration Program has established an industry led steering committee on technical standards, referred to as the Interoperability Steering Committee, with wide representation across the sector.

⁵ CSIP-Aus (Common Smart Inverter Protocol) is the Australian derivation / implementation of the IEEE 2030.5 standard that has been mandated for inverter-based resources in California.

1.1 Approach

To support undertaking this work as an immediate priority, the ESB engaged FTI Consulting.⁶ FTI Consulting have assisted ESB in this process with the development of a proposed assessment framework. This framework is intended to support development of ESB policy advice regarding the applicability of different feature sets within the CSIP-Aus interoperability technical standard. In preparing the framework, FTI has considered a number of feature sets within the CSIP-Aus standard, setting out for discussion and illustrative purposes relevant trade-offs to be considered across each of the assessment criteria.

The FTI paper has been published as an accompanying document to this public consultation and can be found on the ESB website.⁷

1.2 Relationship to other activities

The development of interoperability policy frameworks will be a key element to support the effective integration of DER and flexible demand. These activities have been set out as a priority for delivery in Horizon One of the ESB's DER Implementation Plan, sequenced to support alignment with and inform the technical standards work already in train. This work relates to many types of DER, including solar PV, battery storage, electric vehicles, and smart appliances such as hot water.

The technical standards work being led by DEIP related to inverter-based resources (rooftop solar PV and battery storage) is well underway. This workgroup is finalising adaptation of the proposed standard over the coming 6-12 months. Clear policy regarding application of this standard is required to support its implementation. For this reason, the ESB identified in its final Post-2025 advice the need to provide policy advice regarding interoperability for solar PV and battery storage technical standards as an immediate priority.

The need for effective interoperability across the DER ecosystem and between systems operating other types of DER, such as electric vehicle smart charging and flexible load, are also important considerations. These will be considered subsequently as part of delivery of the DER Implementation Plan. These items are planned for public consultation in the first half of 2022. While the assessment framework has been developed to consider initially the CSIP-Aus standard, there is likely to be value in seeing how the framework can be leveraged to support further related policy development regarding interoperability of other DER devices.

The ESB notes that there are a number of other workstreams underway, or planned, that have close relationships with this work. In coordinating reform activities across the DER Implementation Plan, the ESB and market bodies will be carefully considering the potential implications for adjacent bodies of work. These include:

- **DEIP White Paper on Dynamic Operating Envelopes (DOEs).** This paper is due to be published in January 2022 and outlines the potential issues and approaches for managing DER to operate inside system and network constraints at all times.
- **Governance of DER Technical Standards Rule Change.** AEMC are currently considering this rule change proposal, with a draft determination due on 16 December.

⁶ FTI Consulting: <https://www.fticonsulting.com/>

⁷ <https://esb-post2025-market-design.aemc.gov.au/>

- **Cyber working group (as part of DEIP).** is developing a no-regrets technical workplan for cyber security for DER, supporting Home Affairs cyber security standards work. This work is being coordinated in parallel along with other DEIP working groups related to interoperability.
- **Policy and Regulatory Frameworks of Dynamic Operating Envelopes.** AER are considering the regulatory aspects of DOEs, including how capacity allocations are determined, changes to the connection agreements, and any risks that arise, governance, data, and transparency around their application.
- **Retailer Authorisation and Exemption Review.** AER are carrying out a review of the existing retailer authorisation and exemption arrangements. Factors likely to be examined include different business models for future and existing service offerings, the trade-offs between risks to consumers and allowing more competition and better products and services through a simpler authorisation environment.
- **Flexible Trading Arrangements.** AEMO are developing proposals to enable flexible trading arrangements; where mechanisms would be introduced to allow customers to access more than one service provider (i.e., two service providers behind a single connection point).
- **Customer Insights Collaboration (The Collaboration).** The ESB will be commissioning research and gather evidence, to support consideration of key cross-cutting customer questions and issues arising across the reform activities together with stakeholders. Key questions from this consultation will feed as inputs into the Collaboration process.

