

# Getting ready for TERRE

Industry webinar

7 & 16 April 2020

Host

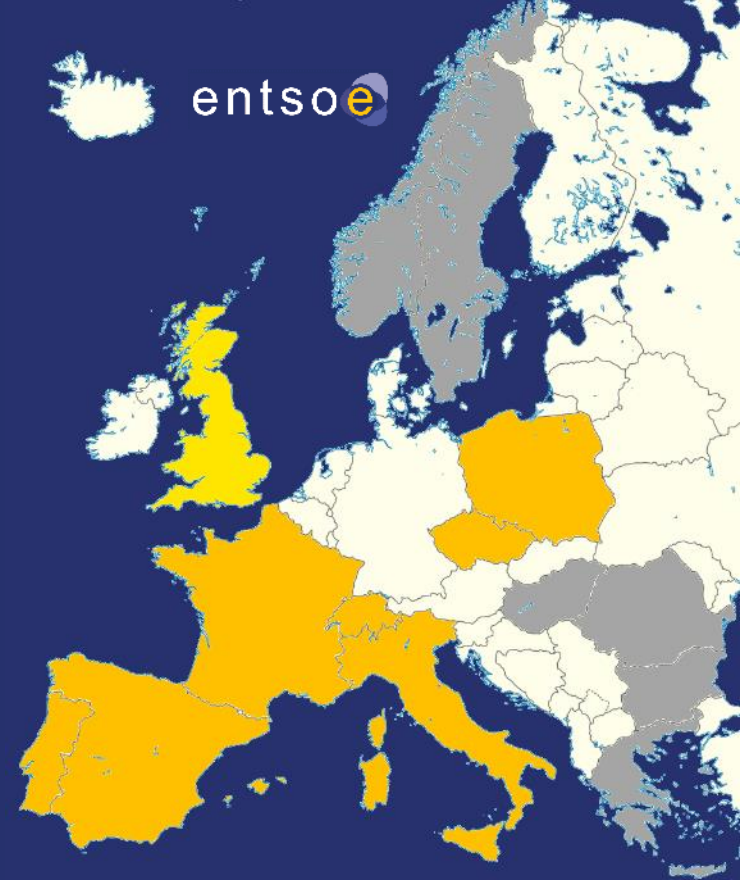
**John Clifford** (NGESO)



# Welcome

## Replacement Reserve (RR)

Created by the  
**Trans-European Replacement  
Reserve Exchange (TERRE)**  
industry project



# Contents

1	Introduction	Pradeep Ninan		4
2	Pre-Qualification and how to participate in the RR market	Haarith Dhorat		9
3	Data submissions	Martin Brown		14
4	Q&A			23
	Break 10 mins			
5	TERRE settlement	Matt Roper		25
6	Industry testing	Isobel Squire & Partho Pal	 	34
7	Next steps	Pradeep Ninan	 	37
8	Q&A		 	40

# Introduction

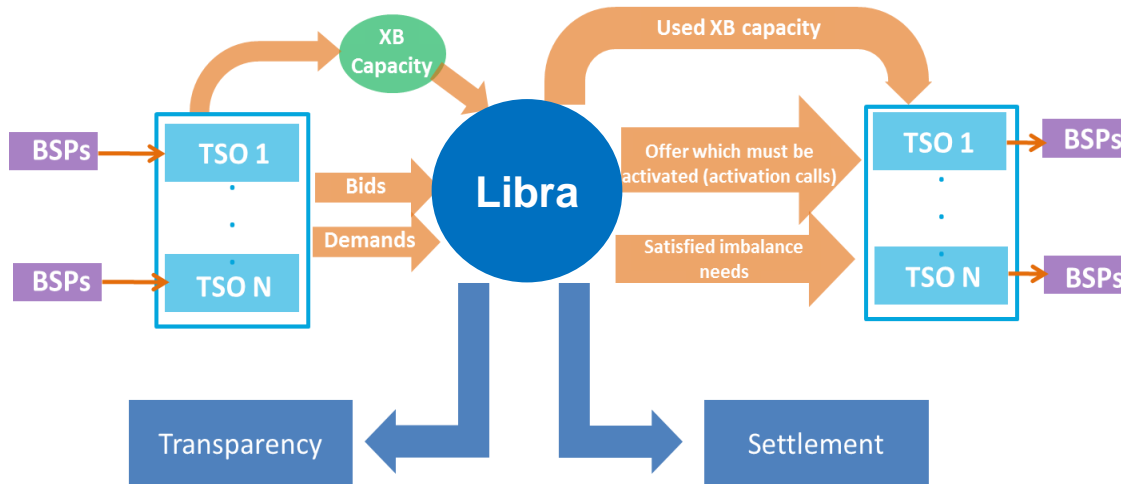
Presenter

**Pradeep Ninan (NGESO)**



# Libra: Pan-EU balancing platform

- Establishing a European balancing energy market
- Facilitating competition
- Creating a harmonised playing field for market participants
- Allowing exchange of Replacement Reserves (RR) in line with the Electricity Balancing Guideline (EBGL)



