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Level 1, Building B, 91 Parry Street,
Newcastle NSW 2302

27th July 2023

The Hon. Lily D'Ambrosio
Minister for Energy, Environment and Climate Change

Dear Minister,

RE: Victoria's Emergency Backstop Mechanism

SwitchDin welcomes the opportunity to provide feedback on the Department of Energy, Environment and Climate Action (DEECA) Consultation Paper on Victoria's Emergency Backstop Mechanism.

SwitchDin is an Australian energy software company that bridges the gap between energy companies, original equipment manufacturers (OEMs) and energy end users to integrate and manage energy resources on the grid. SwitchDin's technology enables our clients to build and operate vendor-agnostic virtual power plants (VPPs) and to optimise performance across fleets of diverse assets. Founded in 2014, SwitchDin operates in all states of Australia, in leading-edge distributed energy projects like Project Symphony, Simply Energy's VPP, the Northern Territory (NT) Solar Connect VPP, and others.

SwitchDin works with DNSPs, electricity retailers, aggregators and OEMs to enable flexible export capability. We are working closely with SAPN, AusNet Services, Horizon Power and others, to enable direct interaction with consumer energy resources (CER) using utility servers and clients compliant with the IEEE 2030.5 Australian Common Smart Inverter Profile (CSIP-Aus) protocol handbook. We also have a gateway device, called a Droplet, which can operate as a IEEE 2030.5 client and we support other interoperability standards and proprietary methods. Using these capabilities we enable DNSPs to implement flexible exports, and we enable traders to access energy markets. This experience gives us a deep understanding of the challenges and benefits of the various interoperability approaches.

We support the proposal for an emergency backstop mechanism in Victoria and we strongly recommend using the approach being implemented by SAPN where interoperability has been a requirement since 1 July this year.

We are very concerned that if Victoria and other states do not closely follow the approach already adopted in South Australia (SA), which is being incorporated into a national CSIP-Aus Test procedure, there is a risk that each distribution network service provider (DNSP) implements its utility server differently enough that servers are incompatible with the established 'white list' of inverters compatible with the SA Power Networks (SAPN) utility server. This would necessitate multiple testing procedures and multiple inverter 'white lists'. Victoria has an opportunity to help ensure that this does not happen and in our submission we outline the steps that are needed to prevent incompatibility issues.

For the sake of interoperability, it is crucial that Victorian DNSPs should look to adopt what SAPN has already done. We very strongly urge the Victorian Government to ensure that all Victorian DNSPs develop utility servers that are sufficiently similar to SAPN approach to enable use of the SAPN testing procedure and utility handbook. Otherwise there is a significant risk that the inverters on the

Clean Energy Council (CEC) list of [Inverters with Software Communication Clients](#) will not be interoperable with all the Victorian DNSPs' utility servers.

The SAPN handbook and test procedures has been adopted by the Australian Renewable Energy Agency (ARENA) Distributed Energy Integration Program (DEIP) Distributed Energy Resources (DER) Integration Application Programming Interface (API) Technical Working Group (ARENA DEIP DERIAPITWG) as the basis for a CSIP-Aus comms client test procedure document. In late July the DERIAPITWG published the CSIP-Aus comms client test procedures and we understand that it will be used as the basis for a Standards Australia document. Victorian DNSPs should be strongly encouraged to use the DERIAPITWG comms client test procedure.

Thank you for the opportunity to respond to these important issues. I remain available for further discussions and inputs.

Best regards,

Andrew Mears PhD
Founder

Executive Summary

SwitchDin understands the need for and supports the proposal and timeline to introduce an emergency backstop mechanism in Victoria.

The most appropriate technology to implement an emergency backstop mechanism in Victoria will be to establish interoperability between inverters and DNSPs, using the approach being implemented by SAPN. This approach has the clear advantage of being suitable for implementation of the emergency backstop mechanism, and a range of other applications such as flexible exports.

The interoperability requirements have been mandated in South Australia (SA) since 1 July 2023. The SAPN connection requirement will ensure that most, if not all, inverters sold in Australia after 1 July 2023 will be capable of flexible exports.

