

## Agenda

- 1. Dynamic Containment procurement changes
- 2. The auction platform
- 3. Next steps
- 4. Q&A session



### Dynamic Containment overview

- Dynamic Containment (DC) is the first of our new end-state services
- DC is designed to operate post-fault, i.e. after a significant frequency deviation

#### Since the launch of DC in October 2020:



Increased daily volume procured from ~150MW to over 700MW



Increased number of providers from 4 to 13



Introduced day-ahead procurement



Enabled option to change MW submission



Introduced BM stacking



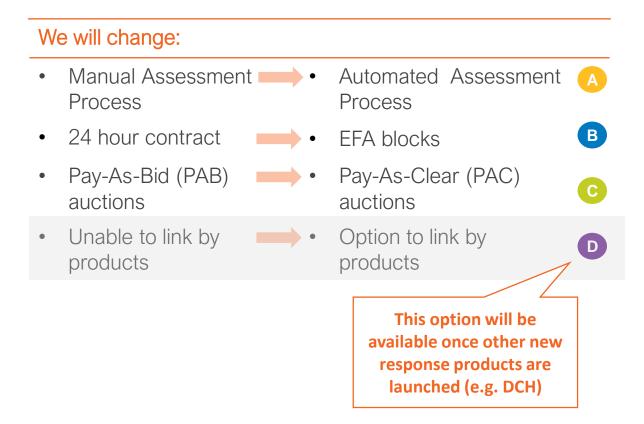
Spent £34m on service to date

### Daily DC procurement

Following a successful weekly auction trial, we are preparing to move our new response services to daily auctions. The procurement process will largely remain the same, apart from a few changes that came out in the trial feedback and lessons learnt

#### We will carry on:

- Procuring via the existing EPEX auction platform
- Matching using HELENA algorithm
- Displaying individual results immediately after each auction
- Publishing full market results on the ESO website
- Following the same onboarding process (data forms A,B,& C)
- Procure FFR via monthly tender





### Daily DC procurement

#### Key messages

This spring: we have launched consultation on changes to the service terms 27 April. You have got 7 days left to respond

From this summer: we intend to procure DC by EFA blocks on a pay-as-clear auction platform

## DC procurement changes: Automation\*



**Automation** 

Automated assessment process provides real-time validation



• Validation at the time of assessment excludes non-compliance orders from participating in the auction

HOW

- Orders are immediately validated by the platform
- Participants get immediate feedback if an order fails validation

**BENEFITS** 

- Ability to review and modify orders up until the Gate Close
- Reduced operational risk from manual assessment process and Excel-based tools



## DC procurement changes: EFA blocks



Procurement via EFA blocks provides greater flexibility

**WHY** 

 To improve cost-effectiveness by procuring different volumes in different periods, depending on the system needs

**HOW** 

Daily procurement by six 4-hour EFA blocks

**BENEFITS** 

- Potential for different clearing prices in different EFA periods and more accurate market price signals
- Increased market participation and, as market develops and grows, increased liquidity

## DC procurement changes: Pay-as-clear



Pay-as-clear



Pay-as-cleared settlement mechanism promotes market efficiency and increases price transparency

#### WHY

• Reduced barriers to entry, as the need to forecast auction results is removed

#### HOW

- Each individual provider will receive a contract for the same price at the end of the auction
- · Bidders are encouraged to bid their marginal cost

#### **BENEFITS**

- Increased market transparency
- Reduces the need for bidders to forecast auction outturn prices
- A single clearing price creates a signal that can be used for other commercial markets and decisions



## Process for submitting DC Sell Orders

- To participate in an auction registered providers must:
  - ☐ Receive a confirmation receipt of Forms A, B, and C
- Illustrative timeline:

	D-14		D-1		D-1	D			
8.00	Order book opens for DC Sell Orders		<ul> <li>Auction Closure         Time (Order book         closes)</li> <li>Deadline for         submission/update         of NGESO's buy         Order</li> </ul>	10.30	<ul> <li>Auction results         available to view         on EPEXSPOT         platform</li> </ul>	23.00	<ul> <li>Delivery starts for EFA block one on service delivery day D (which is the same calendar day as D-1)</li> </ul>		
				14.30	<ul> <li>Auction results published on the ESO website</li> </ul>				



### User interface similar to Weekly Auction



Web-based application Same platform used for both weekly and daily auctions (no need for a new account) https://www.cts-fra.epexspot.com/login



**■**← • process

Select session for

**Upload submission** 

Preview market results



Differences with weekly auction

You can now submit your orders 14 days before delivery day

- It means that on a given day, you can bid for the next 14 delivery days
- Orders can be updated or deleted until order books are closed

Everything else remains unchanged (screens, process...)