- **TSO-TSO model**  
BSPs participate via their TSO
- **'Pay as clear' Marginal Pricing**  
One price (unless borders are congested)
- **Restoration Reserve product**
  - Scheduled activation
  - 30min full activation time
  - 15min Blocks
- **One auction per hour**  
Four blocks cleared per auction

# What does TERRE mean for GB?

## For NGESO

- New balancing auction (similar to Day Ahead arrangements), taking place after gate closure
- An additional process for submitting offers to TERRE in parallel with Balancing Mechanism processes
- An additional tool to conduct coarse energy balancing actions, etc. using 15 min blocks
- Access to additional flexibility such as non-BM units and across borders for energy balancing

## For market participants

- New international market to compete in
- Increased liquidity and opportunities to offer flexibility
- Opportunity to compete in two markets in parallel
- Introduction of new 'pay as clear' pricing approach, in parallel with 'pay as bid' BM arrangements
- Removal of barriers to entry for non-BM participants and small embedded generation sources
- Estimated reduction in balancing costs of €13 million for GB

# Implementation

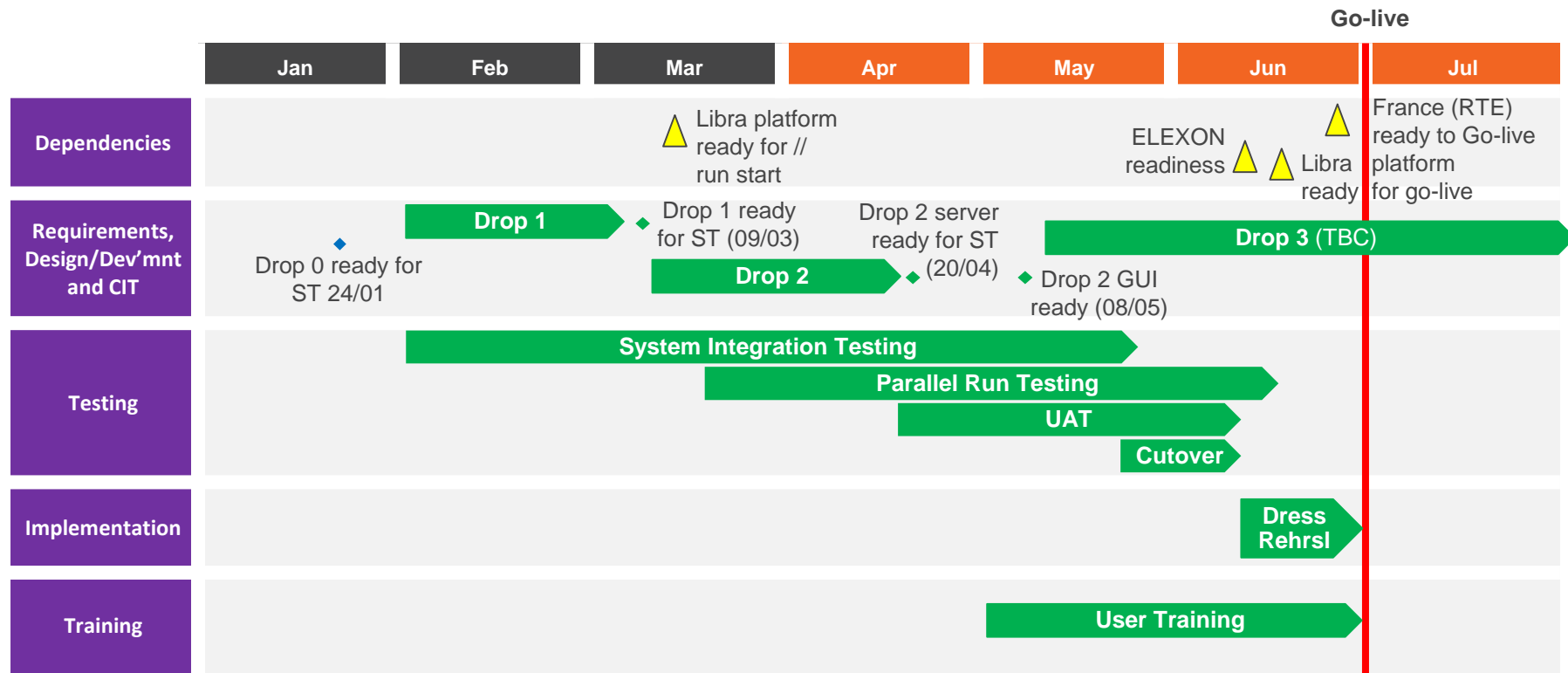
## Libra platform Go-live first phase

- **Czech Republic** (CEPS) – using the platform since **January** within their own market
- **Spain** (REE) – joined the platform in **March**  
Staggered implementation, approx 3 hrs/day
- **Italy** (Terna) and **Switzerland** (Swissgrid) possibly **June**
- **France** (RTE) – June/July Go-Live probably **delayed** until later this year; timeline awaited and will be shared
- **Portugal** (REN) – indefinitely **delayed** due to Covid-19
- **GB** (NGESO) – Go-Live scheduled for **June**  
*Continual review of all programmes ongoing*



