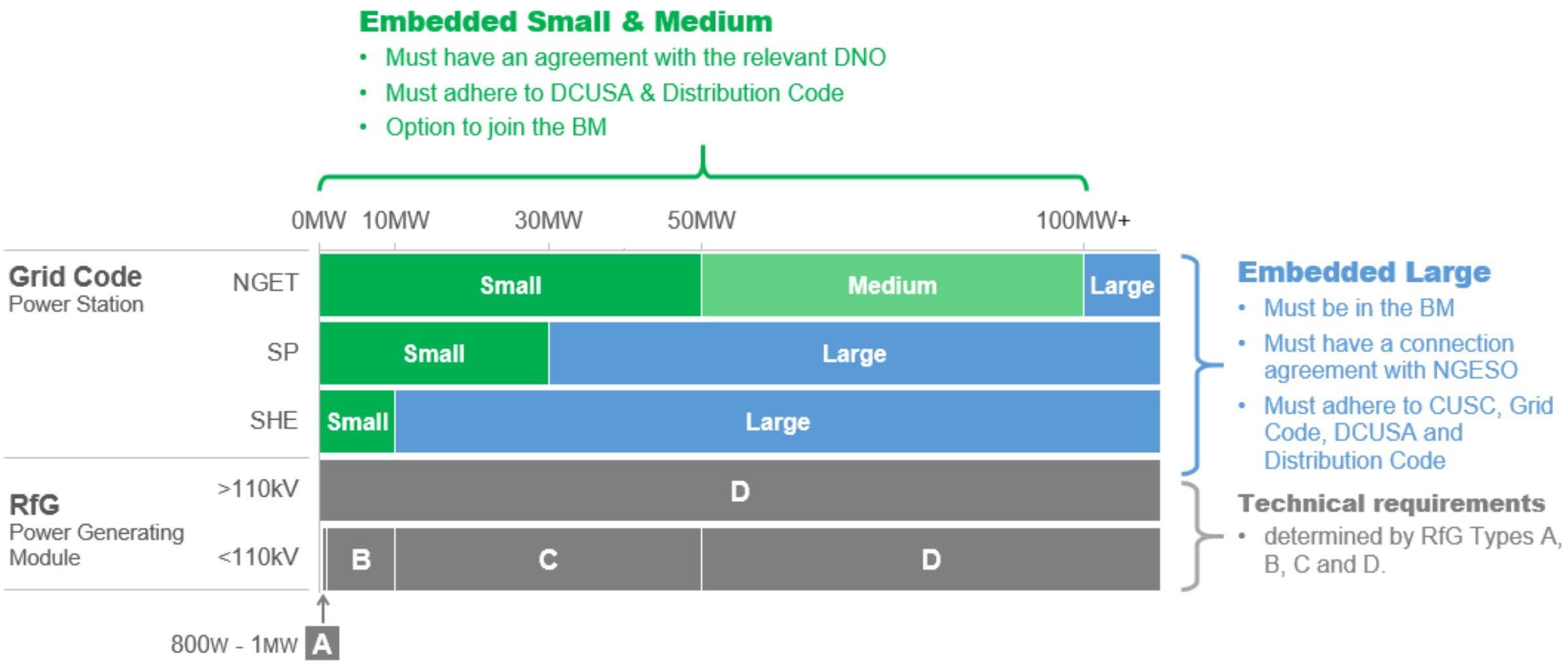
GC0117 Webinar – Overview of current options and implications for future participants

- The following slides detail the current options presented as part of the GC0117 Workgroup Consultation and the potential implications for future connecting parties for each option
- For information, this slide pack presents the discussions held at previous GC0117 workgroup meetings with this presentation prepared to enable participants of this webinar to have an overview of the original proposal and alternatives

