|  |  |  |  |
| --- | --- | --- | --- |
| Workgroup Report | | | |
| **GC139:**  **Enhanced Planning-Data Exchange to Facilitate Whole System Planning Overview:** To increase the scope and detail of planning-data exchange between Network Operators and NESO to help facilitate the transition to a smart, flexible energy system. | | **Modification process & timetable**  **Proposal Form**  12/02/2020  **Workgroup Report**  24 July 2025  **Code Administrator Consultation**  31 July 2025 to 01 August 2025  **Draft Modification Report**  25 September 2025  **Final Modification Report**  07 October 2025  **Implementation**  TBC  **1**  **2**  **3**  **4**  **5**  **6**  **7**    **Workgroup Consultation**  17 December 2024 to 21 January 2025 | |
| **Have 5 minutes?** Read our [Executive summary](#_Executive_summary_1)  **Have 40 minutes?** Read the full [Workgroup Report](#_Why_change?)  **Have 120 minutes?** Read the full Workgroup Report and Annexes. | | | |
| **Status summary:** The Workgroup have finalised the proposer’s solution. They are now seeking approval from the Panel that the Workgroup have met their Terms of Reference and can proceed to Code Administrator Consultation. | | | |
| **This modification is expected to have a:**  **High impact:** National Energy System Operator, Transmission System Owners and Network Operators (i.e. Distribution Network Operators and Independent Distribution Network Operators)  **Medium impact:** Power System Analysis Software Vendors  **Low impact:** Non-embedded and embedded customers. | | | |
| **Modification drivers:**  *System Planning, System Security and Transparency* | | | |
| **Governance route** | *Standard Governance modification with assessment by a Workgroup* | | |
| **Who can I talk to about the change?** | **Proposer:** Ian Povey, Electricity North West Limited  [Ian.Povey@enwl.co.uk](mailto:Ian.Povey@enwl.co.uk)   1. Phone: 07796 548166 | | **Code Administrator** **Chair**: Jess Rivalland   1. [Jessica.Rivalland@neso.energy](mailto:Jessica.Rivalland@neso.energy) |

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# Executive Summary

This modification seeks to increase the scope and detail of planning-data exchange between Network Operators and the National Energy System Operator (NESO) to help facilitate the transition to a smart, flexible energy system.

**What is the issue?**

1. The existing requirements of the Grid Code, in respect of data exchange between Network Operators and NESO, are insufficient for the coordinated and efficient planning of their networks. As the industry transitions to a smart energy system, these requirements must change to give Network Operators and NESO better visibility of each other’s system and its operation.
2. To facilitate the efficient and coordinated planning of the Transmission System, NESO and Transmission Owners need a greater understanding of the quantity, type, and impact of distributed energy resources connected to distribution networks.
3. To facilitate the efficient and coordinated planning of their distribution networks, Network Operators need a greater understanding of transmission system power flows and fault contributions in a variety of demand and generation scenarios.

**What is the solution and when will it come into effect?**

**Proposer’s solution:** An enhanced level of planning data exchanged between Network Operators and NESO; the data exchanged will largely be in the Common Information Model (CIM) format, supplemented by data in an Excel Workbook format. Data exchanges will take place twice a year for both the NESO and Network Operators. Details of the new routine data submissions can be found in the new sections of the Planning Code, PC.9/10/G

**Implementation date:** It is proposed to implement the modification within 10 working days following approval by the Authority, with the new obligations taking effect from 1 January 2027.

**What is the impact if this change is made?**

1. *This modification will require all Network Operators to have the capability to produce power system models in a CIM format, based on the Common Grid Model Exchange Standard (CGMES) v3 standard with required extensions and deviations to meet the data exchange requirements of the Planning Code. It will require NESO to extend its current CIM capability to produce a power system model of the National Electricity Transmission System (NETS) or produce a bespoke NETS equivalent model for each Distribution Network Operator (DNO) in CIM format.*
2. *Whilst this represents a significant increase in workload, the proposal represents the most efficient way to exchange the enhanced level of data required as the industry transitions to a smart energy system and assist NESO, Transmission Owners and distribution system operators in complying with their requisite licence activities.*

*This modification will require the establishment of a CIM interface point agreement system. This modification will also require the establishment of a CIM governance body for Great Britain.*

1. *A secure data exchange platform will be required to facilitate the exchange of data between all relevant parties.*

**Workgroup conclusions:** The Workgroup concluded unanimously/by majority that the Original better facilitated the Applicable Objectives than the Baseline.

**Interactions**

1. *Key interactions are listed below. However further consideration was given to other codes and modifications and details of these are outlines in in the main Interactions section.*
2. GC0117 - may drive a significant increase in the size and scope of the Network Operators models particularly if Large Generators are identified as 10MW in England & Wales.
3. CMP434 – additional forecast data on future generation applications
4. GSR029 – alignment of definitions

What is the issue?

​The existing requirements of the Grid Code, in respect of data exchange between Network Operators and NESO, are insufficient for the coordinated and efficient planning of their networks going forward. As the industry transitions to a smart energy system, these requirements must change to give Network Operators and NESO better visibility of each other’s system and its operation.

1. ​Network Operators are experiencing an increasing volume of distributed energy resource (DER) connection applications. These connections include generation connections of differing energy conversion technology and fuel type, electricity storage facilities and demand connections where their operators offer a demand side response service. These distributed energy resource connections present a new set of issues in relation to the planning and operation of the distribution network and transmission system.
2. ​Similarly, the move away from coal and oil fired generation towards large scale renewable and High Voltage Direct Current (HVDC) interconnector technology is changing the operation of the GB transmission system and its power flows. This presents a new set of issues to the planning and operation of transmission and distribution networks, particularly those distribution points that connect across different Grid Supply Points.

## Why change?

To facilitate the efficient and coordinated planning of the Transmission System, NESO and Transmission Owners (TOs) need a greater understanding of the quantity, type, and impact of distributed energy resources connected to distribution networks.