Announcement 24 April: Due to Covid-19, **France** and **GB**  
Go-lives rescheduled for **October 2020** at the earliest

# NGESO TERRE Plan



# Pre-Qualification and how to participate in the RR market

Presenter

**Haarith Dhorat (NGESO)**

# Background to Pre-Qualification

## Requirement of European Regulations

- Timeframes for whole process – up to 5 months
- Light on detail, but internal business rules have been designed

## Main steps for:

### RR, BM, STOR and Fast Reserve

- Sign-up to relevant industry codes – *CUSC (NGESO Connections team), BSC (ELEXON)*
- Unit information – *capacity, location, fuel type, etc.*
- Completion of necessary communications systems – *EDL/EDT, Operational Metering*
- Registration with ELEXON



# How to Pre-Qualify – Virtual Lead Parties (VLP)

## New Secondary BMUs

- Pre-Qualification via Salesforce portal to provide necessary information – *Request access via [RR page](#) on NGESO website*
- Information reviewed with relevant Distribution Network Operators (DNOs) for accuracy and system constraints
- BMU ID provided once information checked and validated – *VLP shares this with ELEXON to complete their registration*
- Complete development of EDL/EDT and Operational Metering API
- NGESO update internal systems with unit information
- VLP informed once Pre-Qualification complete with Go-live date

## Existing Secondary BMUs

- Contact [commercial.operation@nationalgrideso.com](mailto:commercial.operation@nationalgrideso.com), highlight any changes to units details