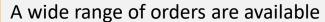
The following documents are available on NGESO's website and will be updated before go-live

- Cheat sheet: contains high level information and troubleshooters
- Trader user guide: contains detailed information on using the platform

### Block order submission similar as Weekly Auction



Same format (csv file) as weekly auction, but with 6 delivery periods instead of 42.



- Single-period non-curtailable block order
- Multi-period non-curtailable block order
- Single-period curtailable orders (made by linking orders in a family)...

Portfolio	BiddingLevel	OrderId	Version	User ID	BlockCode	BlockPRM	MAR	Price	1	2	3	4	5	6
Unit1	DCL	1			C01			1.23	-10					
Unit1	DCL	2			C01			2.34		-5	-5			
Unit1	DCL	3			C01			3.45				-1		
Unit1	DCL	4			C02	3		4.56				-9		



↑ Q	Quantity (MW)											
1				4	livery riods							
		2	2	3			<b>11003</b>					
1		2	3	4	5	6						

Order 4 can only be accepted if its parent block (order 3) is accepted.

It's called a child block. Child blocks always have "CO2" as code and are single period and fully-curtailable.

Parent blocks are always "CO1" blocks and non-curtailable



### Block order submission similar as Weekly Auction



Same format (csv file) as weekly auction, but with 6 delivery periods instead of 42.

Effect can be combined by linking CO1 and CO2 blocks in a family

Portfolio	BiddingLevel	OrderId	Version	User ID	BlockCode	BlockPRM	MAR	Price	1	2	3	4	5	6
Unit1	DCL	1			C01			1.23		-5	-5	-10	-5	
Unit1	DCL	2			C02	1		2.34	-3					
Unit1	DCL	3			C02	1		3.45		-4				
Unit1	DCL	4			C02	1		4.56			-5			
Unit1	DCL	5			C02	1		5.67					-6	





#### **Main Rules**

CO1 orders are defined on consecutive periods
Sell orders' volumes are strictly negative
Families can only link orders of the same {unit, product}

Orders are validated against those rules at submission and can be corrected up until OBK are closed.



### Orders are matched using a 2-steps algorithm



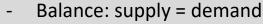
Determine accepted quantity for each order

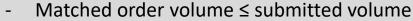


#### **Objective**

Maximize market welfare across all delivery periods







- Block properties (fill-or-kill, link families, etc.)
- Merit order rules for basic block orders



Determine prices for all products and delivery periods



#### **Objective**

Minimize market clearing prices across all delivery periods



#### Rules / constraints

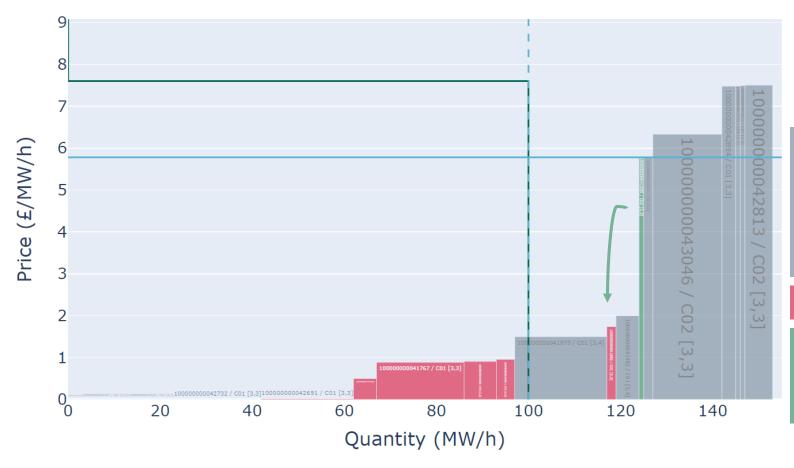
No paradoxically accepted curve/block order (Every accepted order must generate a positive surplus)



HELENA algorithm public documentation on NGESO's website Merit order constraints description Explanation on Paradoxically Rejected Blocks (PRB)



# Example of application of the algorithm (weekly auction, DLH, auction of 14/08/20, delivery period 3)



- NGESO Buy Curve
- Sell Orders
- Clearing Price: £ 5.78 /MW/hClearing Quantity: 100.0 MW/h

#### **REJECTED** because:

- Non curtailable (C01)
- Can't accept more than what NGESO is willing to buy
- Would decrease welfare if accepted instead of cheaper block

