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Requirements for Generators RFG

Generator Banding Thresholds 3 – January 2015

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RfG – background on Generator banding

- RfG introduces the concept of generator banding, to ensure a proportionate level of response dependent on a station's installed capacity and/or connection voltage

- Banding thresholds in each synchronous area need to be agreed via public consultation and are ratified by NRA approval. Generators are required to support this activity

- Once banding thresholds become active, they cannot be adjusted for three years and do not apply retrospectively

- SOs seeking to make a change must follow the same process as agreeing the initial band thresholds

Banding Analysis

- This presentation is a follow up to a previous set of scenario analysis (Nov '14) on a fit for the GB banding thresholds

- It presents data based on:

    - a GB banding proposal from the current draft of RfG (January 2014);

    - a Central European (CE) view which may be recommended for adoption in GB (also from January '14);

    - and a banding proposal put forward by the NGET SO

- Data tables are compiled using expected trends on future users of the Distribution and Transmission system

Data Sources

- All data submissions now received (6/6 DNO organisations) – many thanks for your help!

- RIIO ED1 Price Control submissions have been used by *majority* of DNOs for Distributed Generation analysis

  - This means MW granularity to technology level is available. ***Should this be analysed too?***

- ED1 submissions present an aggregated view of projects and MW. Therefore the true deviation of project capacities is not clear:

  - ***Is a 'total' average (per technology) too simplistic?***

- 29/12/14 version TEC and Embedded Register used

Data Assumptions

- An arbitrary average project MW has been formed to allow the analysis, based on Total MW/No. of Projects

- Projects >100MW in capacity have been excluded from analysis (inevitably Type D by default)

- Connection data in all sources is limited, therefore:

    - *Projects below 100MW connecting to a Scottish TO are assumed to be at 33kV*

    - *England & Wales BEGA projects are also assumed to be connected 33kV*

- Projects which are operational or in construction are excluded – ***should this also be analysed for info?***

Reminder on banding proposals

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	Type A	Type B	Type C	Type D
GB: Jan '14 draft RfG	0.8KW-1MW	1MW-10MW	10-30MW	30MW+
CE: Jan '14 draft RfG	0.8KW-1MW	1MW-50MW	50-75MW	75MW+
GB: NGET proposal	0.8KW-1MW	1MW-30MW	30-50MW	50MW+

Project/MW summary 2015-2023: Distributed Generation

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	Type A: 0.8KW-1MW		Type B: 1-9.9MW		Type C: 10-29.9MW		Type D: 30MW+	
GB (Jan 14)	Projects	MW	Projects	MW	Projects	MW	Projects	MW
DNO TOTAL			3,792	5,924.960	50	868.326	14	750.000

			Type B: 1-49.9MW		Type C: 50-74.9MW		Type D: 75MW+	
CE (Jan 14)			Projects	MW	Projects	MW	Projects	MW
DNO TOTAL	2,287,182	22,182.483	3,842	6,793.285	0	0.000	14	750.000

			Type B: 1-29.9MW		Type C: 30-49.9MW		Type D: 50MW+	
GB (NGET Proposal)			Projects	MW	Projects	MW	Projects	MW
DNO TOTAL			3,842	6,793.285	0	0.000	14	750.000

- No. of schemes = 2,291,037; Total MW= 29,725.768

- 99.8% of projects are **Type A**

- 14 projects default to Type D due to their 132kV connection

- CE Jan '14 draft/NGET proposals have Type B ceiling so high as to leave *no Type Cs*

Project/MW summary 2015-2023: TEC/Embedded Register schemes

GB (Jan 14)	Type B: 1-9.9MW		Type C: 10-29.9MW		Type D - 30MW+	
	Projects	MW	Projects	MW	Projects	MW
TEC Reg	1	4.000	23	507.850	66	3,922.100
Embedded Reg	73	300.510	12	279.750	3	131.100
TOTAL	**74**	**304.510**	**35**	**787.600**	**69**	**4053.200**

CE (Jan 14)	Type B: 1-49.9 MW		Type C: 50-74.9 MW		Type D - 75MW+	
	Projects	MW	Projects	MW	Projects	MW
TEC Reg	51	1,577.450	22	1,345.200	17	1,511.300
Embedded Reg	87	646.360	1	65.000	0	0.000
TOTAL	**138**	**2223.810**	**23**	**1410.200**	**17**	**1511.300**

GB (NGET Proposal)	Type B: 1-29.9 MW		Type C: 30-49.9 MW		Type D - 50MW+	
	Projects	MW	Projects	MW	Projects	MW
TEC Reg	24	511.850	27	1,065.600	39	2,856.500
Embedded Reg	85	580.260	2	66.100	1	65.000
TOTAL	**109**	**1092.110**	**29**	**1131.700**	**40**	**2921.500**

- No. of schemes = 178; Total MW = 5,145

- **All projects have a Scottish host TO**. There are no England and Wales developments below 100MW on either register