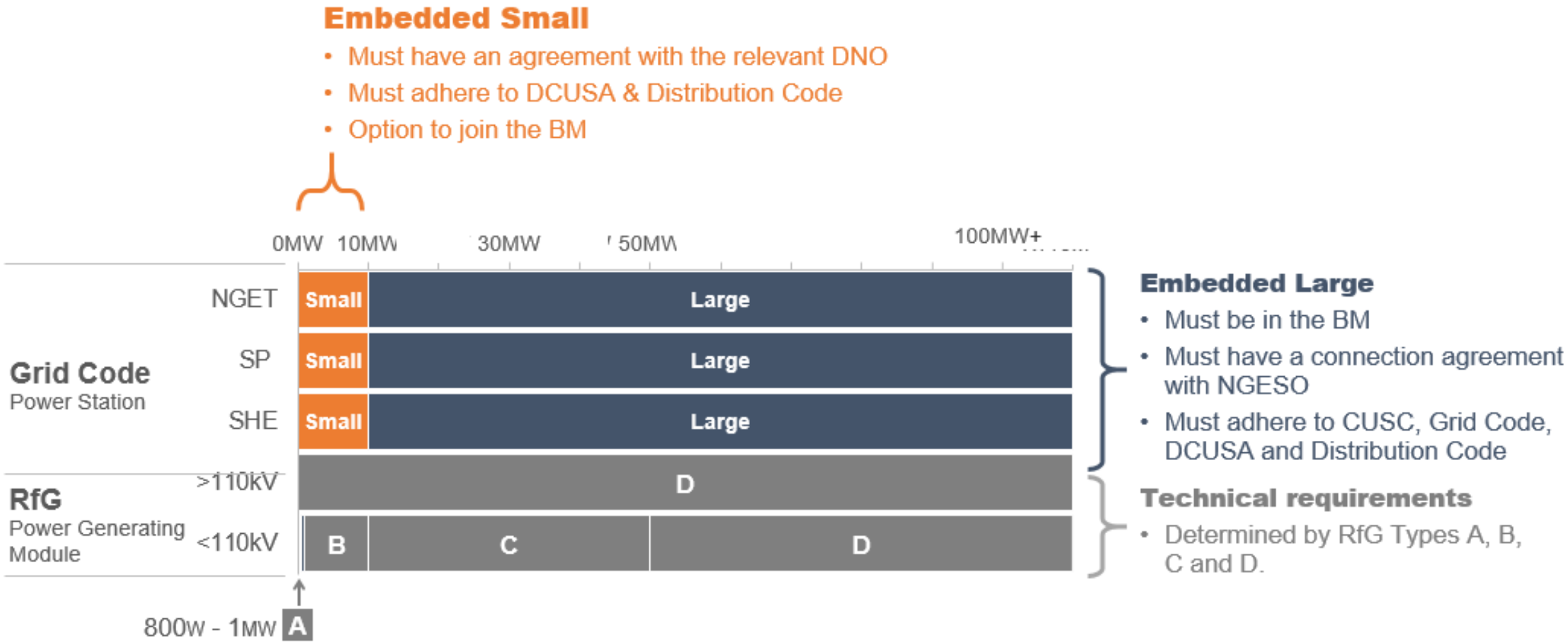
Current Thresholds and obligations



Review of Options

Options	Summary of Original Proposal and Alternatives
Original Proposal	Large/Small Power Station Threshold changed to 10MW
WACM1	Large/Medium/Small Power Station Thresholds in England and Wales applied in Scotland
Alternative 1	Large/Small Power Station Threshold changed to 100MW
Alternative 2	LEEMPS Plus – Medium Power Station Threshold changed to 10 – 100MW across GB. Applies LEEMPS arrangements with a Balancing Mechanism Component and hence becomes a hybrid of LEEMPS and BELLAs or BEGAs
Alternative 3	Apply Large/Medium/Small Power Station Threshold in England and Wales in Scotland (as per WACM1) but all embedded plant between 10 – 100MW would be required to participate in the BM and provide Ancillary Services through a control system which would take the Appendix G and Active Network Management processes behind each Grid Supply Point into account. National Grid ESO are developing several schemes using this approach using the Regional Development Platform (RDP)
Alternative 4	Hybrid solution of Alternative 2 & 3 RDP solution for Small Power Stations between 10 – 49.9MW and LEEMPS Plus solution for Medium Power Stations between 50 –100MW