1. To facilitate the efficient and coordinated planning of their distribution networks, Network Operators need a greater understanding of transmission system flows and fault contributions within a variety of demand and generation scenarios.
2. It is essential that network companies have a detailed knowledge of adjacent connected networks. This modification will significantly improve the scope and detail of the planning data exchanged between Network Operators and NESO.

What is the solution?

## Proposer’s solution

This modification proposes:

* ​To introduce a new section to the Planning Code (PC.9) that describes the information to be provided by a Network Operator to NESO.  The new PC.9 replaces the existing related PC obligations in respect of annual planning data submissions to NESO.
* ​To introduce a new section to the Planning Code (PC.10) that describes the information to be provided by NESO to a Network Operator. The new PC.10 replaces the existing related PC obligations in respect of annual planning data submissions to Network Operators.
* ​To introduce a new appendix to the Planning Code (PC.G) that specifies the detail of the power system models in CIM format and associated documentation.
* ​To introduce new schedules in the Data Registration Code (DRC), describing the information provided by a Network Operator to NESO, that will support the data submissions with forecasts of demand and generation at cardinal points in time. These new schedules will apply to Network Operators and replace the existing schedules.
* ​To introduce new defined terms to the Glossary and Definitions.
* ​That there will be two submissions a year by both Network Operators and NESO. These submissions will reflect the peak and minimum demands on the transmission system and connection points.
* ​That each submission will consist of a Power System Model (PSM) in CIM format, schedules, a PSM Scenario document and a PSM Changes Document.
* ​The requirements and timings of each submission are set out in Table and Figure 1 below:

Table 1: High Level overview of GC0139 Submissions

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Routine** | **As Needed** |
| Network operators  to NESO (PC.9) | Power System Model (PSM) | Week 2: Solved Subtransmission PSM  for NETS minimum demands  Week 28: Solved Subtransmission PSM  for NETS peak demands | Evaluation of Transmission Impact assessment:  Planned connections and updated network development projects |
| Tabular | Week 2: Schedules: 21A-C, 22, 29A-B & 30  Week 28: Schedules: 23A-C, 24, 25A-C, 26A-B, 27, 28, 29A-B, and 30 |  |
| Narrative | Week 2: PSM Scenario Document/PSM Change Document  Week 28: PSM Scenario Document/PSM Change Document |  |
| NESO to Network Operators (Pc.10) | Power System Model (PSM) | Week 12: Summer Solved NETS PSMs  for 4 forecast grid conditions  Week 38: Winter Solved NETS PSMs  for 3 forecast grid conditions | Transmission Licensee-initiated  modification:  Planned connections/works and updated network development projects |
| Narrative | Week 12: PSM Scenario Document/PSM Change Document  Week 38: PSM Scenario Document/PSM Change Document |  |



Figure 1: GC0139 Submissions Timeline



* To support the Evaluation of Transmission Impact (ETI) assessment process with the provision of updates of accepted-to-connect connections and their associated changes to the PSM. The submitted power system models will be suitable for use in the ETI analysis.
* An enhanced level of planning data exchanged between Network Operators and NESO; the data exchanged to largely be in the CIM format.
* Network Operators, at weeks 2 and 28, to provide NESO with a switch level PSM in CIM format detailing the sub-transmission network and equivalents representing networks at the boundary between the sub-transmission network and networks operating at a lower voltage.
* That the lower voltage distribution network equivalents shall detail total demand at the boundary and the generation at the boundary. The generation at the boundary shall be aggregated by Energy source with existing generation detailed separately from generation that is accepted to connect but not yet connected.
* PSM in CIM format of the distribution network shall be provided for the following demand/generation scenarios:
  + NETS minimum Demands; and
  + NETS Peak Demands
* NESO, at weeks 12 and 38, to provide Network Operators with PSMs in CIM format of a switch level, single boundary representation of the transmission system.
* The physical extent of the representation of the transmission system shall be bounded by boundary nodes agreed between NESO and Network Operators.
* PSMs of the transmission system shall be provided for a number of demand and generation scenarios, as follows:
  + Maximum fault level;
  + Peak demand;
  + Summer minimum demand;
  + Solar-peak/daytime-minimum demand;
  + National high-power transfer dispatch scenario, and;
  + National low power transfer dispatch scenario.
* To align the data exchange requirements of the Weeks 2 and 28 data submissions with the those of an ETI.

**An Overview of New Schedules**

The Subgroup developed schedules within this modification that are either updated previous schedules or newly created ones. To allow for easier completion and submission of the new schedules, they have been created as a single excel file split into separate worksheets for each table. This excel file allows for colour coding and drop downs to be added, contributing to easier submission of data. Schedules are submitted in either week 2 or 28, or in both.

The purpose of many of the new schedules is to keep up with the changing nature of the electricity system. The amount of generation that is connected to distribution networks is increasing, moving away from the traditional approach where most of the generation was connected to the transmission system. To ensure that NESO has a better understanding of distribution networks in the context of network planning, a greater level of detail is required within Network Operator’s submissions. Schedules which previously required seven years of forecasting have been altered to ten years, to allow NESO to have a better understanding of upcoming changes to distribution networks.

One of the largest blind spots for NESO was embedded electricity storage. To combat this, many of the new schedules make specific mention of embedded electricity storage.

DRC Schedule 21A-C (week 2)

The Subgroup used Schedule 11 as a starting point to create the new Schedules 21 and 23, with 21 focused on summer minimums and 23 on winter peaks. Schedule 21 is split into three sheets based on three different network conditions: NETS minimum demand, Connection Point minimum demand, and summer daylight minimum. The latter was added due to the increase usage of solar on the GB system.

Other changes in this schedule include the removal of references to the Single Line Diagram, as this is being replaced with the new CIM models, and the addition of rows where export from various Aggregated Energy Sources at and below the Subtransmission voltage are to be added. Forecasting has been increased from seven years to ten, to match the ETYS. Import to Electricity Storage has been added as it becomes more prevalent.

