



GC0154: Interconnector Ramping Workgroup

Working group session 9

NG - ESO
23 02 2023



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Options and Shortlisting

A reminder of the Options Baringa was asked to consider

A long list of options were shared with WG on 18/01/2023 and based on review and feedback from the WG and ESO were refined to the options below for further assessment

		Option	Further description of option
1	Ramp Mgmt Tools	a) TSO Ramp Management	Use the existing ramp rates in Interconnector agreements and add to the Grid Code. Use Ramp Management agreements that are in tripartite agreements (not necessarily in all current agreements)
		b) TSO-TSO arrangements	Use the existing ramp rates in Interconnector agreements and add to the Grid Code. Utilise European balancing platforms to allow for optimisation of products in the market when simultaneous fast ramping requires counteraction. <i>Additional trading would be informed by day-ahead reference programmes.</i>
	Ramping arrangements	a) Dynamic ramp rate	Base ramp rate of 50MW allocated to all Interconnectors. Additional ramping to be made available based on day ahead forecasting of up to 250MW with a max ramp rate of 100MW. The additional ramping is based on the rate of change of demand forecast.
		b) Static ramp rate	Change interconnector base rate ramp limit to match generators (50MW/min). <i>Evaluate and then further compare effect of alternative rates.</i>
		c) Static ramp rate (status quo)	Interconnectors currently connected to the system have a ramping maximum of 100MW - continue with this rate. <i>This represents our proposed baseline.</i>
	Market Based Solutions	a) Procure increased Frequency response	ESO to hold sufficient Frequency Response to facilitate up to 100MW/min interconnector ramping. <i>This will take into account FRCR policy.</i>
		b) Base rate set for all IC and a market would be created for IC to participate	Each IC gets a ‘banked’ 50 MW, and the extra 50 MW is multiplied across the number of ICs, then a market is run for this availability. The IC to choose if they wanted to be in that market. <i>As this is a variant of 2a+2b, this option will require further analysis.</i>
		c) Create a ramping market	ESO to set up a “ramping market” where, based on the day ahead position of trade and risks estimated across ramping transition a volume dependent escalating ramping price is identified reflecting the costs incurred in operating the GB system, which allows the benefits of offsetting that position to be reflected by those offering flexibility to mitigate it whether interconnectors or other providers. <i>If shortlisted additional market parameters will be defined.</i>
	2		
3			

Short List Criteria were developed to do a high-level assessment of options

This original shortlist criteria was shared with Working Group on 18/01/23 and sent out for comments post meeting

Criteria	Sub criteria
Adaptability	<ul style="list-style-type: none">• Solution adaptable for projected future interconnector additions to GB grid• Embrace new or evolving business models
Consumer Fairness	<ul style="list-style-type: none">• Limit adverse distribution impacts for consumers
Deliverability	<ul style="list-style-type: none">• Minimise complexities / interdependencies• Minimise market disruption• Minimise implementation cost• Reduce risk of unproven solutions• Expedite implementation
Decarbonisation	<ul style="list-style-type: none">• Increase probability of achieving decarbonisation objectives
Energy security and system operability	<ul style="list-style-type: none">• Ensure sufficient capacity to meet peak demand• Ensure sufficient energy available to manage extended low renewable output• Ensure sufficient energy available to manage extended high renewable output• Manage external shocks and unintended consequences
Financial risks	<ul style="list-style-type: none">• Ensure any solution doesn't expose ESO to excessive financial risk
Interoperability with Europe neighbours	<ul style="list-style-type: none">• Ensure solution can be technically adapted by European markets• Ensure our solution is fair to all markets and does not disproportionately preference certain interconnectors• Reduce operational costs on both TSO's
Investor rights	<ul style="list-style-type: none">• Respect existing legal framework and rights• Provide assurance for debt holders• Promote market liquidity
Market risks	<ul style="list-style-type: none">• Ensure low probability solution could increase GB wholesale energy system costs• Ensure low probability solution could increase EU wholesale energy system costs
Modelling complexity	<ul style="list-style-type: none">• Data availability• Time requirements• Modelling accuracy
Technical viability	<ul style="list-style-type: none">• Option can be embedded within current environment

We consulted with the WG to finalise the Shortlist Criteria and their definitions

Based on feedback from Working Group members and ESO the final shortlist criteria below was created

Criteria	Sub criteria
Adaptability	<ul style="list-style-type: none">• Ease of codifying in the Grid Code
Commercial Impacts	<ul style="list-style-type: none">• Change required to external arrangements (i.e., external tripartite agreements)• Interconnector revenue impact should be calculable• ESO Balancing costs should be calculable from analysis
Compatibility with other users	<ul style="list-style-type: none">• Similarity to other grid code arrangements (e.g., generators)
Decarbonisation	<ul style="list-style-type: none">• Decarbonisation impact is calculable
Energy security and system operability	<ul style="list-style-type: none">• Decrease likelihood of frequency events
GB/Europe Consumer Benefit	<ul style="list-style-type: none">• Modelling can demonstrate consumer benefit or cost
Implementation	<ul style="list-style-type: none">• Ease of implementation• Implementation cost• Speed of implementation
Interoperability with Europe	<ul style="list-style-type: none">• Technically viable with European GCs and technological constraints• Non-discriminatory to current or future interconnectors• Minimise operational costs on (other) both TSOs.
Modelling Viability	<ul style="list-style-type: none">• Data availability• Publicly available data• Modelling duration• Modelling accuracy

We applied the Criteria within our Shortlisting Methodology as presented to WG

The approach outlined below was shared with WG on 18/01/23 – this methodology was utilised on Options

