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10 July 2020

Submission by email to:
ETRConsultations@sa.gov.au

Dear Department for Energy and Mining

RE: Consultation on Regulatory Changes for Smarter Homes

SwitchDin is a digital energy technology company providing DNSPs, Electricity Retailers, commercial facility managers and equipment manufacturers with the software to improve the way they integrate and manage renewable energy, battery storage and demand management. SwitchDin's product enables customers to implement virtual power plants, microgrids, energy management solutions and integration support for distributed energy resources. We ensure energy consumers, energy service companies, and aggregators have visibility, flexibility and firm dispatch of heterogeneous fleets of distributed energy resources (DER). Commencing in 2015, SwitchDin is based in Newcastle NSW and is operating in all states of Australia and in Europe.

SwitchDin has the capabilities required to successfully meet the requirements in Attachments 1, 2 and 4 of the Consultation and has a solid track record in delivery of these solutions in Australia in partnership with DNSPs, the solar industry and its customers. Our solution gives the operator(s) real-time visibility and control of diverse fleets of DER devices, including solar and battery inverters, to provide advanced network support and enable flexibility at the grid interaction point.

Outlined below is our feedback on the SA Government Consultation on Regulatory Changes for Smarter Homes. This feedback is based on pertinent contemporary experience within the space of DER management as well as solar inverter technology and installation. To provide a clear response to each attachment, this response is broken down into a separate response for each topic.

Attachment 1
Consultation on the proposed remote disconnection and reconnection requirements for distributed solar generating plants in South Australia.

SwitchDin recognises the need for appropriate remote control of solar generating plants in order to ensure the security and quality of the power supply in South Australia. In many cases, especially for smaller systems, the remote control capabilities are not installed. However, cost effective technical solutions are available either via the solar vendor's platform or via an external device. The remote control can deliver a range of value by ensuring DER flexibility. The remote disconnection and reconnection of solar generating plants is only one aspect of the benefits of remote control and provides only a small amount of the value that could be obtained from the deployment of this type of capability.

The salient issue discussed in Attachment 1 is the reduction of minimum demand during daylight hours due to large amounts of unmanaged rooftop solar. While the disconnection of rooftop solar plants can facilitate an increase in aggregate demand, SwitchDin can provide solutions - already deployed in Australian distribution networks - which allow for granular control of PV as well as dispatch of other types of DER such as home batteries and discretionary loads (hot water, air conditioning, pool pumps etc), all of which can be leveraged to increase aggregate demand. These solutions have also been deployed on secure network operator systems and have been proven to be both secure and reliable.

SwitchDin can enable this solution for new Solar PV installations and also have a cost effective retrofit option for existing Solar PV systems. This flexibility function can further increase the value of the customer's investment and reduce the need to completely disconnect customers instead enabling smooth control to avoid contingency events all together..

Complete disconnection of multiple customers will unnecessarily burden the customers with lost value, and runs the risk of introducing transient behaviour which can cause further issues with grid stability and power quality. This would add further cost and complexity to a solution which on the surface seems simple to address. SwitchDin's StormCloud

platform can control and ramp PV, battery and loads to provide a smooth transition across an aggregate fleet to preserve energy security while ensuring the highest level of low cost PV energy penetration in the energy system.

We have described our solution and platform in response to Attachment 2 with regards to the ability to control DER for dynamic exports, but would like to highlight that the same platform would simultaneously satisfy the requirements for increasing minimum demand on the network. If there is a requirement for a PV generator to be disconnected, then the SwitchDin platform is able to provide this response as a backstop in case other forms of DER (increasing loads or PV curtailment) do not provide a suitable or sufficient increase in demand.

Any proposed solution is required to be future proof. A simple disconnect/reconnect of PV is likely to take a hardware based solution which integrates with existing network infrastructure. Software solutions such as SwitchDin's can be updated remotely and can in fact be hosted on many different types of hardware. As an example, the SwitchDin controller has been deployed within third party smart meters and battery systems, where it can facilitate a cost effective and scalable solution well suited to rapid deployment.

