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| **Modification** | | At what stage is this document in the process? |
| DCRP/MP/23/04:  The Application of EREC P2 and EREP 130 to Electricity Storage | |  |
| **Purpose of Modification:**  To refocus EREC P2 and EREP 130 on their socioeconomic purpose of securing final demand customers, by not counting the electricity imported by premises whose primary purpose is wholly or mainly Electricity Storage towards Group Demand. | | |
| Description: Description: YES_GREEN | The Proposer recommends that this modification should be assessed by a Workgroup. The defect is a pressing matter; the Proposer seeks the Panel’s support in prioritising it.  This modification will be presented by the Proposer to the Panel on 03 August 2023. The Panel will consider the Proposer’s recommendation and determine the appropriate route. | |
| Description: Description: High_Impact | High Impact:  DNOs, customers | |
| Description: Description: Low_Impact | Medium Impact:  Generators (particularly Electricity Storage operators) | |
| Description: Description: Medium_Impact | Low Impact:  Demand Side Response providers | |

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# Summary

## What

Annex 1 Standard EREC P2 (*Security of Supply*) sets out engineering requirements to limit the socioeconomic disruption that would result from reasonably foreseeable distribution system outages. Although intended to benefit final demand customers (i.e., electricity consumers), the current version (EREC P2 Issue 8) extends the same security of supply to electricity imported by Electricity Storage customers.

## Why

Applying EREC P2 to the import of fungible customers such as Electricity Storage can result in a requirement to reinforce the system to provide enhanced security of supply which may be uneconomic. This is in part because the security standards in EREC P2 were justified for the Value of Lost Load (i.e., the socioeconomic detriment caused by power cuts) for final demand customers. The Value of Lost Load for Electricity Storage customers has been estimated to be two orders of magnitude lower than that of final demand customers, so securing both to the same standard is unlikely to be economical. This issue is most profound when Electricity Storage customers come to dominate groups. The final demand customers in groups without significant Electricity Storage capacity receive lower security of supply than those in otherwise similar groups with Electricity Storage; this is a source of inconsistency. The unprecedented growth in Electricity Storage projects, and the application of EREC P2, has triggered extensive reinforcement, preventing the timely and economic connection of subsequent final demand customers. This has the potential to delay societal decarbonisation.

## How

Redefine Group Demand in Annex 1 Standards EREC P2 and EREP 130 to not count the import behaviour of premises whose primary purpose is wholly or mainly Electricity Storage towards Group Demand.

A wider review of how access rights are defined and governed for different types of customers might prove necessary. This is detailed in Cross-Code Impacts.

# Governance

This proposal seeks to modify Annex 1 Standards, so will require approval from the Authority in due course.

## Requested Next Steps

This modification should be assessed by a Workgroup. The defect is a pressing matter; the Proposer seeks the Panel’s support in prioritising it.

Since the defect affects two Annex 1 Standards (EREC P2 and EREP 130), the Proposer seeks the Panel’s guidance on whether it should be treated as:

1. A single Modification affecting both Annex 1 Standards; or
2. Two Modifications, one for each Annex 1 Standard. If this option is chosen, it will be necessary to ensure that both modifications stand or fall together to prevent inconsistency.

# Why Change?

Applying P2 to the import of fungible customers such as Electricity Storage can result in a requirement to reinforce the system to provide enhanced security of supply which may be uneconomic. Storage, like generation, is broadly fungible, i.e., so long as sufficient storage with appropriate technical parameters can operate across the system, which particular units are operating is not critical. In contrast, final demand is broadly non-fungible: electricity used for societal or economic purposes such as heating, transport, or manufacturing would be hindered by insufficient access rights. Whilst some reduction or time-shifting of electricity consumption is possible for some final demand customers, this tends to be limited before it becomes unacceptable. Locational shifting is rarely possible as it is with storage or generation.

