Workgroup Consultation Response Proforma

CMP393: Using Imports and Exports to Calculate Annual Load Factor for Electricity Storage

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses to cusc.team@nationalgrideso.com by **5pm** on **02 June 2023**. Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

If you have any queries on the content of this consultation, please contact jessica.rivalland@nationalgrideso.com or cusc.team@nationalgrideso.com

Respondent details	Please enter your details	
Respondent name:	Damian Jackman	
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Which best describes your organisation?	☐Consumer body ☐Demand ☐Distribution Network Operator ☐Generator ☐Industry body	☐Interconnector ☒Storage ☐Supplier ☐Transmission Owner ☐Virtual Lead Party ☐Other

I wish my response to be:
(Please mark the relevant box) ☒Non-Confidential ☐Confidential

Note: A confidential response will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

For reference the Applicable CUSC (charging) Objectives are:

a. *That compliance with the use of system charging methodology facilitates effective competition in the generation and supply of electricity and (so far as is consistent therewith) facilitates competition in the sale, distribution and purchase of electricity;*

b. *That compliance with the use of system charging methodology results in charges which reflect, as far as is reasonably practicable, the costs (excluding any payments between transmission licensees which are made under and accordance with the STC) incurred by transmission licensees in their transmission businesses and which are compatible with standard licence condition C26 requirements of a connect and manage connection);*

c. That, so far as is consistent with sub-paragraphs (a) and (b), the use of system charging methodology, as far as is reasonably practicable, properly takes account of the developments in transmission licensees' transmission businesses;

*d. Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency *; and*

e. Promoting efficiency in the implementation and administration of the system charging methodology.

**The Electricity Regulation referred to in objective (d) is Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast) as it has effect immediately before IP completion day as read with the modifications set out in the SI 2020/1006.*

Please express your views in the right-hand side of the table below, including your rationale.

Standard Workgroup Consultation questions		
1	Do you believe that the Original Proposal facilitates the Applicable Objectives?	Mark the Objectives which you believe the Original Solution facilitates: Original: ☒A ☒B ☒C ☒D ☒E ☐F ☐G Click or tap here to enter text.
2	Do you support the proposed implementation approach?	☒Yes ☐No We strongly support this modification that will reduce the disproportionate network charges that storage faces when locating in regions where it may not require any network reinforcement and which will have large energy surpluses and where storage – if managed correctly by the ESO - could help to reduce constraint costs.
3	Do you have any other comments?	It is not clear whether the solution proposes negative or positive ALFs; it would appear from the workgroup report that negative ALFs are discussed. A standalone storage unit will always consumer more energy than it generates therefore the calculation as proposed on Page 8 of the report (Demand Volume (MWh) - Generation Volume (MWh)) will always result in a positive number yet on P.9 it notes the ESO's draft storage ALFs are negative? The workgroup needs to consider unintended consequences of negative ALFs; i.e could a high negative ALF arise from specific types of user leading to an incentive for such a user to locate in an area simply because it produces a highly negative TNUOS charge? Examples of Users with either Imports >> Exports (or vice versa) are hydrogen turbines collocated with a hydrogen electrolysis unit, storage collocated with solar and pumped storage with high runoff.
4	Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?	☒Yes ☐No To avoid excessively negative ALFs leading to perverse outcomes, we would like the workgroup to consider an alternative approach in which a 'deemed' a Round-Trip

		Efficiency (RTE) (say 86%) for storage was applied such that the ALF becomes either the maximum of either: - the round-trip efficiency x demand or - the net generation minus demand. For example, a 2 hour battery with an 86% RTE would have: Imports = 2hr Generation = duration / RTE = 2/0.84 So Generation volume – Import volume = 2/0.84 – 2 = 1 – 0.84 = 0.14 Then to calculate the final Load Factor, the denominator is the annual generation exports. For non-storage users (e.g 'pure' generators or users with collocated generation and flexible demand as distinct from a single 'storage' entity), the alternative is simply (Generation – demand) / the denominator (which is either the annual generation exports. So as a formula, ALF = max(0.14*demand , generation - demand)]/(Generation MW * Hours per year) The attraction of this approach is that a more efficient storage user would be rewarded with a lower ALF thus benefiting from a lower TNUOS. Ultimately, the key characteristic of the user is that the imports and exports are dispatchable (and so respond to market price signals) such that the overall effect is to operate in opposition to renewable generation output.