Original Proposal - Large/Small Threshold set at 10MW



Grid Code requirements: Embedded connections

Requirements for Small and Large Power Stations

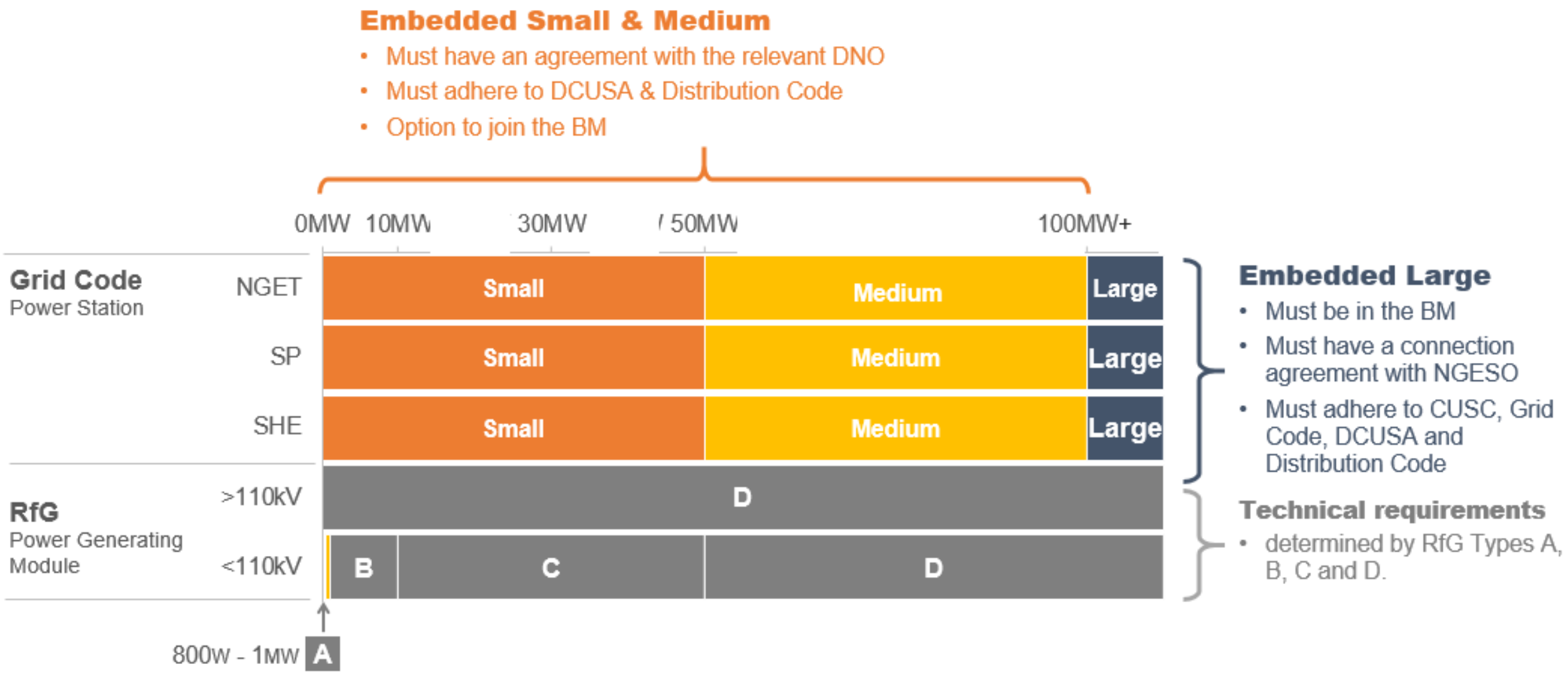
Grid Code requirement	Embedded Small	Embedded Large (BELLA)	Embedded Large (BEGA)
Planning Code	✘	✓	✓
European Connection Conditions	✘	Except EDL	✓
European Compliance Processes	✘	✓	✓
Operating Codes	✘	✓	✓
Balancing Codes	✘	BC1 & BC2 apply only in respect of Generating Units, not BM Units BC3 does not apply	✓
Data Registration Code	✘	Yes (part)	✓

EXAMPLE

What would a future **Embedded** Power Station with a Registered Capacity of 10MW or more have to do if the Original Proposal is applied

- Satisfy the applicable requirements of the Grid Code and sign CUSC
- Participate in the Balancing Mechanism either as a full BMU or as a Generating Unit (as a BELLA)
    - e.g., Instruction Facilities, Operational Metering / ability to be instructed in the BM (variations apply between BEGAs and BELLAs)
- Comply with the requirements of the Planning Code, Operating Codes, Connection Conditions or European Connection Conditions (as applicable), Compliance Processes or European Compliance Processes, Balancing Code 1 & 2 and Data Registration Code.
- Technical Requirements as per RfG are already consistent between the Grid Code and Distribution Code (G99)
- There would be no changes to the Generators connected in Scottish Hydro Electricity Transmission System
- The main additional requirements would be:
    - Sign the CUSC which has implications for charging
    - Comply with the applicable requirements of the Grid Code
    - Submission of static, scheduled and real time data to the ESO
    - Systems to submit real time data to the ESO

