










Modification	At what stage is this document in the process?
<h1 style="color: #008080;">DCRPMP/17/05</h1> <h2 style="color: #008080;">Provision for Energy Storage Devices in the Distribution Code</h2>	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="border: 1px solid #008080; background-color: #008080; color: white; padding: 5px; margin-bottom: 5px;">01 Modification</div> <div style="border: 1px solid #008080; padding: 5px; margin-bottom: 5px;">02 Workgroup Report</div> <div style="border: 1px solid #008080; padding: 5px; margin-bottom: 5px;">03 Draft Modification Report</div> <div style="border: 1px solid #008080; padding: 5px;">04 Final Modification Report</div> </div>
<p><b>Purpose of Modification:</b></p> <p>Distribution Network Operators (DNOs) have recently received a number of connection applications for Distribution connected energy storage devices which can both import and export electricity to the Grid, for which there is an apparent lack of clear provisions in the Distribution Code. In addition, in the recent Ofgem “Call for Evidence” stakeholder responses have informed the Authority that further technical guidance for the connection of Storage is required in the Distribution Code and/or the Code’s relevant annex 1 qualifying standards.</p> <p>The aim of this modification proposal is to identify and clearly specify Distribution Code requirements for a range of energy and electricity storage devices of diverse technology type which could reasonably be considered to fall outside of the existing code provisions.</p> <p>For the avoidance of doubt energy storage includes electricity storage devices.</p>	
	<p>The Proposer recommends that this modification should be:</p> <ul style="list-style-type: none"> <li>assessed by a Workgroup</li> </ul> <p>This modification will be presented by the Proposer to the Panel 8 June 2017. The Panel will consider the Proposer’s recommendation and determine the appropriate route.</p>
	<p>High Impact:</p> <p>DNOs, Aggregators/Manufacturers/Regulator/Directly Connected Demand (Including Response providers)</p>
	<p>Medium Impact:</p> <p>Developers &amp; Operators of Medium and Small Generating Units/Suppliers</p>
	<p>Low Impact:</p> <p>None</p>

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Timetable		
<b>The Proposer recommends the following timetable:</b>		
<b>Modification proposal presented to Panel</b>	<b>08 June 2017</b>	
Workgroup Report presented to Panel	dd month year	
Draft Modification Report issued for consultation	dd month year	
Consultation Close-out for representations	dd month year	
Final Modification Report available for Panel	dd month year	
Modification Report to Authority submitted	dd month year	

## 1 Summary

### What

There is currently a lack of bespoke requirements in the Distribution Code for a diverse range of energy storage devices (other than a short reference to pumped storage).

In May 2016 the Grid Code Panel agreed to commence work on a similar Grid Code proposal and subsequently established Grid Code Work Group GC 0096<sup>1</sup>. This working group has been working on a modification to the Grid Code to accommodate a diverse range of technology type energy storage devices that may be connected to the Transmission System. Terms of Reference for GC0096 can be found in Appendix 1.

From the commencement of the work of GC0096 both DNOs and the ENA have been represented on this working group. At the meeting of GC0096 held on 10 April 2017, and following discussions with National Grid and Ofgem, it was agreed that this collaborative joint panel working group should continue but in addition to the Grid Code modification proposal a separate Distribution Code modification proposal should be prepared and submitted to the Distribution Code Review Panel (DCRP) for consideration/approval.

Therefore this modification proposal seeks the approval of the DCRP for the continuation of the Grid & Distribution collaboration in GC 0096 but to also consider and agree that a this modification includes in its deliverables an assessment of the appropriate Distribution Code provisions for energy storage devices and to propose any consequential changes that may be required to the Distribution Code or any of the relevant annex 1 qualifying standards for example Engineering Recommendations G83 and G59.

This is particularly significant given that energy storage devices are not covered under any of the forthcoming EU Network Codes. Furthermore, energy storage devices have the capability to act as a source of either generation or demand. It is therefore necessary to establish a set of requirements which is consistent with existing industry codes/standards, gives due consideration to compatibility with developments needed in other code areas (for example: the Planning Code and the Data Registration Code) and ensures equitable treatment with other Users including any wider changes that may be required for example energy storage connections and queue management.

### Who

Parties who own energy storage devices and use the Distribution Systems will be expected to meet applicable sections of the Distribution Code which are consistent with the existing requirements. There is a need, therefore, to consider code developments which account for a range of technology solutions and different operational characteristics.

