



FRONIUS SUBMISSION - SA GOV CONSULTATION PAPERS

To SA Dept. of Energy & Mining,

We understand the system security risks South Australia is facing and appreciate government's effort to deploy solutions with an aim to increase system strength, act as stabilizing factor in the country's electrical system and enable smoother penetration to a decentralized network with embedded generation and storage in mind.

We do voice concerns however, that many of the proposed changes have been published with extremely short notice and consultation period, and with an even more challenging delivery timeframe.

Unfortunately, the Australian Solar industry has a history of implementing sudden changes, primarily from governments, that fuel uncertainty in the industry. These can be out of line with production lead times, R&D lead times and global resource planning and allocations for manufacturers. This not only creates the threat of a gap in the market for manufacturers and their Australian businesses, but also the solar businesses who order equipment in advance, have long term product and marketing strategies and rely on market supply. It effects the livelihood of the industry and does not promote a sustainable renewable energy industry.

Since the release of these consultation papers, Fronius have seen reports of cancelled orders from our distributors, a reduction in forward planning orders and requests for information and clarification by installers which is a concerning sign.

Again, we understand the urgency for some of these changes, but it is our view that these needed to be implemented in a more achievable and sustainable timeline with a staggered approach. This will relieve unnecessary pressure in the industry and enable relevant stakeholders, mostly SAPN and SA Government, to better measure the success of each proposal and make adjustments if required. The proposed combined approach with dense timeline has a high risk factor, as potential failures could lead to unintentional and undesired effects.

Response 1:

Consultation_on_the_Proposed_Remote_Disconnection_and_Reconnection_Requirements_for_Solar_Generating_Plants_in_SA

*The new requirement is proposed to commence in **September 2020**.*

Fronius understand the issues raised in the consultation paper in conjunction with AEMO and the corresponding need for some remote DER functionalities in order to maintain the power system security with the increase of installed DER. In addressing the proposal, Fronius seeks clarification on what date is being referred to by Sept 2020.

The proposed technical standard in the consultation paper is vague and ascertaining what solutions may be compliant for manufacturers like Fronius will require further investigation and consultation. This exerts unnecessary pressure on manufacturers, likes of Fronius, as well as Networks likes of SAPN. Furthermore, this could potentially have detrimental effects to the actual purpose of the paper, in the sense that unclear interfacing requirements means manufacturers are left to their own devices to select which interface to adopt from device point of view, while networks like SAPN/AEMO are left to their own devices as to what adaptations to make from control and verification point of view. With the time frame provided, there is no possibility of an integrated approach between the manufacturers and the networks. In addition, it is probable that Networks would face additional challenges with regards to interfacing complexity and compliance, and the technical resources to support it, as Networks are the controlling point for Demand Controlling Signals.

In order for the benefits of the proposed changes to be realised by the SA Government, a more transparent, well defined and integrated approach between the networks and manufacturers is recommended. If the proposal came into effect as suggested at present, manufacturers may offer several interfaces that the Networks are unable to support and vice versa.

At this stage we are unable to advise our customer and solar installer base, as to whether we will have a product that complies and able to be installed in South Australia post September 2020. It is proposed that the



Technical Regulator will issue a “guideline” deeming particular technical solutions but until we know which methods are acceptable, the SA solar industry will be left in a period of uncertainty

The proposal could render need for additional ancillary equipment be it hardware or software which may increase system complexity and cost without significant benefits, and pose additional burden for end-customers including DNSPs.

There are, of course, other solutions that could be favourable for consumer and networks, which are being worked on already such as utilisation of existing networks via HTTP protocol / API’s and corresponding standards like IEEE 2030.5. These solutions would have clear visibility, increased functionality, less components and possibly lower costs to consumers. This functionality would however not be available until mid-2021.

We recommend that the requirement for Remote Disconnection & Reconnection is deferred to at least June 2021, with an integrated strategy to provide more definition and clarity on the required interfaces for manufacturers by September 2020.

We also refer to the requirements regarding partners/participants becoming official “Agents”. For this to be possible, Fronius internal infrastructure & control would need to be able to be assigned as a “registered agent”.