WAGM1– Small/Medium/Large in England and Wales applied in Scotland

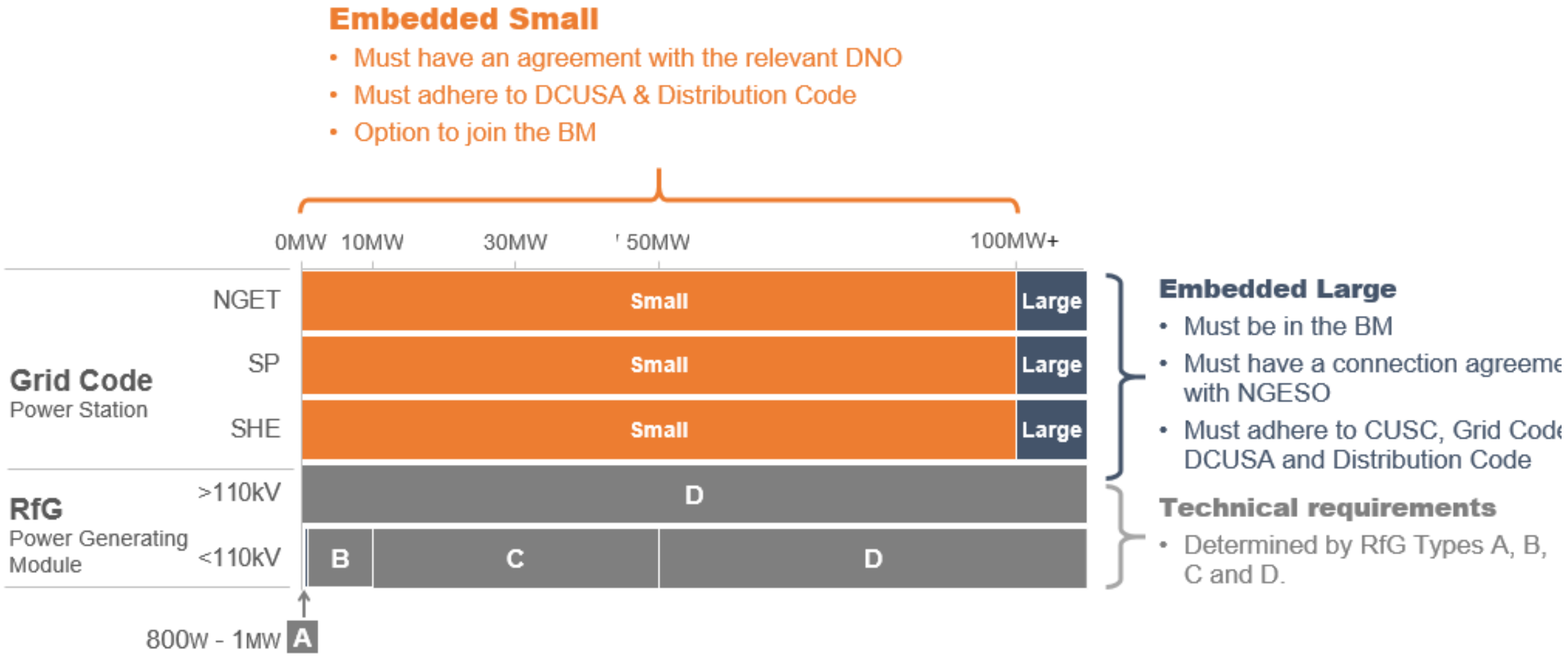


EXAMPLE

What would a future **Embedded** Power Station with a Registered Capacity of less than 100MW have to do if WAGCM 1 is applied

- Meet the requirements of the Distribution Code
- If the Embedded Power Station is Medium it will need to satisfy the requirements of the Distribution Code which in turn will require obligations to be satisfied under PC3.3 – Data and CC/ECC3.3 which relates to technical requirements – many of which are already captured under G99.
    - Mechanisms of sending and receiving real time data
    - In this case, there would be no impact to Generators in England and Wales
    - Generators in Scotland who have Embedded Power Stations with a Registered Capacity of less than 100MW would no longer be obliged to satisfy the requirements of the Grid Code or CUSC or obliged to meet the requirements of BC1 and BC2.
- In Scotland, Embedded Medium Power Stations 50 – 100MW) would either become a LEEMPS and fall outside the BM though they would need to provide data under PC3.3 and meet technical requirements (which would largely be required under G99) or become a BEGA. An owner and operator of a LEEMP would not need to sign the CUSC.
- In Scotland, any Embedded Power Station less than 50MW would be small and would have no obligations under the Grid Code unless the Generator in respect of that Small Power Station applied for a BEGA. There would be no impact in England and Wales
- Subject to retrospectivity, existing Large Power Stations in Scotland would no longer be obliged to meet their existing obligations under the Grid Code and CUSC or be in the BM