DRC Schedule 22 (week 2)

The Subgroup used Schedule 10 as a starting point for Schedules 22 and 26. The greatest changes from schedule 10 are an increase in the forecast to ten years, and a new row for the aggregate export from all Embedded Power Stations at the forecast half-hourly NETS minimum demand. The time and date of the NETS minimum Demand will be provided by NESO.

DRC Schedule 23A-C (week 28)

Schedule 23 is again based on Schedule 11, following many of the same modernisations as Schedule 21. The three sheets of 23 are NETS peak, Connection Point peak, and Connection Point Access period peak. Sheets A and B are broadly similar to 21 A and B, whereas 23C is not.

23C contains rows which refer to post-fault operational configurations and running arrangements within the PSM Scenario Document. These rows should contain high level details, whilst the main information will be included in the PSM Scenario Document

DRC Schedule 24 (week 28)

Schedule 24 is based on Schedule 17 and formalises much of the ad-hoc additions that have been made to schedule 17 since its introduction. NESO will fill out their planned outages which will be reviewed by Network Operators. The accepted weeks have been increased to include weeks 10-43, and any potential outage clashes are automatically highlighted.

DRC Schedule 25A-C (week 28)

Schedule 25 is based upon schedules 12A, and OC6, aiming to formalise the collection of data which has happened outside of the DRC in the past. This data is related to Demand Control and disconnection.

DRC Schedule 26A-B (week 28)

This schedule is based upon schedule 10 and contains the same updates as Schedule 22. This Schedule is used to express the half hour measured demand at both the Network Operator’s Peak and NETS peak, which will be provided by NESO.

DRC Schedule 27 (week 28)

Schedule 27 is an updated version of the second table in Schedule 10. Some Subgroup members debated as to whether this information was still required by NESO. After some searching within NESO, teams were found which continue to use this data.

DRC Schedule 28 (week 28)

This schedule originated as part of [CMP434 (Page 15)](https://www.neso.energy/document/346896/download) but was transferred to GC0139 due to embedded power stations no longer being considered in CMP434. Originally this schedule separated Power Stations and Plant by technology types, but this was altered to Aggregated Energy Sources to better fit with the rest of the new schedules. Network Operators will fill in forecast aggregated Registered Capacities for each Connection Point for the next ten years.

The first part of schedule 11 table b is similar to schedule 28, but with much less detail.

DRC Schedule 29A-B (week 2 & 28)

Schedule 29 is based upon schedule 11 tables c and d. One difference is that the Sub 1 MW Embedded Power Stations data is collected alongside a unique object RDF ID contained within the Solved PSM. The list of fuel types has been replaced with Aggregated Energy Sources. Instead of using Large, Medium, and Small when talking about Embedded Power Stations, below and above 1 MW was selected so that the outcome of GC0117 would not affect this modification.

The Embedded Power Stations at or above 1 MW Schedule has been expanded to include location of solar and wind farms. Rather than ask for Technology and Production Type, Schedule 29 asks for Energy source and Energy Conversion Technology using drop downs. The details surrounding voltage control mode have been increased to include maximum and minimum Reactive Capability. The last additions are a box to highlight whether the plant has been connected yet and a box for any extra comments the Network Operator may want to add.

DRC Schedule 30 (week 2 & 28)

This schedule is based upon table b in schedule 11, being expanded to take ten years of forecast data rather than seven. The first part of schedule 11 table b is not required in schedule 30 as it has been covered by schedule 28.

**PSM Documents**

Types of data in a PSM

There are four types of data in a PSM, Structural, Diagram, Situational, and Solution. Structural Data contains system components and their characteristics such as Energy Source or voltage limits. Diagram Data is a visual representation of Structural Data. Situation Data is information on the status of system plant and assets, such as stored energy or regulating status. Solution Data is the results of relevant power system analysis, such as the calculated Active and Reactive power output. These types of data are combined into a Solved PSM and sent between parties at agreed dates.

Solved PSMs are based on different system scenarios, such as peak demand or low power transfer. Multiple PSMs are sent at each submission date so that the receiving party can understand how the sending party’s system functions under different conditions.

Network Operator’s PSM

When Network Operators submit PSMs to NESO in weeks 2 & 28, they will contain:

* A model encompassing the whole of the subtransmission system – typically 132kV in E&W and 33kV in Scotland
* Detailed modelling of any direct connections to the Subtransmission system
* Equivalence modelling of any lower voltage system interconnection across the Subtransmission system
* Equivalence modelling of generation (Large, Medium & Small) connected to lower voltage systems, aggregated by energy source
* Equivalence modelling of demand connected to lower voltage systems, including EREC G74 fault contributions
* P, Q equivalences at each boundary node with the transmission system and any interconnected Network Operators system

NESO’s PSM

NESO PSMs are similar to Network Operator’s PSMs. NESO will submit PSMs to Network Operators in weeks 12 & 38, which will contain:

* A switch level transmission model of either the entire NETS or the NETS in detail local to a particular Network Operator with equivalence of the rest of the system at boundary nodes
* Generation modelled as equivalents, as detailed control systems will not be provided
* HVDC modelled as equivalents at each end of the DC link.

PSM Adjacent Files

Solved PSMs are accompanied by a PSM Scenario Document, a PSM Change Document, and a Power System Difference Model (PSDM). The purpose of a PSM Scenario Document is to provide contextual information to help the receiving party better understand the submitted PSM and the assumptions made in developing it. A PSM Change Document’s purpose is to explain what has changed in the Solved PSMs relative to the previously submitted Solved PSMs. A PSDM is a model which explains changes to a PSM’s Structural Data such as altered connections or proposed alterations to the sending party’s system.

**New Defined Terms created from a Gap Analysis**

Aggregated Energy Source, Energy Source, and Energy Conversion Type are all newly defined terms that came from a gap analysis performed by Open Grid Systems. This analysis aimed to bridge the gap between what the subgroup had envisioned for the planning code’s new submissions and what power system software was capable of providing. The Subgroup and the analysis’s authors worked together to define, in PC.G.1, what characteristics are needed from each type of asset on the system.