All energy storage devices should be considered in the context of both standalone energy storage installations and energy storage devices which are part of a hybrid power plant with a mix of technology types.

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<sup>1</sup> <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/GC0096/>

## How

The proposed solution is for a DCode working group (this should also include recommendations from GC 0096 and the TSO/DSO project) to develop an appropriate set of Distribution Code requirements including new definitions with regards to energy storage. It is recommended that the Panel should support the workgroup, giving due respect to the need for swift action as imposed by pending connection applications and potentially by impending recommendations from the Ofgem Flexibility Call for Evidence. This will be a six month timescale.

Developments considered by the workgroup should be consistent with existing code requirements where possible, recognising that the capabilities of energy storage devices span conventional generator and demand definitions, whilst giving due regard to operational requirements.

The workgroup should also consider the more detailed data submissions that are likely to be required under the Planning Code in addition to amendments to the Data Registration Code.

## Which Distribution Code clause/section is relevant for this issue?

All sections of the Distribution Code will require review but it is envisaged that the major elements of change will be to the Connection Conditions and Planning Code. Some general areas for consideration which relate to the Connection Conditions and Planning Code. include:

- Frequency variations, frequency response
- Voltage variations, reactive power capability, voltage control capability, voltage waveform quality and response to voltage fluctuations
- Fault ride through and behaviour under fault conditions
- Modelling data

## 2 Governance

### Requested Next Steps

This modification should:

- Work group assessment then proceed to workgroup consultation.

## 3 Why Change?

There is currently a lack of bespoke requirements in the Distribution Code and qualifying standards G59 and G83 for a diverse range of energy storage devices (other than for pumped storage). The aim of this modification proposal is therefore to identify and clearly specify the Distribution Code requirements for a wide range of energy storage devices of diverse technology type which could reasonably be considered to fall outside of the existing code provisions but are connected to a Distribution System.

## 4 Code Specific Matters

### Technical Skillsets

Understanding of the Distribution Code and Energy/Electricity Storage

### Reference Documents

Distribution Code, ER G59 and ER G83

## 5 Solution

The proposed solution is continue to establish a DCRP working group to develop an appropriate set of Distribution Code requirements with regards to energy storage. Findings and recommendations from the GC 0096 work group will also be considered.

The panel should, give due respect to the need for swift action as imposed by pending connection applications but also the expected Ofgem Smart, Flexibility Plan (call for evidence follow up document) report where the Authority are expecting Industry to submit proposals on requirements for storage connecting to the distribution network by end of 2017.

Developments considered by the workgroup should be consistent with existing code requirements where possible, recognising that the capabilities of energy storage devices span conventional generator and demand definitions, whilst giving due regard to operational requirements.

The workgroup should also consider the more detailed data submissions are likely to be required under the Planning Code in addition to amendments to the Data Registration Code.

## 6 Impacts & Other Considerations

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

No

### Consumer Impacts

None

## 7 How are the Distribution Code objectives better achieved by resolving this issue

Relevant Distribution Code Objective	Identified impact Positive/Negative/None
(i) to permit the development, maintenance and operation of an efficient, coordinated and economical system for the distribution of electricity	Positive  The capability of energy storage devices to act as both a generation and demand source raises a number of unique opportunities to permit the development and maintenance of an efficient, coordinated and economic distribution system.
(ii) to facilitate competition in the generation and supply of electricity ... (on terms which neither prevent nor restrict competition in the supply or generation of electricity)	Positive  New developments in energy storage technologies provide an additional avenue to facilitate competition in generation and supply.
(iii) Efficiently discharge the obligations imposed upon <b>DNOs</b> by the <b>Distribution Licence</b> and comply with the Regulation (where Regulation has the meaning defined in the <b>Distribution Licence</b> ) and any relevant legally binding decision of the European Commission and/or Agency for the Co-operation of Energy Regulators.	Positive  The development of bespoke provisions for energy storage devices in the Distribution Code will ensure that the Distribution Code does not constitute an undue barrier to entry for the connection of energy storage devices to the Distribution Networks

## 8 Implementation

It is anticipated that implementation will be within an agreed period of time from the publication of the Authority's decision.

It is anticipated that there will be no costs associated with the implementation of this modification proposal.

## 9 Legal Text

- Legal text will be provided with the draft workgroup modification report.

## 10 Recommendations

### Proposer's Recommendation to Panel

Panel is asked to:

- Approve this modification proposal..