Alternative 1 - Large/Small Threshold set at 100MW



EXAMPLE What would a future **Embedded** Power Station with a Registered Capacity of 100MW of more have to do if Alternative 1 is applied

- Satisfy the applicable requirements of the Grid Code and sign CUSC
- Participate in the Balancing Mechanism as a BMU hence all agreements would be BEGA's
- Comply with the requirements of the Planning Code, Operating Codes, Connection Conditions or European Connection Conditions (as applicable), Compliance Processes or European Compliance Processes, Balancing Code 1 & 2 and Data Registration Code.
- The main additional requirements would be:
  - Signature to the CUSC and implications on charging
  - Comply with the applicable requirements of the Grid Code
  - Submission of Static, Scheduled and Real time data
  - Mechanisms of receiving real time data
  - **In this case, there would be no impact to Generators in England and Wales**
  - **Generators in Scotland who have Embedded Power Stations with a Registered Capacity of less than 100MW would no longer be obligated to satisfy the requirements of the Grid Code or CUSC or obliged to meet the requirements of BC1 and BC2.**

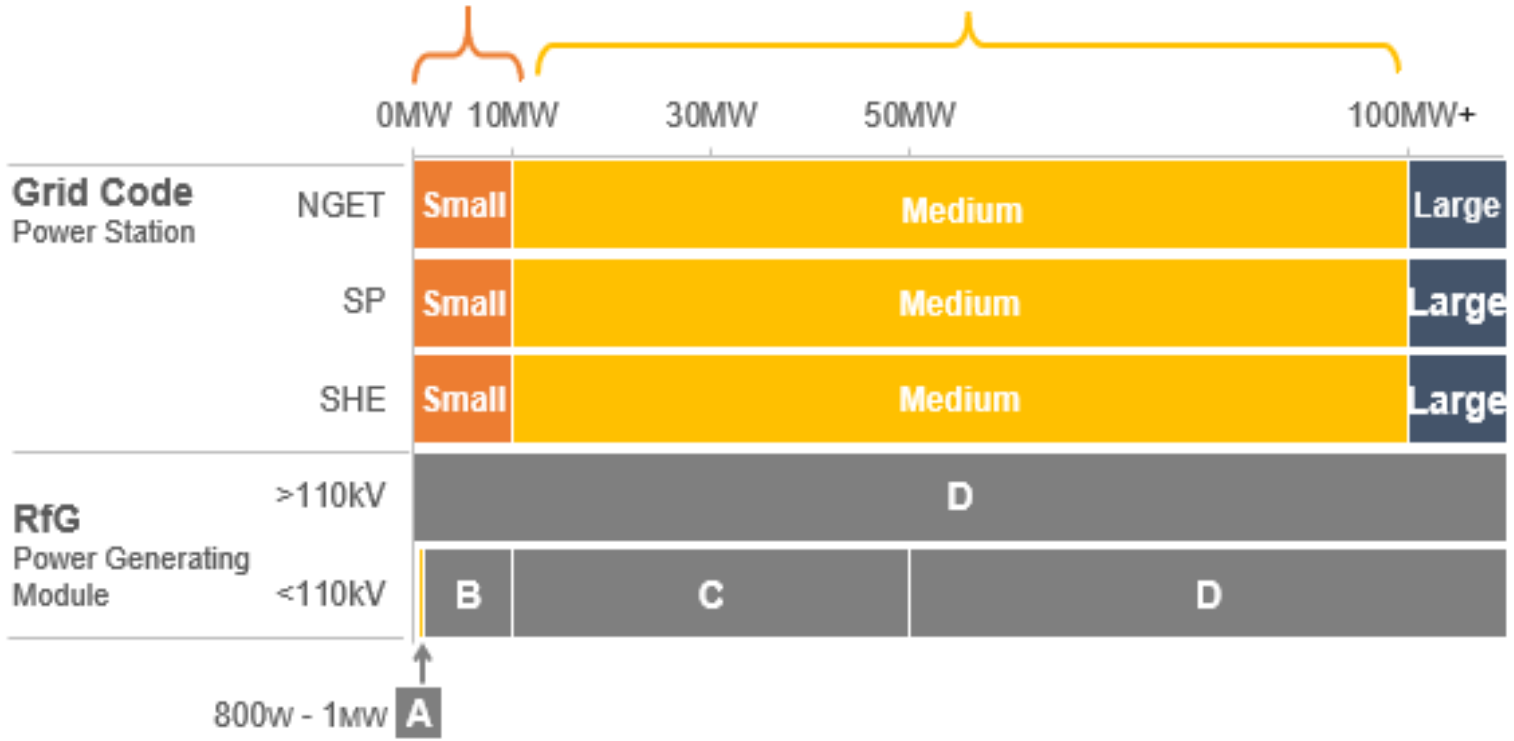
Alternative 2 – LEEMPS Plus applied across GB