This is in part because the security standards in EREC P2 were justified for the VoLL (Value of Lost Load, i.e., the socioeconomic detriment caused by power cuts) for final demand customers. Value of Lost Load (VoLL) is a good measure of the socio-economic value of access rights and supply security. The RIIO-ED2 VoLL for demand is £21,000/MWh. There is no official VoLL for generation, but it’s likely to equate to the wholesale value of lost export - usually <£300/MWh (source: <https://www.ofgem.gov.uk/energy-data-and-research/data-portal/wholesale-market-indicators>). There is no official VoLL for storage, but it’s likely to equate to lost service revenue or a less optimal arbitrage value – this is unlikely to be more than a few hundred pounds per MWh. This suggests the VoLL for storage is two orders of magnitude lower than that of final demand, and like that of generation.

This issue is most profound when Electricity Storage customers come to dominate groups. The final demand customers in groups without significant Electricity Storage capacity receive lower security of supply than those in otherwise similar groups with Electricity Storage; this is a source of inconsistency. This is detailed in Consumer Impacts.

The unprecedented growth in Electricity Storage projects, and the application of EREC P2, has triggered extensive reinforcement, preventing the timely and economic connection of subsequent final demand customers. This has the potential to delay societal decarbonisation.

# Code Specific Matters

## Technical Skillsets

* Security of Supply standards (e.g. members of previous EREC P2 modification Workgroups)
* Electricity Storage connections and access rights (e.g. members of the ENA’s Battery Storage Connections subgroup)
* Stakeholders with experience of designing, developing and operating electricity storage sites

## Reference Documents

* Current and past issues of EREC P2 and EREP 130
* The Security and Quality of Supply Standard (SQSS)
* Ofgem’s Access SCR Final Decision (May 2022)

# Solution

## Proposer’s Core Solution

Redefine Group Demand in Annex 1 Standards EREC P2 and EREP 130 to not count the import behaviour of premises whose primary purpose is wholly or mainly Electricity Storage towards Group Demand.

*This proposed solution is subject to further development by the Workgroup, where alternative solutions may also be presented.*

## Further Implications and Considerations for the Workgroup

* To avoid undue discrimination between different types of customers, it might be appropriate to extend the scope to include the import supplies to premises whose purpose is wholly or mainly Electricity *Generation*. This would ensure consistent treatment of:
  + Electricity Storage sites,
  + “Hybrid” sites that combine both Electricity Storage and Electricity Generation, and
  + Electricity Generation sites that have significant import capacity necessary to their generating plant such as fuel processing.
* It might remain necessary to secure that fraction of an Electricity Storage customer’s import as is necessary for safety, security, and staff welfare. This might be via alternative exit points (akin to station transformers) rather than via the main exit point (akin to unit transformers).
* The examples and guidance in EREP 130 that refer to Electricity Storage will need to be updated to align to the new definition of Group Demand. It might also be necessary to create new examples to explain the new definition.
* The effect on customer access rights will need to be considered. The proposed solution is not intended to change individual customers’ access rights in connection agreements but would affect aggregate security of supply to groups of customers. As detailed in Cross-Code Impacts, this might necessitate a wider review of how access rights are defined and governed for different types of customers. The widespread use of curtailment makes the description of access rights more complex than the traditional dichotomy between on and off; it may also be necessary to define access rights for system intact conditions.
* The proposed solution would increase the distinction between EREC P2 compliance and ensuring that network capability is not exceeded. This is a pre-existing issue, best demonstrated by groups of less than 100MW that are supplied by three or more circuits in parallel: while EREC P2 places no obligation to secure demand for a second circuit outage, this does not mitigate the risk that a circuit is overloaded during the second circuit outage of its partner circuits. It might be necessary to set a general requirement to ensure that network capability is not exceeded for reasonably foreseeable combinations of network loading and outages.
* It might be necessary to clarify the treatment of Demand Side Response (DSR) to distinguish between:
  + Visibility and control of final demand; and
  + Visibility and control of import to Electricity Storage.

Impacts & Other Considerations

## Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

The Proposer is not aware of any current Significant Code Reviews that would be substantially impacted by this modification.

