

## Dynamics Model Register

This document outlines the current status of the wind turbine generator dynamic models with respect to the Planning Code Appendix of the Grid Code.

The relevant sections of the **Planning Code Appendix** (PCA4.10.1) can be found here<sup>1</sup>.

All transmission and distribution connected wind farms greater than 5 MW are required to submit with their application a dynamic model in compliance with PCA4.10.1. 2.

Wind farms which had 'live' connection offers or had signed connection agreements as of the 9<sup>th</sup> July 2004 are required by CER Direction CER/04/245 9th July 2004 to provide the dynamic model no later than 120 business days prior to their scheduled date of connection to the power system. The CER Direction CER/04/245 can be found here<sup>2</sup>.

This document lists the models that have been provided to EirGrid and assesses their compliance with the Planning Code Appendix (PCA4.10.1. 2).

Please note all dynamic models must be provided for use with PSS/E versions 29 up to version 32.

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<sup>1</sup> <http://www.eirgrid.com/EirGridPortal/uploads/Regulation and Pricing/MPID 126 Approved.pdf>

<sup>2</sup> <http://www.eirgrid.com/EirGridPortal/uploads/Regulation and Pricing/Wind Connection Policy - cer04245.pdf>

| Manufacturer    | Model                                     | MW Size (MW) | Version Number | Compliant with Grid Code (Note1) | Reason for non compliance | Remark   |
|-----------------|---|--------------|----------------|----------------------------------|---------------------------|--|
| Siemens - Bonus | 1.3 MW                                    | 1.3          | Ver_09         | ü                                |                           | Comments on this model have been sent to Siemens on 09/01/08.  |
|                 | 2.3 MW                                    | 2.3          | Ver_09         | ü                                |                           | Comments on this model have been sent to Siemens on 09/01/08.  |
|                 | 3.6 MW                                    | 3.6          | Ver_1.02a      | ü                                |                           | Comments on this model have been sent to Siemens.  |
|                 | 2.3 MW<br>(SMK213<br>82 m rotor diameter) | 2.3          | Ver_1.1        | ü                                |                           | This full converter model was received from Siemens on the 01/12/06 Some minor issues with this model have been referred to Siemens. |
|                 | 2.3 MW<br>(SMK203<br>93 m rotor diameter) | 2.3          | Ver_1.1        | ü                                |                           | This full converter model was received from Siemens on the 01/12/06 Some minor issues with this model have been referred to Siemens. |
| DeWind          | D6 1.25 MW                                | 1.25         | Ver1.2         | ü                                |                           |  |

| Manufacturer | Model           | MW Size (MW) | Version Number | Compliant with Grid Code (Note1) | Reason for non compliance | Remark                          |
|--------------|-----------------|--------------|----------------|----------------------------------|---------------------------|---------------------------------|
| DeWind       | D8<br>2 MW      | 2            | Ver1.2         | ü                                |                           |                                 |
| Enercon      | E40             | 0.6          | Ver 5.3        | ü                                |                           |                                 |
|              | E48             | 0.8          |                |                                  |                           |                                 |
|              | E66             | 2.0 /2.3     |                |                                  |                           |                                 |
|              | E70             | 2 /2.3       |                |                                  |                           |                                 |
| Enercon      | E44             | 0.9          | Ver 5.3        |                                  |                           |                                 |
| Gamesa       | G5X (G52 & G58) | 0.85         | Ver5.2         | ü                                |                           |                                 |
|              | G8X             | 2            | Ver5.3         | ü                                |                           |                                 |
| GE           | 1.5 MW          | 1.5          | Ver 4.2        | ü                                |                           | This model has not been tested. |
|              | 2.5 XL          | 2.5          | Ver4.2         | ü                                |                           | This model has not been tested. |
|              | 3.6 MW          | 3.6          | Ver 1.00       | ü                                |                           |                                 |

| Manufacturer | Model | MW Size (MW) | Version Number | Compliant with Grid Code (Note1) | Reason for non compliance | Remark  |
|--------------|-------|--------------|----------------|----------------------------------|---------------------------|---|
| Nordex       | N80   | 2.5          | Ver2.2         | ü                                |                           | Received this model version on 12/02/08.  |
|              | N90   | 2.5          | Ver1.2         | ü                                |                           | Received this model version on 12/02/08.  |
| Vestas       | V47   | 0.66         |                | ü                                |                           | New model received from PTI on 15/10/06. Some issues with this model have been referred back to PTI.        |
|              | V52   | 0.85         | Ver7.1         | ü                                |                           | Received a new model of the Vestas V52 machine from Vestas on 27/03/2009.                                   |
|              | V66   | 1.75         |                | -                                |                           | Received a new model of the Vestas V80 machine from Vestas on 27/03/2009.                                   |
|              | V80   | 2            | Ver7.1         | ü                                |                           |   |
|              | V90   | 3            | Ver7.1         | -                                |                           | EirGrid is in correspondence with Vestas. Some issues with the V90 model have been referred back to Vestas. |

## Notes:

1. Compliance with the Grid Code is assessed based on the requirements of the Planning Code Appendix (PCA.4.10.1). At present, a model can be deemed compliant with PCA4.10.1 without having fulfilled the requirements of the section titled "Validation of Model" (PCA4.10.1.3)