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Form of Long Term Development Statement

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Form of Long Term Development Statement

The Long Term Development Statement (the "Statement") has six constituent parts:

- Introductory Section
- Summary Information
- Detailed Information
- Development Proposals
- Grid Modelling
- Capacity Heatmaps

Each part is described in a section below.

The complete set of Annexes and Appendices associated with this Form of Statement is available at: https://www.ofgem.gov.uk/publications/formal-consultation-form-long-term-development-statement

1 Introductory Section

This is a stand-alone section that is part of the Statement. It will be published on the licensee's website without the need for registration of user details and be provided free of charge to people in hardcopy on request. It contains sufficient information to enable any person to understand the scope of the information contained within the Statement and to assess whether it would be of use to them.

It includes the following content:

1.1 Purpose of the Statement

This explains the purpose of the Statement, consistent with standard condition 25 of the electricity distribution licence, which includes:

- Improving availability of distribution network information
- Furnishing developers with sufficient information to carry out initial assessments on network capability
- Informing users of development proposals for the distribution network
- Informing members of the public of the correct point of contact within distribution companies for specific enquiries

1.2 Content of the Statement

This overviews the content of each of the other sections of the Statement, as follows:

1.2.1 Summary Information Section Content

This explains that the content provided in the Summary Information section of licensee's Statement includes:

- High level information relating to the design and operation of all voltage levels of the distribution network
- Small scale geographic plan(s) providing an overview of the 132kV networks (except in Scotland), Extra High Voltage (EHV) networks and substations
- Sources of supplemental information and how it can be obtained

1.2.2 Detailed Information Section Content

This explains that the content provided by the Detailed Information section of the licensee's Statement includes:

- Schematic diagrams detailing normal operating configurations of the distribution network
- Tables of data related to various grid components

It further states that detailed information is provided for 132kV networks (EHV in Scotland) to the lower voltage busbars of primary substations but includes details of any interconnectors at lower voltages that are needed to assess the capability of the higher voltage networks.

1.2.3 Development Proposals Section Content

This explains that the content provided by the Development Proposals section of the licensee's Statement includes:

- Information on future network development proposals (where finance has been secured) and their impacts on the distribution network
- Summary details of licensee design policies and practices related to connections to assist a user in assessing potential future development of the distribution network.

1.2.4 Grid Modelling Section Content

This explains that the content provided by the Grid Modelling section of the licensee's Statement comprises grid models expressed in the Common Information Model (CIM) which are sufficient to support steady state power flow calculations and also include:

- Schematic and geographic diagram layouts
- Bus-level information like
    - firm capacities
    - fault levels
    - projected peak loadings

- connection interest/activity
- Descriptions of future firm development projects

1.2.5 Capacity Heatmaps Section Content

This explains that the content provided by the Capacity Heatmaps section of the licensee's Statement is intended to support end users to perform automated analysis of pre-computed capacity data using common data analytics and office software. It explains that this data must be defined in a standard structure and JavaScript Object Notation (JSON) serialisation format that includes:

- Capacity Heatmap dataset(s) containing substation generation and demand capacity data
- Location data for substations in latitude/longitude
- Optional data elements including circuits, transformers, individual or aggregated generator, demand, and storage data, and definitions of substation restrictions
- Metadata for each data set including when it was created, the area covered, the validity period

1.3 Contact Point within the Distribution Company for Further Information/Feedback

This provides details of the contact point within the distribution company to:

- Discuss a specific enquiry relating to a new connection to the distribution network
- Discuss a specific enquiry relating to an existing connection to the distribution network
- Request further information/clarity relating to the data contained in the Statement, and
- Provide feedback on any aspect of the Statement.

1.4 Relationship to Other Information Sources

This provides links to other related information sources, including:

- The Distributed Generation Connection Guide
- The Guaranteed Standards for the provision of budget estimates and formal quotations for distributed generation connections
- Guidance on the process for requesting network data additional to that contained in the Statement.

2 Summary Information

This section includes information about:

- Design philosophies and practices
- Engineering recommendations and standards (references to information sources)
- High level summary of the structure of and design policies applied to the lower voltage networks (20kV and below)
- General network characteristics including descriptions of:
  - Standard plant and equipment sizes used
  - Harmonics (design standards and areas where harmonic levels are known to be an issue)
  - Methods of earthing used on different voltage levels or regions
  - Protection systems used
  - Network automation (existing usage and strategy for extension)
  - Use of auto-reclosers (design policy and preferred settings)
  - Operating voltages (target and bandwidth) for each voltage level of the distribution network
  - Use of line drop compensation
  - Load management areas
  - Areas where constraints or other restrictions are used to maximise network utilisation
- Standard methods and approaches used to determine several types of grid model data required by the Grid Modelling section. These include:
  - The standard approaches used to calculate circuit-related amp limits and transformer apparent power limits
  - The standard approach used to determine firm capacity at a bus group level, including the types and grid location (transmission or distribution) of limiting and mitigating factors considered. Limiting and mitigating factors expected to be reflected in firm capacity values include: thermal limits, fault levels, operational strategies (like Active Network Management), use of novel grid technologies, and curtailment arrangements.
  - The typical process followed and the factors considered in determining future non-coincident maximum loadings on bus groups.
  - The method used to calculate fault currents (including a description of the application of engineering recommendation G74). Calculated fault currents should include all relevant contributions from synchronous and induction machines as well as other parts of the distribution network and other connected networks (transmission and distribution).