The interoperability of inverters will be a wasted capability unless all Victorian DNSPs have developed utility servers capable of interacting with CER directly utilising the IEEE 2030.5 protocol compliant utility servers and clients aligned with the CSIP-Aus implementation guide. We urge the Victorian Government to monitor the progress of DNSPs regarding their development of this capability.

There should be no supply chain issues for inverter OEMs required to meet a similar connection requirement in Victoria from 1 July 2024, *provided that the utility servers developed by Victorian DNSPs are able to use the same test procedure for inverters as that used by SAPN.*

We are very concerned that a misunderstanding of the interoperability requirements between utility servers and inverters could result in incompatibility issues, and we provide a detailed explanation of this issue below.

There will be a need for training of installers to ensure they are capable of establishing an internet connection between inverters and the DNSP's utility server. Solar Victoria can play an important role in provision of information for consumers and supporting training for installers.

Resolving issues of governance of the regulation of CER technical standards is a crucial first step to improving compliance. If the Australian Energy Market Commission (AEMC) review of CER technical standards is unable to strengthen the enforcement powers available to DNSPs under the National Electricity Rules (NER), the onus of regulatory reform in this area could fall upon jurisdictional governments.

The role for the Victorian Government in addressing risks of server-inverter incompatibility

SwitchDin is very concerned that a misunderstanding of the implementation approach for interoperability between utility servers and inverters could lead to incompatibility issues unless the Victorian Government takes a leading role in this area of CER technical standards.

To date, only SAPN has implemented flexible exports. Since 1 July 2023, inverters connecting to the SA distribution grid have been required to demonstrate flexible export capability based on testing conducted by SAPN. Their approach relies on a utility server that draws upon the CSIP-Aus protocol. SAPN has developed a testing procedure that verifies that inverters can communicate as required with its utility server. SAPN has provided the facilities to verify the compatibility of inverters with its utility server and the CEC is maintaining a list of [Inverters with Software Communication Clients](#), which includes inverters with a communication channel that is compliant to the IEEE 2030.5 CSIP-Aus handbook and the SAPN utility handbook.

It will be crucial to ensure that all Victorian DNSPs' utility servers are able to communicate with all of the inverters that are already on the CEC list of [Inverters with Software Communication Clients](#). Otherwise, there will be incompatibility issues and, potentially, a need for multiple 'white lists' of compatible inverters. Inverter OEMs supply their product range for the entire Australian market. The same version of their product is, generally, sold in all Australian jurisdictions. Misjudgments in the implementation of utility servers could result in OEMs needing to supply different versions of their inverters to different regions because of inconsistent implementation of utility servers by DNSPs. The SAPN connection requirement will ensure that most, if not all, inverters sold in Australia after 1 July 2023 will be capable of flexible exports. However, there is no guarantee that the inverters that are interoperable with the SAPN utility server will also be interoperable with other DNSPs' utility servers. Even if utility servers are compliant with the CSIP-Aus handbook, it is also necessary to ensure that the testing procedure used by other DNSPs is identical to the testing procedure used by SAPN and which the DERIAPITWG has incorporated into a national Testing Procedure for comms clients.

The issue of regulating for interoperability was recently considered by the Energy Security Board (ESB) and the AEMC and they decided not to regulate because inverter OEMs are already supplying the Australian market with inverters that are interoperable with the SAPN utility server and compliant with the SAPN utility handbook. However, the AEMC's decision did not address the risk of other DNSPs developing utility servers that are not interoperable with the inverters on the CEC list of [Inverters with Software Communication Clients](#). This is already emerging as an issue in other states. For example, the Energy Queensland Smart Energy Profile 2.0 (SEP2) utility server could encounter difficulties with demonstrating that it is interoperable with the inverters on the CEC list of [Inverters with Software Communication Clients](#).

To avoid incompatibility issues in Victoria, there is a crucial role for the Victorian Government to ensure that utility servers developed by Victorian DNSPs will be compatible with the inverters on the CEC list of [Inverters with Software Communication Clients](#). The testing procedure for inverters to demonstrate interoperability with the Victorian DNSPs' utility server must be based on the DERIAPITWG comm client test procedure.

