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## HumeLink PADR Submission

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Regulatory Consultation  
TransGrid

## Submission to the TransGrid HumeLink Project Assessment Draft Report

Smart Wires are pleased to make this submission in response to the TransGrid HumeLink Project Assessment Draft Report (PADR). As the leading provider of modular power flow control (MPFC) solutions, we welcome the opportunity to provide our unique and valuable perspective on how state-of-the-art power flow control technology can be used to maximise the capability and utilisation of the southern NSW transmission network, in particular with regard to maximising the benefits provided by the proposed network augmentations that comprise the preferred option for the HumeLink project, and in doing so contributing towards the development of a more effective and efficient solution to address the future electricity supply needs of NSW, enabling the connection and integration of increasingly greater quantities of renewable energy as the National Electricity Market (NEM) transitions to a low emission renewable energy future.

As per Smart Wires' submission to the TransGrid 'Reinforcing the NSW Southern Shared Network to increase transfer capacity to the state's demand centres' Project Specification Consultation Report (PSCR), we recognise the essential requirement to provide a significant increase in the transmission capacity between the Snowy/Victoria area, south-western NSW, and the greater Sydney load area and the objective of the RIT-T to identify the option that represents the most economic and technically feasible solution, we would like to propose the use of modular power flow control (MPFC) equipment as an integral part of the project. In doing so, we see the potential for MPFC to extract the maximum capability from the existing transmission system and the proposed transmission augmentations more economically and with greater flexibility.

### Advantages of modular power flow control equipment

In our previous submission, Smart Wires outlined the unique advantages and benefits made available by deploying MPFC equipment in the transmission network, namely:

- Controllability
- Flexibility
- Cost-effectiveness
- Short installation times
- Absence of SSR and SSCI
- Fail-safe and redundant design

These characteristics of MPFC equipment remain as essential characteristics of our proposed solutions and we refer to the detail provided on each in our earlier PSCR submission.

### **Consideration of MPFC within the HumeLink preferred option**

The HumeLink PADR has nominated the construction of three new 500 kV circuits between Maragle, Wagga, and Bannaby as the preferred option. These circuits will operate in parallel to the existing 330 kV transmission corridor between the Snowy area and Bannaby. Smart Wires PSCR submission had identified the potential for using MPFC to allow the HumeLink project to provide even greater transmission capability between the Snowy and Sydney by relieving congestion on the existing 330 kV system and thus increasing utilisation of new high capacity circuits established under the HumeLink project, potentially replacing the proposed phase-shifting transformer installations at Wagga and Bannaby.

The HumeLink PADR considers the proposal for using MPFC, however, it then states that *‘the preferred option in this PADR does not include phase-shifting transformers, and as such, does not require a power flow solution’*, thus dismissing the need to employ any type of power flow control. Smart Wires acknowledges this statement, however, we would suggest that while the selected preferred option is able to deliver a similar, or even greater, network capability and benefits than the alternative considered options, this in itself does not mean that there are no substantial benefits to be obtained by the inclusion of MPFC in the preferred option. Rather the inclusion of power flow control should be based on an evaluation of the net economic benefits it would provide in the context of the preferred solution, without need to reference the MW capacities provided by other options. This would mean that the optimal market outcome would not be limited by an assumed network capability level, and also would address the inherent limiting assumption that power flow control alternatives would all have similar costs to installing phase-shifting transformers.

### **Potential benefits of inclusion of MPFC in the final HumeLink solution**

The proposed 500 kV transmission lines have the potential to provide even greater increases to the transfer capacity of the southern New South Wales shared network by allowing congestion in the existing 330 kV network to be managed. Rather than making a comparison with the nominal increases provided by the alternative options in the PADR, our opinion is that the inclusion of MPFC in the final solution should be based on the economic merit of doing so. As outlined earlier, MPFC can provide economically efficient solutions at a much lower cost than traditional alternatives, with the cost per unit increase in terms of \$/MW of incremental capability improvement often being a small fraction of the equivalent measure for establishing new lines.

Our preliminary modelling demonstrates the potential for providing additional capacity increases under the preferred option that could deliver excellent returns on investment in terms of market benefits for the modest cost required.

### **Compatibility with longer-term plans**

A key objective of the AEMO Integrated System Plan (ISP) is to enable the greater sharing of renewable energy across geographically diverse areas through increased interconnection capability. The Energy Connect, HumeLink, and VNI West projects all combine to provide the necessary interregional connection capability to serve that purpose. The inclusion of MPFC in the HumeLink project is consistent with the longer-term objectives of the ISP, allowing the maximum benefit of

these substantial network developments to be realised. The modular and flexible nature of MPFC also represents a ‘no regrets’ investment that can be augmented over time as the network continues to evolve to meet the challenges of the renewable energy transition.

We hope that this submission has provided further insight into how the deployment of MPFC technology could be used to enhance the HumeLink preferred option strategy and would welcome the opportunity to discuss our ideas and provide any further information that would be helpful. We look forward to continuing to collaborate with TransGrid on the HumeLink project and identifying any opportunities to enhance the benefits that the proposed development option can provide.



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