Embedded Small

- Must have an agreement with the relevant DNO
- Must adhere to DCUSA & Distribution Code
- Option to join the BM

Embedded Medium

Exisiting LEEMPS provisions apply
ESO has an agreement with the DNO
Obligations on Licence Exempt Embedded Medium Power Stations to comply with Grid Code requirements which now extends to OC's and BC's
LEEMPS submit trading and price data to ESO.
ESO instruct LEEMPS via DNO



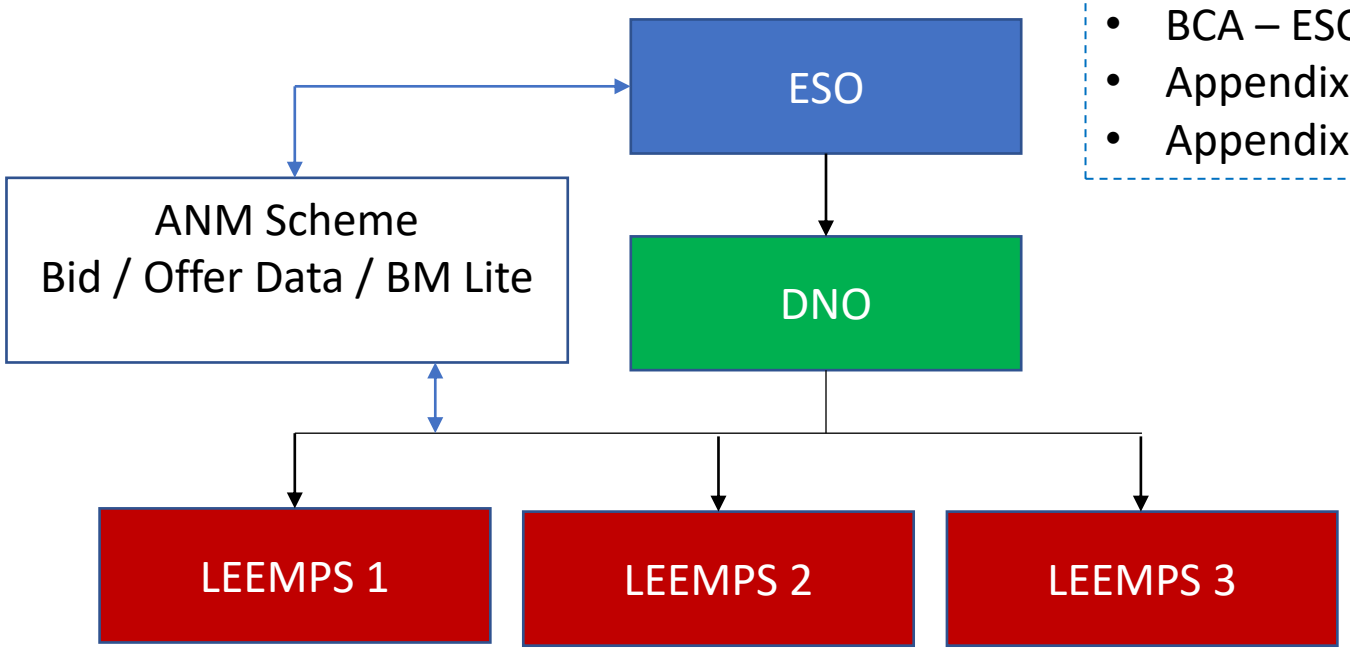
Embedded Large

- Must be in the BM
- Must have a connection agreement with NGESO
- Must adhere to CUSC, Grid Code, DCUSA and Distribution Code

Technical requirements

- determined by RfG Types A, B, C and D.