Additional information for individual limits, firm capacities, loadings and fault currents whose derivation deviated from the standard method or approach is to be provided in the .description attribute of the appropriate grid model object. Details on the specific objects to be used are provided in *LTDS Grid Modelling Annex 1 – Grid Modelling Guidelines*.

- The approximate locations of 132kV and EHV circuits and substations, which are shown on geographic plan(s) of sufficient scale to allow a user to identify if there is network at these voltage levels in an area.
- Other sources of network and charging information published by the distribution company including competition in connections information (references to other sources of information are sufficient, provided that the method of obtaining the information is clearly identified).
- How other information, related to information in this Statement, can be made available for a specified part of the distribution network on request. The main categories of this information include:
  - Load – Details of the limitation on the firm capacity of a substation
  - Fault level – Details of each contribution to fault current at a node
    - Calculated level of rms break currents decremented to the expected protection operation time
    - Details of the limitation on the fault level rating at one or more specified nodes
    - Indicative cost of relieving the limitation and the resulting increase in fault level headroom

  The procedure for obtaining this information, which requires the:
  - Person making the request to define the specific:
    - Areas of interest including details of the substation group and the substation or busbar node names
    - Information required (selected from the options provided in the Statement)
  - Distribution company to define the:
    - Contact point for information requests
    - Timescales for providing information
    - Cost for providing additional information
    - Format in which the information will be provided (tabular or narrative)
- Any transmission or distribution networks connected to the distribution network detailed in the Statement (with interface points clearly identified), together with a contact point within other companies for information (a website address/or company name and head office address is sufficient).

3 Detailed Information

This section contains details of the 132kV networks (EHV in Scotland) to the lower voltage busbars of primary substations (including details of any interconnectors at lower voltages that are needed to assess the capability of the higher voltage networks).

3.1 Schematic Diagrams

Schematic diagrams shall be provided of sufficient scale and clarity to assist a user in interpreting and using the detailed network information. As a minimum, the nomenclature relating to substations on the schematic diagrams shall be consistent with that used in the relevant accompanying data tables. Normal open points shall be clearly indicated on all schematic diagrams and where named must also use consistent nomenclature on both diagrams and tables.

3.2 Tables

Information is provided for:

- Circuits (Table 1)
- Transformers (Table 2)
- Load (Table 3)
- Fault level (Table 4)
- Generation (connected and connection offers accepted, table 5)

Table 1 – Circuit Data

S/S Group	S/S or Busbar Name		Operating Voltage	Positive Sequence Impedance		Susceptance	Rating Information	Circuit Length
	Node 1	Node 2		R	X	B		
			kV	% on 100 MVA base			Amps or MVA	km
				Note 3		Note 4	Note 5	Note 6

Notes

1 Data should be clearly linked with transformer data, loading information and network schematic diagrams contained within the Statement.

2 100 MVA is suggested as a convenient base for impedance data.

3 If X and R values are not stored separately within the licensee's distribution network model then an X/R ratio is an acceptable replacement for the X and R fields in this table.

4 Susceptance information should be included for 132kV networks and available on request at other voltage levels.

5 Rating information that is used by the licensee should be provided together with any explanatory note required to assist a user to interpret the information.

6 Details of circuit length should be included in this table or clearly marked on schematic diagrams unless this information can be estimated by the user from the geographic plans within the Statement.

Table 2 – Transformer Data

S/S Group	S/S or Busbar Name				Vector Group	Positive Sequence Impedance		Zero Sequence Reactance	Tap		Transformer Rating	Reverse Power Capability	Method of Earthing
	Node 1	Voltage	Node 2	Voltage		R	X	X	Minimum	Maximum			
		kV		kV		% on 100 MVA base			%	%	MVA	MVA	
							Note 2	Note 3	Note 4			Note 5	

Notes

1 Data should be clearly linked with circuit data, loading information and network schematic diagrams contained within the Statement

2 100 MVA is suggested as a convenient base for impedance data.