Project/MW summary 2015-2023: All

GB (Jan 14)	Type A: 0.8KW-1MW		Type B: 1-9.9MW		Type C: 10-29.9MW		Type D: 30MW+	
	Projects	MW	Projects	MW	Projects	MW	Projects	MW
DNO TOTAL	2,287,182	22,182.483	3,792	5,924.960	50	868.326	14	750.000
TEC Reg			1	4.000	23	507.850	66	3,922.100
Embedded Reg			73	300.510	12	279.750	3	131.100
TOTAL	**2,287,182**	**22,182.483**	**3,866**	**6,229.470**	**85**	**1,655.926**	**83**	**4,803.200**

CE (Jan 14)	Type A: 0.8KW-1MW		Type B: 1-49.9MW		Type C: 50-74.9MW		Type D: 75MW+	
	Projects	MW	Projects	MW	Projects	MW	Projects	MW
DNO TOTAL	2,287,182	22,182.483	3,842	6,793.285	0	0.000	14	750.000
TEC Reg			51	1,577.450	22	1,345.200	17	1,511.300
Embedded Reg			87	646.360	1	65.000	0	0.000
TOTAL	**2,287,182**	**22,182.483**	**3,980**	**9,017.095**	**23**	**1,410.200**	**31**	**2,261.300**

GB (NGET Proposal)	Type A: 0.8KW-1MW		Type B: 1-29.9MW		Type C: 30-49.9MW		Type D: 50MW+	
	Projects	MW	Projects	MW	Projects	MW	Projects	MW
DNO TOTAL	2,287,182	22,182.483	3,842	6,793.285	0	0.000	14	750.000
TEC Reg			24	511.850	27	1,065.600	39	2,856.500
Embedded Reg			85	580.260	2	66.100	1	65.000
TOTAL	**2,287,182**	**22,182.483**	**3,951**	**7,885.395**	**29**	**1,131.700**	**54**	**3,671.500**

- No. of schemes = 2,291,215; Total MW = 34,871.078

- Types A-B make up the majority of the position in all cases.
  Therefore is the lack of Type C a concern?

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Comparison of 'All' tables: Jan '15 to Nov '14

GB (Jan 14)	Type A: 0.8KW-1MW		Type B: 1MW-10MW		Type C: 10-30MW		Type D: 30MW+	
	Projects	MW	Projects	MW	Projects	MW	Projects	MW
TEC / Emb Reg	0	0.000	58	237.810	52	1,052.720	86	5,025.600
DNO	1,146,932	5,869.923	1,595	3,676.567	88	1,352.696	9	450.000
TOTAL	1,146,932	5,869.923	1,653	3,914.377	140	2,405.416	95	5,475.600
Diff to Jan 15	1,140,249	16,312.560	2,212	2,315.093	-55	-749.491	-12	-672.400

CE (Jan 14)	Type A:0.8KW-1MW		Type B: 1MW-50MW		Type C: 50-75MW		Type D: 75MW+	
	Projects	MW	Projects	MW	Projects	MW	Projects	MW
TEC / Emb Reg	0	0.000	146	2,696.230	31	1,913.600	19	1,706.300
DNO	1,146,932	5,869.923	1,683	5,029.263	9	450.000	0	0.000
TOTAL	1,146,932	5,869.923	1,829	7,725.493	40	2,363.600	19	1,706.300
Diff to Jan 15	1,140,249	16,312.560	2,150	1,291.602	-17	-953.400	12	555.000

GB (NGET Proposal)	Type A:0.8KW-1MW		Type B: 1MW-30MW		Type C: 30-50MW		Type D: 50MW+	
	Projects	MW	Projects	MW	Projects	MW	Projects	MW
TEC / Emb Reg	0	0.000	110	1,290.530	36	1,405.700	50	3,619.900
DNO	1,146,932	5,869.923	1,683	5,029.263	0	0.000	9	450.000
TOTAL	1,146,932	5,869.923	1,793	6,319.793	36	1,405.700	59	4,069.900
Diff to Jan 15	1,140,249	16,312.560	2,157	1,565.602	-7	-274.000	-5	-398.400

- Significant increase in number of Type A-B schemes under all banding proposals in second submission

- Moderate decrease of schemes in the C-D bands

Summary of findings

- Data is a forecast and has been aggregated (as before) – it cannot therefore be deemed as 100% accurate

- However it provides a fair reflection on anticipated trends for future connections:

  - Substantial volume of 'Type A' photovoltaic projects

  - Count of Type's C-D largely consistent from previous analysis

  - Majority of schemes that could make up Type C would be Scottish-based

  - Data does not capture the nature of connection voltages; assumptions on whether 50-100MW schemes could fall as Type D is a particularly important next step (for schemes currently 'B' or 'C')

Next Steps

- Position on Type D is largely out of scope in this analysis. Do we need to capture 100MW+ schemes to understand full picture?

- Is a split by project technology important (synchronous vs non-)?

- Is the existing profile of generators important for our consideration in setting the thresholds? If so, what data sources for Distributed generation?

- Should we consider market/political developments as well?

  - Capacity Mechanism

  - Closure of RO/commencement of CFD regime

  - Others?

- Finally - how far do we need to continue our analysis? Could we draw conclusions from the two data analysis activities now carried out? If not, why?