#### **FULLY ACCEPTED**

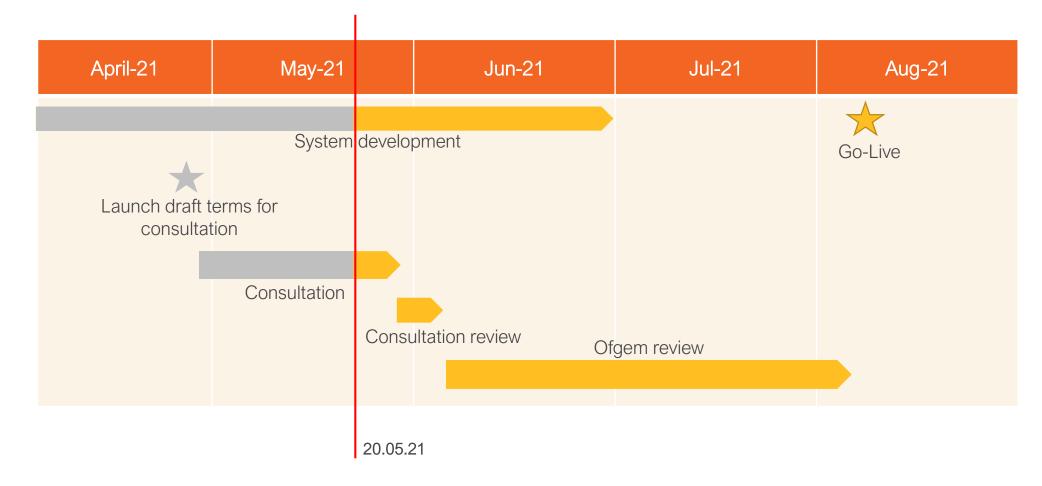
#### **PARTIALLY ACCEPTED** because:

- Curtailable (CO2)
- Parent C01 block is accepted



## DC procurement changes timeline

Dynamic Containment Procurement changes

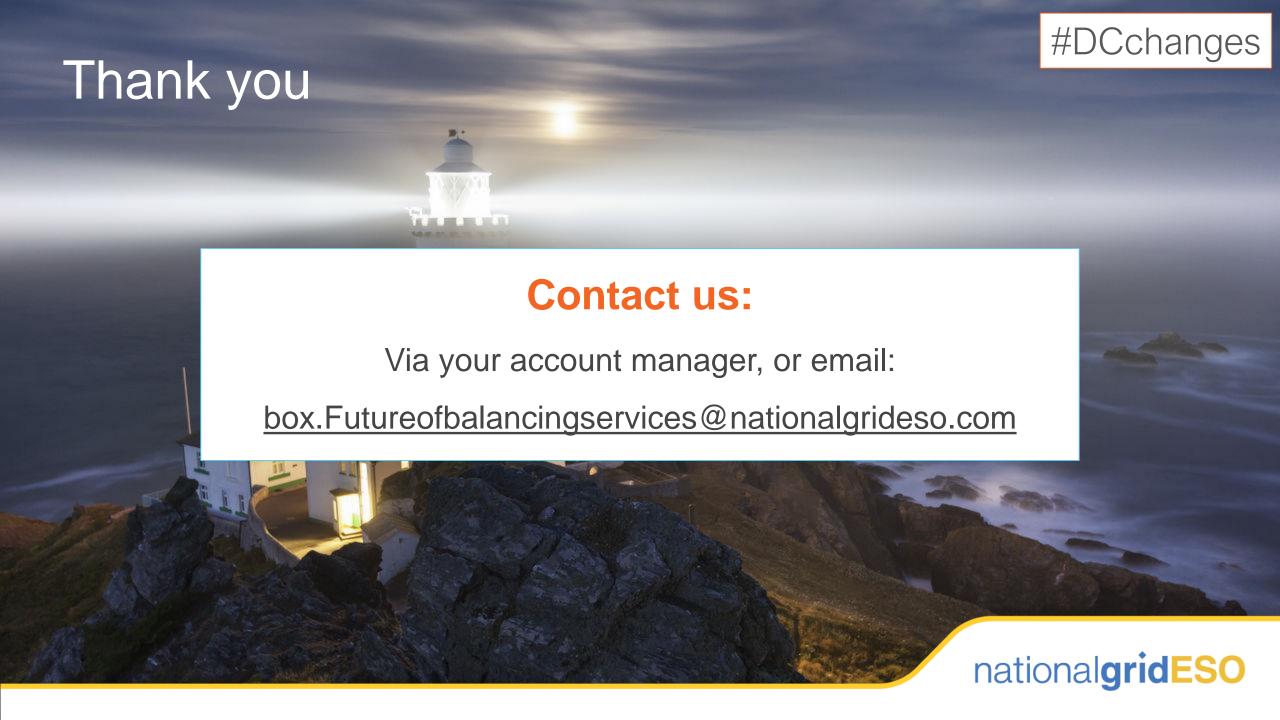




### Next steps

- Consultation on DC procurement changes closes on 27 May. The suite of consultation documents can be accessed <u>here</u>
- For updates, please <u>sign up</u> to our Future of Balancing Services newsletter
- Get in touch: <a href="mailto:box.futureofbalancingservices@nationalgrideso.com">box.futureofbalancingservices@nationalgrideso.com</a>





