System Strength Charges

Overview | March 2023

What is system strength?

System strength is an attribute that describes how well the power system can return to normal operation following a disturbance or fault.[1] Adequate system strength is required to maintain power quality and ensure, among other things, the stable operation of inverter-based resources (IBR) and that protection equipment operates correctly during disturbances.

Enhanced system strength framework

In October 2021, the Australian Energy Market Commission (AEMC) made a Rule to provide for efficient levels of system strength in the National Electricity Market (NEM)[2]. This placed new obligations on Powerlink as a System Strength Service Provider (SSSP), which included a requirement to meet a new system strength standard.

System strength charging

The AEMC's Final Rule also introduced a system strength charging framework for inverter-based resources that apply to connect to Powerlink's network.

Under the new framework, parties who submit an application to connect on or after 15 March 2023 will be able to choose to:

- remediate their system strength impact; or
- pay for their use of system strength resources procured by Powerlink.

From 1 July 2023, system strength charges will apply to connecting parties who come under this new framework and use system strength but choose not to remediate their system strength impact on the network.

System strength charges are determined at system strength nodes declared by the Australian Energy Market Operator (AEMO).[3] Powerlink will confirm the relevant node for system strength charging purposes for new applicants at the connection enquiry stage.

Several components of the system strength charges are determined for a system strength charging period, which is the five-year period that commences in the second year of a SSSP's regulatory period. Powerlink's first system strength charging period commences 1 July 2023.

System strength charges intend to provide connecting parties with long-run locational and technological signals and reflect the efficient costs imposed on a SSSP from the connection of a party who uses system strength. The charge has three components:

System Strength Unit Price (SSUP): This represents the forward-looking unit cost of Powerlink's supply of system strength at a system strength node. For the first year of a system strength charging period, Powerlink will calculate the SSUP for each system strength node based on long-run average cost as described in our Pricing Methodology.[4] In subsequent years, unit prices are indexed by the consumer price index.

System Strength Locational Factor (SSLF): This represents the impact of the electrical distance from the closest system strength node to the transmission network connection point (TNCP). We calculate this quantity for each TNCP. The SSLF is fixed for the duration of a system strength charging period.

System Strength Quantity (SSQ): This is calculated by multiplying the size of the connecting party's plant in megawatts (MW) and its short circuit ratio (MVA per MW) requirements, as set out in the National Electricity Rules (Rules) and AEMO's System Strength Impact Assessment Guidelines.

Impact on Queensland electricity users

The new system strength framework aims to lower total costs to consumers of providing system strength, ensure costs are shared and risks appropriately allocated. To meet the new system strength standard, Powerlink will incur costs to provide and/or procure system strength resources to:

- meet network performance standards with respect to protection system operation and voltage control; and
- host the efficient level of inverter-based resources at each system strength node.

Powerlink will collect system strength charges from connecting parties who use system strength. The difference between the revenue Powerlink receives from system strength charges and payments we make to procure system strength resources will be recovered from, or returned to, our transmission customers.

[1] See **System Strength in the NEM** (Australian Energy Market Operator, March 2020) for more information

[2] AEMC Rule Determination, *National Electricity Amendment (Efficient Management of System Strength on the Power System) Rule 2021*

[3] AEMO's **2022 System Strength Report** declared Gin Gin, Greenbank, Lilyvale, Ross and Western Downs as system strength nodes on Powerlink's network

[4] Powerlink's Pricing Methodology is approved by the Australian Energy Regulator and is available on **our website**