To: Energy Policy WA
By online Submission

Melbourne, 11. November 2025

Re: Power System Security and Reliability (PSSR) standards Consultation

Vestas appreciates the opportunity to contribute to the Power System Security and Reliability (PSSR) Standards Review Consultation and commend EPWA for its leadership in progressing reforms that will shape the future of the South West Interconnected System (SWIS).

As a wind turbine OEM committed to supporting the energy transition in Western Australia, we welcome the intent to streamline and modernise the technical and planning standards that underpin system reliability. The move toward a unified, end-to-end PSSR framework is a positive step that will help facilitate the integration of renewable energy technologies and improve transparency for all stakeholders.

High-Level Comments

Our comments focus on four key areas:

1. **Support for Consistent, End-to-End Standards**

   A unified, technology-agnostic framework under the Electricity System and Market (ESM) Rules will:

   - Provide greater clarity for proponents of wind and hybrid renewable projects.
   - Reduce regulatory complexity.
   - Streamline project development and enable more efficient deployment of wind generation and associated technologies.

2. **Enabling Flexible Connection and New Technologies**

   Vestas welcomes the proposed revisions to technical requirements that aim to remove barriers for emerging renewable technologies, including wind paired with co-located storage. The emphasis on flexible compliance—whether at the Connection Point or an alternative defined location—supports innovation in hybrid and integrated wind facilities.

   Modern wind farms, often designed with integrated with other technology like storage or solar, require coordinated standards that:

   - Recognise their ability to contribute to system strength and reliability.
   - Enable operational flexibility without compromising grid stability.

3. **Addressing System Strength and Grid Services**

   The proposed System Strength framework provides welcome clarity on market and network operator responsibilities. Wind farms (with or without third party kit) and in general, hybrid renewable projects are increasingly capable of delivering essential system services such as:

   - Fast frequency response
   - Voltage regulation
   - Synthetic inertia

   To unlock these capabilities, revised standards must remain:

   - Transparent
   - Fair
   - Proportionate

   This will avoid undue compliance costs or technical barriers that could hinder the uptake of advanced grid-support functionality.

4. **Forward-Focused Governance and Implementation**

   We strongly endorse the establishment of centralized governance for the PSSR standard. As the SWIS undergoes significant transformation, including thermal plant retirements and increased distributed energy resources, versatile and resilient rules will be essential.

   Transitional arrangements, to be consulted on during Stage 4, will be particularly important for:

   - Projects currently in development
   - Projects undergoing late-stage design changes

Technical Considerations

The proposed PSSR changes introduce several new technical requirements that will significantly impact wind farm design, connection, and operation. Key concerns include:

1. **System Strength and Short Circuit Ratio (SCR)**

   Wind farms must meet minimum withstand SCR thresholds:

   - Grid-forming inverters: **SCR ≥ 2.0**
   - Grid-following inverters: **SCR ≥ 3.0**

   Meeting these thresholds may require:

   - Additional investment in onsite equipment or services.
   - Coordination with network operators under centralized system strength planning.

2. **Voltage Phase Angle Stability**

   New standards require:

   - Grid-following inverters to withstand phase angle jumps below **25 degrees**
   - Grid-forming inverters to tolerate jumps up to **60 degrees** and respond within **20 milliseconds**

   These requirements may necessitate:

   - Upgrades to inverter control systems.
   - Careful coordination of protection settings to avoid unintended disconnection during grid disturbances.

3. **Fault Ride Through and Current Injection**

   Wind farms will be expected to deliver fast and adequate active/reactive current responses during contingency events, including:

   - Defined response times and sustainment durations
   - Control of negative sequence current
   - Robust fault ride through capabilities for both inverter types

4. **Oscillation Damping and System Interaction**

   Grid-forming inverters must demonstrate that their control systems do not degrade or destabilise system oscillations. This may require:

   - Ongoing re-tuning as system conditions evolve.
   - Compliance with frequency bandwidth limits and damping performance standards.

5. **Centralized Governance and Retuning Obligations**

   Facilities may be required to periodically re-tune settings as directed by the network operator or AEMO. This introduces:

   - Operational uncertainty
   - Increased compliance costs over the asset lifecycle

6. Investment and Connection Uncertainty

Under the centralized system strength planning model, connection costs, timing, and technical requirements may vary depending on:

- Broader network needs
- Outcomes of annual system strength assessments

This variability introduces risk for wind farm proponents during project development and financial close.

To summarize,

- Ensure revised standards are technology-neutral and proportionate, to avoid creating barriers to wind and renewable project investment.
- Provide clear transitional arrangements and communication to support projects already in development or approaching financial close.
- Engage directly with OEMs and wind developers in the refinement of technical standards, especially around grid connection, system strength contributions, and hybrid facility treatment.
- Harmonise SWIS requirements with national and international best practices for wind and renewable grid integration.
- Continue to streamline and clarify compliance pathways for hybrid wind/battery projects, which offer reliability, flexibility, and system strength.

These changes underscore the need for **clear, proportionate, and technology-neutral standards** that support the integration of wind farms (or in general renewable/sustainable energy sources), while maintaining system reliability.

Should you wish to discuss any aspect of our comments, please contact Ram Raghuraman via [redacted], or the undersigned.

Yours sincerely
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