LEEMPS Plus



- BCA – ESO to DNO at each GSP
- Appendix G
- Appendix E

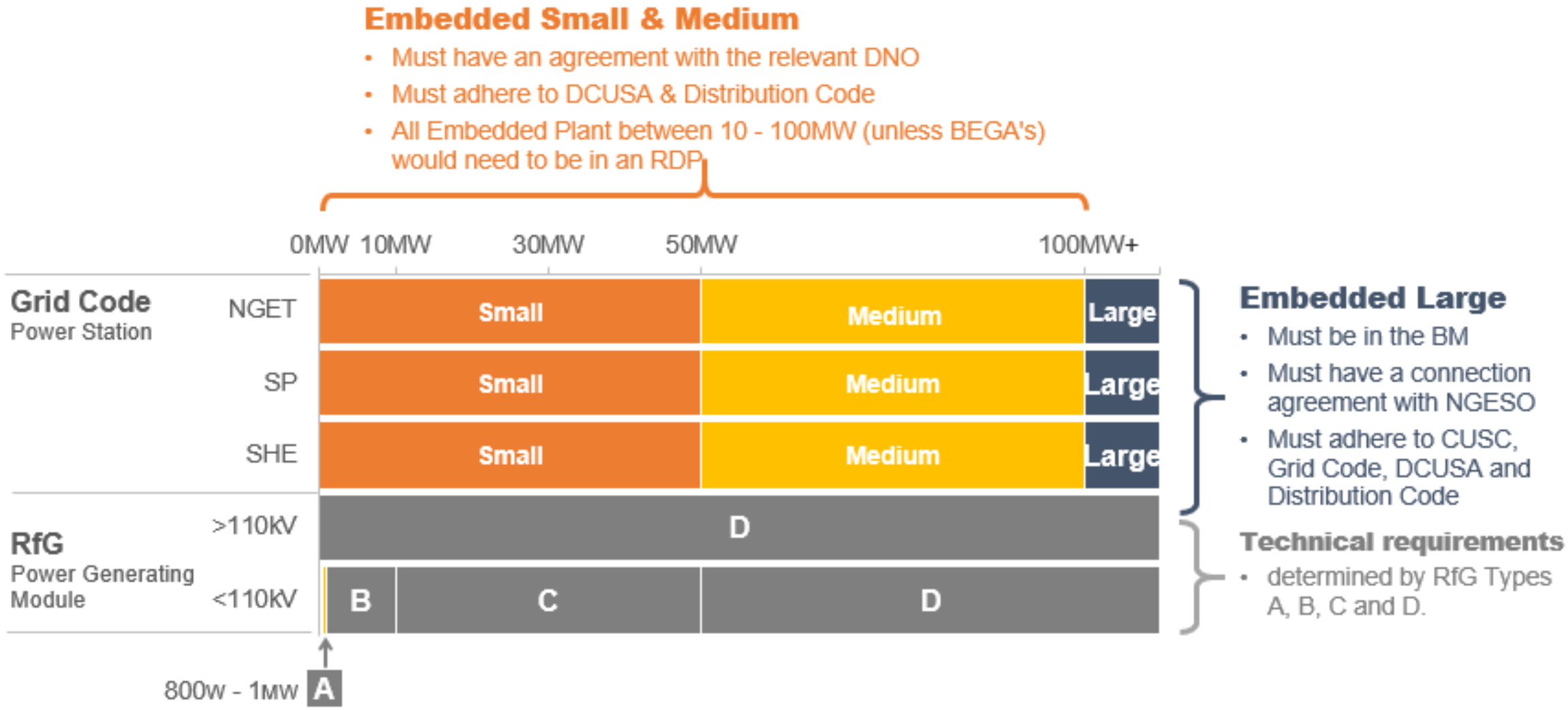
- ESO issue instructions to the DNO who in turn instruct the LEEMPS
- The DNO will not see Price and Dynamic data submitted by the LEEMPS
- DNO Connection Agreement with each LEEMP
- Includes Appendix E and Appendix G requirements
- LEEMPS only supply data once