2. Why an interoperability policy?

For customers to have access to a wide range of energy providers and plans to enable choice in how they use their assets, providers will require the ability to communicate with and operate these devices. This refers to the ‘interoperability’ of devices. Without a minimum level of ‘open’ interoperability functionality within the device, customers may have their DER assets locked-in to certain providers or offerings. This would limit future choices for customers as well as limiting the ability for contracted service providers to use those assets to maximise the benefits for the customer under an energy plan. It will also limit the ability of new aggregators or retailers to enter the market and stimulate competition and innovation as they will not be able to communicate and compete for the existing fleet of customers, without additional cost and installation of extra equipment at the premises. Enabling providers with technical standards and processes for interoperability will see more value flowing back to customers, and a more flexible and lower cost system.

In its final Post-2025 advice, the ESB identified principles relating to the interoperability of DER devices.⁸ It is intended that these principles can be used to guide efforts on the creation of standards, and structures that incorporate active DER efficiently into the larger system. These include:

- *Consumers should be able to share data with service providers.* Interoperability should be standardised to allow data portability and sharing between consumer, aggregator, network, and market
- *Consumers’ DER assets should have a level of portability between providers.* These standardised communications should enable consumers to move between providers (and technology) and promote competition between providers. These standards should be minimum levels of capability while allowing providers to layer additional functionality over the top so they can offer their own innovative products and services.
- *Control of and access to consumer devices should be limited to clear use cases.* Control of (operation of and/or access to) any consumer device by a network or system operator should be limited to a set of well documented use cases that can be updated from time to time as agreed by industry.
- *Consumers need to receive clear information about the compatibility of their DER assets.* Device manufacturers, installers, and service providers must be transparent about any proprietary technology resulting in closed eco-systems and the consequences or limits of those closed eco-systems.

In the final Post-2025 advice, the ESB also identified the need for technical standards to support security for the grid system as the penetration of DER devices and high variable renewable energy resources continues to rapidly progress. Effective standards will also enable customers to make choices to take up new products and services and unlock greatest value to customers from their flexibility.

Work is underway to progress development of these technical standards. Policy advice regarding the application of relevant features within these standards, is important to ensure they are applied weighing up factors in the overall interests of consumers (consistent with the National Energy Objective, ‘NEO’, and the National Energy Retail Objective, ‘NERO’). Policy advice regarding application of the standard will also provide benefits of forward visibility to product vendors and service providers in the market. This will assist forward planning and support future readiness for new capabilities.

⁸ ESB, Post-2025 market design: Final advice to Energy Ministers – Part B. Available at: <https://esb-post2025-market-design.aemc.gov.au/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf>

2.1 What might a useful interoperability policy look like?

One of the key drivers for timing of the planned policy release by the ESB, highlighted in the ESB final Post-2025 advice, is to support alignment with technical standards development. This industry led process has been running for over 18 months and is now entering the phase where Standards Australia is moving the process into a national standards framework. To ensure the CSIP-Aus technical standard is fit for purpose, it is important that policy direction is provided to support alignment with the future needs of the National Electricity Market (NEM).

The other key driver is the value of the ESB and market bodies providing clarity to industry, signposting a future pathway and the role of technical standards (i.e., an implementation roadmap). This direction will allow product vendors and service providers time to prepare, to implement software features, adapt products, and provide clarity to service providers on roles and obligations needed to ensure that customers can achieve the best possible outcomes. Such direction will also likely have a positive impact on the costs for their implementation.

Table 1 below provides an indicative framework for how an ‘implementation roadmap’ for interoperability policy could look like. While the feature sets and application will be informed by stakeholder feedback, this highlights for example, the key parameters that could be committed to support meeting the objectives of providing forward certainty to industry and consumers.

Table 1 - Indicative framework for developing an implementation roadmap

Stage	Feature sets	Applicability	Related Decisions	Compliance date
Stage 1	Feature set 1:	All newly installed inverters > YY kW	Related decision 1 Related decision 2	1 st XX 202X
	Feature set 2:	All newly installed inverters > XX kW		
Stage 2	Feature set 3:	All newly installed inverters > AA kW	Related decision 3	1 st XX 202X
	Feature set 3:	All newly installed inverters > BB kW		
Stage 3	Feature set 1	All inverters		1 st XX 202X
	Feature set 2	All inverters		

Key parameters for this roadmap could include the following:

Compliance Dates

The target date for compliance with the feature sets defined, via one or more technical standards. The readiness of the industry to adopt and leverage new interoperability standards will be a key factor on the timing of standards introduction.

Applicability

The applicability would define rules and limits on who is subject to meet the compliance obligation of each Stage. For example, this could include market segments (residential, commercial), size of inverters, types of connected assets (e.g., solar PV, battery storage).