3 Zero sequence reactances should be included for 132kV networks and available on request at other voltage levels

4 The tapping range can be expressed as a percentage provided that the voltage base is clearly defined.

5 If the reverse power capability of a transformer has not been assessed, this should be shown as "NOT KNOWN" in this table

6 This table should be supplemented by narrative that provides a clear explanation of the characteristics and model of any non-standard items of plant

Table 3 – Load Information

S/S Group	S/S or Busbar Name	Voltage Level	Maximum Load of Previous Year		Forecast Load Information					Firm Capacity of S/S	Maximum Load Scaling Factor
		kV	Note 2	Note 2	Year 1	Year 2	Year 3	Year 4	Year 5		
			Notes 3 and 5	Notes 4 and 5	Note 6					Note 7	Note 8

Notes
1 Data should be clearly linked with network schematic diagrams
2 Maximum load information for the previous year would be detailed as a description of the existing system
3 Unit of measurement (MW or MVA) should be clearly defined (either is acceptable)
4 Reactive power requirement of the network can be recorded as reactive power demand (MVArs) or quoted as a power factor
5 Estimated values should be clearly identified within the table or by a generic statement
6 Forecast load information (define unit as MW or MVA) for five years should be provided. Where this applies to a single customer, then the distribution code submission (or equivalent) from the customer should be used.
7 A clear definition of firm capacity should be provided
8 Minimum load scaling factor can be defined within the table or by a generic statement

Table 4 – Fault Level Information

S/S Group	S/S or Busbar Name	Voltage Level	System Impedance		Existing System Fault Currents		Rating	
			R	X	Peak Make	rms Break	Make	Break
		kV	% on 100 MVA base				kA	kA
			Note 2	Note 2	Note 3	Notes 3 and 4		
			Notes 5 and 6					

Notes

1 Data should be clearly linked with network schematic diagrams contained within the Statement.

2 100 MVA is suggested as a convenient base for impedance data.

3 Calculated fault currents should include all relevant contributions from synchronous and induction machines as well as other parts of the distribution network and other connected networks (transmission and distribution). A clear definition of the method used to calculate fault currents (including a description of the application of engineering recommendation G74) should be provided in this or the summary information section.

4 The undecremented rms break current may be provided (as long as clearly defined with accompanying explanatory note)

5 Three phase fault level information should be provided for nodes with switchgear installed.

6 Single phase fault level information should be provided for nodes with switchgear installed where single phase faults are more onerous than three phase faults.

Table 5 – Generation

S/S Group (Grid Supply Point)	Supply Point	Primary Substation	Connection Voltage (kV)	Installed Capacity	Fuel Type	Connected / Accepted
Note 1	Note 1	Note 1	Note 4	Notes 2 and 3	Notes 4 and 5	Note 6

Notes

1 Nomenclature used for substation names shall clearly align with that on the schematic diagrams.

2 1 MVA is suggested as the minimum installed capacity for inclusion in the table.

3 Unit of installed capacity (MW or MVA) should be clearly defined (either is acceptable)

4 Generation may be aggregated by connection voltage and fuel type for any one particular substation.

5 Fuel type is split by the following categories:

- Onshore Wind (>=1MW)
- Offshore Wind (>=1MW)
- Tidal stream & wave power (>=1MW)
- Biomass & energy crops (not CHP) (>=1MW)
- Waste incineration (not CHP) (>=1MW)
- Photovoltaic (>=1MW)
- Small CHP (>=1MW, <5MW)
- Medium CHP (>=5MW, <50MW)
- Large CHP (>=50MW)
- Other generation (>=1MW)

6 A statement of whether the generation is already "connected" or "accepted" i.e. a connection offer has been accepted, but the generator is not yet connected.

3.3 Decommissioned Assets

This document will also highlight where assets included in the previous year's Statement have been decommissioned. This can be achieved either using Tables 1, 2 and 5 of the Detailed Information and/or by providing this information in the Development Proposals section.

4 Development Proposals

4.1 Development Proposal Detail

For development proposals on the network described in the detailed information section of the Statement, where finance has been secured (either within the company or from a third party) and as such the proposal can be viewed as firm, the following details shall be included in the Statement:

- Area of the network affected
- Outline of the planned works
- Reason for carrying out the works
- Expected timescale
- Expected impact on distribution network capability (including details of any network capability limitation that is relieved)

In order to assist users of the Statement in understanding whether or not a development proposal may impact on their plans, all firm development proposals shall be grouped by grid supply point.

Detailed information of planned additions to the network is provided, where available, in line with Tables 1 to 5, so that the user can make an assessment of future opportunities on the distribution network.

4.2 Network Capability Limitations and Development Practices

An overview of the areas of the network that are expected to reach or exceed their capability within five years of the date of publication of the information shall be provided. A summary of capability limitations expected to be relieved within the next five years by various firm development proposals shall also be provided.

