

MODIFICATION PROPOSAL FORM			
Proposer <i>(Company)</i>	Date of receipt <i>(assigned by Secretariat)</i>	Type of Proposal <i>(delete as appropriate)</i>	Modification Proposal ID <i>(assigned by Secretariat)</i>
EirGrid/SONI/SEMO	5 th October 2023	Standard	Mod_11_23
Contact Details for Modification Proposal Originator			
Name	Telephone number	Email address	
Grace Burke		Grace.Burke@EirGrid.com	
Modification Proposal Title			
SDP_02 Battery Integration			
Documents affected <i>(delete as appropriate)</i>	Section(s) Affected	Version number of T&SC or Agreed Procedure used in Drafting	
T&SC Part B Appendices Part B Glossary Part B Agreed Procedures Part B	B.9.1.3, D.4.2.6, D.4.2.15, D.5.1.4, D.5.1.5, F.2.1.4, F.2.4.10, F.4.3.2, F.4.3.3, F.4.3.4, F.4.3.5, F.5.3.3, F.6.2.3, F.6.2.5, F.6.4.7, F.6.4.9, F.7.1.3, F.7.1.5, F.9.4.2, F.13.2.1, F.13.2.2. Appendix I – 2, Table 1, Table 2. Appendix O – 10, Table 1, Table 2, Table 3, 25, 28, 29, Table 8, Table 9, 37(a), 40. Glossary Part B Definitions and List of Variables and Parameters	V28.0	
Explanation of Proposed Change <i>(mandatory by originator)</i>			
<p>In support of Irish and Northern Irish Government renewables targets for the electricity sector, EirGrid and SONI have undertaken to define and implement a set of initiatives to allow them to operate the system under conditions of 80% total renewable energy and 95+% system non-synchronous penetration (SNSP) on an instantaneous basis. A number of these initiatives relate to how the system is scheduled and dispatched, and in conjunction with related changes required to support compliance with the Clean Energy Package, have been grouped together into the Scheduling & Dispatch Programme (SDP).</p> <p>The SDP_02 initiative within this programme encompasses battery integration. Its objective is to facilitate the more effective use of batteries in scheduling and dispatch processes and systems. With increasing intermittent generation, energy storage is an ever-growing important source of flexibility and stability to the electrical system, while also providing needed system services capabilities in Ireland and Northern Ireland. These changes will allow market participant and the control centres to realise more value from batteries, and better align with their operating characteristics. In particular they will allow Battery Storage Units to submit negative Physical Notifications and be dispatched to specific MW levels in their charging range. The wider suite of system and operational changes associated with this initiative will also be detailed in updates to Grid Codes, Balancing Market Principles Statement and relevant methodologies published by the TSOs.</p> <p>Changes to market rules are needed to support these scheduling and dispatch changes and to better reflect the characteristics of the technology. An overview of the Trading and Settlement Code changes proposed is given below:</p> <ul style="list-style-type: none"> In registration, Battery Storage Units will be required to register as part of a Trading Site so that non-firm quantities can be settled correctly with respect to their allocated Firm Access Quantity as per other generator units. 			

- In Commercial Offer Data, new fields will be created to give the control centres information on whether Physical Notifications submitted breach the unit's MWh storage limits. Forecast Minimum Stable Generation will be mandated to be entered as zero to reflect the fact that these units can traverse through zero.
- In Technical Offer Data, some fields will be used for both Pumped Storage Units and Battery Storage Units.
- The description of Charging Mode will no longer be required for Battery Storage Units as it will no longer be necessary to be able to differentiate between the treatment of battery units while charging or discharging under the Trading and Settlement Code.
- The application of Loss Factors and the Testing Charge will be applied to Battery Storage Units as for Interconnector Units to account for negative meter volumes.
- The Imbalance Charge and Uninstructed Imbalance Charge will be applied to Battery Storage Units as they are for other generator units while charging and discharging. This reflects the fact that, unlike Pumped Storage Units, Battery Storage Units can control the level to which they consume power when dispatched to charge. This also complies with regulatory requirements for Balance Responsible Parties (under the EU's Clean Energy Package (CEP), Energy Balancing Guidelines (EBGL), and Imbalance Settlement Harmonisation Proposal methodology (ISHP)).
- The Outturn Minimum Output will be used as a floor value in the calculation of Accepted Offer Quantities, ensuring that a unit isn't compensated for volumes it is not capable of importing (e.g. as it is already fully charged), mirroring the current use of Outturn Availability Quantity in the calculation of Accepted Bid Quantities.
- Dispatch Instructions and Instruction Profiling logic will be updated as GOOP instructions will not be used for Battery Storage Units, and ramp rates will apply between the Registered Minimum Output and zero as well as between the Minimum Stable Generation and the Registered Capacity. Instruction Profiling will use the same logic for charging and discharging.