Applicability could also be defined inclusive of existing installations, e.g., defining the sunset of any existing grandfathering arrangements.

Related Decisions

This relates to a number of policy determinations that make clear statements on how the technical standard is to be implemented, which might include the required mechanisms for certification and compliance, policies on where features should be monitored (e.g., at connection point). These decisions may not all be defined up front and may be determined at later points in the staged rollout.

Related decisions may also refer to certain 'trigger' conditions under which the policy dates might move. For example, a sudden sharp uptake in the rate of electric vehicles which puts increased strain on systems and consumers and requires a policy response.

2.2 What is the process for establishing the policy?

This paper is requesting stakeholder feedback on the content of this paper and the accompanying FTI assessment framework by **3 February 2022**.

In February 2022, the ESB will undertake a workshop with stakeholders and interested parties to discuss the content of this paper and provide stakeholders with a further opportunity for feedback and discussion on the approach.

Following consultation, consideration will be given to feedback received and an assessment will be undertaken of relevant trade-offs in the application of the CSIP-Aus standard. This work will be led by ESB and undertaken together with market bodies. As part of this assessment a proposed pathway for implementation will be set out.

As part of the consultation process, the ESB intend to also engage with DEIP Interoperability Standards Committee as an expert technical advisory group to review the technical and practical implications of the policy once the initial assessment framework outlined by FTI has been applied.

The DEIP Committee, which represents many of the industry bodies as key stakeholders, will be invited to provide input into these considerations prior to the release of the ESB policy direction in March-April 2022.

The ESB recognises that this work is being undertaken in parallel with work currently underway at AEMC to consider the 'Governance of DER Technical Standards rule change proposal'. The AEMC will shortly be issuing a draft determination on this proposal.

3. Assessment framework

FTI Consulting has been engaged by the ESB to develop a draft assessment framework to support consideration of features within relevant technical standards.

The framework has two main components.

- The first is a method to break down the technical standards that are within the scope for the policy (in this case, the inverter-based grid connected solar and storage resources) into a number of 'feature sets' that are largely mutually exclusive and can be regulated separately from other features.
- The second is a proposed set of criteria for assessing whether each of these feature sets should be subject to the application of mandatory standards.

These are outlined briefly in the sections below.

3.1 Technical features to be assessed

As set out in **Figure 1** below, five categories of technical features were identified as indicative high-level groupings of features that may be applicable through current and future releases of the CSIP-Aus technical standard:

- **Grid support DER functions** – Technical requirements or features that are defined for DER devices, inverters or connection points that support the security and reliability of the connecting distribution network and wider power system. Grid support DER functions typically seek to manage the impact DER is having on the system, and use 'back-to-base' communications capabilities.
- **Mechanisms for control** – The mechanism and extent to which the DNSP, or SO, communicates or controls the DER device (where 'control' refers to operation of and/or access to the device). Mechanisms for control represent the method upon which grid support DER functions are delivered to DERs. This is primarily via interfaces through which DNSPs, and aggregators (and ultimately DER devices) communicate. These protocols may be via an aggregators proprietary API/ language or standardised based on IEEE 2030.5.
- **Data** – The measurement, collection and reporting of data specific to the DER device and site or connection point. A variety of data may be measured and/or collected relating to the physical performance of the DER as well as the resulting impact on the network. Data may be measured and recorded at differing intervals and is likely to include monitoring data (power, voltage, frequency), operational status reports (device activity, state of charge, enabled) or alarms.
- **Registration** – The static information or data that defines the technical characteristics of DER. Registration data specifies (for example) the size, number of, type and model of DER devices and inverters, and aggregates this up to the connection point. Registration includes identifiers for the purpose of centralised registry or oversight.
- **Cyber security** – The protection of devices and data in relation to the DER with the potential to be accessed by devices, aggregators, site hosts and centralised bodies. Cyber security standards and protocols protect these information flows and the hardware and software itself.