The design policies and practices that are used by the licensee to assess the distribution network and identify likely options for its development shall be described. This includes a description of the process for managing network development at interface points with other transmission and distribution networks.

A user should have sufficient information to make a reasonable assessment of likely developments on the distribution network, using the detailed information within the Statement about the current network and the firm development proposals.

4.3 Interest in Connections

A high level summary of interest in demand and generation connections to parts of the distribution network described in the detailed information section shall be provided (Table 6). This summary will be a snapshot of activity on a particular date that is clearly stated in the Statement. A table is required for each substation group defined in the Detailed Information section. This is likely to be at the main interface points between the 132kV and EHV distribution networks (interface with transmission network in Scotland) or other similarly sized defined parts of the distribution network.

Table 6 – Table of interest in a connection

Grid supply point	Supply point	Primary substation	Proposed connection voltage (kV)		DEMAND		GENERATION	
					Number received in previous year		Number received in previous year	
					Total Number	Total Capacity	Total Number	Total Capacity
Note 1	Note 1	Note 1	Note 3			Note 2		Note 2
				Connection offers accepted by customer				
				Connection offers made (not yet accepted by customer)				
				Budget estimates provided				

Notes
1 Nomenclature used for substation names shall clearly align with that on the schematic diagrams.
2 1MVA is suggested as the minimum installed capacity for inclusion in the table.
3 Generation may be aggregated by connection voltage

This should inform the user of the Statement of the level of interest in each area of the network and will assist in the analysis of future opportunities on the distribution network.

5 Grid Modelling

5.1 Overview

The Statement shall be supported by the provision of LTDS grid model data that:

- Enables the use of steady state network analysis studies of portions of the GB distribution grid, both within and across licence areas, to evaluate potential grid connection requests; and
- Provides supplemental information that can be used in conjunction with study results to further refine the evaluation of potential connection requests.

The goal is to provide grid model data sufficient to calculate power flow. Modelling of grid components is required at a level of detail sufficient to be able to apply control or switching actions and study variants.

5.2 CIM Grid Modelling

The LTDS requires grid model data to be published in Common Information Model (CIM) form. CIM is an information model which describes an industry-wide (i.e., common) way to structure electric utility data. Data sharing solutions can be designed and implemented based on the CIM and such solutions are aided significantly by the large number of standards, artefacts, tools, and practices that have been developed based on the CIM. Data exchanges (both standard and local) are defined using the CIM information model. This allows data shared among software tools to have a common meaning across multiple exchanges. Data sharing implementations (like LTDS) leverage CIM-based data exchange definitions to design and build data sharing solutions that facilitate automation and enable software interoperability.

In this Form of Statement, the acronym CIM is used frequently. If CIM appears in a description, it simply means that what's being described leverages some part of the structure expressed by the underlying CIM information model.

The CIM forms the basis of the IEC 61970 family of standards. The LTDS grid model definition leverages the information model described in IEC 61970-301 and profile standards known as the Common Grid Model Exchange Standard (CGMES) described in IEC 61970-600-1 and -2. Where LTDS required data is not supported by the IEC data exchange standards, extensions/deviations are defined in order to clearly specify LTDS data exchange requirements.

CIM-based data provision relies on two major organising constructs. One supports the division of grid model data by type, the other enables grid data to be expressed as either a snapshot or as a collection of changes.

Types of CIM Data

The CIM information model defines a very comprehensive set of grid model data. To enable the exchange and management of grid model data, CIM profile standards divide the grid model data which appears in CIM-based data exchanges into three main types:

- Physical data, which provides information about the behaviour, connectivity, and geographic location of the equipment that makes up the electrical system
- Situation data, which describes a grid operating state
- Solution data, which describes the output resulting from a successful power flow execution

A fourth type of data defined by the CIM profile standards is Diagram Layout data, which describes the layout of diagrams displaying CIM data objects. And LTDS adds a fifth type of data (referred to as System Capacity data), which describes bus level system characteristics, like capacities, loadings and fault levels.

The types of CIM grid model data are further subdivided by profile:

- Physical data is made up of:
  - Equipment (EQ) profile data
  - ShortCircuit (SC) profile data
  - GeographicalLocation (GL) profile data
- Situation data is made up of:
  - SteadyStateHypothesis (SSH) profile data
- Solution data is made up of:
  - Topology (TP) profile data
  - StateVariables (SV) profile data
- Diagram data is made of up of:
  - DiagramLayout (DL) profile data
- System Capacity data is made up of:
  - SystemCapacity (SYSCAP) profile data

These profiles are used to describe the content of the CIM-based grid model data exchanges overviewed in 5.3.