The SwitchDin solution is available to provide remote disconnection and reconnection commands to PV systems in addition to a range of flexibility services to maximise value for customers. This can be done within the proposed timeframe and SwitchDin is already working closely with the South Australian Power Networks to ensure alignment of this capability with their systems. We believe that if the SA Government were to implement a control requirement of DER, it should be done in such a way as to maximise the value to customers and operators.

Attachment 2
Consultation on the proposed export limit requirements for distributed solar generating systems in South Australia

SwitchDin is in favour of implementing dynamic export connection agreements for distributed solar generating systems, as this will allow the power system to significantly increase the penetration of customer owned solar generation. Traditionally the DNSPs in Australia have only been able to manage the impact of high levels of solar penetration through the static terms defined in the customer connection agreements. Typically these are zero export requirements or limits placed on the system size. Together these static constraints mean that customers are not able to maximise the value from their investments, and the entire power system loses the value of the customer's system. The introduction of dynamic export limits, being export limits which are only applied during times of network constraint, and the relaxation of static constraints means that customers can maximise their value whilst networks can safely support higher penetration of solar.

SwitchDin has multiple solutions in the market which would allow DNSPs to support dynamic export for residential, commercial and industrial customers. These solutions have been developed in conjunction with Australian DNSPs to comply with standards and meet their interoperability requirements with their distribution management systems. The flexibility of the SwitchDin solution allows dynamic exports to be deployed in multiple ways including a simple retrofit on existing systems.

The same platform which allows for dynamic export limits can also provide control of loads and battery storage to improve energy efficiency and reduce costs whilst enabling connection to upstream value providers such as through the provision of Virtual Power Plants (VPPs) for electricity retailers, or the demand response initiatives of DNSPs simultaneously.

The SwitchDin Droplet is a DER controllers which integrates with most inverters, meters, and load controllers in the market.The Droplet (which can take the form of hardware or embedded software in the smart meter or battery storage device) provides localised energy management & control of DERs to enable remote services. According to independent market share data for inverters installed in South Australia, SwitchDin currently provides the VPP capability for more than 75% of the market by brand (Fronius, Goodwe, SolarEdge, SMA, SolaX, Growatt, Solis, Sungrow) for systems up to 10kW. SwitchDin also has experience integrating with almost 90% of the market according to brands (Fronius, SMA, SolarEdge, ABB/Power-One, Huawei, Solis, Selectronic, Goodwe, SolaX) for systems 10-100kW. As such SwitchDIn can support a solar vendor agnostic approach to reduce the likelihood of orphaned systems, thereby providing greater access to the network for more customers.

Droplets may be deployed individually as autonomous energy management systems (EMSs) for homes & businesses, or at scale to enable microgrids and virtual power plants using SwitchDin's StormCloud platform. Stormcloud provides user portals and integrations with energy companies and markets operators.

