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Australian Energy Market Operator
Level 22
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Submitted by email to cfg.consultation@aemo.com.au

Constraints Formulation Guidelines and Schedule of Constraint Violation Penalty Factor

Snowy Hydro Limited welcomes the opportunity to comment on the Australian Energy Market Operator (AEMO)'s Constraints Formulation Guidelines and Schedule of Constraint Violation Penalty Factor.

As part of the Constraints Formulation Guidelines (CFG) Snowy Hydro submits that AEMO should undertake an investigation of rounding constraint coefficients in the energy market. As part of the transmission access reform work undertaken by the Energy Security Board (ESB) there has been support for the investigation of the proposal to round constraint coefficients. The proposal has been deemed as valuable by the ESB and the rounding of constraint coefficients has been linked to the proposed Congestion Relief Market (CRM).

Snowy Hydro however believes that the proposal can be implemented as a stand-alone proposal and that AEMO should conduct some modeling to assess the potential impacts from rounding constraint coefficients on congestion and assess how much rounding would be required to deliver impactful results in the market.

Change rounding of constraint coefficients

When a transmission constraint equation is binding in the National Electricity Market (NEM) Dispatch Engine (NEMDE), there will often be multiple DUIDs with terms on the left hand side (LHS) of the equation.

NEMDE prioritises dispatch, and hence transmission access, based on the bid price (after loss factors have been applied) and the DUIDs coefficient on the LHS of the equation. When spot prices are high, DUIDs will normally bid to their market price floor (after losses) to maximise dispatch, which means access is purely determined by each DUID's transmission constraint equation LHS coefficient ("coefficient").

The DUID with the highest (positive) coefficient will have the lowest priority of transmission access and hence dispatch. While this is maximising the utilisation of all transmission equipment and hence maximising the flow of energy to the load centre, it can lead to significant commercial implications for an immaterial increase in energy flow to the load centre.

This occurs when two or more DUIDs have very close coefficients, and one is awarded 100% transmission priority over the other. At the most extreme example, Limondale Solar Farm has 100% transmission access priority over Silverton Wind Farm, while their coefficients are only 0.0001 different.

This means that if they were both 1000MW stations, NEMDE would dispatch Limondale for 1000MW and Silverton at 0MW, in order to get 0.1 MW extra to the load centre. Likewise for a station like Tumut (Upper Tumut and Lower Tumut), the 2500MW station may be reduced to zero output to allow about 1MW extra flow to the load centre.

The significant commercial implications of this theoretical approach to constraint equation formulation are clear to see for existing generators and AEMO. Uncertainty over slight changes to coefficients (and hence transmission access) will affect investment decisions.

In determining the constraint equations coefficients, TNSPs could take a more pragmatic approach by "clustering" similar DUIDs together and assigning them the same coefficients. Alternatively, AEMO in applying the TNSP constraints could perform some rounding by rounding up or to the closest 1 or 1.5 decimal places.

What changes should AEMO assess

Snowy Hydro proposes that AEMO seek to round up to the nearest 1 decimal place or rounding to the closest 1.5 decimal place the constraint coefficients. Rounding coefficients will make the constraint equations' representation of the physical network slightly less accurate. However, there is already an "operating margin" built into constraints for that reason and the constraint equations are always imperfect as they are based on historic modeling, not the real time conditions.

The RHS constraint term coefficients do not need to change. If the rounded LHS coefficients lead to more or less flow than the unrounded coefficients, the dynamic RHS (which uses real time transmission equipment utilisation, e.g line flows) will account for this.

For example, with a thermal constraint if the rounded coefficients lead to an over utilisation of the transmission line, that will lead to higher line flow values on the RHS, which will lower the RHS and hence lower the LHS in the following dispatch interval. This inturn will lower the DUID targets and transmission line utilisation.

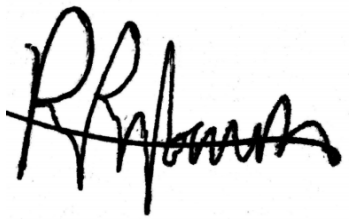
Snowy Hydro suggests that AEMO meet with Snowy Hydro to discuss this proposal if it is found to be particularly complex and/or if more information is required.

About the Snowy Hydro Group

Snowy Hydro Limited is a producer, supplier, trader and retailer of energy in the National Electricity Market (NEM) and a leading provider of risk management financial hedge contracts. We are an integrated energy company with more than 5,500 megawatts (MW) of generating capacity. We are one of Australia's largest renewable generators, the third largest generator by capacity and the fourth largest retailer in the NEM through our award-winning retail energy companies - Red Energy and Lumo Energy. Collectively, they retail gas and electricity in South Australia, Victoria, New South Wales, Queensland and the ACT to over 1.2 million customers.

Snowy Hydro appreciates the opportunity to respond to the Australian Energy Market Operator (AEMO) Constraints Formulation Guidelines and Schedule of Constraint Violation Penalty Factor. Any questions about this submission should be addressed to panos.priftakis@snowyhydro.com.au.

Yours sincerely,



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