PC.G.8 contains two tables which define Aggregated Energy Source, Energy Source, and Energy Conversion Type. Energy Source is a list of all possible fuel sources for generation and storage assets on the system, Aggregated Energy Source is a simplified version of this list for use when generators are being represented as equivalents. Energy Conversion Technology is a list which expresses all possible ways an Energy Source can convert its energy into electricity on the system.

**Submissions**

A table of submissions containing how new schedules, PSMs and PSM adjacent documents are submitted compared to the current planning code can be seen in Table 2.

Table 2: GC0139 Submissions compared to current planning code

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Baseline | GC0139 | | | | | |
| Week 50/2 User submission | DRC Schedules  Updates on 5A-B, 5D-F, and 13 Given in last year’s week 24/28 | Solved PSMs   * Minimum demand * Minimum daylight demand   Minimum fault level | PSM Documents   * PSM Scenario document   PSM Change Document | | PSDM   * Updated accepted **Generator** List   All Authorised **NETS** updates | | DRC Schedules  21A-C, 22, 29A-B, and 30 |
| Week 6/12 NESO submission | Start and finish date for each **Access Group** and **Transmission Interface Circuit**  **Connection Points** in each **Access Group** | Solved PSMs   * Minimum demand * Minimum daylight demand * Low power transfer   Minimum fault level | | PSM Documents   * PSM Scenario document   PSM Change Document | | PSDM   * Updated accepted **Generator** List   All Authorised **NETS** updates | |
| Week 24/28 User submission | **Standard Planning Data**  **Detailed Planning Data** part 1 | Solved PSMs   * Peak demand   Maximum fault level | PSM Documents   * PSM Scenario document   PSM Change Document | | PSDM   * Updated accepted **Generator** List   All Authorised **NETS** updates | | DRC Schedules  23A-C, 24, 25A-C, 26A-B, 27, 28, 29A-B, and 30 |
| Week 38/42 NESO submission | **Network Data** (**Detailed Planning Data** part 2) | Solved PSMs   * Peak demand * High power transfer   Minimum fault level | | PSM Documents   * PSM Scenario document   PSM Change Document | | PSDM   * Updated accepted **Generator** List   All Authorised **NETS** updates | |

Both NESO and the Network Operators can request additional data from each other outside of the requirements in PC.9 and PC.10, so long as the requests are reasonable.

Workgroup considerations

The Workgroup convened 25 times to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Applicable Code Objectives.

Due to the complexity of the legal text, a subgroup was created to develop the changes to the Planning Code, Glossary and Definitions, and consequential changes to the Data Registration Code. Subgroups were run in addition to Workgroups.

A detailed summary of work considered in the Subgroups and presented back to the Workgroup can be found in Annex 4.

The Workgroup held their Workgroup Consultation between 17 December 2024 and 21 January 2025 and received 7 responses. The full responses and a summary of the responses can be found in Annexes 7 and 8.

**Consideration of the Proposer’s solution**

**Data Exchange Options**

The Workgroup considered 4 options (See Annex 6) relating to Data Exchange:

**Option 1** – Minimum number of CIM files, augmented with BSP Schedules to reflect all the forecast scenarios

**Option 2** – All Cardinal Point Scenarios in CIM files

**Option 3** – the use of Steady State Hypothesis (SSH) files which may be used reduce the need to either:

1. present different demand scenario data in excel spreadsheets (Option 1); or
2. reduce the number of CIM files that need to be exchanged (Option 2)

**Option 4** – Minimum number of CIM files Augmented with GSP Schedules to reflect all forecast scenarios

Both the Proposer and Workgroup members showed preference to Option 4.

**CIM**

CIM was developed to allow power system data to be shared between parties who may be using different modelling software. As a standard, CIM is recognised by the International Electrotechnical Commission (IEC) and is now in use by ENTSO-E.

The Workgroup’s use of CIM would allow a standardised approach for power system model data exchange to be taken across GB, as was noted by OFGEM in their [Open Letter](https://www.ofgem.gov.uk/sites/default/files/2022-01/The%20Common%20Information%20Model%20%28CIM%29%20regulatory%20approach%20and%20the%20Long%20Term%20Development%20Statement.pdf) from January 2022.

Having a standard data exchange format allows data to be transferred more efficiently, as compared to using excel spreadsheets. CIM gives both NESO and the Network Operators a greater understanding of how each other’s systems work, as instead of receiving just the results of system modelling, they will see how those results were reached. Once these CIM models have been developed, each year they will be updated to reflect the changes within both the transmission and distribution networks.

**Work with the ENA’s Data & Digitalisation Steering Group (DDSG)**

The proposer worked with the DDSG’s CIM subgroup to seek CIM technical expertise to identify gaps in the CIM CGMES v3 standard compared to the new requirements of the PC. Following this, a tender was issued seeking companies that could undertake a gap analysis between the CGMES v3 CIM format (with extensions specified by Ofgem for the Long Term Development Statement (LTDS)) and the requirements of the PC. Open Grid Systems (OGS) were the successful tender. OGS have useful background experience supporting Ofgem with their CIM work on the LTDS.

OGS assisted with further changes to Section 9, 10 and Appendix G to ensure the language used was not only appropriate for engineering use but was also suitable for translation into CIM syntax. This element of the work has necessitated several new definitions which are proposed in the Glossary and Definitions.

**GB SQSS Review – GSR029**

The workgroup was cognisant of the proposals of the GSR029 workgroup, to align SQSS with EREC P2. The Subgroup met with members of GSR029 Workgroup to insure the two modifications definitions aligned. This modification, GC0139, has adopted definitions that aim to align with the SQSS and EREC P2 by incorporating them into the Glossary and Definitions. PC.9 therefore requires reporting against these definitions, which are: Gross Demand, Group Demand, Latent Demand, Measured Demand, Embedded Power Station Export, and Embedded Power Station Import. These updates were introduced to the Workgroup who were supportive of the changes made.

A stylised diagram of a power system was included in the new PC.9 to explain the new types of demand, as can be seen in figure 2.