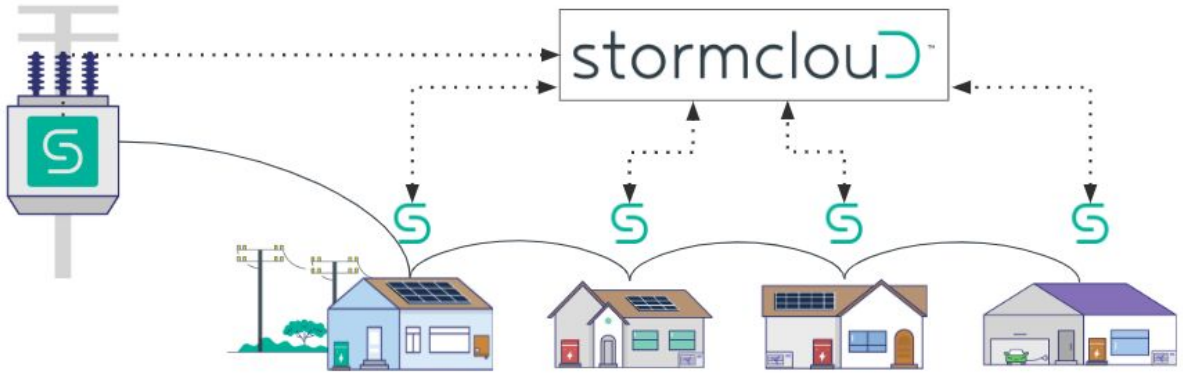

Figure 1. Real time visibility and control of DER assets

Here are three solutions provided to multiple Australian DNSPs to provide dynamic export on both the NEM and remote networks.

Solution 1 - IEEE 2030.5 server and client

The IEEE2030.5 standard is an emerging standard for inverter based DER management and SwitchDin implemented the first such solution in Australia for Horizon Power in Western Australia. This standard provides a consistent device agnostic solution to remote management of solar PV and battery inverters. For inverter systems which are not able to implement a IEEE2030.5 client to connect to the server, a SwitchDin Droplet can be retrofitted to provide this connectivity with full visibility and control. As the Droplet is a digitally connected device, it does not require any changes to the electrical installation of the PV system with regards to standard installation thereby reducing costs of this approach.

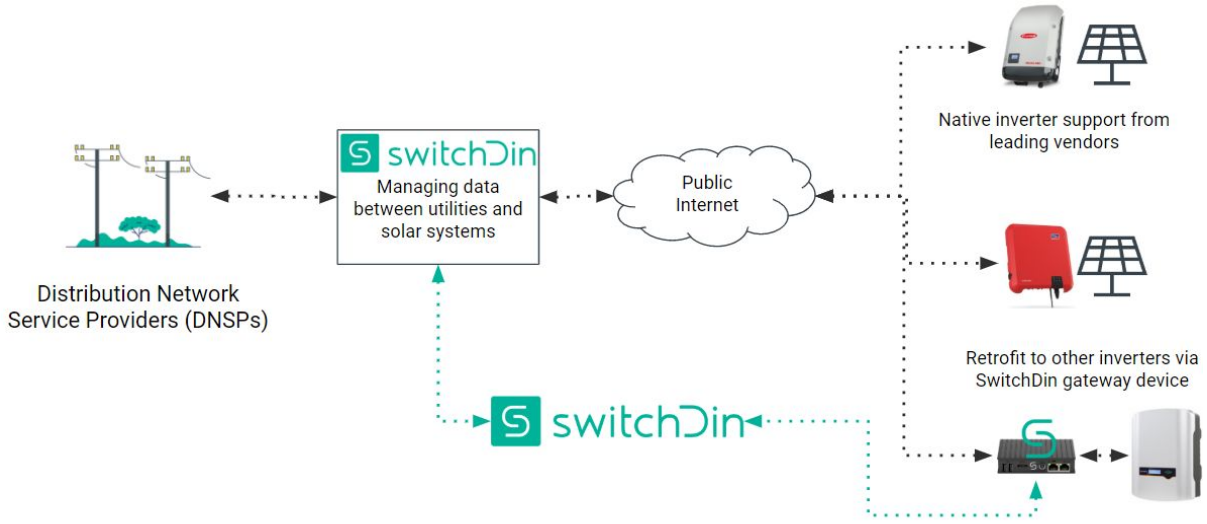

Figure 2. Overview of IEEE 2030.5 implementation

Solution 2 - SwitchDin StormCloud VPP platform

SwitchDin can provide DNSPs with a direct user interface to provide control of DER. This solution has been provided to Horizon Power for wide area projects in Broome and Onslow regions. In the case of Broome the entire system is based within the SwitchDin platform and has met the strict security and reliability requirements.

The platform can be used to provide manual dispatch or curtailment of DER or can be coordinated with real time dynamic constraint data from key network assets such as transformers and substations to manage flexibility. The platform can provide this capability autonomously by adjusting downstream DER to ensure operation is within network constraints.