## Consumer Impacts

If this modification were accepted:

1. Customers applying for new or augmented connections would be less likely to be subject to long delays and/or expensive reinforcement because of capacity contracted to Electricity Storage sites.
2. The EREC P2 Class of Supply (and so level of security) afforded to groups of final demand customers would not depend upon whether there happens to be significant Electricity Storage connected within the group. As such it would be possible to apply the intended principles of EREC P2 more consistently between groups with and without Electricity Storage. Consider the example of two similar substations:
   1. Substation A has a Group Demand of 210MW normally supplied by two 132kV circuits operating in parallel. It is a Class D group, where the Second Circuit Outage requirements can be met by 70MW of Transfer Capacity that is available within 3 hours. The circuit(s) that provide the Transfer Capacity do not need to be capable of operating in parallel with either of the normal circuits.
   2. Substation B also has a Group Demand of 210MW normally supplied by two 132kV circuits operating in parallel. An application to connect 100MW Electricity Storage customer to substation B increases Group Demand to more than 300MW. This makes it a Class E group, where the Second Circuit Outage requires a third circuit that can:
      1. Operate in parallel with each of the normal circuits to prevent interruption, and
      2. Supply the greater of 2/3 Group Demand and the maintenance period demand.

While this confers additional security of supply on the final demand customers supplied by substation B, it comes at considerable expense that is likely to be at least partially DUoS-funded, but is of no benefit to other customers such as those supplied by substation A.

## Cross-Code Impacts

Ongoing SQSS modification GSR029 (*“Review of Demand Connection Criteria to Align with EREC P2/7”*) is intended to amend the demand data provided by Network Operators used by NGESO when undertaking a SQSS Section 3 compliance assessment to better align to that in EREC P2/7 (now P2/8). is understood that the treatment of Electricity Storage is under consideration as part of this modification. The Proposer recommends that this modification’s Workgroup coordinates with GSR029’s Workgroup to promote cross-code consistency where appropriate.

The Minimum Scheme criteria in schedule 22 (CCCM) of DCUSA do not directly cover access rights, but the criterion *“accepted industry standards, including the requirements of the Distribution Code”* is generally taken to confer such access rights on customers importing electricity as can be expected if the upstream network meets EREC P2 (as a DCode Annex 1 Standard). In contrast, there is no *“accepted industry standard”* that directly or indirectly confers access rights on customers exporting electricity. This modification would clarify the applicability of EREC P2 to the import access rights of Electricity Storage and potentially Distributed Generation customers. It is not entirely clear whether access rights are a DCode or DCUSA matter, however it is important that the access rights, security of supply and Minimum Scheme implications stated or implied by these two codes are harmonised. The Proposer recommends that this modification’s Workgroup considers this issue in more detail and, if appropriate, raises a consequential modification proposal to DCode or DCUSA.

Relevant Objectives

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| Impact of the modification on the Relevant Objectives: | |  |
| **Relevant Objective** | **Identified impact** | **Rationale** |
| permit the development, maintenance, and operation of an efficient, co-ordinated, and economical system for the distribution of electricity; and | Positive | The distribution system would be made more economical by avoiding inappropriate reinforcement.  It would be made more coordinated by better alignment with SQSS. |
| facilitate competition in the generation and supply of electricity; and | Neutral to Positive | A more economical distribution system is likely to lead to less onerous Minimum Schemes, so reducing barriers to entry. |
| efficiently discharge the obligations imposed upon distribution licensees by the distribution licences and comply with the Regulation and any relevant legally binding decision of the European Commission and/or the Agency for the Co-operation of Energy Regulators; and | Neutral | No impact identified by the Proposer. |
| promote efficiency in the implementation and administration of the Distribution Code. | Neutral | No impact identified by the Proposer. |

Implementation

Implementation should be reasonably straightforward but will require some changes to DNOs’ internal system planning and network design processes. The Proposer suggests that implementation should be implemented 10 working days from issue.

Legal Text

The Proposer is keen to contribute to the legal text but would prefer to do so at the Workgroup stage.

# Recommendations

## Proposer’s Recommendation to Panel

The Panel is asked to:

* Agree that the Distribution Code governance procedures should apply; and
* Refer this proposal to a Workgroup for assessment as a matter of priority.