Full Models and Difference Models

CIM-based grid model data exchanges are expressed either as a snapshot (which is called a Full Model) or as collection of changes (which is called a Difference Model). A Full Model describes a specific portion of the grid (like a licence area) and is made up of a set of CIM grid objects with properties which conform to a specific profile or profiles. A Difference

Model is a collection of changes that can be applied to a Full Model. Difference Models are most frequently used to describe changes to Physical data resulting from grid construction projects.

5 .3 LTDS in CIM

The Statement requires CIM-based descriptions of the licensee's grid be provided which reflect both the grid as it exists and as it will exist in the future.
The set of required data which reflects the licensee's existing grid includes:

- Several solved cases, each comprised of a set of Full Models containing data of these types: Physical, Situation, Solution, and Diagram. These cases provide both insight into license area grid capabilities under specific operational conditions and evidence of the quality of the grid modelling.
- A set of Full Models containing Physical data and System Capacity data, which together describe the following at a bus level:
  - The capacity and characteristics of the existing grid (firm capacities, non-coincident loadings, fault levels)
  - Counts of connection activity over a preceding period

The set of required data which reflects the licensee's expected grid over the next 5 years includes:

- For each of the next 5 future years, a set of Full Models containing Physical data and System Capacity data, which together describe the anticipated future physical grid and anticipated non-coincident bus loadings
- Difference Models of all firm future development projects anticipated to complete in the next 5 years

Two Annexes provide detail on LTDS data exchange requirements:

- LTDS Grid Modelling Annex 1 – Grid Modelling Guidelines describes the grid model data to be provided and the CIM classes, attributes and associations to be used to do so.
- LTDS Grid Modelling Annex 2 – Data Exchange Specifications describes the CIM-based data structures used to organise and publish the LTDS data exchanges.

An overview of each is given below.

LTDS Grid Modelling Annex 1 - Grid Modelling Guidelines
The Grid Modelling Guidelines document provides the detailed requirements for expressing LTDS grid model data in CIM. It specifies what distribution grid equipment is to be described by LTDS grid model data and which CIM constructs are to be used to supply and organise the data.

The topics covered by the Grid Modelling Guidelines include:

- Grid model scope. The definition of the grid scope to be represented by Grid Modelling includes from the 132kV network (EHV network in Scotland) down to the lower voltage busbars of primary substations. It also includes details of any interconnectors at lower voltages between primary substations needed to assess the capability of the higher voltage networks.
- Grid components represented. The following grid components, their electrical parameters, their connectivity, their geo-location, and their facility location, are represented:
    - Buses and bus groups
    - Switching devices
    - Circuits and their limits
    - Transformers, their controls, and their limits
    - Loads, individually or in aggregation
    - Generators, individually or in aggregation, and their grid connections
    - Compensators
- CIM representation of grid components. A variety of CIM classes and attributes are used to represent the required grid components.
- System capacities. Several types of system capacity and loading data are provided at the bus level and multiple CIM classes are used to represent them.
- Grid diagrams. Several types of diagrams (schematic, geographical) are required and a number of CIM classes are used to describe their layouts.
- Development projects. Future firm development projects are required to be represented as CIM Difference Models.

LTDS Grid Modelling Annex 2 - Data Exchange Specifications

The Data Exchange Specifications document provides detailed information and requirements related to the exchange of LTDS grid model data. The four major topics it addresses are:

- How the CIM defines data exchanges. CIM uses an underlying information model for all defined data exchanges to ensure that shared data content is uniform among data exchange definitions. It describes data exchanges in terms of profiles (which describe allowed data structure) and constraints (which describe allowed data content).
- The layered approach to data exchange definition. Both the LTDS information model and the LTDS data exchange definitions are defined in layers. The LTDS information model is described by a set of LTDS extensions to the CIM information model described in the IEC 61970-301 standards. The LTDS profiles use a set of LTDS

extension and deviation profiles that "layer" on top of the CGMES profiles. And the complete set of LTDS constraints is made up of a subset of CGMES constraints plus a set of LTDS-specific constraints.

- LTDS data exchange definitions. The LTDS data exchange defintions, which are based on the LTDS information model, are comprised of:
    - Seven sets of layered profiles (EQ, SC, GL, SSH, TP, SV, DL, SYSCAP) which are described in UML diagrams and RDFS XML and
    - Seven sets of layered SHACL constraints, one for each profile
- The serialisation approach and conventions used in the provision of LTDS grid model data in CIM.

6 Capacity Heatmaps

6.1 Overview

The Statement shall be supported by the provision of capacity heatmap data supplied in accordance with a set of requirements and a data standard, separate, but complementary to those of the Grid Modelling section. This capacity heatmap data shall:

- Allow end users to assess generation and demand capacity on distribution networks
- Support the display of capacity data geographically

The capacity heatmaps data complements the Grid Modelling data defined in the previous section, supporting use-cases that do not require electrical network analysis techniques such as power-flow, state estimation, or short-circuit analysis. This data is intended for users performing data analytics focussed on the pre-computed capacity values and geographical data.