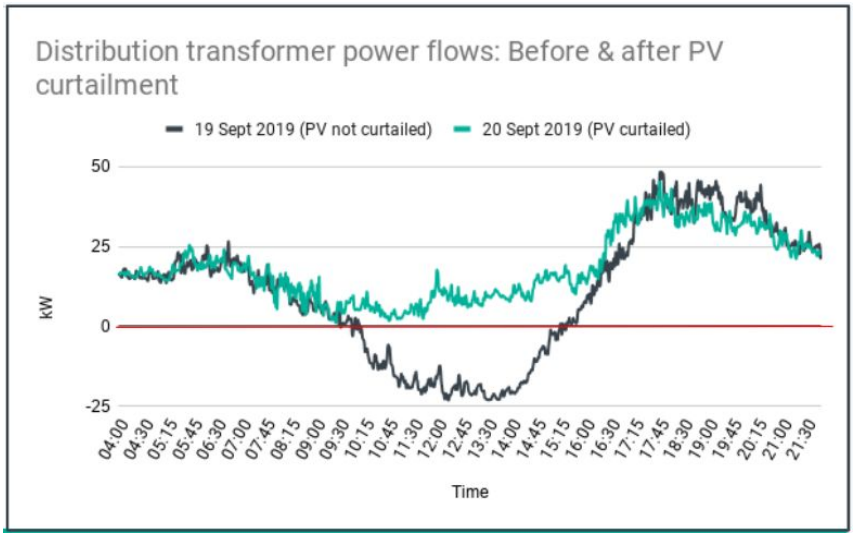

Figure 3. Real example of PV system capacity being curtailed when necessary.

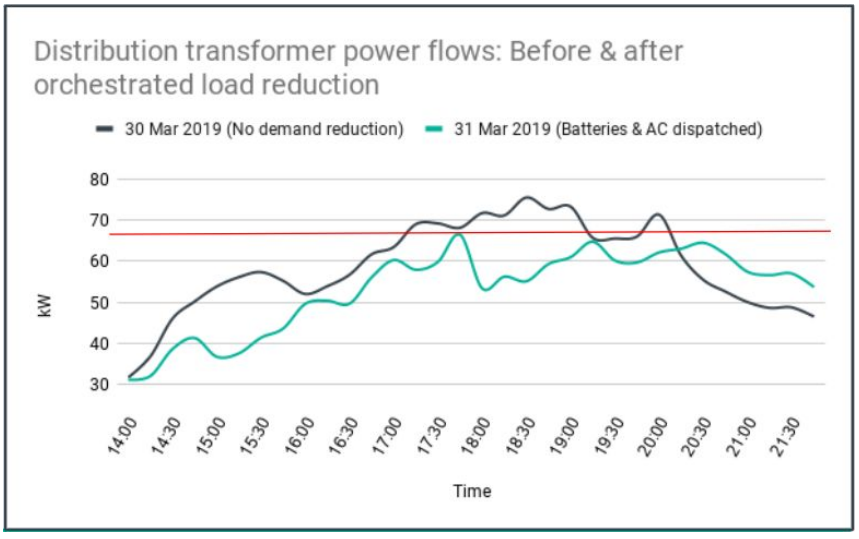

Figure 4. Real example of target maximum demand 67kW achieved (15min avg) through the use of battery discharging and Aircon load reduction.

Solution 3 - Direct integration with network control infrastructure

SwitchDin is able to provide Energy Queensland with control of distributed solar generation and battery assets on remote microgrids. One such example is the deployment in Lockhart River for Ergon Energy where SwicthDin provided direct digital integrations with network control equipment and solar inverters to allow the network operator to request a limit and the SwitchDin system will orchestrate the downstream assets to provide the requirement of the network controller.

It is clear the flexibility and hardware agnostic SwitchDin solution allows it to be future proof for any changes in the requirements of DNSPs and to avoid single vendor DER solutions.

Attachment 3

Consultation on the proposed new low voltage ride-through requirements for smart inverters in South Australia.