## Appendix

### Refresher of key auction terms

#### **Portfolio**

 Portfolio = Unit (BMU or non-BM unit)

#### **Block Order**

 All Sell Orders in the Daily Auction are Block Orders. They have one price and one volume per unit per EFA block

#### **Linear Order**

 The NGESO buy order is a linear order, there can be multiple/price volume pairs for each EFA block

#### C01 Block

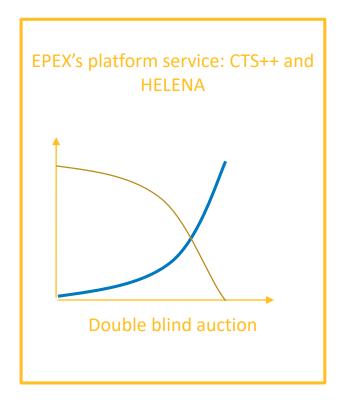
 Also called 'parent block' if part of a linked family a C01 block is noncurtailable and will either be fully executed or fully rejected

#### C02 Block

 A 'child block' and part of a linked family. A C02 block is linked to a C01 block and is fully curtailable.

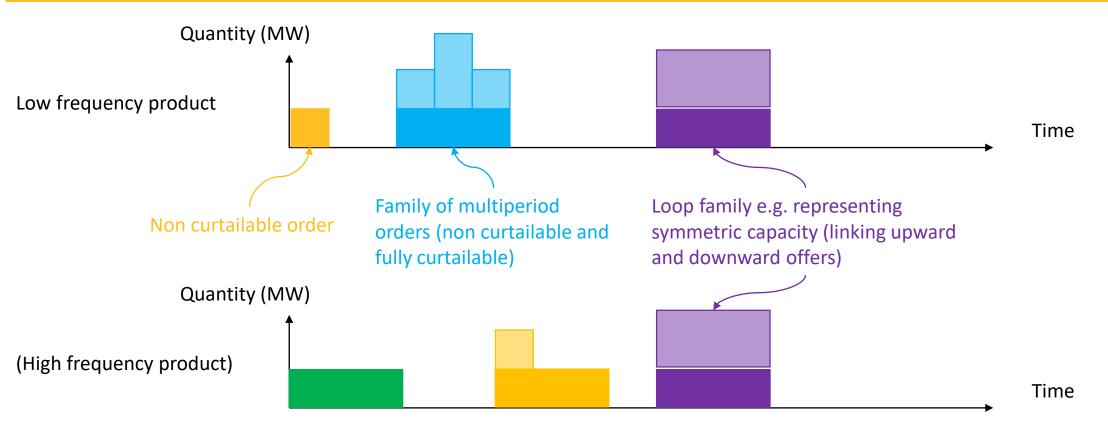
#### **Basic Blocks**

- = Single-period block orders
- Not a new order type
- A new category of orders on which specific merit order rules apply



# HELENA algorithm offers a lot of flexibility to suppliers while maximizing market welfare and minimizing procurement price

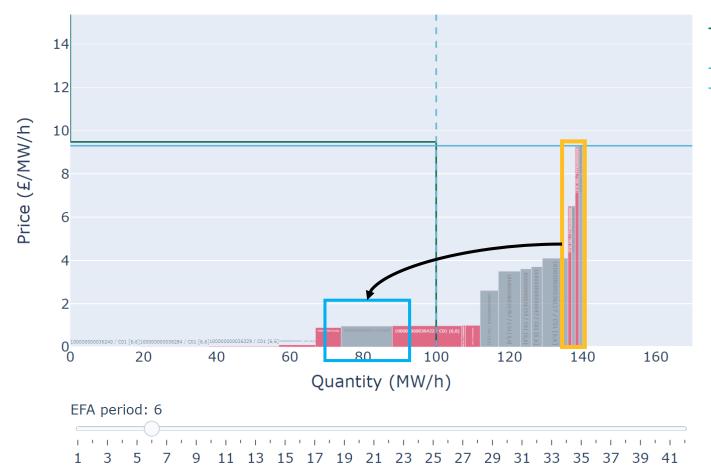
#### Sellers can use a variety of block orders to reflect their constraints





### Taking into account family dependency

FRA OBK DLH, auction: 2020-07-17



- NGESO Buy Curve
- Sell Orders
- Clearing Price: £ 9.3 /MW/h
- - Clearing Quantity: 100.0 MW/h
- This CO2 block is rejected because its parent CO1 block is also rejected.
- Without this link, it would have made more sense to accept this CO2 and reject the next block in the stack