6.2 Data Structure

A minimum standard data structure and serialisation format is defined for capacity heatmaps data. This standard is intended to support:

- The rendering of capacity information on a geographical display as a heatmap, choropleth, or similar visualisation format
- Manual or automated assessment of substation and circuit capacity using data analytic techniques

The data structure is described in *Capacity Heatmaps Appendix 1: Information Model,* which includes:

- A class diagram defining the data elements agnostic of any one serialisation format. The data element definitions link to the Grid Modelling CIM definitions and re-use definition and data types where applicable.
- A definition of the data elements, their properties, datatypes, multiplicities, required/optional status, and documentation.

A machine readable version of the API definition is provided in *Capacity Heatmaps Appendix 2: Open API*.

7 General Statement Requirements

7.1 File Format

The constituent parts making up the Statement shall be published in the following formats suitable for use by other parties.

Introductory Section and Summary Information

- These sections are to be provided in Adobe PDF format.

Detailed Information

- This section is to be provided in Adobe PDF format with **all** accompanying data tables provided in Microsoft Excel.

Development Proposals

- This section is to be provided in Adobe PDF format with any required data tables provided in Microsoft Excel.

Grid Modelling

- The grid model data called for in the Grid Modelling section are to be provided in CIM XML form as described by *LTDS Grid Modelling Annex 1: Grid Modelling Guidelines* and *LTDS Grid Modelling Annex 2: Data Exchange Specifications*.

Capacity Heatmaps

- The capacity heatmaps data called for in the Capacity Heatmaps section are to be provided in a JSON format that complies with the data structure documented in *Capacity Heatmaps Appendix 1: Information Model*.

7.2 Frequency of Update and Availability

All sections of the Statement, other than the Introductory Section, shall be made available on the licensee's website following registration of user details.

Introductory Section and Summary Information

These sections of the Statement and their accompanying data shall be refreshed with the latest licensee's data annually and published on or before the 30th of November annually. The November publication will, wherever possible, keep to the same format as the previous year's so as to aid the user in their identification of any changes that may affect them. Changes of significance shall be highlighted.

Detailed Information

This section of the Statement and its accompanying data shall be refreshed with the latest licensee's data annually and published on or before the 30th of November annually. The November publication of the Statement will, wherever possible, keep to the same format as the previous year's Statement so as to aid the user in their identification of any changes

that may affect them. Wherever a data entry has been changed or added, this shall be highlighted.

Development Proposals - Development Proposal Detail subsection and Interest in Connections subsection

These subsections of the Statement and their accompanying data shall be refreshed with the latest licensee's data annually and published on or before the 30th of November annually.

In addition to the November publication, the Statement shall be supplemented with updates to the licensee's firm development proposals and generation data on or before the 31th of May annually. This supplement shall include the following details:

- Area of the network affected
- Outline of the planned works
- Reason for carrying out the works
- Expected timescale
- Expected impact on distribution network capability (including details of any network capability limitation that is relieved)

Detailed information of planned changes and additions to the network is to be provided, where available, in a format consistent with Tables 1 to 5 of the detailed information. This allows users to update the full data set published in November and make an assessment of future connection opportunities on the distribution network. For the avoidance of doubt the tables themselves in the November document will not be updated for the May supplement but Table 6 will be updated and published as part of the May update.

The November publication of the Statement will, wherever possible, keep to the same format as the previous year's Statement so as to aid the user in their identification of any changes that may affect them. Wherever a data entry has been changed or added, this shall be highlighted.

In order to assist users of the Statement in understanding whether or not a development proposal may impact on their plans, all firm development proposals shall be grouped by grid supply point.

Development Proposals - Network Capability Limitations and Development Practices subsection

This subsection of the Statement and its accompanying data shall be refreshed with the latest licensee's data annually and published on or before the 30th of November annually. The November publication will, wherever possible, keep to the same format as the previous

year's so as to aid the user in their identification of any changes that may affect them. Changes of significance shall be highlighted.

Grid Modelling and Capacity Heatmaps

These sections of the Statement are each to be refreshed and published on a bi-annual basis, on or before the 31st of May and the 30th of November annually.

7.3 Cost

The Statement will be free of charge until Ofgem decides otherwise.

8 Data Security and Confidentiality

Licensees should ensure grid model data is subjected to Open Data Triage processes as set out in Data Best Practice guidance.[1] Data provided in satisfaction of LTDS requirements must be compliant with all relevant regulations, legislation and Security, Privacy and Resilience (SPaR) requirements.

[1] Decision on Data Best Practice Guidance and Digitalisation Strategy and Action Plan Guidance | Ofgem

9 Phased Implementation Requirements

9.1 Summary

A phased implementation is planned for the new requirements of LTDS grid model data in CIM described in section 5 – Grid Modelling.