SwitchDin supports the move to enforce low voltage ride-through requirements for smart inverters. Through SwitchDin's platform, DNSPs can remotely access inverters to get visibility on operational settings, and to monitor compliance with connection settings such as low voltage ride through.

Attachment 4

Consultation on the proposed smart meter minimum technical standards in South Australia.

SwitchDin understands that DNSPs and market operators require visibility and control of distributed solar generation to reduce the need for widespread customer disconnections in the case of market failure. While new smart meters may be able to provide a solution, we believe that there are more flexible and cost effective solutions available which provide more value to all stakeholders. The SA Government should investigate these solutions more closely before mandating a change to smart mater technical standards and the subsequent change in wiring requirements of distributed solar generating systems.

As discussed in response to Attachment 2, SwitchDin has a solution which can provide visibility and control to the operator in real time and with greater resolution than typically available through smart meters. The SwitchDin Droplet is also a digitally connected device and can monitor and control the inverter product directly without the need for any special changes to the smart meter or system wiring.

The incremental cost of adding an extra metering element and contactor to the smart meter is significant. However the additional installation costs of reconfiguration of residential power boards and some solar PV installations will be prohibitive.

One example would be a home where the solar is being installed on a shed which already has a sub board installed. Rather than the system being able to use the existing infrastructure, installers would need to run a new cable, typically underground, to the main board to allow for connection to the second element. This would make the solar system uneconomical in this case.

Another example would be larger systems which are installed on commercial premises or schools, where there may be multiple buildings and multiple systems behind a single meter. These additional costs will increase the overall cost and reduce the customer benefits.

In both of these cases, SwitchDin can provide visibility and control of total loads and generation - regardless of where they are physically located or wired - and provide control capability of the inverters without the need to modify metering or wiring. It is as simple as connecting the Droplet to the same communications infrastructure as the inverters and meter.

Another challenge when changing the wiring requirements is the changes required to solar inverter internal algorithms, which allow customers to monitor self consumption and also to enable export limitation functionality. Typically, meters or CTs must be installed in a position which provides the inverter a Nett reading of the total of load and solar generation.

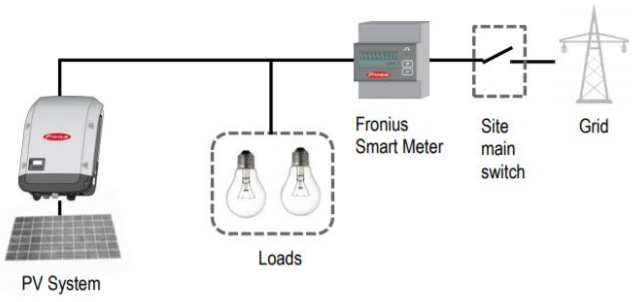

Figure 5. Typical SLD of required positioning of meters/CTs for monitoring and export limitation (Fronius Australia)

If the wiring requirements are changed and the solar production is removed from this net reading, the export limitation and monitoring functions will no longer operate correctly. This means that inverter manufacturers will be required to develop and deploy algorithms to be used specifically in South Australia while the rest of Australia (and the world) use the current algorithm.

This will add time and cost to inverter manufacturers' operations and can also lead to a reduction in competition, with fewer options available on the market to further drive up prices of distributed solar generation.

Attachment 5
Consultation on proposed tariffs to incentivise energy use in low demand periods in South Australia.

SwitchDin agrees that tariff reform will be an effective component of a comprehensive strategy to provide energy consumers - and prosumers - incentives to modify behaviour in a way that benefits the energy systems and the consumers alike.

This will also provide a driver for markets in the energy technology space such as energy efficiency, home automation and energy management systems to provide consumers with solutions which ultimately provide increased cost savings on energy.

SwitchDin thanks the SA Government for allowing us to provide feedback to these regulatory changes and hope that we can support their implementation with suitable solutions in the future.

Best regards,

Andrew Mears

Chief Executive Officer, SwitchDin