Figure 1 – ‘Feature Sets’ within the CSIP-Aus Standard

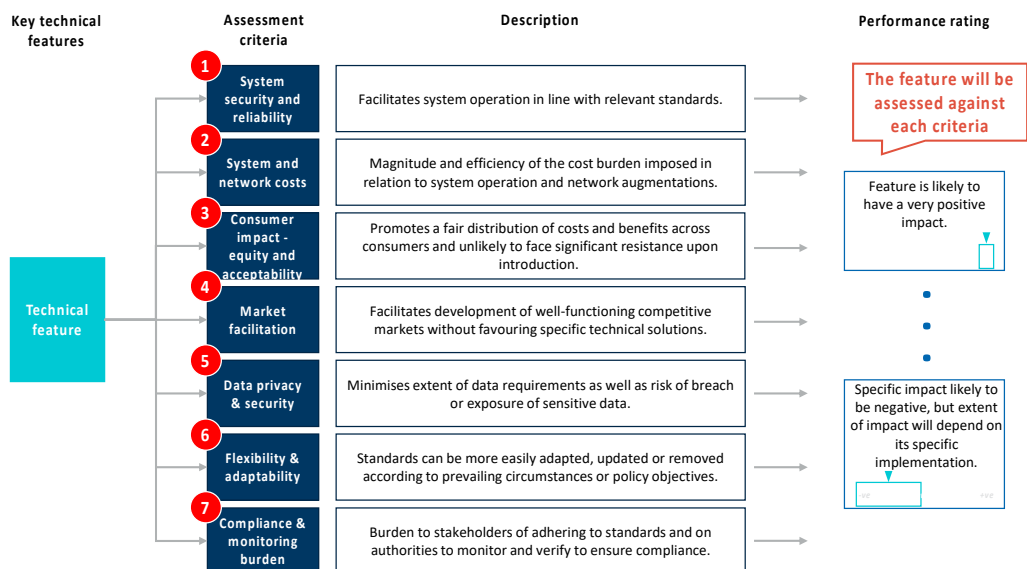
	1 Grid support DER functions	2 Mechanisms for control	3 Data	4 Registration	5 Cyber security
Description	<ul style="list-style-type: none"> Features (autonomous or controllable) which can support the security and reliability of the power system 	<ul style="list-style-type: none"> The levels of communication which must comply with IEEE 2030.5 under CSIP The interfaces through which entities and assets must communicate 	<ul style="list-style-type: none"> Measuring, collecting and reporting data relating to the performance of DER and the local network 	<ul style="list-style-type: none"> Registration of DER assets and their respective technical characteristics 	<ul style="list-style-type: none"> Protecting data shared between the aggregators, site hosts, and DERs and other entities.
Example features	<ul style="list-style-type: none"> Grid import and export limits Charge and discharge rate limits 	<ul style="list-style-type: none"> Protocols between the aggregator and DER Range of DER which standards will apply to 	<ul style="list-style-type: none"> Monitoring data (power, voltage and frequency) Operational status reports Alarms 	<ul style="list-style-type: none"> Maximum rate of energy transfer Maximum reactive power Max apparent power Min power factor displacement 	<ul style="list-style-type: none"> Data flows Data storage Device authentication Request authorization

3.2 Proposed Assessment Framework

The application of the assessment framework developed by FTI is illustrated in Figure 2 below.

This sets out seven criteria to be used to articulate the trade-offs when assessing the applicability of particular feature sets as outlined above. This assessment process will inform whether particular settings may be appropriate to be mandated for standardisation.

Figure 2 Assessment framework



- Criterion 1: System stability (which encompasses reliability and security):** ‘System stability’ evaluates the extent to which a standard facilitates efficient and effective system operation in line with both current standards and standards that may become increasingly relevant in future (for example, DNSP-provided dynamic operating envelopes).

- **Criterion 2: System and network costs:** ‘System and network costs’ considers the magnitude and efficiency of the cost burden imposed in relation to system operation and network augmentations.
Criterion 3: Consumer impact – equity and acceptability: ‘Consumer impact – equity and acceptability’ evaluates two main factors. Firstly, it considers how fairly the costs and benefits of a standard are distributed across individual consumers. Secondly, it considers the extent to which it gives customers the functionality they need and expect, and the acceptability of the associated operation/access, data flows and other aspects of the standard.
- **Criterion 4: Market facilitation:** ‘Market facilitation’ refers to the extent to which a standard facilitates the development of well-functioning competitive markets without favouring specific technical solutions. This includes the extent to which barriers to entry are created, the availability of information in the market, and the possibility of causing a ‘lock in’ for a specific technology.
Criterion 5: Data privacy and cyber security: ‘Data privacy and security’ measures the extent to which data requirements are imposed and the risk that a breach or exposure of sensitive or personal data could occur.
Criterion 6: Flexibility, adaptability, and innovation: ‘Flexibility and adaptability’ covers the ability of a standard to adapt in line with the evolving power market, prevailing policy objectives and the future needs of consumers.
- **Criterion 7: Compliance and monitoring burden:** ‘Compliance and monitoring burden’ covers the burden created by adherence to a new standard placed on stakeholders, as well as the burden placed on authorities to monitor compliance and to take action against non-compliance.