A diagram of a circuit

Description automatically generated

Figure 2: Stylised Diagram of a Power System

M1, M2 measurement at the **Connection Point**

EGi import to **Large Power Stations**, **Medium Power Stations** and **Small Power Stations** other than to **Electricity Storage Module(s)**

EGe export from **Large Power Stations**, **Medium Power Stations** and **Small Power Stations** other than from **Electricity Storage Module(s)**

ESi import to **Electricity Storage Module(s)**

ESe export from **Electricity Storage Module(s)**

D aggregated **Embedded Customer Import**

∆D aggregated **Latent Demand** of **Embedded Customers**

Where:

**Group Demand** = D + ∆D

**Group Demand** = (M1 + M2) + (EGe + ESe) – (EGi + ESi) + ∆D

**Latent Demand** = ∆D

**Gross Demand** = (D + ∆D) + (EGi + ESi)

**Embedded Power Station Export** = EGe + ESe

**Embedded Power Station Import** = EGi + ESi

**Measured Demand** (Net Demand) = M1 + M2

**Interaction with CMP434**

During CMP434, a Schedule which aimed to gather information on the Registered Capacity of different types of generation was raised to be included as part of Network Operators submissions. After some debate it was decided in the CMP434 Workgroup that this schedule would be out of scope, and that GC0139 would be a better place for it to be included. This schedule was the basis for schedule 28.

**Interaction with GC0117**

GC0117 is a modification that aims to unify the size ranges of Small, Medium, and Large Power Stations within the GB power system, which has been in development for seven years. During the development of GC0139, it became clear that using the terms Small, Medium, and Large to describe elements within yearly submissions could lead to unintended consequences if GC0117 altered these definitions. The Subgroup avoided using Small, Medium, and Large where possible, instead using exact MW values. An example of this can be seen in the Schedules 29A&B. The boundary between the two sets of submissions within schedule 29 was set at 1 MW, so that regardless of the outcome of GC0117, GC0139’s outcome would remain as intended.

**Mentions of week 24/28 Submissions elsewhere in the Grid Code**

The Subgroup discussed how GC0139 would alter the meaning of mentions of week 24/28 in areas of the Grid Code outside of the Planning Code.

ECCs/CCs/OC2

The mentions of week 24 in the ECCs, CCs, and OC2 are related to Generators. As GC0139 is about data exchanges between Network Operators and NESO, these sections have been left unchanged.

OC5

The mentions of week 24 are related to Network Operator’s yearly submissions. The legal text was edited to remove Network Operators from this obligation, and a new clause was added below explaining how pre the PSM Implementation Date, this data could be submitted in week 24, whereas post PSM Implementation Date it could be submitted in week 28.

OC6

All mentions of week 24 in OC6 relating to Network Operators were altered to week 28. PC.A.1.2 explains that while the requirement for the submission of this data is set at week 24, Network Operators are allowed to push this submission date back to week 28. Network Operator members of the Subgroup stated that this allowance is almost always used, so altering the date to week 28 is not a major change. As the new submission date in GC0139 is week 28, changing this legal text now removes the need for a “clean-up” modification to take out mentions of PSM Implementation Date in the future.

DRC

As the DRC contains the templates for new schedules, it has the largest amount of changes outside of the Planning Code and Glossary and Definitions. Details of these new schedules were added, along with a new table to explain the difference between applicable schedules pre and post the PSM Implementation Date.

Schedules 10 and 11 will no longer be required to be submitted by Network Operators post PSM Implementation Date as they are being replaced with more detailed schedules. Schedules 12 and 16 were altered to include a clause that would change what data had to be submitted post PSM Implementation Date. When reviewing the DRC and the Planning Code, the Subgroup was unable to find any requirements to submit schedule 13. The subgroup therefore did not include a new requirement to submit schedule 13.

**PC.G’s Depth**

PC.G can be viewed as an updated, expanded form of the Planning Code’s appendix A. The decision was made to have the main body of the new additions to the Planning Code contain a high-level overview of submissions, with the majority of the detail contained within PC.G. Worked examples are not usually something that would be in the Grid Code, but the Subgroup felt this approach was favourable to using guidance notes. The use of guidance notes has led to debates on what requirements in the Grid Code do and do not apply, as well as confusion on interpretation of the Grid Code. To avoid these issues, the Subgroup attempted to explain the new requirements in the fullest detail, rather than writing requirements using the least possible words.

**PSM Implementation Date**

The term PSM Implementation Date, which is the date that the new changes within GC0139 will come into effect, has been added to the Glossary and Definitions. The provisional date is set as the first of January 2027, unless NESO and the Network Operators agree that they are not ready to implement the changes. In this case, the PSM Implementation Date will be pushed back to a more suitable date.

During the Workgroup Consultation, six of the seven respondents stated that they did not believe the previous PSM Implementation Date, the first of January 2026, was practically achievable.

**Implementation and Costs**

The NESO estimated costs are outlined in Annex 5.

Network Operators are already working to implement the requirements of CIM and the Long-Term Development Statement (Distribution SLC25). It is estimated that implementation costs of GC0139 will partly be covered by the ongoing work on the Long-Term Development Statement. Annual preparation and reporting costs may increase compared to the current PC preparation, submission and reporting costs.

The Workgroup acknowledged the need for trial data exchanges between Network Operators and NESO, suggesting the creation of a new working group for coordination after the legal text is approved.

**Governance Arrangements**

To implement the proposals of this modification will require extensions to the scope of the current format of CGMES v.3. These extensions will need to be agreed by the Company and all Network Operators and implemented by the relevant software vendors. It is anticipated that future modifications to the PC requirements will need further extensions to CGMES. Hence there is a requirement for Governance arrangements for CIM within GB.

This requirement has already been identified by the working group that is implementing the requirements of the new Long Term Development Statement (Distribution SLC25). The Long-Term Development Statement working group has assumed the role of Governance body for an interim period however, arrangements are to be implemented to establish an enduring Governance body that will oversee CIM development in GB and seek international adoption with the International Electrotechnical Commission . This governance will contain representatives from all Network Operators, Transmission Owners, and NESO, along with assistance from CIM industry experts such as Open Grid Systems. In time, this governance is expected to be taken over by the British Standards Institute (BSI).

