CUSC Alternative Form

CMP393 Alternative Request 2:

Overview: An second approach to avoid excessively negative ALFs for storage users with low Round-Trip-Efficiencies

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What is the proposed alternative solution?

The proposed CMP393 solution is somewhat unclear but the calculation of the ALFs by NGESO suggests that it is based on Generation energy volume *minus* demand energy volume.

Since storage will always have some round-trip efficiency losses, demand volumes for pure storage users will always exceed generation so Generation volume minus Demand volume will result in a negative ALF. This risks the unintended consequence of very low-efficiency storage users could have in strongly negative ALFs.

This could lead to perverse outcomes in which a user with a strongly negative ALF locates in a region *specifically to access a negative TNUoS charge*.

It does not seem efficient that a locational signal should incentivise an outcome that promotes inefficiency elsewhere in the market.

If the workgroup believes that setting the ALF to zero is not reflective of the inherent Round Trip Efficiency (RTE) of storage, then this alternative suggests an approach to limit how negative an ALF can be for storage users with low RTEs.

The method is to 'deem' a nominal efficiency value of storage and use the following formula in (A) to set a floor for how negative the ALF can be.

- If a user's actual RTE is **higher** than the deemed value then they would have an ALF closer to zero (and so benefit from an even lower TNUOS charge)
- If a user's actual RTE is **lower** than the deemed value then they would have an ALF limited by the 'deemed' value of storage (and so there is no incentive for a user deliberately having a low RTE to create a very negative ALF)

So ALF is calculated as the Maximum of either:

A) $((1 - 1/RTE_{deemed}) \times \text{Generation volume}) / TEC \times 24 \times 365$

or

B) Generation minus demand / TEC x 24 x 365

Example:

- A 2 hour storage user with 100 MW bi-directional generation / demand capability, at 1.5 cycles / day
- Workgroup agrees a 'deemed' RTE for all storage users will be = 85%

Example A) Storage User with actual **86%** RTE (i.e typical user with an RTE higher than the 'deemed' RTE value)

ALF is the maximum of either:

A) = ((1 – 1/0.85) x 2hr x 100 MW x 1.5 cycles x 365 days) / (100 MW x 24 hrs x 365 days)

= -2.21% **(= Lowest ALF can be, set by 'deemed' RTE value)**

Or

B) = Generation = 2 x 100 x 1.5 x 365 = 109500 MWh

Demand = 2 x 100 x 1.5 x 365 / RTE_{actual} = 127326 MWh

So Generation – Demand / TEC x 24 x 365

= 109500 – 127326 / 100 x 24 x 365

= **-2.03%**

ALF is Maximum of -2.21% or -2.03% is **-2.03%.**

Example B) Storage User with lower actual 60% RTE (i.e much lower than 'deemed' RTE value)

ALF is the maximum of either:

A) = ((1 – 1/0.85) x 2hr x 100 MW x 1.5 cycles x 365 days) / (100 MW x 24 hrs x 365 days)

= -2.21% **(= Lowest ALF can be, set by 'deemed' RTE value)**

Or

B) = Generation = 2 x 100 x 1.5 x 365 = 109500 MWh

Demand = 2 x 100 x 1.5 x 365 / RTE_{actual} = 182500 MWh

So Generation – Demand / TEC x 24 x 365

= 109500 – 182500 / 100 x 24 x 365

= **-8.33%**

ALF is Maximum of -2.21% or -8.33% is **-2.21%.**

So ALF of the user with the 60% lower RTE is limited by the lower bound of the 'deemed' value of storage yet the user with RTE higher than the 'deemed' value is rewarded with an ALF closer to zero.

Advantages

This ensures:

- Highly negative ALFs do not result in excessively negative ALFs and this is limited by the 'deemed' RTE chosen by the group to represent storage users
- For users without dispatchable demand (i.e demand = zero), the ALF calculation remains unchanged

The key caveat (which should also apply for the original proposal) is this only applies to classes of users that have 100% dispatchable demand (and so respond to market price signals) such that the overall effect of their use of the system is to tend to operate in opposition to renewable generation output so as to relieve network congestion and avoid requiring additional network build to accommodate the user (assuming that the network will in future be sized to accommodate the maximum renewable output).

(It would be even better to apply to this to the *proportion* of a user's TEC or Import capacity that was dispatchable but in the proposer's view it is likely to be too complex to define how that is demonstrated/proven but could be looked at in a future mod)

What is the difference between this and the Original Proposal?

After contacting the proposer of the modification, we understand the original proposal defines the ALF only by Generation minus demand / TEC x 24 x 365 (and that there was a 'typo' in the workgroup report that showed this as "Demand minus generation").

The difference between this modification and the Original is that this modification avoids excessively negative ALFs that could otherwise occur for storage with low round-trip efficiencies. This is achieved by defining a nominal efficiency for storage such that if a user had a lower efficiency it would not result in a more negative ALF.

What is the impact of this change?

Proposer's Assessment against CUSC Charging Objectives	
Relevant Objective	**Identified impact**
(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;	**Positive:** This removes the risk of perverse incentives that could result in inefficient storage being located specifically in response to negative charges Otherwise benefits are same as original proposal
(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	**Positive:** This removes the risk of perverse incentives that could result in

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);	inefficient storage being located specifically in response to negative charges. Otherwise benefits are same as original proposal
(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;	**None**
(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency *; and	**None**
(e) Promoting efficiency in the implementation and administration of the system charging methodology.	**None**
*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.	

When will this change take place?

Implementation date:

As per Original proposal

Implementation approach:

As per Original proposal