Relevant considerations regarding each of these feature sets and proposed criterion are discussed by FTI in the accompanying document.

4. Questions for consultation

To inform an assessment of the applicability of features within the CSIP-Aus technical standard, the ESB welcomes stakeholder feedback on the following matters.

4.1 Questions related to the assessment framework

1. What are stakeholder views on the framing of the feature sets as described in Chapter 3 (and in the accompanying FTI paper)?
2. What are stakeholder views on the selected the groupings of functionality for the feature sets? Are these the most appropriate grouping of feature sets, or are there others that should be considered?
3. What are stakeholder views on each of the proposed criterion as described in Chapter 3 (and in the accompanying FTI paper)?
4. Are there considerations that have not been captured in the assessment framework?
5. This assessment framework has been established to assist consideration of the CSIP-Aus standard for inverter based DER (solar PV and battery storage); however, it could also support consideration of other technology groups, such as EV smart charging and smart appliances. What are stakeholder views in respect of the applicability of this framework to other technologies, e.g., could the framework be applied to electric vehicle charging standards as a subsequent exercise?

4.2 Question related to application of the policy

Applicability

6. Understanding consumer needs will be important to support effective interoperability settings and secure acceptance for application of standards. What might be implications for the way households and businesses use their DER devices and how they may choose to interact with systems and markets?
7. Is there an assumption that existing fleets of devices would need to be grandfathered? If so, how long might be appropriate? Would sunset arrangements need to be considered to address potential issues of inequity issues?
8. Is it appropriate for new standards to apply to all retailers? How would aggregators and embedded network providers be treated?

Compliance timeframes

9. How might we assess timing of industry readiness? Is it appropriate for timing to be considered as part of the feature sets, rather than conformance to the entire standard, to allow gradual phasing in of functionality over time?
10. Is there a case for phasing in introduction of the standard (or relevant aspects of the standard) across different jurisdictions based on need? What might these considerations include?
11. Are there other parameters (additional to those described in Table 1) that may also be valuable for consideration of inclusion in this process?

Related decisions

12. How and when is the certification and compliance mechanisms determined? What are the likely lead times to establish such a capability?

13. What might be likely systems and processes required to ensure that customers can easily switch providers that conform to these new standards? How does this relate to other IT and systems upgrades identified as part AEMO regulatory and IT systems roadmap?
14. Are there other cross-cutting issues that stakeholders consider need to be raised and explored as part of this policy assessment?

Costs

15. The burden of compliance with implementing the technical standards will fall in the immediate term on the vendors across the solar and storage industry. In the medium term, the upfront and operational costs for compliance will likely be passed back to customers via Traders (retailers and aggregators). What are the key issues for retailers in ensuring this can be delivered at low cost? Are there aspects of the feature sets that have significant cost implications? Is there merit in staging the introduction of functionality over time?

5. Matters for consultation

The ESB invites comments from interested parties in response to this consultation paper by **Thursday 3 February 2022**.

5.1 How to make a submission

Submissions will be published on the Energy Ministers website, following a review for claims of confidentiality. All submissions should be sent to info@esb.org.au.

Submission information	
Submission close date	3 February 2022
Lodgement details	Email to: info@esb.org.au
Naming of submission document	[Company name] Response to Interoperability Policy, Stage 1: Inverter based resources - Consultation Paper
Form of submission	Clearly indicate any confidentiality claims by noting "Confidential" in document name and in the body of the email.
Publication	Submissions will be published on the Energy Ministers website, following a review for claims of confidentiality.

The ESB intends to hold a workshop with stakeholders and interested parties on the material covered in this paper on **Thursday 17 February 2022, 10am-12pm**.

Interested parties are invited to register their interest by email to info@esb.org.au.

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W: <https://energyministers.gov.au/market-bodies/energy-security-board>