Legal Drafting Change

*(Clearly show proposed code change using **tracked** changes, if proposer fails to identify changes, please indicate best estimate of potential changes)*

Tracked changes below.

[T&SC Part B Tracked Changes](#)

[T&SC Part B Appendices Tracked Changes](#)

[T&SC Part B Glossary Tracked Changes](#)

[T&SC Part B Agreed Procedure 1 Tracked Changes](#)

[T&SC Part B Agreed Procedure 4 Tracked Changes](#)

Modification Proposal Justification

(Clearly state the reason for the Modification)

These changes will allow the treatment of Battery Storage Units to be decoupled from the treatment of Pumped Storage Units to better reflect their technical characteristics.

At present the treatment of Battery Storage Units while charging is the same as the treatment of Pumped Storage Units while pumping. Particular treatment was put in place in settlement because Pumped Storage Units cannot control the level to which they consume power when dispatched to pump. This is not a feature of Battery Storage Units and so once market systems have the capability to receive Physical Notifications and Dispatch these units in their charging range this treatment will no longer be appropriate for Battery Storage Units.

This decoupling will apply to the requirement that Pumped Storage Units not be registered as part of a Trading Site, the application of the Imbalance Charge and Uninstructed Imbalance Charge, Dispatch Instructions and Instruction Profiling. The change to the application of the Imbalance Charge was identified as necessary in SEM-21-017 (EirGrid and SONI Analysis of SEM Compliance with Commission Regulation (EU) 2017/2195 of 23 November 2017 Establishing a Guideline on Electricity Balancing) in order to comply with the EU's Clean

Energy Package (CEP), Energy Balancing Guidelines (EBGL), and Imbalance Settlement Harmonisation Proposal methodology (ISHP).

A change is also proposed to the calculation of Accepted Offer Quantities (QAO) when a unit is dispatched above its Physical Notifications. The Outturn Minimum Output will be used as a floor value in these calculations, mirroring the current use of Outturn Availability in the calculation of Accepted Bid Quantities (QAB). This will have the effect of limiting compensation to volumes that a unit would have been capable of importing if run to their Physical Notifications. This is necessary to ensure equivalent treatment of unavailable volumes across all generator units across incremental and decremental actions, taking into consideration the ability of Battery Storage Units to import and export energy.

Further changes are proposed in order to handle import volumes appropriately. This relates to the application of Loss Factors and the Testing Charge. In each of these cases the Loss Factor or Testing Tariff Price should be a multiplier for positive metering or dispatch quantity and a divisor for negative metering or dispatch quantity. Without these changes Lost Factors and Testing Tariff Price would always be applied as multipliers leading to unintended settlement outcomes.

Changes are also proposed to provide greater situational awareness to control centre engineers. The new Commercial Offer Data fields (Operational Maximum and Minimum Storage Quantity) will give the control centre engineer information on whether Physical Notifications submitted by participants are feasible with respect to the unit's state of charge, and as a result whether it is possible to schedule and dispatch the unit to those Physical Notifications.

Finally, changes are proposed to Technical Offer Data field names so that where similar fields are used for Pumped Storage Units and Battery Storage Units the same field name can be used for both.

Code Objectives Furthered

(State the Code Objectives the Proposal furthers, see Section 1.3 of Part A and/or Section A.2.1.4 of Part B of the T&SC for Code Objectives)

- c) to facilitate the participation of electricity undertakings engaged in the generation, supply or sale of electricity in the trading arrangements under the Single Electricity Market;
These changes will improve market access because rules for participation will be clearly set out for participants.
- e) to provide transparency in the operation of the Single Electricity Market;
These changes will improve market transparency because units will be registered with their own true characteristics.
- f) to ensure no undue discrimination between persons who are parties to the Code; and
These changes will ensure no undue discrimination as Battery Storage Units will be treated as similarly as possible to other generator units while respecting their unique technical characteristics.
- g) to promote the short-term and long-term interests of consumers of electricity on the island of Ireland with respect to price, quality, reliability, and security of supply of electricity.
These changes will promote the interests of consumers by minimising Dispatch Balancing Costs through not compensating for unavailable incremental volumes or non-firm decremental quantities and correctly applying Loss Factors, Testing Tariff Prices and the Uninstructed Imbalance Charge.

Implication of not implementing the Modification Proposal

(State the possible outcomes should the Modification Proposal not be implemented)

If these changes are not implemented Battery Storage Units will not be settled according to their unique characteristics.
Battery units will by default be settled as fully-firm regardless of allocated Firm Access Quantity under the unit's connection agreement as a result of the requirement not to register as part of a Trading Site.

These units will unnecessarily be subject to a different form of the Imbalance Charge to other generators while charging, contrary to EU regulatory requirements for Balance Responsible Parties, and will be exempted from the Uninstructed Imbalance charge while charging.

Loss Factors and Testing Tariff Prices will be applied incorrectly for imports leading to unwanted settlement outcomes.