EXAMPLE

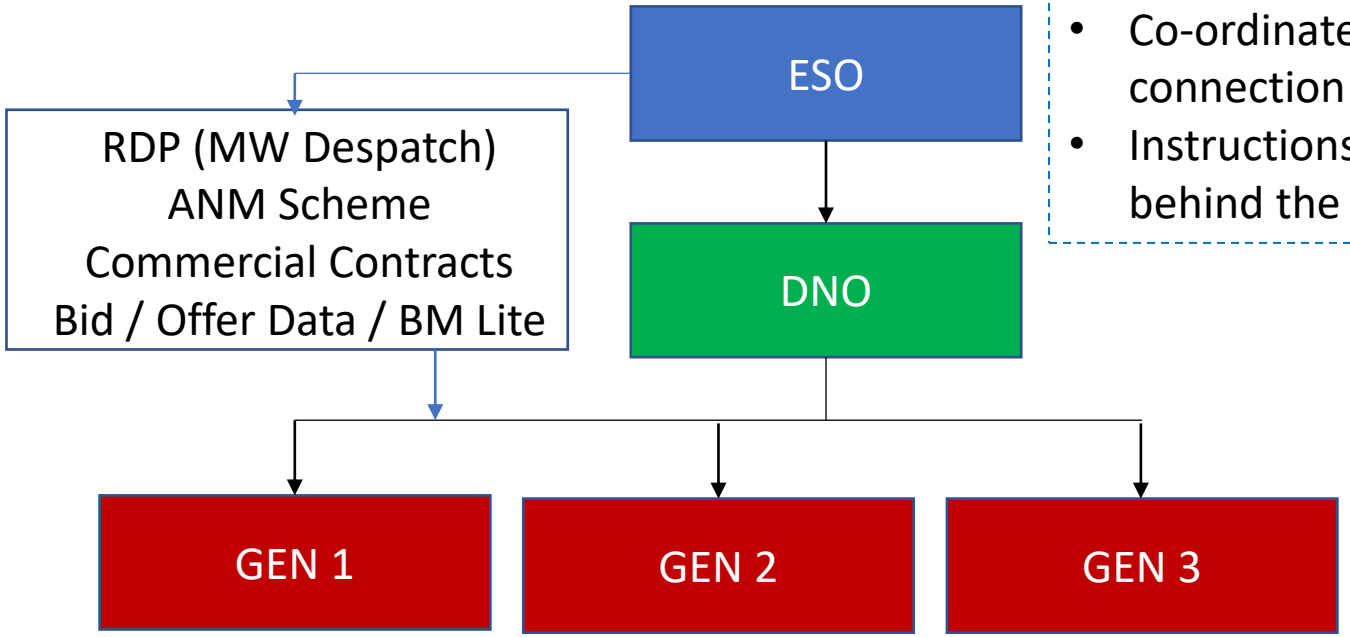
What would a future LEEMPS Plus Generator have to do if Alternative 2 is applied

- A future LEEMPS would be Licence Exempt, Embedded and have a Registered Capacity of between 10 – 100MW.
- Meet the requirements of the Distribution Code
- The D Code would be updated so that additional obligations of the Grid Code are satisfied which would extend to the relevant Operating Codes and Balancing Codes in addition to those already required.
- Some simplification may be possible as the technical requirements in the Grid Code are consistent with those in G99 though the technical requirements would need to be extended for the data communication facilities which are necessary to participate in the BM
- It is expected that similar obligations would apply which are consistent to those of Medium Power Stations already in the Grid Code but the management (other than in respect of balancing) would be managed through the DNO.
- The DNO would pass all relevant data from the
- Separate agreement between the ESO and LEEMPS in respect of participation in the BM e.g., ECC6.5 (Telephony and Data Communication Systems).
- The DNO would require Data Communication Systems so they can act as a proxy to give instructions to the LEEMPS on behalf of the ESO.
- Confidential data would not be visible to the DNO.
- ESO could constrain the embedded generation and they would also be subject to acting upon instructions from the ESO

Alternative 3 – Regional Development Programme



Regional Development Platform



- BCA – ESO to DNO at each appropriate GSP
- Co-ordinated with the CUSC and the Appendix G in the bilateral connection agreement with the DNO
- Instructions given to 10 – 100MW Embedded Generation via RDP behind the ANM Scheme

- DNO Connection Agreement with each Embedded Generator
- ESO issue instructions to the DNO who in turn instruct the Generator
- The DNO will not see Price and Dynamic data submitted by the Generator
- Utilises Open Networks for Data Sharing between ESO and DNO

EXAMPLE

What would a future Small Embedded Power Station between 10-99.9MW have to do if Alternative 3 applied

- Meet the requirements of the Distribution Code and G99
- Would need to sign up to an RDP which would enable the ESO to instruct the generator for MW
- Would have the opportunity to provide ancillary services and be instructed by the ESO for purposes of providing those ancillary services
- Additional control and communication facilities would be required including operational metering data
- Greater co-ordination required between the DNO and ESO in respect of data sharing and constraint management

Alternative 4 - Hybrid Approach

- The current thresholds in England and Wales are applied in Scotland
- For Medium Power Stations (50 – 100MW) LEEMPS Plus is applied
- For Small Power Stations (10 – 49.9MW) RDP applies