The ARENA DEIP DERIAPITWG used the SAPN test procedures as the basis for the recently published CSIP-Aus comms client test procedure document. The document contains test procedures to assess whether a communications client conforms to the requirements of CSIP-Aus v1.1a (2023). The test procedures focus primarily on validation of communications, with a limited set of tests that ensure a physical response is able to be generated.

It will be crucial to ensure that Victorian DNSPs' utility servers are able to support the test procedures developed by SAPN and adopted by the ARENA DEIP DERIAPITWG and are compatible with the CEC list of [Inverters with Software Communication Clients](#). If this is not done, there will be incompatibility issues, multiple 'white lists' and multiple test procedures. Multiple 'white lists' would be symptomatic

of policy failure by the relevant governments.

The DERIAPITWG CSIP-Aus comms client Test Procedure must be the reference for testing interoperability between utility servers and inverters in Australia. Any other approach risks fragmenting a market that is already small and too fragmented by variation between jurisdictions and DNSPs.

Responses to Questions raised in the Consultation Paper

1. Do you understand the reasoning behind the proposal to implement an emergency backstop mechanism in Victoria to manage the risks of minimum system load?

Yes. We understand the need and support the proposal to introduce an emergency backstop mechanism in Victoria to manage the risks of minimum system load.

2. Are you clear on the scope and the timelines of the emergency backstop mechanism? Please specify where you would like more clarity?

We understand the scope and timelines of the proposed emergency backstop mechanism.

3. Are there scenarios where new and replacement rooftop solar systems should be exempt from complying with the emergency backstop requirement? For example, an inverter replaced under warranty. Please provide specific examples.

For the benefit of customers, it would be preferable to allow like-for-like replacement of inverters under warranty. It would be reasonable to require flexible export capability for inverters replaced under warranty if the inverters were installed after 1 July 2023. With a firmware update, some models of inverters installed before 1 July 2023 will also be capable of flexible exports.

4. What do you think is the most appropriate technology to implement an emergency backstop for < 200 kW systems? Please specify key benefits and challenges.

The most appropriate technology to implement an emergency backstop mechanism in Victoria will be to establish interoperability between inverters and DNSPs, using the approach being implemented by SAPN and adopted by the DERIAPITWG as the basis for a national approach. This approach has the clear advantage of being suitable for implementation of the emergency backstop mechanism, and a range of other applications such as DOEs. Technologies proposed for use elsewhere (e.g. the Queensland 'ripple control' solution) do not enable other applications and are a technology 'dead end'. Utility servers that do not use the DERIAPITWG CSIP-Aus comms client test procedure might not be interoperable with the inverters on the CEC list of [Inverters with Software Communication Clients](#).

Since 1 July 2023, inverters connecting to the SA distribution grid have been required to demonstrate flexible export capability based on testing conducted by SAPN. The CEC will maintain a list of [Inverters with Software Communication Clients](#), which includes Inverters with a communication channel that is compliant to the IEEE 2030.5 CSIP-Aus handbook. Inverter OEMs supply their product range for the entire Australian market. The same version of their product is, generally, sold in all Australian jurisdictions. The SAPN connection requirement will ensure that most, if not all, inverters sold in Australia after 1 July 2023 will be capable of flexible exports. However, the inverters on the CEC list of [Inverters with Software Communication Clients](#) will only be interoperable with Victorian DNSPs' utility servers if those servers have the same test procedure as SAPN.

The ARENA DEIP DERIAPITWG is using the SAPN test procedures as the basis for a CSIP-Aus comms client test procedure which has been finalised and was recently published. It will be crucial to ensure that Victorian DNSPs' utility servers are able to support the test procedures developed by SAPN and adopted by the ARENA DEIP DERIAPITWG and are compatible with the CEC list of [Inverters with Software Communication Clients](#). If this is not done, there will be incompatibility issues, multiple 'white lists' and multiple test procedures. Multiple 'white lists' would be symptomatic of policy failure by the relevant governments.

