

DISTRIBUTION CODE MODIFICATION PROPOSAL FORM

Modification Proposal submitted By: ESB Networks	DATE OF SUBMISSION OF PROPOSAL: 14-5-18	Modification Proposal Number: <i>(to be assigned by Review Panel Secretary)</i>
CONTACT DETAILS FOR MODIFICATION PROPOSAL ORIGINATOR: (IF NOT DISTRIBUTION CODE REVIEW PANEL		
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MODIFICATION PROPOSAL TITLE:	Extension of WFPS requirements to PV and other Non-Synchronous generation plus the non-retrospective reduction of the MW Controllability threshold for PPMs to 1MW.	
DISTRIBUTION CODE SECTION(S) AFFECTED BY PROPOSAL		
<ul style="list-style-type: none">• DCC6.9.1• Definitions• DCC 11		
MODIFICATION PROPOSAL DESCRIPTION <i>(Clearly state the desired amendment and all text changes. Attach further information if necessary)</i>		
DCC6.9.1: Replace Wind Generators with Power Park Modules		
To apply the bulk of the content of DCC 11 ADDITIONAL REQUIREMENTS FOR WIND GENERATION to any other form of generation, including PV, which presents to the Distribution System through an inverter.		
Specific text: [additional text in green]		
New text in CATEGORIES OF USER OF THE DISTRIBUTION SYSTEM		
Existing Customers		
Some clauses of the Distribution Code may not apply to Customers before a specified instance in time. Where applicable, the Date of Effect for such clauses are given in Figure 3-A below.		

Cohort		Date of Effect
1	Exempted from 1MW threshold for MW controllability	
2	Deemed Existing for certain EUNC Requirements for Generators provisions	
3	Deemed Existing for certain EUNC Demand Connection Code provisions	

Figure 3A. ~~Cohorts of Existing Customers~~

Changes to DCC11, which is to be re-named **ADDITIONAL REQUIREMENTS FOR POWER PARK MODULES [PPMs]**.

Within this section, the following changes to be made:

1. DCC11.1.2

Pre-existing c) Delete as no longer needed.

Re-arranged and augmented to reflect retention of pre-existing scope per re-labelled Table 6X and

New sections to reflect 1MW threshold to all other PPMs

2. Table 6: Replacement of ~~5MW~~ threshold to **1MW**, in the following rows:

DCC11.2, DCC11.3.2.3, DCC11.3.2.3, DCC11.3.2.2, DCC11.5.1.1, DCC11.5.1.2, DCC11.5.1.3, DCC11.5.1.4, DCC11.5.1.5, DCC11.5.2.1, DCC11.5.2.2

3. Removal threshold values, in the following sections:

DCC11.2

4. Table 6: Row DCC11.5.1.7 ~~2MW~~ threshold change to **1MW**. WFPS replaced by PPM in two instances in this table

5. Existing Table 6 copied and re labelled as Table 6X, for application to the newly defined

Existing Category cohort of Generators. WFPS replaced by PPM in two instances in this table.

6. DCC11.1 Replacement of “~~wind~~” with **non-synchronous Generation**

7. For signal related text, replacement of the word “~~Wind~~” with **Resource**. Occurs in the following Sections:

Table 6: Row DCC11.5.3.

DCC11.5.3

DCC11.3.2.3.1

DCC11.3.4.1

8. Global word replacements

Original text	New text
WFPS	PPM
Wind Farm	PPM
WTG	Generating Unit

9. DCC11.5.1.6 Signals List #6

Wind speed signals retained for Wind Farms Only

New Signal of Solar Irradiance for Solar Farms

Glossary and Definitions:

New text:

Cohort ~~————— A grouping of Customers to which certain Distribution Code conditions may or may not apply, particularly in the context of those Customers deemed to be Existing at a point in time.~~

Date of Effect ~~————— A date which is relevant to the determination of when a given Cohort of Customers is deemed to be Existing.~~

Existing ~~————— A PPM shall be considered to be Existing if:~~

- ~~(a) It is already connected to the Distribution System on the Date of effect for a given Cohort or~~
- ~~(b) the PPM owner has concluded a final and binding contract for the purchase of the main generating plant by two years after the Date of effect for a given Cohort. The PPM owner must notify the DSO of conclusion of the contract within 30 months after the Date of effect for a given Cohort.~~

