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Date: 21st July 2016

RE: DS3 System Services Qualification Trial Process

Dear Sir/Madam,

Thank you for the opportunity to provide feedback on the DS3 System Services Qualification Trial Process.

Brookfield Renewable Ireland is part of Brookfield Renewable Partners L.P., one of the largest publicly-traded pure-play renewable power platforms globally with over 7,300 MW of hydroelectric and wind capacity across 14 power markets and in excess of 460MW of operating wind capacity with a 200MW wind development pipeline in Ireland. Our power operating platform employs over 1,500 people globally, including full operating, development, construction oversight, and wholesale power marketing capabilities. In addition to operating a wind portfolio in the Single Electricity Market, Brookfield Renewable also actively trade power across the interconnectors between SEM and BETTA.

Brookfield Renewable welcome the progress to-date on the DS3 work streams by both the RAs and TSOs, including their work on System Services but are increasingly concerned regarding the timely delivery of stepped increases in the SNSP limit. The DS3 Program is crucial to facilitate amounts of non-synchronous generation on the Irish grid and ensure that all the benefits of low-carbon generation are delivered to Irish electricity consumers. Increasing the grids System Non-Synchronous (SNSP) limit is essential to ensuring that rising levels of the curtailment of wind generation are minimised to facilitate the investment needed to successfully meet the 2020 target of 40% renewables.

Brookfield Renewable would like to reiterate that facilitating renewable access to the network and minimising curtailment is also required to ensure compliance with the RES Directive which states that "*appropriate grid and market-related operational measures are taken in order to minimise the curtailment of electricity produced from renewable energy sources*" and that "*if curtailment of renewable energy sources is required to ensure security of supply, systems operators must propose corrective measures to prevent inappropriate curtailments*".

We also wish to address some of the risks of participation in the trial to wind asset owners. It appears that software and hardware upgrades required for participation in the trial would introduce a requirement for re-testing for grid code compliance following installation. We recognise that this requirement is not unique to

wind. However, wind generators face challenges that other generators do not face in order to prove grid code compliance primarily due to the challenges of scheduling multiple parties to align including high wind speeds, which cannot be predicted when test slots are booked a number of weeks in advance.. The biggest risk of any software and hardware upgrades is that during the GCCT process the site has a non-compliance identified and is placed in Category (i) This has significant commercial impacts for the asset owner. Brookfield welcome engagement with the System Operators to ensure that wind generators that wish to participate in the Qualification Trials, and indeed that wish to invest in providing additional System Services, can remove requirement for repeating the operational readiness process, limit the Grid code testing requirements and remove the risk of being declared Category (i) (uncontrollable) because under current arrangements this risk is likely to preclude many wind generators from providing additional System Services.

Brookfield believe that in addition to the trial outlined in this consultation it is important not to preclude future market entry. At present there is a lot of uncertainty for wind generators due to the introduction of ISEM and balance responsibility, lack of clarity over the reference price for supports, market integration for supported wind as well as the changes in ancillary services regime. This uncertainty is coming at a time when market participants are procuring systems and ensuring technical readiness for ISEM go live. These factors might mean that market participants have limited resources and risk appetite to participate in trials at present.

It should also be noted that ancillary services as per current definitions are written for conventional generators. Brookfield believe that as more wind becomes market dependent following the end of current support regime and the introduction of future market premium based support schemes there will be more incentive and requirement for wind to provide ancillary services. Brookfield also urge the TSO to engage with industry on how the current ancillary services definitions (i.e. wind can offer POR but this requires the current definition to be updated to reflect the variability of wind speeds) and measurement criteria should be updated to reflect required contribution under future market scenarios and wind penetration levels.

The remainder of this response focusses on responding to the specific questions put forward in the consultation. I would be pleased to discuss these points or any other in relation to the DS3 programme or services in more detail at your convenience.

Kind Regards,

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Detailed Response

Question 1: Do you agree that the Qualification Trial Process should focus on both "Provenability" and "Measurability"?

The Grid Code Compliance team and OEM specialists are already tight on resources and we are facing into a challenging period with a significant number of new connections testing, ongoing enduring connection testing and DS3 compliance testing and derogations workload to contend with. Any testing identified as part of this trial should be limited to reflect this and to ensure that these resources are allowed to continue the positive progress that has been made in the last number of years in relation to getting projects through the testing process. In particular ongoing monitoring should be used instead of testing wherever possible to allow both work streams to progress unaffected in parallel.

Question 2: Do you agree that the Provenability Trials should focus on proving only two System Services, as representative of all System Services in those categories of System Services?

Brookfield acknowledge that the approach taken here is prudent as it reduces the administrative and technical burden of the trial and that the ancillary services tested are representative of their respective subsets of DS3 system services. However, we do not believe that as a technology class wind has equal ability and likelihood of providing all of these services and that SOR would be a preferable choice for wind.

That said, as per current grid code definitions, wind will not be able to provide the majority of these services but that should not limit potential future contributions. Brookfield believe for example that wind can provide reserve power during curtailment and frequency mode operation scenarios. Brookfield also believe that as the SNSP limit increases there is potential benefits to the consumer of wind providing reserve services instead of dispatching conventional plant. Brookfield strongly believe that industry and system operators should collaborate to define reserve and ramping products that could be technically provided by wind and explore the market scenarios that would incentivize participation to the benefit of the system.