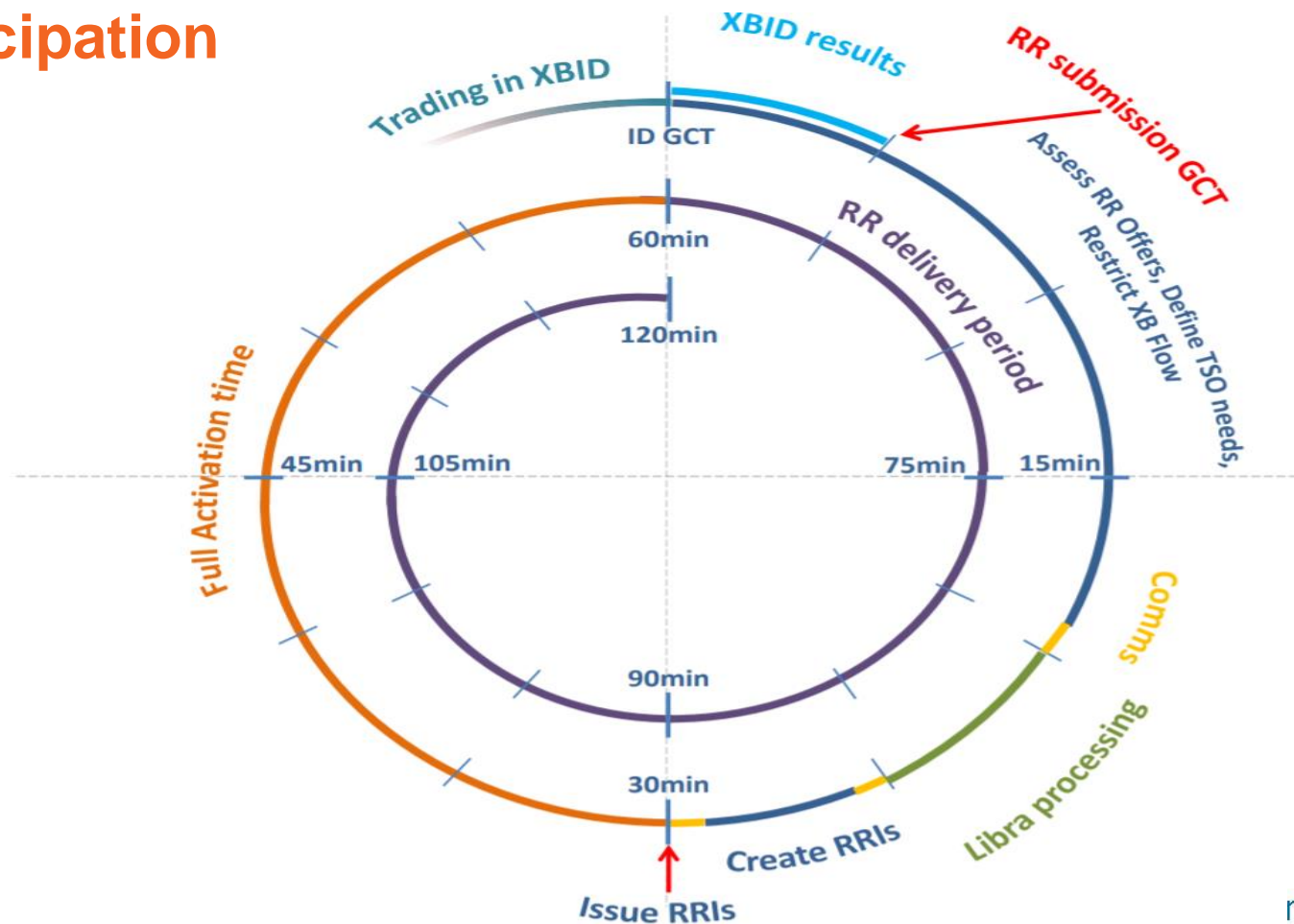
# How to Pre-Qualify – Other BMUs

## Primary and additional BMUs

- Complete connection process as normal  
*Connection agreement, BMU & ELEXON Registration, install EDL/EDT and Operational metering*
- Contact [commercial.operation@nationalgrideso.com](mailto:commercial.operation@nationalgrideso.com) requesting relevant units to prequalify
- Application will be managed by NGESO to update systems and unit status
- Provider to update EDT to allow for submission of RR bids
- Lead Party informed once Pre-Qualification complete with go-live date