EUNC **European Union Network Code**

Power Park Module (PPM) A unit or ensemble of units generating electricity, which is either connected to the Network non-synchronously or through power electronics, and also has a single Connection Point to the Distribution Network

Resource Following Mode A mode of Operation of a Controllable PPM where the system Frequency is within normal range and the Controllable PPM is not under Active Power Control by the TSO, allowing the Controllable

PPM to produce up to 100% of its **Available Active Power**, depending on the power-frequency curve in **Operation**. When operating on power-frequency curve 2, the **Controllable PPM** is required to maintain its **Active Power** output at a fixed percentage of its **Available Active Power** when **Transmission System Frequency** is within the range F_B - F_C .

Resource Following Ramp Rate The maximum rate of increase of **Active Power** output of a **Controllable PPM** in response to an increase in the resource of the **Generating Unit**.

Solar Farm Power Station

(SFPS)

A site containing at least one **SG**. For avoidance of doubt, a **Solar Farm Power Station** is considered to be a **Power Park Module**

Solar Generator

(SG)

A **Generating Unit** which generates electricity from photo-voltaic or other solar technology, which forms an indivisible unit for the purposes of implementation of control functions. It would typically comprise an Inverter Block, with which the **Solar Farm Power Station** controller would interact.

Changed Text:

Collector Network:

The network of cables and overhead lines within a **Controllable WFPS PPM** used to convey electricity from individual **WTG's or Generating Units** to the **Connection Point**.

~~Contiguous Wind Farm Site~~ change to **Contiguous Power Park Module Site**

Deleted Text:

~~**Wind Following Mode** — A mode of **Operation** of a **Controllable WFPS** where the system **Frequency** is within normal range and the **Controllable WFPS** is not under **Active Power Control** by the **TSO**, allowing the **Controllable WFPS** to produce up to 100% of its **Available Active Power**, depending on the power-frequency curve in **Operation**. When operating on power-frequency curve 2, the **Controllable WFPS** is required to maintain its **Active Power** output at a fixed percentage of its **Available Active Power** when **Transmission System Frequency** is within the range F_b - F_c .~~

~~**Wind Following Ramp Rate** — The maximum rate of increase of **Active Power** output of a **Controllable WFPS** in response to an increase in wind speed.~~

Schedule 1(e): extra row added.

MODIFICATION PROPOSAL JUSTIFICATION *(Clearly state the reason for the modification. Attach further information if necessary)*

The requirements stated under DCC11 are driven largely by the combined effect that large penetration of Non-Synchronous generation on the operation of the Transmission System. To date, this cohort of generation has comprised, almost exclusively of wind generation. It is now apparent that other forms of generation [most notably PV], which have an inverter between the primary source and the Connection Point, present the same technical challenges to System Operation. It is logical therefore that the same technical requirements should apply to them.

This approach is also consistent with that which will be taken upon adoption of the European Network Codes, most notably the Requirements for Generation [RfG], wherein the document structure is divided between Synchronous Generators and what are termed Power Park Modules.

Separately, the total quantum of generation connecting to the system has reached levels at which the quantum of un-controlled real power from distribution connected generation poses a threat to the stability of the power system. For that reason and for the reasons stated above with regard to the increase in solar generation connections, EirGrid deem necessary to make more of the PPM fleet MW controllable.

IMPLICATIONS OF NOT IMPLEMENTING THIS MODIFICATION

- The work to date, in mitigating and addressing the issues associated with significant penetration of Non-Synchronous generation, will be undermined by the connection of large tranches of PV and other non-wind Non-Synchronous generation.
- By default, PV and other non-wind Non-Synchronous generation, will have the same requirements as Synchronous generation
- The proportion of un-controlled real power generated from distribution connected customers, is such as to pose a material threat to the ongoing stability of the power system as a whole.

PLEASE SUBMIT MODIFICATION PROPOSALS TO THE PANEL SECRETARY BY E-MAIL TO: DistCodePanel@mail.esb.ie