Finally, as the proposed strategy is to be “technology neutral” we have concerns regarding procedures and standards or the lack of, specifically re compliance & testing.

Certification:

There is no information in the proposal about a possible certification of this functionality. We recommend that there needs to some technical requirements for these functions, for example, how fast should the inverter react to commands, before this becomes a mandated requirement. Without this, there is no assurance to the South Australian Government or industry that the systems are really working as required and that the required benefit to the Government can be obtained.

Security:

There is also no information in the proposal about security. If the market is left to decide what’s the best solution is, then we see potential concerns with security. Solar installers and consumers are likely to go for the cheapest solution. A minimum level of security for a remote connection needs to be defined. Proprietary solutions combined with a short time for reaching compliance, might result in manufacturers ignoring or leaving out security precautions. If a manufacturer does not require a secure remote connection, who would then be liable if a breach of security were to occur. With recent high level security breaches in multiple levels of Australia’s government infrastructure, this is something that should be considered seriously. When comparing to Rule 21 in California which is written with similar outcomes in mind: it is required to have a secure connection (which is specified) to the utility. If there are other connections (e.g. between inverter and aggregator or gateway) then these connection are supposed to be secured in the same way.

Technology neutral:

Keeping the standard “technology neutral” might lead to multiple different solutions and also to some proprietary solutions but definitely not to a common standard. If this is what is desired to be achieved, this will make an automated interface or process for distributing settings to the agents almost impossible.

Before implementation of such a proposal, we recommend that appropriate standards/procedure benchmarked for compliance and quality assurance purposes is concurrently defined, and a suitable timeframe for manufacturers to achieve such standards be considered.



Response 2:

Consultation on the Proposed Export Limit Requirements for Distributed Solar Generating Plants in South Australia

The new requirement is proposed to commence on 1 January 2021.

In this consultation paper, it is proposed that *“a new technical standard would require distributed solar generation to be capable of being export limited. Distributed solar generation would be considered capable of being export limited if the energy exported to the distribution network from the plant can be programmed to keep to thresholds which may vary at different times of the day.”*

Fronius is one of 3 x manufacturers currently involved with the ARENA funded SAPN “Flexible Export Limits” project. The technical implementation assessment for this project has just started, with the completion date for testing being mid-2021. This project is working on building the same functionality that is being proposed here.

The timeline for ARENA’s project was carefully assessed by all participating parties and stakeholders (including SAPN) and set with an aggressive completion date. In the Flexible Export Limits project, a timeframe had to be agreed to, so the project could responsibly and correctly implement such requirement.

We have concerns that the short time frame proposed in this paper would jeopardise the quality and robustness of the functionality, and hence result in increased risk for the network. It is critical that this functionality is developed with SAPN, as they too will need to implement various Utility servers to transmit the dynamic limits and ensure accurate and correct limits are taking place to deliver the desired outcomes.

Considering the required Networks infrastructure changes and inverter software changes, the proposed commencement date of 1 Jan 2021 is not achievable.

Our inverters currently have the capability (with the installation of a Fronius Smart Meter) of export limiting a solar system anywhere between the values of 0% - 100% of the overall system rating. This functionality has been implemented and installed successfully for the past five years. Fronius however do not currently have the capability to remotely change this export limit value, nor dynamically. As one of the leading inverter brands in South Australia, making our product non-compliant in South Australia within such a short period would not only damage our business in Australia but also be very damaging for the large volume of South Australian solar businesses which utilise our product and have built the businesses around it in terms of marketing/sales strategy and internal business processes. As one of the highest quality and service orientated inverter manufacturers, operating in Australia for over ten years, this would be damaging to the solar industry overall.

Finally, as strategy is to be “technology neutral” we have concerns regarding procedures and standards or the lack of, specifically re compliance & testing.

Certification:

There is no information in the proposal about a possible certification of this functionality. We recommend that there needs to some technical requirements for these functions, for example, how fast should the inverter react to commands, before this becomes a mandated requirement. Without this, there is no assurance to the South Australian Government or industry that the systems are really working as required and that the required benefit to the Government can be obtained.