Specific Workgroup Consultation questions		
5	Do these potential options better facilitate the charging objectives than the original proposal and if so, why?	☒Yes ☐No
		These proposals better facilitate the charging objectives as they eliminate charges that are disproportionate for storage in constrained regions. By reducing the barriers for storage to locate in constrained regions, they will also lead to lower costs to the consumer as the ESO can use such storage as a cheaper alternative to bidding back wind generation (although this is a secondary benefit). This avoided wind

		curtailment would also reduce carbon emissions when the stored 'wind-derived' energy is exported at a later time, thereby displacing gas generation and its associated carbon emissions that would otherwise have been emitted.
6	Should Storage ALF be floored at zero?	☐Yes ☐No
		Perhaps but needs more discussion. Flooring the ALF to zero looks attractive for its simplicity and would result in the wider tariff being simply = peak + residual; which makes sense given storage will only be exporting at what it expects to be peak periods and importing at non-peak periods. This may be an approach that could also allow the same application of CMP405 if it could also be specifically applied to storage. It's attraction is that it is simple and could be applied to a distinct class of users (e.g storage if that can be clearly defined). But the challenge is that by flooring to zero for a particular user class, it's then necessary to define what constitutes 'Storage' which may be harder than first appears (e.g. is hydrogen electrolysis collocated with a hydrogen gas turbine storage?). It may also require consideration of the case where storage may wish to export into a constrained network which would normally lead to increased balancing costs for the ESO and so undermine the underlying assumption that storage is not adding to network costs; i.e should setting ALF to zero also be linked to an agreed bid price (eg. System cashout) at which Storage would be bid for system constraints? On balance we believe it's more straightforward that this modification is agnostic to the user's technology type and that the same approach is also used by CMP405. We suggest the key characteristic for the user to which both CMP393 and CMP405 are aimed is that they apply to users with "fully dispatchable generation **and** demand" and that both the generation and demand is 100% dispatchable (i.e not only a proportion of it)
7	Would CMP393 disincentivise storage	☐Yes ☒No

	from locating in the south?	The forecast TNUOS charges with the lower ALF imply it would make very little difference to TNUOS for storage and other generators in the south and so have no effect other than to reduce the disproportionately high charges currently incurred by storage in the north of the country.
8	Should storage have its own generation classification for TNUoS?	☒Yes ☐No
		In theory we would rather this modification remained agnostic to a user's technology but we recognise that defining the level of 'dispatchability' of a user's generation and demand is not straightforward and therefore on balance, it may be more simple to create a separate TNUOS category for storage. However, we would also ask the group to consider how this modification would then apply to co-located generation and storage and whether the same approach can be taken for CMP405 (or at least not limit how CMP405 could be applied)
9	Should CMP393 apply only to storage or to all generation?	☐Yes ☒No
		In theory it should apply to any user whose has dispatchable generation **and** demand. It should also apply to generation if it is able to co-locate storage behind the meter and whose imports are measured as those imports from the transmission system (not imports from any collocated generation). Defining the ALF as "Generation minus Demand volumes" would also reward generation users who choose to collocate storage behind the meter with slightly lower ALFs so is another reason to consider this approach.
10	How, if at all, does the proposed methodology interact with demand TNUoS charging?	☐Yes ☒No
		The crux of this modification is that it applies only to users whose generation and demand is 100% dispatchable. Some large demand users may only have dispatchable demand and therefore they should benefit from separate modifications that focus on pure demand connections. The attraction of defining this modification to being for users with both dispatchable generation and demand is

		that it caters for the situation where generation is able to add co-locate storage and storage is able to co-locate generation.
11	Does the proposed solution have any materially different impact on battery storage compared to pumped storage that should be considered (While taking into account the proxy nature of TNUoS)?	☐Yes ☒No
		This modification is in effect creating an ALF that is a function of the round-trip-efficiency of storage. But depending on whether the ALF is defined by Demand minus generation or Generation minus Demand could create a materially different impact for pumped storage where it incorporates a high amount of runoff. E.g. if a pumped storage unit generated considerably more than it imported due to additional water runoff, then this could lead to it having a highly negative ALF (if defined by demand **minus** generation)