Process

- We plan to utilise a structured framework to allow detailed analysis to be translated into quantitative scores to allow easy comparison with other options
- This analysis will be presented through “Harvey Balls” scoring to easily communicate with stakeholders
- To conduct analysis, we shall select:
 - Criteria - These are the overall principles which should be used within decision-making
 - Sub criteria - These are the individual statements which we evaluate each option against
 - Sub criteria weighting - This is the weight given to each sub criteria based on the bearing on the criteria

Criteria	Sub-criteria weight	Sub-criteria
		>> Select option from drop down >>
Deliverability	20%	Minimise complexity/interdependencies
	20%	Minimise market disruption
	20%	Minimise implementation cost
	20%	Reduce risk of unproven solutions
	20%	Expedite implementation

Example of criteria and sub criteria



Example of Harvey ball scoring

Scoring Methodology

- Each sub criteria will be scored between -4 to +4
- 4: represents any option that fully does not meet sub criteria with data
- 3 to -1: represents any option that does not meet sub criteria without data
- 0: represents any neutral option
- +1 to +3: represents any option that meets sub criteria without data
- +4: represents any option that fully meets sub criteria with data

Key	Icon
Score	
-4	Red circle
-3	Red circle with dot
-2	Red circle with dot
-1	Red circle with dot
0	Yellow circle
1	Green circle
2	Green circle
3	Green circle
4	Green circle
n/a	Grey circle

Illustration of scoring

Using the accepted Shortlisting Methodology and Criteria we assessed the Options

As a reminder – this is the outcome of our Shortlisting scoring assessment, which we seek WG views on

Key	Icon
Score	
-4	●
-3	●
-2	●
-1	●
0	○
1	○
2	○
3	○
4	○
n/a	

Therefore, if an Option score a -4 it is represented by a full red circle and flip side a score of +4 a full green circle

Equal weighting was applied to each sub criteria and the cumulative score is shown at the bottom

Criteria	Sub criteria	Baseline	Options						
		100MW/ min (2C)	1A	1B	2A	2B	3A	3B	3C
Adaptability	Ease of codifying in the Grid Code	○	●	●	●	●	●	●	●
	Change required to external arrangements (i.e. external tripartite agreements)	○	●	●	●	●	●	●	●
Commercial impacts	Interconnector revenue impact should be calculable	○	●	●	●	●	●	●	●
	ESD Balancing costs should be calculable from analysis	○	●	●	●	●	●	●	●
Compatibility with other users	Similarity to other grid code arrangements (e.g. generators)	○	●	●	●	●	●	●	●
Decarbonisation	Decarbonisation impact is calculable	○	●	●	●	●	●	●	●
Energy Security and system operability	Decrease likelihood of frequency events	○	●	●	●	●	●	●	●
GB/Europe Consumer Benefit	Modelling can demonstrate consumer benefit or cost	○	●	●	●	●	●	●	●
Implementation	Ease of implementation	○	●	●	●	●	●	●	●
	Implementation cost	○	●	●	●	●	●	●	●
	Speed of implementation	○	●	●	●	●	●	●	●
Interoperability with Europe	Technically viable with European GCs and technological constraints	○	●	●	●	●	●	●	●
	Non-discriminatory to current or future interconnectors	○	●	●	●	●	●	●	●
	Minimise operational costs on (other) both TSOs.	○	○	○	○	○	○	○	○
Modelling Viability	Data availability	○	●	●	●	●	●	●	●
	Publicly available data	○	○	●	●	●	●	●	●
	Modelling duration	○	●	●	●	●	●	●	●
	Modelling accuracy	○	●	●	●	●	●	●	●
Overall Score		0	28	45	29	63	55	-1	-1

Our Shortlisting assessment of the Options led us to proposed leading Options


The scoring and our proposed reduced Options to those which merited a detailed CBA assessment was presented to WG on 09/02/23

- Baringa conducted an internal scoring session and then conducted a challenge and review session with the ESO – this resulted in the scores presented at the WG session
 - We did not have the opportunity to test and validate the scoring with the WG on 9 Feb due to the WG wanting to be reminded/better understand the shortlist criteria definitions and how the scoring was determined
 - We hope that this presentation will enable WG members to provide feedback we will consider in order to finalise scores across the Options
- At the WG on 9 Feb we indicated our provisional recommendations for Options that should be modelled further in detail:
 - Option 2C – keeping ramp rates at 100MW/min is used as the Base case for other Options to be scored against
 - Two clear Options for detailed analysis emerged from the scoring undertaken i.e Option 2B and Option 3A
 - We proposed at the WG on 9 Feb that to widen the Options for detailed CBA assessment either Option 3b or 3c should be included as a potential additional Option to model - our opinion is that Option 3b is a more realistic option and incorporates the original ESO proposal of Dynamic Ramping periods
- We seek WG views on these recommendations, taking into account the shortlisting assessment.
- We will take a final view taking into account this feedback and proceed to detailed analysis of final options

We will next proceed to detailed CBA assessment of the Shortlisted Options

This detailed CBA assessment will allow the WG to understand the impact on different stakeholders and to UK consumers overall of the adoption of the different shortlisted options – and guide WG recommendations

- Following consideration of written feedback, we seek from WG members by 24 Feb on (a) our shortlisting assessment; and (b) our recommended options; we will finalise both scoring and determination of the options for detailed CBA assessment
- We will conduct that detailed CBA assessment to model and assess the relative impact on the ESO, interconnectors, and the wholesale market; and the resulting overall impact for UK consumers
- We will present the results of this CBA assessment and our observations and conclusions from our detailed CBA assessment at the next WG meeting
- This will enable the WG to form a view of the preferred option and potentially an alternative option for consideration for adoption into the Grid Code and for a recommendation to be provided subsequently to Ofgem and the Grid Code Panel



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