The TSO should also accept successful trials of system services on other systems as evidence of provenability. For example, Acciona delivered 150MW on average of reserve power across a three hour period in February this year[1].

Question 3: Do you agree that the Provenability Trials should focus on the Reserve and Ramping categories of System Services?

[1] http://www.windpowermonthly.com/article/1388259/analysis-acciona-plays-reserve-game

Yes

Question 4: Do you agree that the technology classes targeted in the Provenability Trials should be wind, demand side and 'other technologies'?

Yes, it is particularly important that wind is treated as a separate technology class as it represents a large portion of Irelands generation capacity and will continue to account for this.

Question 5: Do you agree that the Measurability Trials should be technology neutral?

Yes, Brookfield support the approach taken by the TSOs here. Measurability of a service is not linked to technology type. However, some clarity is required here. Brookfield note that there is a difference between provider measurability and TSO measurability and it is unclear what is acceptable. If the provider can demonstrate it from IPP installed equipment but TSO does not have real-time sight of this, is this acceptable to the TSO?

Question 6: Do you agree with the proposed service provision volumes and proposed number of Service Providers to be included in the Provenability and Measurability Trials respectively?

Brookfield have no objection to either of those proposals. However, we see no reason why the trial needs to be replicated in ROI and NI and request further clarity that successful performance in one jurisdiction is sufficient to demonstrate both provenability and measurability in both due to the synchronous nature of the all island system

Question 7: Do you agree with the minimum sizes of Providing Unit proposed for the Provenability trials?

Brookfield agree with the minimum size of providing unit as described.

Question 8: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Provenability Trials?

Brookfield do not believe that it is appropriate that providers success is dependent on response to 5 trials in a single 6 month period. Using the 8-10 range provided the average number of events in any 6 month period is 4.5. As this is an average, in any one 6 month period there could be deviations outside of this. Brookfield believe that if a fixed length trial is chosen then success should be measured by the providers response rate to the events that occurred regardless of number. If 5 event responses are desirable then the trial should not be fixed in length.

It is also worth noting that wind generators ability to provide services in response to events are dependent on the wind resource available to it. A wind generator will not be able to respond to an event if the wind speed is below the cut in speed for that turbine type. The evaluation criteria as proposed do not make allowance for this and implementation in its current form would be penal to wind. The reliance of wind on the intermittent nature of the resource should not preclude it from providing ancillary services to the grid. For instance if wind has demonstrated capability in a single instance it should be accepted and further monitoring can be carried out to ensure continued delivery. In times of high SNSP following the successful delivery of all of the DS3 incremental improvements a different mix of generators will be required to provide system services in comparison to times when there is no wind on the system. It is at these times that wind can provide valuable services to the grid. Brookfield again request that the TSO engages with industry on system service updates that reflect capability of wind to provide system services under future market and penetration level scenarios.

Question 9: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Measurability Trials?

Brookfield believe that successful performance in either jurisdiction should be considered successful completion for the all island system. As a result successful completion of the trial should not be dependent on procurement of trial candidates in both jurisdictions.

Brookfield also believe that there should be further consultation on the remuneration cap. The TSO has suggested a capped payment of €25,000 without explanation. Given the importance of the services to the delivery of the DS3 program, the risks to providers of participation and the as of yet unknown costs of upgrade it is inappropriate to set a capped payment rate. Providers that prove capability of a service that benefits the system and allow consumers to receive the benefit of increased levels of wind on the system and recoup their investment in renewable technologies should be adequately remunerated.

Question 10: Given the stated aims of the Qualification Trial Process, are there different criteria that would better achieve those outcomes than what is proposed here? If so, what are they and how will they work?

It is our view that the current grid code requirements do not facilitate participation of wind in the ancillary market nor do they encourage innovation in same. Ireland, with a SNSP limit of 75%, will be at the forefront of the global market integration of wind. It is essential that innovation and development is encouraged and that grid code definitions and requirements do not preclude intermittent generation from providing services that are valuable to the grid.

Brookfield would also like to state that the timing of this trial could prohibit or limit participation. Fundamental and coordinated changes to the capacity market, the energy market and ancillary services market have placed

a weight of uncertainty on market participants that is magnified for supported wind as there is still no clarity on settlement and the integration of balance responsibility. Without clear foresight on how these markets will work together for wind generators participation is not straight forward.

The TSO should be mindful of the fact that as wind comes to the end of its support period, the dynamics of how it will participate in the market will change and there might be more incentive to bid for ancillary service provision at that point. Brookfield believe that trials should not be one off and that there is an enduring solution that will facilitate trials of service provision in response to changes in market design and grid code requirements for ancillary service provision.

Finally, it is our view that in the first instance Type A and B distribution connected wind farms should be allowed to participate in the trials and should be offered the same system service remuneration available to TSO connected sites. These distribution sites have invested similarly to the transmission sites and should have the same opportunities afforded to them. Type C, D, E should also be considered for inclusion depending on the outcome of the trials.