**Consideration of how new Schedules are shared and governed**

The newly created schedules are larger and more complex than their previous counterparts. This difference has lead to issues representing these schedules properly within the DRC, where schedules are pasted in as tables. The DRC is posted on the NESO website as a word document as well as a PDF, so that relevant parties can access the tables easier. This approach works when the tables are small and have no internal calculations.

The Workgroup sees two potential solutions for this problem.

**Option 1:** *Simplify the new schedules and remove all internal calculations from them.*

This option would allow the current method for sharing schedules to continue, removing the need for an extra file to be maintained by Code Governance, reducing the chances for discrepancies between files to appear.

However, selecting this option would mean that dropdown menus and internal checks with the new schedules would have to be removed, making the schedules harder to fill in and increasing the chance of errors during submissions. An example of a useful internal check is in schedule 24, where overlapping access periods are highlighted to show potential clashes.

NESO would also have to dedicate more time to mapping the six different sets of submissions into one format, as Network Operators will likely submit them with slight differences between companies.

**Option 2:** *Create a new section on the [NESO Grid Code website](https://www.neso.energy/industry-information/codes/grid-code-gc/grid-code-documents) where the new schedules can be found in Excel format.*

This option would allow for more useful schedule files to be shared, meaning Network Operators could fill them in easier and NESO would be able to process them faster. NESO would have to spend less time accounting for differences between submissions.

The downside of this option is that a new submission box would have to be added to the NESO website, effectively meaning that there would be two separate places where the working versions of the DRC schedules are kept. The impact of this change could be minimised by amending the link to the word version of the document to say schedules 1 – 20 and having the link to the Excel file end with schedules 21 – 30. A mock up of this can be seen in figure 3.

A screenshot of a computer

AI-generated content may be incorrect.

Figure 3: Mock-up of Option 2 Implementation

There was discussion within the Workgroup as to if option 2 would be allowed to happen within the rules of the Grid Code. If it were allowed, who would have to make that decision, the Workgroup or Panel? Option 2 was preferred by the Subgroup, but NESO legal would have to be consulted to determine if it was legally sound.

**Consideration of other options**

The early work considered an expansion of the current data exchange methodology using spreadsheets to exchange switch level models. This option was rejected as requiring too much individual business development to both populate and consume the data on an initial basis. Funds would need to be regularly allocated to deal with changes. The Workgroup then debated if a specific power system modelling software should be selected or if a software agnostic data exchange standard should be used. It was decided that the most efficient way to exchange the enhanced data reporting requirements would be through the exchange of PSMs in CIM format.

CIM was selected to be vendor agnostic to give all parties the flexibility to develop their own business investment strategy. The Workgroup recognised that some Network Operators do not have CIM capability and that implementation would require a phased approach over several years. NESO and Network Operators have other reporting requirements in CIM format. Development of the CIM format therefore represents efficient IT expenditure and provides the opportunity to better integrate with other relevant corporate IT systems to solve multiple requirements.

**Consideration of alternatives**

During the initial stages of the proposed change, a possible alternative solution discussed by the workgroup was to:

* expand the Grid Code Planning Code (PC) obligations placed on Network Operators to include an enhanced level of planning data exchange and to retain the existing Excel Workbook format; and
* expand the PC obligations placed on the ESO to include an enhanced level of planning data exchange in an Excel Workbook format.

This solution could be implemented immediately, without the need to develop a CIM data exchange process, but was seen as highly inefficient and overly burdensome, particularly for NESO. Therefore, this was not formally raised as an alternative.

No formal alternatives have since been raised.

**Terms of Reference Discussion**

1. ***Implementation and costs***

*Initial costs were provided from NESO and can be found in Annex 5. It was agreed following Workgroup Consultation that further costing was required and the Workgroup agreed to complete a cost proforma to provide this information. This proforma was sent out to Workgroup members and received 6 responses.*

*Costs for the implementation of the CIM models and data exchange averaged around £199,000 per Network Operator. Extrapolating this number to all Network Operators gives a total year one implementation cost of £1.19M.*

*Costs for the yearly maintenance of the CIM models and data exchange averaged around £89,000 per Network Operator. Extrapolating this number to all Network Operators gives a total yearly cost of £532,000.*

*One of the reasons for the variance in costs is some parties having to purchase new software while others do not. Another reason is that some parties have to update their network models to be compatible with CIM, whereas others are already using CIM compatible models.*

1. ***Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text***

*The main focus of the subgroup has been to develop the legal text before further development with workgroup. The final legal text can be found in Annex 3.*

1. ***Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report***

*Two industry experts from Open Grid Systems were consulted during the development of GC0139 to ensure that the requirements set out were compatible with both CIM and power system modelling software that is available on the market.*

*The Workgroup acknowledged the need for ongoing engagement between network operators and NESO to facilitate trial data exchanges. This coordination would be vital for ensuring that all parties are prepared for the implementation date. There was a suggestion from Workgroup to form a new working group that would oversee this coordination post-approval.*

1. ***Be aware of and consider cross code impacts, and consider co-ordinate submission and implementations***

*Further details on considerations made by the Workgroup can be found above in ‘Consideration of the Proposer’s solution’.*

1. ***Consider EBR implications***

*The Workgroup agreed the there were no EBR implications. Respondents to the Workgroup consultation agree this to be the case.*

1. ***Consideration of any unintended consequences of effectively redefining the observability area***
2. ***Consider the Ofgem Letter of 10 January 2022***

*The Ofgem letter calls for CIM to be used as the standard method of data exchange within GB, starting with LTDS. The Workgroup has followed this mandate by using CIM and recognising the need for a CIM governance group post implementation. The Ofgem letter mentions GC0139 within its section “Further application of the CIM”*

1. ***Consider any implications of GC0117***

*Further details on considerations made by the Workgroup can be found above in ‘Consideration of the Proposer’s solution’.*

1. ***Consider any temporary governance arrangements required prior to any formal governance being in place***

*The Workgroup considered the development of a working group to facilitate the change should GC0139 be approved. It was agreed that future governance should be developed further by the British Standard Institute (BSI).*

**Workgroup Consultation Summary**

The Workgroup held their Workgroup Consultation between 17 December 2025 and 21 January 2025 and received 07 responses. The full responses and a summary of the responses can be found Annexes 7 and 8.