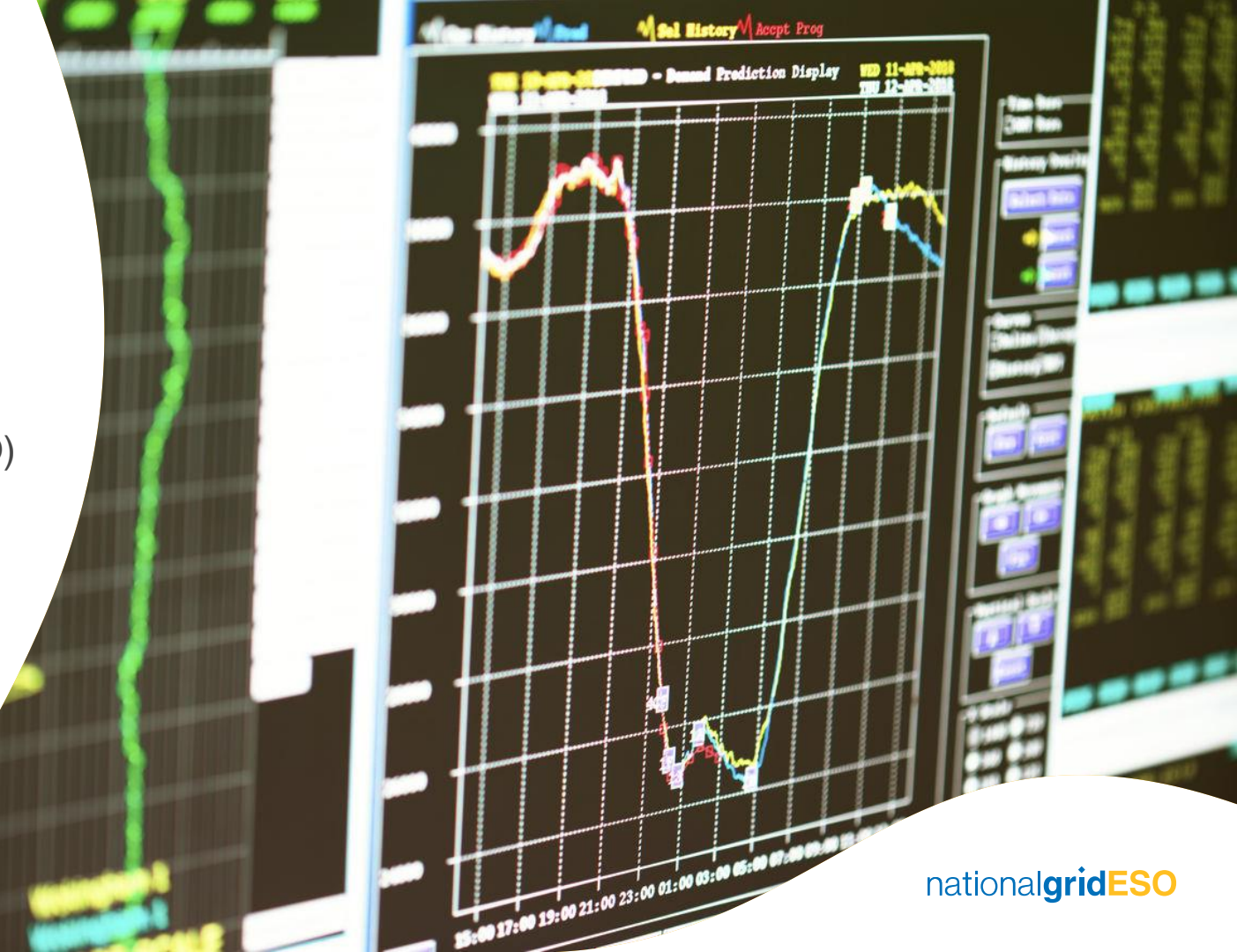
# Participation



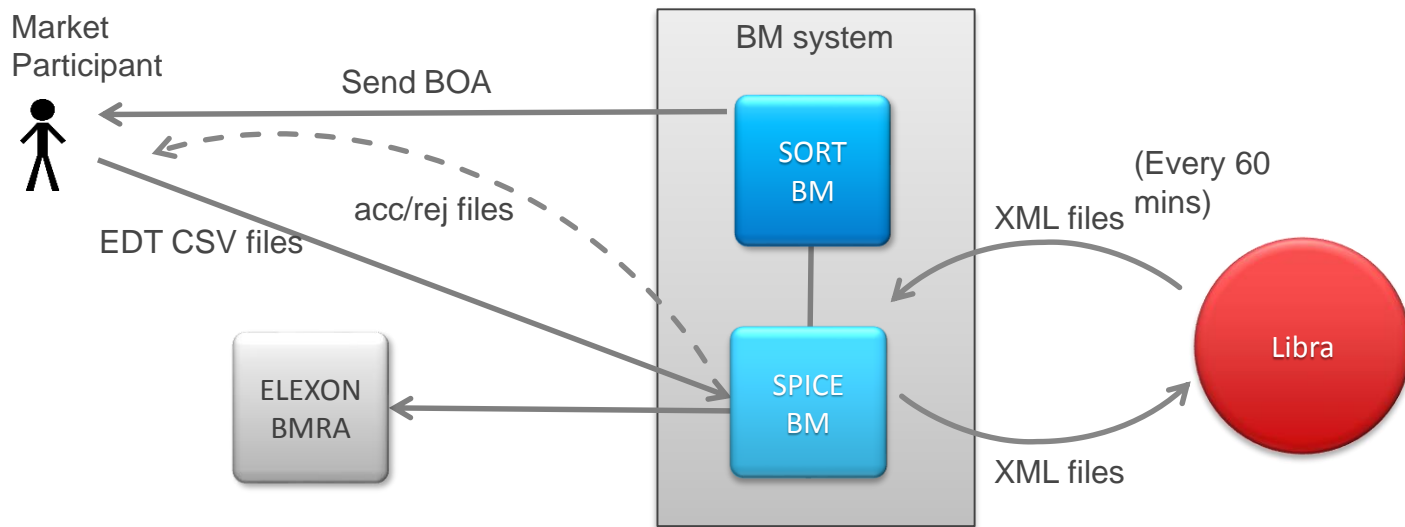
# Data submissions

Presenter

**Martin Brown** (NGESO)



# Data flow – RR bids

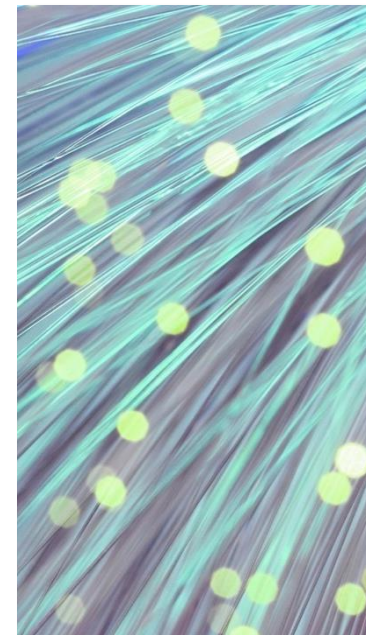


## Processing Phases



# EDT file contents

NAT_POWER_0001.SBM									
• MELS									
*									
* Data, TA name, BMU name, Time from, & level, Time to, & level									
MEL, NAT_POWER, ABTH7,2019-10-30 04:00,1224,2019-10-31 04:00,1224									
*									
• PNS									
PN, NAT_POWER, ABTH7,2019-11-12 11:30,900,2019-11-12 12:00,700									
PN, NAT_POWER, ABTH7,2019-11-12 12:00,900,2019-11-12 12:30,700									
PN, NAT_POWER, ABTH7,2019-11-12 12:30,900,2019-11-12 13:00,700									
PN, NAT_POWER, ABTH7,2019-11-12 13:00,900,2019-11-12 13:30,700									
*									
* RR data									
* Data, TA id, BM Unit, Time from, Dir, max level, Min Level, divisible, price, Bid Id, Assoc Bid Type, Assoc set									
RRB, NAT_POWER, ABTH-7,2019-11-12 09:00,UP, 100, 0,TRUE,1.1, 0001									
RRB, NAT_POWER, ABTH-7,2019-11-12 09:15,UP, 120, 0,TRUE,1.1, 0002									
RRB, NAT_POWER, ABTH-7,2019-11-12 09:30,UP, 75, 0,TRUE,1.1, 0003									
RRB, NAT_POWER, ABTH-7,2019-11-12 09:45,DOWN, -75, 0,TRUE,1.1, 0004									



# Surface Level 1 Validation

- Errors are reported back to participants in EDT rejection files
- Mixture of validation and consistency errors

Field name
<V_RRB_1>,<Mandatory field %s not specified>
<V_RRB_2>,<Notification time of the RR Bid relates to a closed RR Auction period>
<V_RRB_5>,<Record datetime_from must not be greater than planning submission max date>
<V_RRB_6>,<Direction must be UP or DOWN>
<V_RRB_7>,<Assoc bid type must be one of LINK, MULT, EXCL>
<V_RRB_9>,<Divisible flag must be TRUE or FALSE>
<V_RRB_10>,<Assoc bid type and set must both have a value or both be NULL>
<V_RRB_11>,<Max limit of bids per bmu per auction period exceeded>
<C_RRB_9>,<Same bid id needs same values for divisible flag, direction, assoc bid type and set>



# EDT Rejection file

NAT_POWER_0001.REJ	
<!--	
<V_RRB_5>,<Record datetime_from must not be greater than planning submission max date>	
RRB,NAT_POWER,ANSUW-1,2019-12-19 09:00,UP,102,10,TRUE,1.1,0001,,	
<*>	
<!--	