## 11 Appendices

Appendix 1 - GC0096 Terms of Reference

## DCRP/17/06 Storage – Terms of Reference

### - Governance

- The Storage workgroup was established by the Distribution Code Review Panel (DCRP) at the 8 June 2017 DCRP meeting.
- The Workgroup shall formally report to the DCRP.
- The Code Administrator and Chair shall ensure the deliverables of DCRP/17/06 remain in-line with the outcomes of the BEIS/Ofgem call for evidence on Flexibility. BEIS/Ofgem representation in the Workgroup will therefore be requested.

### - Membership

- The Workgroup shall comprise a suitable and appropriate cross-section of experience and expertise from across the industry, which shall include:

Name	Role	Representing
	Chair	Code Administrator
	Technical Secretary	DCode - Code Administrator
	Expert	DNOs
	Expert	IDNOs
	Industry Representatives	Storage Developers/Operators
	Industry Representatives	Existing Generation/Demand Users looking to co-locate Storage
	Industry Representative	National Grid
	Authority Representative	Ofgem/BAIS

### - Meeting Administration

#### Representative Workgroup at ENA, London

- The dates for the workgroup meetings are provided later in this document at point 13. This timetable has been formed to meet the scope and objectives of the work being undertaken in a timely manner.
- The DCode - Code Administrator will provide Chair and Technical Secretary resources to the Workgroup. They will also handle administrative arrangements such as venue, agenda and minutes.
- The Workgroup will have a dedicated section on the DCode website to enable information such as minutes, papers and presentations to be available to a wider audience.

### - Scope

- The focus of the Workgroup is to define 'Storage' in the DCode, where currently only 'Pump Storage' is considered. It will then seek to establish suitable technical requirements to allow this classification of users to connect and safely operate on the GB Distribution System.



## **Workgroup meeting one: “Definitions”**

We will determine which Storage categories shall be the focus of the workgroup; either “Energy Storage” or “Electricity Storage”, or both. Once agreed, we will form a *high-level* working definition (noting the link to the BEIS/Ofgem call for evidence) to set the context for delivering the next workgroup deliverables. We will also consider how this definition links with existing Distribution Generation or Demand users looking to co-locate with Storage.

## **Workgroup meeting two-to-three – “Technical and Planning Requirements”**

We will form the minimum Distribution Code technical requirements applicable to Storage equipment defined above - either via a stand-alone Installation or co-located with an existing Installation, ensuring consistency and transparency with other classes of Distribution System user.

## **Workgroup meeting four – “Structure”**

Consideration of how (or if), the outcomes from the previous workgroup meetings need to be structured in the DCode via legal text changes.

## **Workgroup meeting five – Placeholder for a further meeting if required.**

### **Out of scope**

The scope of the Workgroup shall not include:

- Charging arrangements for Storage; network charging is defined in other GB codes
- Commercial services for Storage; whilst the DCode sets certain technical requirements to deliver response services, the delivery of services is discharged via contractual agreements. This includes procedures to facilitate Aggregation and virtual Power Plants
- Connection requirements for Grid Code; however we will coordinate with the GCRP and our TSO colleagues to ensure that DCRP/17/06 proposals are compatible

**- Deliverables**

- The Workgroup will provide updates and a Workgroup Report to the Distribution Code Review Panel which will:
  - o Detail the findings of the Workgroup;
  - o Draft, prioritise and recommend changes to the DCode and associated qualifying standards in order to implement the findings of the Workgroup; and
  - o Highlight any consequential changes which are or may be required by other Code Administrators
  - o Cross reference with the other Industry codes to ensure that it does not create any consequential impacts
  - o Impact on the Grid Code to ensure no conflicts.

**- Timescales**

- It is anticipated that this Workgroup will provide an update to each GCRP meeting and present a Workgroup Report to the December 2017 GCRP meeting.
- If for any reason the Workgroup is in existence for more than six months, there is a responsibility for the Workgroup to produce a six monthly update report, including but not limited to; current progress, reasons for any delays, next steps and likely conclusion dates.
- An indicative timetable for DCRP/17/06 milestones is shown below.

June 2017	Workgroup meeting 1 (full day)
July 2017	Workgroup meeting 2 (full day)
August 2017	Workgroup meeting 3 (full day)
September 2017	Workgroup meeting 4 (full day)
October 2017	Workgroup Report
November 2017	Workgroup Report at Panel
December 2017	Code Administrator Consultation published
January 2018	Deadline for responses
February 2018	Final Modification Report at Panel
March 2018	Final Modification Report submitted to the Authority
April 2018	Indicative Authority decision