The requirements for the publication of Grid Modelling data are to be met according to the following schedule:

- November 2024 – provision of an Equipment (EQ) Model representing the existing licence area grid
- May 2025 – provision of EQ, Short Circuit (SC) and System Capacity (SYSCAP) Models representing the existing licence area grid and the future grid for each of the next 5 years
- November 2025 – provision of complete Grid Modelling data, including:
  - Solved historic cases
  - Geospatial Location (GL) Models
  - Difference Models for all firm development projects.

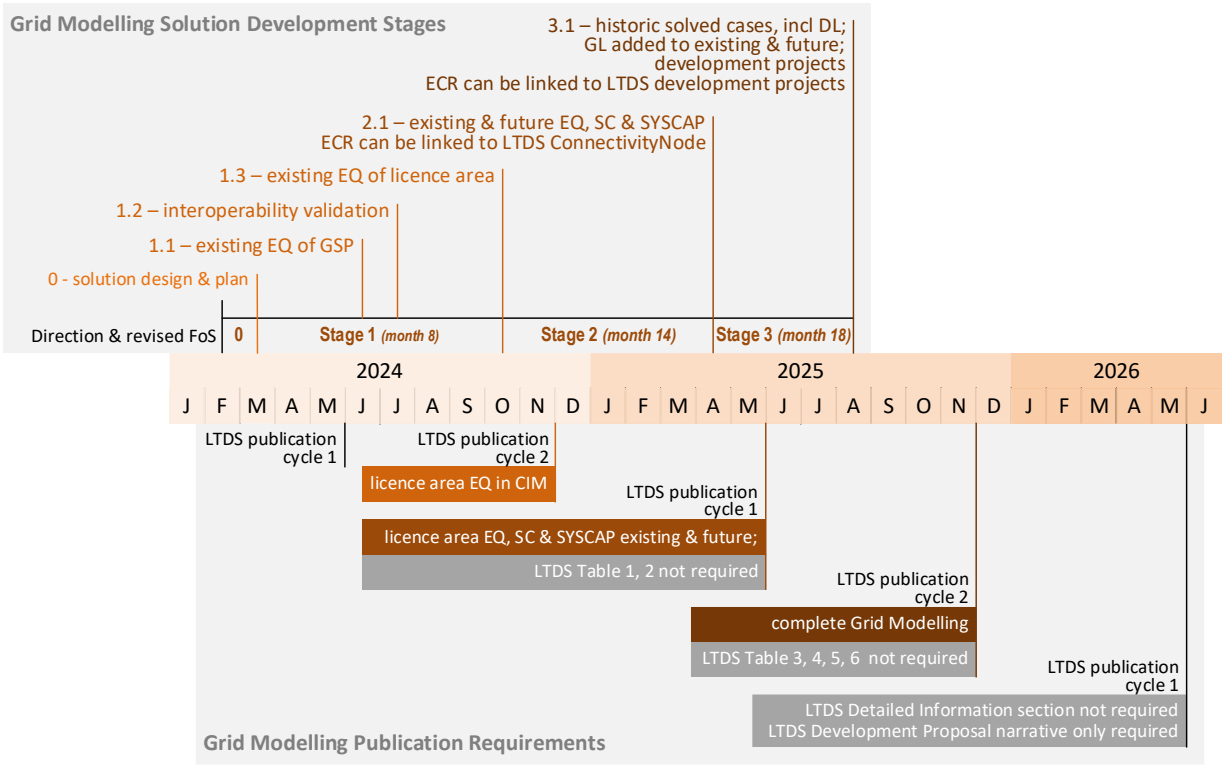
9.2 Solution Development Stages

The schedule of Grid Modelling publication requirements outlined above is supported by a series of Solution Development Stages. Each Stage has a deadline by which a result is to be produced:

Stage	Deadline	Grid Modelling Data Result
Stage 0	15 March, 2024	A solution design and a plan outlining the solution implementation activities of each Stage
Stage 1		
1.1	15 June, 2024	An Equipment (EQ) Model representing the existing grid of a single GSP
1.2	15 July, 2024	Interoperability validation of the GSP EQ Model
1.3	15 October, 2024	An Equipment (EQ) Model representing the existing grid of the entire licence area
Stage 2	15 April, 2025	EQ, Short Circuit (SC) and System Capacity (SYSCAP) Models representing the existing licence area grid and the future grid for each of the next 5 years
Stage 3	15 August, 2025	Solved cases; Geospatial Location (GL) Models for the existing licence area grid and the future grid for each of the next 5 years; licensee grid development projects as Difference Models

It is expected that licensees will implement solutions capable of producing the required Grid Modelling data by the Stage deadline. The time period between the Stage deadline and the required publication date outlined in the preceding subsection is intended to provide an opportunity for licensees to perform interoperability validation activities either independently or in collaboration with users and/or other licensees prior to making the data public.