<V_RRB_2>,<Notification time of the RR Bid relates to a closed RR Auction period>	
RRB,NAT_POWER,BDCHW-1,2019-11-19 09:00,NONE,104,200,TRUE,2.2,0002,,	
<*>	
<!--	
<V_RRB_6>,<Direction must be UP or DOWN>	
RRB,NAT_POWER,BDCHW-1,2019-11-19 09:00,NONE,104,200,TRUE,2.2,0002,,	
<*>	
<!--	
<V_RRB_2>,<Notification time of the RR Bid relates to a closed RR Auction period>	
RRB,NAT_POWER,CAUSW-1,2019-11-19 10:00,UP,106,10,TRUE,3.3,0003,MULT,	
<*>	
<EOF>	



# Types of bids

## Fully divisible bid

- A balancing energy bid that consists of a single quantity and a single price
- Its delivery period is 15 minutes, and it has no minimum quantity

## Indivisible bid

- A balancing energy bid that consists of a single quantity and a single price
- Also referred to as block bids

## Linked bids – Linked, Multi or Exclusive

- Balancing energy bids for which the same acceptance ratio  $\alpha$  will be accepted
- Either fully divisible or divisible, or indivisible
- Must correspond to different single time steps
- Can have different volumes and/or prices
- Can have different directions, ie. upwards and downwards

# Types of bids

## Fully divisible: Specify divisible = TRUE

\*Data, TA id, BM Unit, Time from, Dir, max level, Min Level, divisible, price, Bid Id, Assoc Bid Type, Assoc set  
RRB, NAT\_POWER, ABTH-7,2019-11-12 09:00,UP, 100,,TRUE,1.1, 0001

## Partially divisible: same but with a minimum quantity

RRB, NAT\_POWER, ABTH-7,2019-11-12 09:00,UP, 100,50,TRUE,1.1, 0001

## Implicit linking via bid ID: Use the same bid ID to specify bid across time

\*Data, TA id, BM Unit, Time from, Dir, max level, Min Level, divisible, price, Bid Id, Assoc Bid Type, Assoc set  
RRB, NAT\_POWER, ABTH-7,2019-11-12 09:15,UP, 120,,TRUE,1.1, 0002  
RRB, NAT\_POWER, ABTH-7,2019-11-12 09:30,UP, 75,,TRUE,1.1, 0002

## Explicit Linking using bid sets

**LINK** – Linked bids across time: Offered amounts will have same acceptance ratio applied

**MULT** – Multi-part Bids: Define an amount at one price, then a further amount at higher price

**EXCL** – Exclusive Bids: Offer an amount at one price or a different amount at a different price

*Examples on next slide*

# Linking of RR bids

- Bids linked explicitly by using a bid set and one of three types: LINK, EXCL or MULT