Security:

There is also no information in the proposal about security. If the market is left to decide what’s the best solution is, then we see potential concerns with security. Solar installers and consumers are likely to go for the cheapest solution. A minimum level of security for a remote connection needs to be defined. Proprietary solutions combined with a short time for reaching compliance, might result in manufacturers ignoring or leaving out security precautions. If a manufacturer does not require a secure remote connection, who would then be liable if a breach of security were to occur. With recent high level security breaches in multiple levels of Australia’s government infrastructure, this is something that should be considered seriously. When comparing to Rule 21 in California which is written with similar outcomes in mind: it is required to have a secure connection (which is specified) to the utility. If there are other connections (e.g. between inverter and aggregator or gateway) then these connection are supposed to be secured in the same way.

Technology neutral:



Keeping the standard “technology neutral” might lead to multiple different solutions and also to some proprietary solutions but definitely not to a common standard. If this is what is desired to be achieved, this will make an automated interface or process for distributing settings to the agents almost impossible.

Before implementation of such a proposal, we recommend that appropriate standards/procedure benchmarked for compliance and quality assurance purposes is concurrently defined, and a suitable timeframe for manufacturers to achieve such standards be considered.

Response 3:

Consultation_on_Voltage_Ride_Through

*The new requirement is proposed to commence in **September 2020**.*

In this consultation paper it is proposed that inverters be put through a more defined test for voltages under 180Vac.

The test will demonstrate that an inverter’s default settings ensure that it remains connected and in sustained, continuous operation for a short duration, transmission undervoltage step reduction (50 V or 20% retained voltage for a duration of 80-220 ms). The values selected are based on the distribution clearance times and potential transmission level events.

The proposed test report seeks to confirm two aspects of the inverter’s behaviour:

- *The Inverter remains connected during an event where the voltage reduces to below 180 V and consequently returns above 180V within one second; and*
- *The Inverter disconnects after 1 second following a sudden event where the voltage remains below 180 V.*

Our understanding is that this test is based on the AEMO “*Short Duration VDRT Consultation Test Procedure*”. We note that there are discrepancies between the AEMO procedure and what it stated here. One is referencing 80 – 220ms and the other 2 – 220ms. We request that a uniform test and value is stated.

Although Fronius understands the urgent need for action, it is unachievable to have all of our inverter families tested and certified to this new test by September 2020. As per the UNSW bench test results, the Fronius inverters would already meet the 2 – 220ms voltage disturbance requirement, meaning that no change is required in our software to successfully pass the test.

Nevertheless it will be unachievable to have the inverter ranges tested and certified by September 2020. Accredited test labs that test inverters are generally very busy and lead-times of six to eight months are typical. Even if the test labs only had a one month lead-time to commence testing, the September 2020 deadline would barely be achievable.

In our experience (being a Solar Inverter Manufacturer since 1992), the tests and setup would take a few days per inverter, since typically the process involves report completion, liaising with JAZ-ANZ certifier which often involves significant back and forth communication before a final version of the report is compiled. This then goes via similar process as previously between the lab and certifier. Finally, the certifier, would need to go through internal quality assurance procedures before being able to issue final signed certification. If following the standard procedure for CEC inverter listing in Australia, there would be another two to three weeks until the inverters would be able to be officially listed by the CEC.

With the above issues in mind, for inverter to be tested, certified and listed in such a short timeline, there is large risk of normal procedures not being followed. In order to maintain business operations, there could be pressure to employ unethical practices or shortcuts to meet the deadline. Test labs will also be inundated if the proposal were to be implemented, which would lengthen the lead time even further.

With AEMO’s urgent need for this inverter capability and test lab lead-times in mind, our recommendation is to make the compliance date 1 March 2021. This timeline would still be a challenge for us given the work involved as well as other inverter manufacturers, and would interrupt other projects that we are currently working on, but is at least achievable.

An additional suggestion would be to allow inverter manufacturers to provide internal test results proving that the inverter meets the requirements by Sept 2020, but then have the official external results and listing by 1 March 2021.