Following the Workgroup Consultation the subgroup and Workgroup reconvened to discuss the responses and discussed the following:

Implementation Approach

Six respondents supported the implementation approach with the following points being noted:

* Support may be required prior to implementation for parties unfamiliar with power system modelling (such as iDNOs)
* One respondent noted that the benefits of the modification are unlikely to be realised immediately after implementation

*Workgroup consideration: Some Workgroup members stated in their response that they believe the biggest barrier to the implementation is the date. Since the consultation, the PSM implementation date has been moved back a year to the 1st of January 2027. One member stated that the lack of specified CIM profiles could cause issues, the Subgroup believes this issue will be resolved by the CIM governance group.*

Legal Text

Six respondents agreed that the legal text did satisfy the intent of the modification. However, a number of legal text changes were suggested:

* PC.G was reworked to better fit current power system modelling software
* PC.G.7 was expanded to better describe Connection Points and Access Groups
* Relevant mentions of week 24 in the Grid Code outside of the Planning Code were updated
* Submission date for schedule 22 was moved to week 2
* Aggregated Energy Source and Energy Conversion Technology tables were reworked
* The submission timeline figure was reworked to be easier to understand

*Workgroup consideration: Some Workgroup members wanted greater clarification and guidance within the Legal text, which the Subgroup believes has been provided with the expansion of PC.G. Other members provided feedback using comments on the legal text. The Subgroup used these comments to improve the legal text.*

Consideration of Option 4

Six respondents agreed that Option 4 represents the best solution to providing an enhanced data exchange without a significant increase in the number of forecasting schedules exchanged. One respondent noted that they felt the Workgroup could provide better input on this.

*Workgroup consideration: The workgroup initially looked at extending the current data exchange methodology of spreadsheets to exchange switch level models. After this method was deemed inefficient, the Workgroup then had to decide on going down a specified software route or a software agnostic data exchange like Common Information Model (CIM). The Workgroup and Proposer showed preference for a minimum number of CIM files Augmented with GSP Schedules to reflect all forecast scenarios.*

Adoption of GSR029 Definitions

Five respondents agreed that the risk of PC annual exchanges not being aligned with the existing SQSS requirements was minimal, and that these could be managed on an ad-hoc basis. One respondent was unsure and one did not agree.

* Workgroup agreed that there was interaction between GSR029 definitions and GC0139 but felt that this should not delay progress.
* Discussion took place with the proposer of GSR029 and it was agreed that the progress of each modification would be considered and that the definitions for Gross Demand, Group Demand, Latent Demand, Measured Demand, Embedded Power Station Export, and Embedded Power Station Import should be aligned.

*Workgroup consideration: The Workgroup agreed that as long as the definitions were aligned this should not impact progress of GC0139.*

Annual Planning Data exchange

Respondents considered the position of the Workgroup to be that this modification proposal relates to annual planning data exchanges only. The provision of data to support a new connection (PC.4) will remain unchanged and not directly supported with CIM models. This is because the data requirements within PC.4 are not covered by CGMES v3 and would require significant extensions not justified by the benefits. All seven respondents agreed with this approach.

*Workgroup consideration: Some Workgroup members stated that majorly altering PC.4 would be considered scope creep for GC0139.*

Delivery Timescales

Six respondents did not believe that the delivery timescale of January 2026 to transition to a CIM data exchange methodology was reasonable and practically achievable. Since the Workgroup Consultation, the PSM Implementation Date has been altered to January 2027, and could be altered further if the relevant parties are not able to meet the PSM Implementation Date.

*Workgroup consideration: Workgroup members stated that the alteration of PSM Implementation Date would allow software vendors, Network Operators, and NESO to better prepare for implementation. Workgroup members also expressed concern about beginning implementation without a GB CIM governance group.*

Implementation Costs

Six respondents envisaged that there would be costs incurred to implement the proposal over and above any changes associated with implementing other CIM data exchanges and those associated with the existing data exchanges. One respondent felt that this was possibly the case.

Respondents felt that these costs would relate to software and staff upskilling/additional labour and process changes. To collect data on this subject a cost proforma was created and shared with the Workgroup, as can be seen in Terms of Reference a, and annex 5.

*Workgroup consideration: Some Workgroup members asked for more detail on implementation costs. A cost proforma was created and shared with the Workgroup, which received 6 responses. Workgroup members believe that extra costs will be incurred during the updating of network models and the trialling of data exchanges.*

Legal Text

The legal text for this change can be found in Annex 3.

What is the impact of this change?

|  |  |
| --- | --- |
| Proposer’s assessment against Grid Code Objectives | |
| **Relevant Objective** | **Identified impact** |
| (a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity | Positive  Reduces the time necessary to interpret data exchanges into working models and allows more detailed models than current methods allow. |
| (b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity); | Positive  Accurate network models and alignment with Evaluation of Transmission Impact (ETI) will enable efficient offers for generation and demand connections. |
| (c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole; | Positive  Enables more detailed models than current methods allow which should enable the system operator to reduce uncertainty. |
| (d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and | Positive  Enables a more efficient exchange of information between licensees. |
| (e) To promote efficiency in the implementation and administration of the Grid Code arrangements | Neutral  Implementation and administration of the Grid Code arrangements will remain unchanged by these proposals. |

## Workgroup Vote

The Workgroup met on XX XXXXX to carry out their Workgroup Vote. The full Workgroup Vote can be found in Annex 11?. The table below provides a summary of the Workgroup Members view on the best option to implement this change.