NAT_POWER_0001.SBM												
* Data, TA id, BM Unit, Time from, Dir, max level, Min Level, divisible, price, Bid Id, Assoc Bid Type, Assoc set												
RRB,	NAT_POWER,	ABTH-7,	2019-11-12	09:00,	UP,	100,	0,	TRUE,	1.1,	0001,	LINK,	3333
RRB,	NAT_POWER,	ABTH-7,	2019-11-12	09:15,	UP,	120,	0,	TRUE,	1.1,	0002,	LINK,	3333
RRB,	NAT_POWER,	ABTH-7,	2019-11-12	09:30,	UP,	75,	0,	TRUE,	1.1,	0003,	LINK,	3333
RRB,	NAT_POWER,	ABTH-7,	2019-11-12	09:45,	UP,	75,	0,	TRUE,	1.1,	0004,	LINK,	3333
*												
RRB,	NAT_POWER,	DIDCB5,	2019-11-12	09:00,	UP,	100,	0,	FALSE,	2.6,	3397,	MULT,	1111
RRB,	NAT_POWER,	DIDCB5,	2019-11-12	09:00,	UP,	200,	0,	FALSE,	3,	3398,	MULT,	1111
RRB,	NAT_POWER,	DIDCB5,	2019-11-12	09:00,	UP,	300,	0,	FALSE,	3.4,	3399,	MULT,	1111
*												
RRB,	NAT_POWER,	FAARW-1,	2019-11-12	09:00,	UP,	50,	0,	TRUE,	4.2,	3401,	EXCL,	2222
RRB,	NAT_POWER,	FAARW-1,	2019-11-12	09:00,	UP,	100,	0,	TRUE,	4.6,	3402,	EXCL,	2222
RRB,	NAT_POWER,	FAARW-1,	2019-11-12	09:00,	UP,	150,	0,	TRUE,	5,	3403,	EXCL,	2222

# Libra Validation

- Data passed on to Libra is checked for more detailed errors
- Mixture of validation and consistency errors
- Results not published until end of auction period

Field name
<Min Level greater than max level>
<Submission date/time from does not align to Delivery Period>
<Decimal not valid for mw level>
<Associated Bids are different types>
Associated Bids are across different resources>
<Linked bids do not have 15 minute resolution>
<Bids overlap in time>
<Multipart bids are in different directions>
<Multipart bids must have increasing price curves>
<Associate bid set must exist for same bmu for multiple rows in submission>