Response 4:

Consultation on the Proposed Smart Meters in South Australia

The new technical standard is proposed to commence in **September 2020**.

In this consultation paper it is our understanding that SA Energy & Mining plan to mandate the following Smart Meters:

Proposed:

- Smart meters installed at a connection point in South Australia must have a minimum of two elements with a contactor in each element. The new minimum technical standard for smart meters would be in addition to the minimum requirements prescribed by the national energy frameworks.

Alternative, proposal:

- Two element three contactor meter, with controlled load and solar generation on separate contactors within one element and general load on the other element, which would allow separate control, however, measurement of controlled load and solar generation would be combined.
- Three element three contactor meter which would allow separate measurement and control of general load, solar generation and controlled load

Fronius understands the reasoning and concept for this requirement. Although this technical requirement is not a direct requirement on our product itself, it does have big impacts on our product and systems ability to integrate with such metering systems.

1. Export limiting functionality:

- a. In our export limiting control topology, an energy meter is required to be installed in the “feed-in” path of the customer’s installation i.e. generally directly after the site main switch (see figure 1 below).
- b. Solar & loads must be on the same side of the Fronius energy meter. With the proposed SA smart metering topology, it would no longer be possible to implement an export limited system in South Australia.

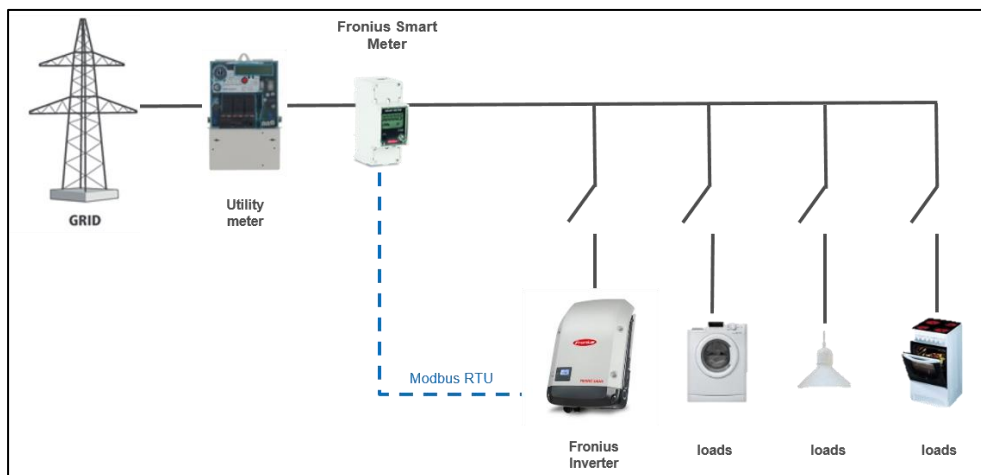


Figure 1: Fronius Smart Meeter installed at “feed-in” point

2. Hybrid Battery systems:

In our hybrid battery systems with batteries a Fronius energy meter is also required in the system in order for the battery to know when to charge and discharge the battery, when excess energy is available; and to enable AC charging from the grid. With the proposed meter changes it will not be possible to install these systems in South Australia.

A large percentage of hybrid battery systems being installed are being configured with backup power functionality. In order for this functionality to work our energy meter and a contactor **MUST** be as shown below.

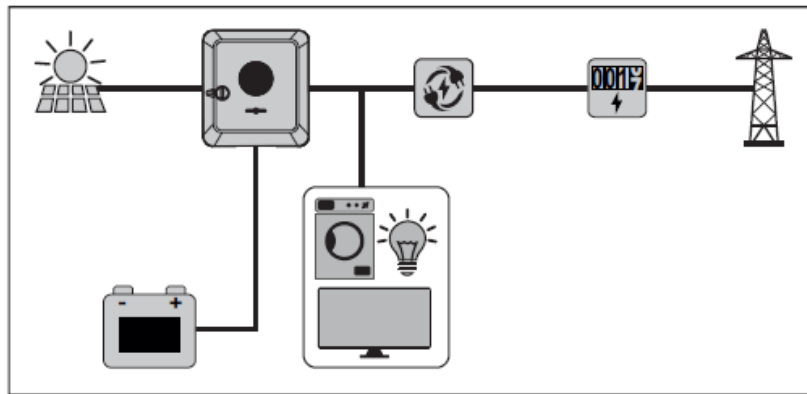


Figure 2: EPS Fronius Solution with Fronius Smart Meter installed at “feed-in” point