The DERIAPITWG CSIP-Aus comms client test procedure must be the reference for testing interoperability between utility servers and inverters in Australia. Any other approach risks fragmenting a market that is already small and too fragmented by variation between jurisdictions and DNSPs.

In the longer term, it would be desirable to develop a national CSIP-Aus test procedure for utility servers, in addition to the comms client test procedure that has been developed by the ARENA DEIP DERIAPITWG. Without specific testing of *utility servers* (as opposed to testing of comms clients) different DNSPs will develop servers with contrasting capability and functionality. Already it is becoming apparent that there are inconsistencies between the SAPN CSIP-Aus utility server and the Energy Queensland (EQL) Smart Energy Profile (SEP) 2.0 server.

The Victorian Government can ensure that DNSPs align with the DERIAPITWG approach either by encouraging them to do so voluntarily or by regulating, using the Victorian Distribution Code for example.

5. *Do you have any concerns or suggestions regarding using an internet-based technology to communicate with rooftop solar systems?*

There are many drawbacks to the use of customer wifi, however that is not the only way to connect to the customer's internet. Ethernet is a superior solution but can introduce additional costs. There will be benefits for consumers who use ethernet rather than wifi, however they might not understand the benefits or be willing to pay the additional costs involved.

Ideally, inverters would include some fallback measures on their direct communication ports. Hence if there are wifi problems the devices will continue to behave appropriately.

Reliance on an internet-based technology brings cyber security risks. This is particularly so in the case of OEMs that communicate directly with consumers' devices and where consumer data is kept in servers that are outside of Australia's borders where legal protections for consumer data may be below Australian standards.

6. *What mitigating measures, safeguards and 'fallback' limits would you recommend to manage the loss of internet connectivity?*

In the event of loss of internet connectivity, a mandatory low, static export limit should apply. Inverters would ideally include some fallback measures on their direct communication ports so that they continue to operate appropriately in the event of wifi problems.

DNSPs should undertake operational monitoring of the continuing compliance of participating embedded generating units with dynamic connection agreements (DCA) and should notify consumers when non-compliance with a DCA, or loss of connection is detected.

7. *What is your view on supply chain readiness to implement emergency backstop mechanism for rooftop solar systems (up to 200kW (inverter capacity)) by 1 July 2024?*

We anticipate there will be a sufficient supply of inverters capable of flexible exports by 1 July 2024. The SAPN requirement for flexible export capable systems commenced from 1 July 2023 and twelve months will be adequate time for preparation and stock control by companies that supply the Victorian market. The more serious concern is whether the Victorian DNSPs' utility servers will be interoperable with the inverters on the CEC list of [Inverters with Software Communication Clients](#).

8. *What information will installers, distribution businesses and consumers need to understand the proposed changes?*

Installers will need training in how to establish an internet connection between inverters and the DNSP's utility server.

Distribution businesses will need to understand the importance of ensuring that their utility server is interoperable with the inverters on the CEC list of [Inverters with Software Communication Clients](#). The

CSIP-Aus Test Procedure document developed by the ARENA DEIP DERIAPITWG should be used by Victorian DNSPs.

The DERIAPITWG test procedures are designed to assess whether a communications client conforms to the requirements of CSIP-Aus v1.1a (2023). The test procedures focus primarily on validation of communications, with a limited set of tests that ensure a physical response is able to be generated.

DNSPs would also benefit from clarification of roles and responsibilities, especially with regard to verification and enforcement of CER technical settings.

Consumers will need to understand what changes are being made, why they are being made, the implications for their ability to import and export, the implications regarding internet connectivity, their ability to 'opt out' and what that means for them, and how they can obtain further information or assistance.

9. How much forward notice will installers, distribution businesses and consumers need to understand the proposed changes?

Installers will need as much forward notice as possible so that they can undertake the training required. Training of installers and verification and inspection of their work will be a significant implementation challenge. Twelve months will likely be insufficient time to train every installer in Victoria. However, installers typically do not seriously consider the new training requirements until close to the deadline, so delaying the commencement date might not improve the situation.