For reference the Applicable Grid Code Objectives are:

1. *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
2. *Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);*
3. *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;*
4. *To efficiently discharge the obligations imposed upon the licensee by this license\* and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and*
5. *To promote efficiency in the implementation and administration of the Grid Code arrangements*

*\* See Electricity System Operator Licence*

The Workgroup concluded unanimously/by majority that the Original and WACMX/WAGCMX/ASMX better facilitated the Applicable Objectives than the Baseline.

|  |  |
| --- | --- |
| **Option** | **Number of voters that voted this option as better than the Baseline** |
| Original |  |
| WACMX/WAGCMX/ASMX |  |
| WACMX/WAGCMX/ASMX |  |

When will this change take place?

**Implementation date**

It is proposed to implement the modification within 10 working days following approval by the Authority, with the new obligations taking effect from 1 January 2027.

**Date decision required by**

[*Same as previous report stage unless there have been any changes]*

**Implementation approach**

This modification proposal specifies that the enhanced data provision is triggered for the whole Distribution Licence area when an Appendix G to the BCA is established for one GSP within that Distribution Licence area.

Interactions

[

|  |  |  |  |
| --- | --- | --- | --- |
| ​​☒​CUSC | ​​☐​BSC | ​​☒​STC | ​​☒SQSS |
| ​​☐​European Network Codes | ​​☐​ EBR Article 18 T&Cs1 | ​​☒​Other modifications | ​​☒​Other |

Impacted parties are NESO, Transmission Owners and all Network Operators

STC

There may need to be consequential changes made to the STC following this modification.  It is therefore proposed that any change arising from this Grid Code modification will have to be acknowledged within STCP 22-1 Production of Models for GB System Planning.

With TOs not being bound by the GC a change to ensure that the annual site compliance process, known as BO7, a requirement in the STC is needed.

Notification to the STC Panel so that the necessary consequential changes can be made.

CUSC

Consideration was given to the following three CUSC modifications which have now concluded:

* [CMP298: Updating the Statement of Works process to facilitate aggregated assessment of relevant and collectively relevant embedded generation](https://www.neso.energy/industry-information/codes/cusc/modifications/cmp298-updating-statement-works-process-facilitate-aggregated-assessment-relevant-and-collectively-relevant-embedded-generation)

Grid Code

* [GC0117: Improving transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of Power Station requirements](https://www.neso.energy/industry-information/codes/gc/modifications/gc0117-improving-transparency-and-consistency-access-arrangements-across-gb-creation-pan-gb-commonality-power-station-requirements)

SQSS

* [GSR029: Review of Demand Connection Criteria to Align with EREC P2/7](https://www.neso.energy/industry-information/codes/sqss/modifications/gsr029-review-demand-connection-criteria-align-erec-p27) - Various Demand definitions

Other

* Distribution Standard Licence Condition 25 (SLC25) requires Network Operators to publish a Long Term Development Statement inclusive of PSM in CIM format.

Acronyms, key terms and reference material

|  |  |
| --- | --- |
| **Acronym / key term** | **Meaning** |
| BSC | Balancing and Settlement Code |
| BSI | British Standard Institute |
| BSP | Balancing Service Provider |
| BCA | Bilateral Connection Agreement |
| CGEMS | Common Grid Model Exchange Standards |
| CIM | Common Information Model |
| CUSC | Connection and Use of System Code |
| CMP | CUSC Modification Proposal |
| DDSG | Data and Digital Steering Group |
| DRC | Data Registration Code |
| DER | Distributed Energy Resource |
| DNO | Distribution Network Operator |
| EBR | Electricity Balancing Guideline |
| EREC | Engineering Recommendation |
| ETI | Evaluation of Transmission Impact |
| GB | Great Britain |
| GC | Grid Code |
| GSP | Grid Supply Point |
| HVDC | High Voltage Direct Current |
| IEC | International Electrotechnical Commission |
| LTDS | Long Term Development Statements |
| NETS | National Electricity Transmission System |
| NESO | National Energy System Operator |
| OGS | Open Grid Systems |
| PC | Planning Code |
| PSDM | Power System Difference Model |
| PSM | Power System Model |
| SQSS | Security and Quality of Supply Standards |
| SSH | Steady State Hypothesis |
| STC | System Operator Transmission Owner Code |
| T&Cs | Terms and Conditions |
| TO | Transmission Owner |

**Reference material**

* Open Networks Workstream 1B Product 4 report: Data Exchange in Planning Timescales; Data Scope – [Final Report](https://www.energynetworks.org/assets/images/Resource%20library/ON19-WS1B-P4%20Data%20Scope%20-%20Final%20Report%20(PUBLISHED).pdf?1718889330) (22 pages)
* Enhanced Schedule 11 ([Excel workbook with 5 spreadsheets](https://www.energynetworks.org/publications/on19-ws1b-p4-enhanced-schedule-11))
* Schedule 5 – Enhanced Node Data V2 ([Excel workbook with 4 spreadsheets](https://www.energynetworks.org/publications/on19-ws1b-p4-schedule-5-enhanced-node-data))
* [Ofgem Open Letter - The Common Information Model (CIM) regulatory approach and the Long Term Development Statement](mailto:https://www.ofgem.gov.uk/publications/common-information-model-cim-regulatory-approach-and-long-term-development-statement) ([10 January 2022](https://www.ofgem.gov.uk/publications/common-information-model-cim-regulatory-approach-and-long-term-development-statement))

Annexes

|  |  |
| --- | --- |
| **Annex** | **Information** |
| Annex 1 | Proposal form |
| Annex 2 | Terms of reference |
| Annex 3 | Draft Legal Text |
| Annex 4 | GC0139 Consultation Presentation Slides |
| Annex 5 | GC0139 NESO Costs and Implementation |
| Annex 6 | GC0139 Data Exchange Option |
| Annex 7 | GC0139 Workgroup Consultation responses |
| Annex 8 | GC0139 Workgroup Consultation summary |
| Annex 9 | GC0139 DRC Schedules |
| Annex 10 | GC0139 SOGL Explanation |
| Annex XX | [Mod number] Workgroup Vote |
| Annex XX | [Mod number] Workgroup Attendance Record |
| Annex XX | [Mod number] Workgroup Action Log |

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