Appendix O will not describe the desired Dispatch Instruction and Instruction Profiling logic which would allow Battery Storage Units to be dispatched to specific MW levels in their charging range and priced and settled accordingly. The existing logic does not allow for ramp rates to be applied below zero as these units would be subject to GOOP instructions which involve ramping instantaneously to the unit's full storage capacity when instructed to pump.

If SDP_02 as a whole is not delivered the control centres and market participants will not be able to gain maximum value from battery resources. Market participation will continue to be limited by the inability to register as a Battery Storage Unit, submit negative Physical Notifications, schedule or dispatch in the charging range, and price and settle accordingly. Participation in and revenue from energy markets will continue to be limited for these units. This may have an impact on investment decisions which may affect the system's ability to reach renewables targets.

<p style="text-align: center;">Working Group <i>(State if Working Group considered necessary to develop proposal)</i></p>	<p style="text-align: center;">Impacts <i>(Indicate the impacts on systems, resources, processes and/or procedures; also indicate impacts on any other Market Code such as Capacity Market Code, Grid Code, Exchange Rules etc.)</i></p>
<p>Not considered necessary.</p>	<p>Minor impact on Grid Codes, primarily to update Technical Offer Data fields. Impact on participant systems in relation to Commercial and Technical Offer Data fields. Once-off impact on participants at cutover. Impact on MI and MA in relation to updated data fields and instruction profiling logic. Impact on settlement systems in relation to updated settlement logic. Removes the need for an existing manual settlement workaround. Otherwise no ongoing resource impact is anticipated within SEMO once implemented.</p>

Please return this form to Secretariat by email to balancingmodifications@sem-o.com

Notes on completing Modification Proposal Form:

1. If a person submits a Modification Proposal on behalf of another person, that person who proposes the material of the change should be identified on the Modification Proposal Form as the Modification Proposal Originator.
2. Any person raising a Modification Proposal shall ensure that their proposal is clear and substantiated with the appropriate detail including the way in which it furthers the Code Objectives to enable it to be fully considered by the Modifications Committee.
3. Each Modification Proposal will include a draft text of the proposed Modification to the Code unless, if raising a Provisional Modification Proposal whereby legal drafting text is not imperative.
4. For the purposes of this Modification Proposal Form, the following terms shall have the following meanings:

Agreed Procedure(s):	means the detailed procedures to be followed by Parties in performing their obligations and functions under the Code as listed in either Part A or Part B Appendix D "List of Agreed Procedures". The Proposer will need to specify whether the Agreed Procedure to modify refers to Part A, Part B or both.
T&SC / Code:	means the Trading and Settlement Code for the Single Electricity Market. The Proposer will also need to specify whether all Part A, Part B, Part C of the Code or a subset of these, are affected by the proposed Modification;
Modification Proposal:	means the proposal to modify the Code as set out in the attached form
Derivative Work:	means any text or work which incorporates or contains all or part of the Modification Proposal or any adaptation, abridgement, expansion or other modification of the Modification Proposal

The terms "Market Operator", "Modifications Committee" and "Regulatory Authorities" shall have the meanings assigned to those terms in the Code.

In consideration for the right to submit, and have the Modification Proposal assessed in accordance with the terms of Section 2 of Part A or Chapter B of Part B of the Code (and Part A Agreed Procedure 12 or Part B Agreed Procedure 12) , which I have read and understand, I agree as follows:

1. I hereby grant a worldwide, perpetual, royalty-free, non-exclusive licence:
 - 1.1 to the Market Operator and the Regulatory Authorities to publish and/or distribute the Modification Proposal for free and unrestricted access;
 - 1.2 to the Regulatory Authorities, the Modifications Committee and each member of the Modifications Committee to amend, adapt, combine, abridge, expand or otherwise modify the Modification Proposal at their sole discretion for the purpose of developing the Modification Proposal in accordance with the Code;
 - 1.3 to the Market Operator and the Regulatory Authorities to incorporate the Modification Proposal into the Code;
 - 1.4 to all Parties to the Code and the Regulatory Authorities to use, reproduce and distribute the Modification Proposal, whether as part of the Code or otherwise, for any purpose arising out of or in connection with the Code.
2. The licences set out in clause 1 shall equally apply to any Derivative Works.
3. I hereby waive in favour of the Parties to the Code and the Regulatory Authorities any and all moral rights I may have arising out of or in connection with the Modification Proposal or any Derivative Works.
4. I hereby warrant that, except where expressly indicated otherwise, I am the owner of the copyright and any other intellectual property and proprietary rights in the Modification Proposal and, where not the owner, I have the requisite permissions to grant the rights set out in this form.
5. I hereby acknowledge that the Modification Proposal may be rejected by the Modifications Committee and/or the Regulatory Authorities and that there is no guarantee that my Modification Proposal will be incorporated into the Code.