SwitchDin was closely involved in the training of installers in preparation for the commencement of SAPN's flexible export requirements. Our observations from that experience include:

- In person, face-to-face training for installers is far more effective than online delivery of training modules,
- There would be value for installers to receive introductory, generic training on what 'interoperability' means and why it is needed, and
- Installers will also require product-specific training.

Victorian distribution businesses are already developing the capability to manage DOEs and SwitchDin is working closely with Ausnet Services as a key technology provider. The Victorian Government should monitor the progress of all Victorian DNSPs to ensure that they are ready to implement the Emergency Backstop Mechanism in time for the proposed 1 July 2024 commencement date.

Consumers should be given at least three months' notice of the changes (and preferably longer) so that they can factor the changes into their purchasing decisions.

10. What information can the Victorian Government provide to assist installers and distribution businesses to communicate the new requirements to consumers? Please provide specific examples.

Training of installers will be critical to the successful introduction of the Emergency Backstop Mechanism. In SA, installer training was provided by SA Power Networks and others. Even so, the SA experience has been that installers struggle to understand the new requirements for commissioning flexible export systems. It will be a bigger task in Victoria, where there are more installers than SA and more distribution businesses. The Victorian Government will have an important role to play by supporting installer training. A training course on installation and commissioning of systems capable of the Emergency Backstop Mechanism could be made a compulsory requirement of eligibility for Solar Homes rebates. In addition, we urge the Government to consider allocating staff and resources to a program of training for installers.

For a more detailed understanding of the information and training needs of installers, we strongly recommend consultation with the Registered Training Organisations recognised under the framework of the Small-scale Renewable Energy Scheme (SRES).

11. *What is the best way to ensure that rooftop solar systems with emergency backstop functionality are commissioned correctly at installation stage and continue to maintain a connection over the lifetime of the system?*

Some OEMs can already report on the compliance (with respect to technical standards) of their installed fleet. Some OEMs have been providing data on compliance to market bodies such as the Australian Energy Market Operator (AEMO) for some time. Provision of data for verification of compliance could be provided by OEMs to Victorian DNSPs as a condition of eligibility for Solar Homes rebates.

Policies will struggle to achieve their objectives without effective compliance and enforcement. Interoperability capability lends itself to 'digital compliance' models i.e. remote verification of compliance. The Government should support plans to update CSIP-Aus to enable digital verification of compliance, enabling DNSPs to remotely check settings at the time of commissioning.

12. *Are there any additional roles and responsibilities that need to be considered?*

Resolving issues of governance of the regulation of CER technical standards is a crucial first step to improving compliance. The Australian Energy Market Commission (AEMC) is currently undertaking a review of CER technical standards and the Draft Report of that review clarified that the DNSP is the responsible party for determining whether CER complies with the technical standards via the connection agreements. The connection agreement establishes obligations of the consumer to the DNSP, however it does not enable DNSPs to take enforcement action against CER OEMs or installers. SwitchDin has recommended the AEMC review of CER technical standards should assess whether DNSPs have the tools at their disposal to discharge their obligations under the NER and, if not, to strengthen their enforcement powers. If the AEMC is unable to strengthen the enforcement powers available to DNSPs under the National Electricity Rules (NER), the onus of regulatory reform in this area could fall upon jurisdictional governments. If the Victorian Government takes on the task of reforming the regulatory framework to improve verification and compliance with CER technical standards, SwitchDin recommends consideration of the following actions:

- confirm that DNSPs are the responsible party for determining whether CER complies with the technical standards,
- clarify the enforcement powers that may be exercised by DNSPs under the Victorian Distribution Code and other jurisdictional instruments, such as whether they have the power to:
 - refuse connection agreements with installers who have a previous record of persistent non-compliance,
 - withhold feed-in tariff payments for newly installed systems that have not been verified as compliant with CER technical requirements,
 - require OEMs (or their agents) to provide data to verify compliance of the OEM's inverter fleet, and
 - withhold connection approval for a system if it proposes to use an inverter supplied by an OEM that has failed to comply with the DNSP's reporting requirements.