- AC contactor that disconnects the site from the Grid



- Fronius Smart Meter (Energy Meter) and is needed to help detect if the Grid is present

With the proposed new multi-channel smart meter topology this will prohibit any of these types of systems from being installed and preventing customers from having a reliable battery backup system. Below is another example of system topology that will not work (Tesla Powerwall)

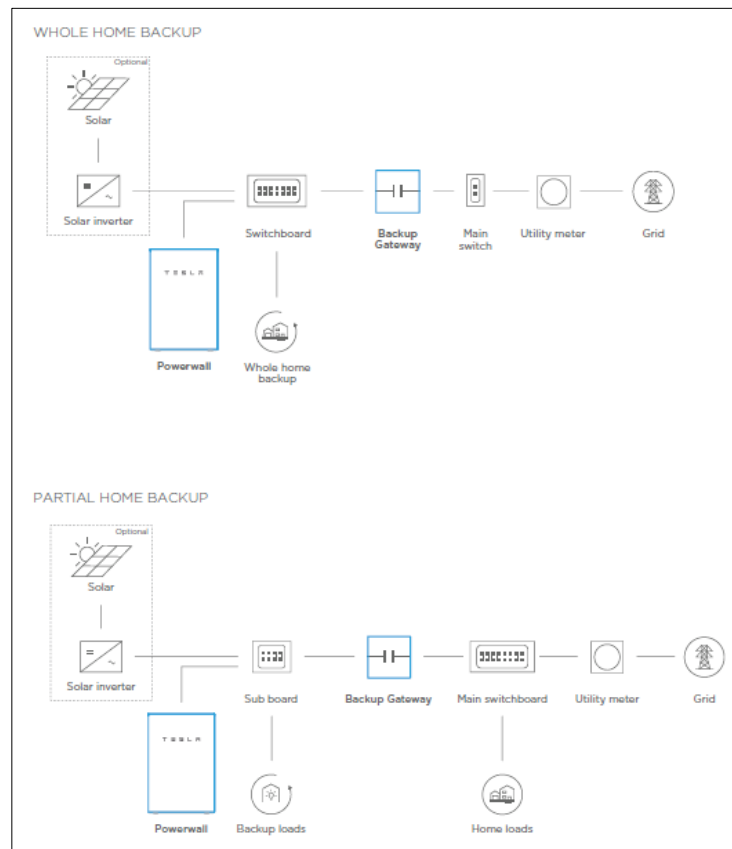


Figure 3: Tesla EPS Solution with Tesla Meter installed at “feed-in” point

To our knowledge there are no other countries that have this proposed multi-channel meter arrangement.



With SA being one of the leaders in battery storage installations in Australia, the proposed meter changes will basically bring this battery storage movement to a standstill. It is unclear whether manufacturers globally will be motivated to make these changes, for the South Australian market alone.

More consideration needs to be taken to look alternative solutions. As pointed out in our responses to **(Consultation on the Proposed Remote Disconnection and Reconnection Requirements for Solar Generating Plants in SA)**, there are more feasible solutions to the challenge the South Australian Government is attempting to overcome. Existing networks could be utilized via HTTP protocol / API's and corresponding standards like IEEE 2030.5. This solution would have better visibility and more functionality. Solar production, battery state / status and load situation could be better assessed with less components, and perhaps less overall cost to customers, as the integration processes are already underway. This functionality is likely available in mid-2021.

Thank you for the opportunity to respond to the consultation papers. Fronius would be happy to discuss our consultation paper responses in further detail at your request.

Regards,

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On behalf of

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