The Solution Development Stages and LTDS publication cycle requirements are illustrated in the diagram below:



More detail about each Solution Development Stage is provided below.

<u>Stage 0</u> – deadline is 1 month after the date of the direction issued pursuant to paragraph 25.2 of the Electricity Distribution Licence (the "Direction")

0.1 Solution design and implementation plan for Grid Modelling requirement.

The following are to be supplied to Ofgem for review:

- An overview of the licensee's solution architecture for producing LTDS in CIM data, illustrating the sources (databases, applications) from which LTDS data is supplied, the software tool(s) where data is being integrated, the system which is publishing the final LTDS in CIM data, and the automated and manual processes enabling the solution.

- A high-level implementation plan, outlining the sequence of activities to be undertaken by the licensee to produce each of the required Stage results.

Stage 1 – deadline is 8 months after the date of the Direction

1.1 Licensees produce a CIM Physical grid Model (EQ profile only) representing the existing grid of one GSP.

1.2 Interoperability validation activity.

Time is allocated on the schedule for an interoperability activity to provide early feedback to DNOs. Industry (licensees, users, tool vendors, industry associations, or others) are responsible for its organisation and execution.

The activity could be as simple as individual DNO self-tests or as comprehensive as an in-person event including licensees, tool vendors, users, and other interested parties. The latter would provide greater industry benefit and would maximise the opportunity to solidify LTDS in CIM requirements.

1.3 Licensees produce a CIM Physical grid Model (EQ profile only) representing the existing grid of the entire licence area.

To enable early interoperability validation of partial solution implementations, the EQ Models produced for Stage 1.1 can conform to any of the following:

- CGMES v3.0 (a set of SHACL constraints already exists for this EQ profile)
- CGMES v3.0 less LTDS deviations
- CGMES v3.0 less LTDS deviations and plus LTDS extensions (the LTDS EQ profile).

The EQ Model representing the licence area grid which is published for the November 2024 LTDS publication cycle must, however, conform to the LTDS EQ profile (CGMES v3.0 less LTDS deviations and plus LTDS extensions).

Stage 2 – deadline is 14 months after the date of the Direction

2.1 Licensees produce the following:

- CIM Physical grid Models (EQ and SC profiles) representing the existing grid of the licence area accompanied by a SYSCAP profile Model with bus group non-coincident historic peak load, system capacity, and fault level information.
- CIM Physical grid Models (EQ and SC profiles) representing each of five future years of the licence area grid accompanied by a SYSCAP profile Model with bus group load forecasts for each year.

Note that the activities of this Stage create future Models which ensure that the LTDS ConnectivityNodes exist whose identifiers are referred to in ECR entries for accepted-to-connect generation.

Stage 3 – deadline is 18 months after the date of the Direction

3.1 Licensees produce complete LTDS in CIM grid model data, including:

- The required historic solved cases, each composed of CIM Models containing Physical data (EQ, SC and GL profiles), Diagram Layout data (DL profile), Situation data (SSH profile), and Solution data (TP and SV profiles).
- CIM Physical grid Models (with GL profiles in addition to EQ and SC) accompanying the existing and future SYSCAP profile Models.
- CIM Difference Models for all firm development projects (where finance has been secured).

Note that the activities of this Stage create Difference Models for licensee development projects whose identifiers can be used in Embedded Capacity Register (ECR) entries to indicate projects on which an accepted-to-connect generation connection depends.

9.3 Retirement of LTDS Requirements

Select requirements from three sections of the Form of Statement (1 – Introductory Section, 3 – Detailed Information, and 4 – Development Proposals) will be incrementally retired as the requirements increase for the publication of Grid Modelling data during the phased implementation period. Data will be published one time in parallel (in both the form required by other sections and in the Grid Modelling form) and then the requirements outlined in other sections will be retired.

The last publication cycle for data required by other sections is shown on the table below:

Statement Section	**Last LTDS publication cycle for which Section requirements must be met**
1.2.2 Detailed Information Section Content	November 2025
3 Detailed Information (entire section)	November 2025
3.1 Schematic Diagrams	November 2025
3.2 Tables (entire subsection)	May 2025
Table 1 and 2	November 2024
Table 3, 4, 5, and 6	May 2025
3.3 Decommissioned Assets	November 2024
4.1 Development Proposal Detail	November 2025
4.3 Interest in Connections	May 2025
7.1 File Format, Detailed Information subsection	November 2025

7.2 Frequency of Update and Availability, Detailed Information subsection	November 2025
7.2 Frequency of Update and Availability, Development Proposals - Development Proposal Detail subsection and Interest in Connections subsection	November 2025