# Answers to your questions

Moderator

**Pradeep Ninan** (NGESO)



**Break**  
*10 mins*





# TERRE Settlement

---

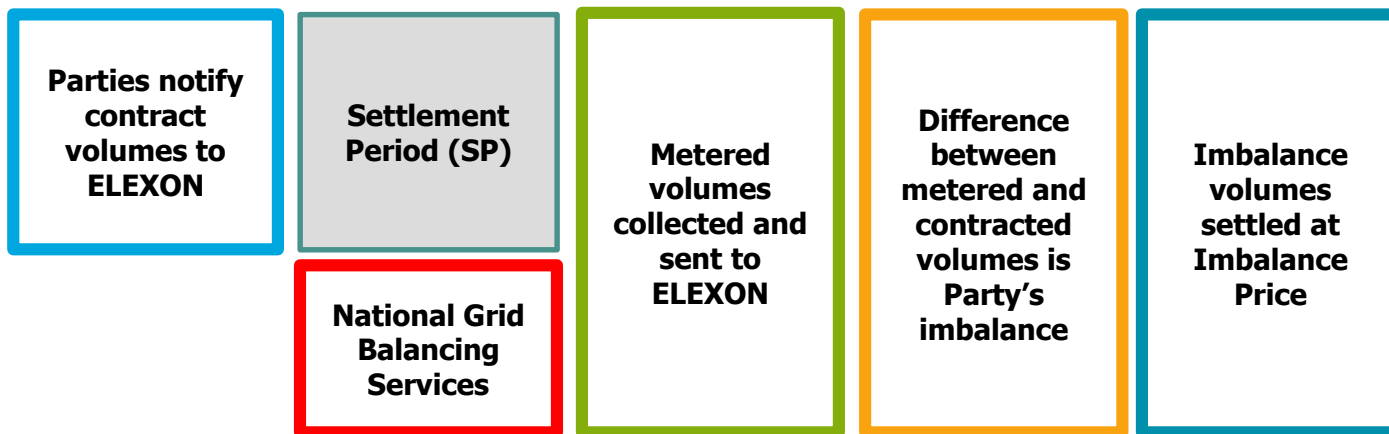
07 April 2020  
Matt Roper

# Introduction



## What is Settlement?

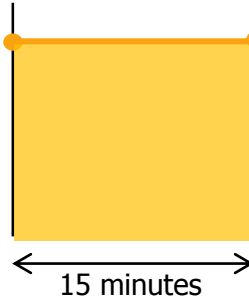
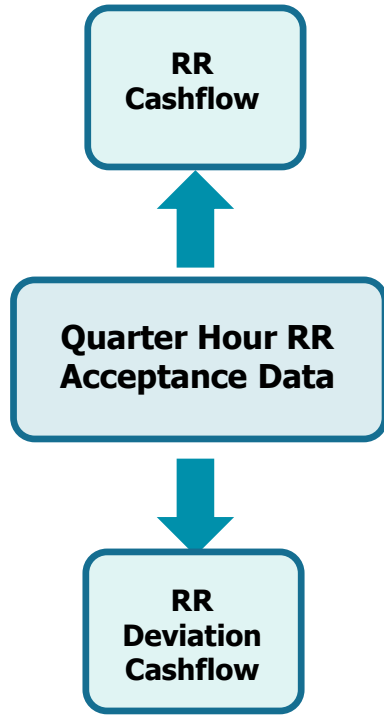
ELEXON calculates payments to / from Parties in regards to mismatches between BSC Parties contracted and metered positions



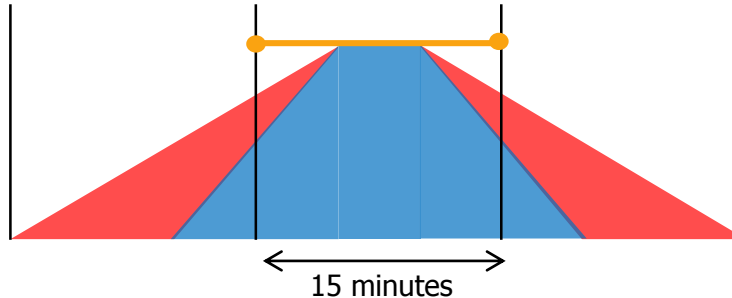
ELEXON calculates payments to / from Parties in regards to Balancing Services

# How will TERRE Acceptances be paid?

$$\text{RR Cashflow} = \text{RRAV}_{ij} * \text{Activation Price}$$



$$\text{RR Deviation Cashflow} = \text{Additional volume} * \text{BEDP } [£0]$$

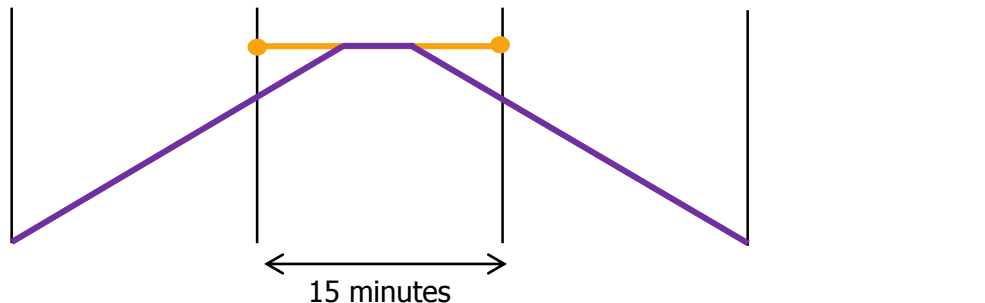


# How will TERRE volumes be calculated?



## What is a RR Schedule?

- Settlement derived representation of the TSO RR dispatch instructions needed to successfully fulfil the activations for a RR Auction period
- The RR Schedule will respect the BM Unit declared Dynamic Data Set (where possible) and align with NGESO RR Dispatch Principles (where possible)

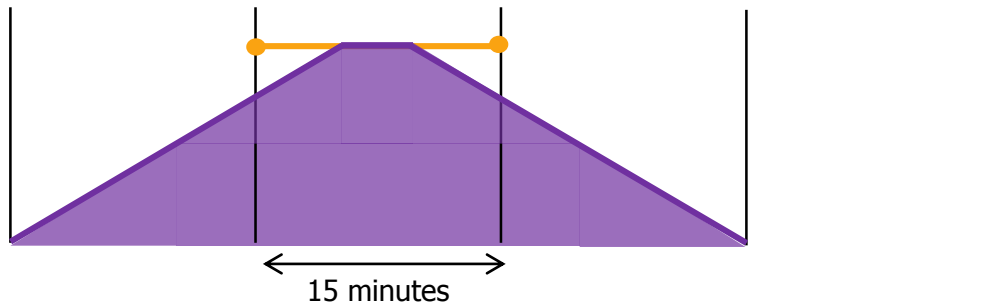


## How will TERRE volumes be calculated?

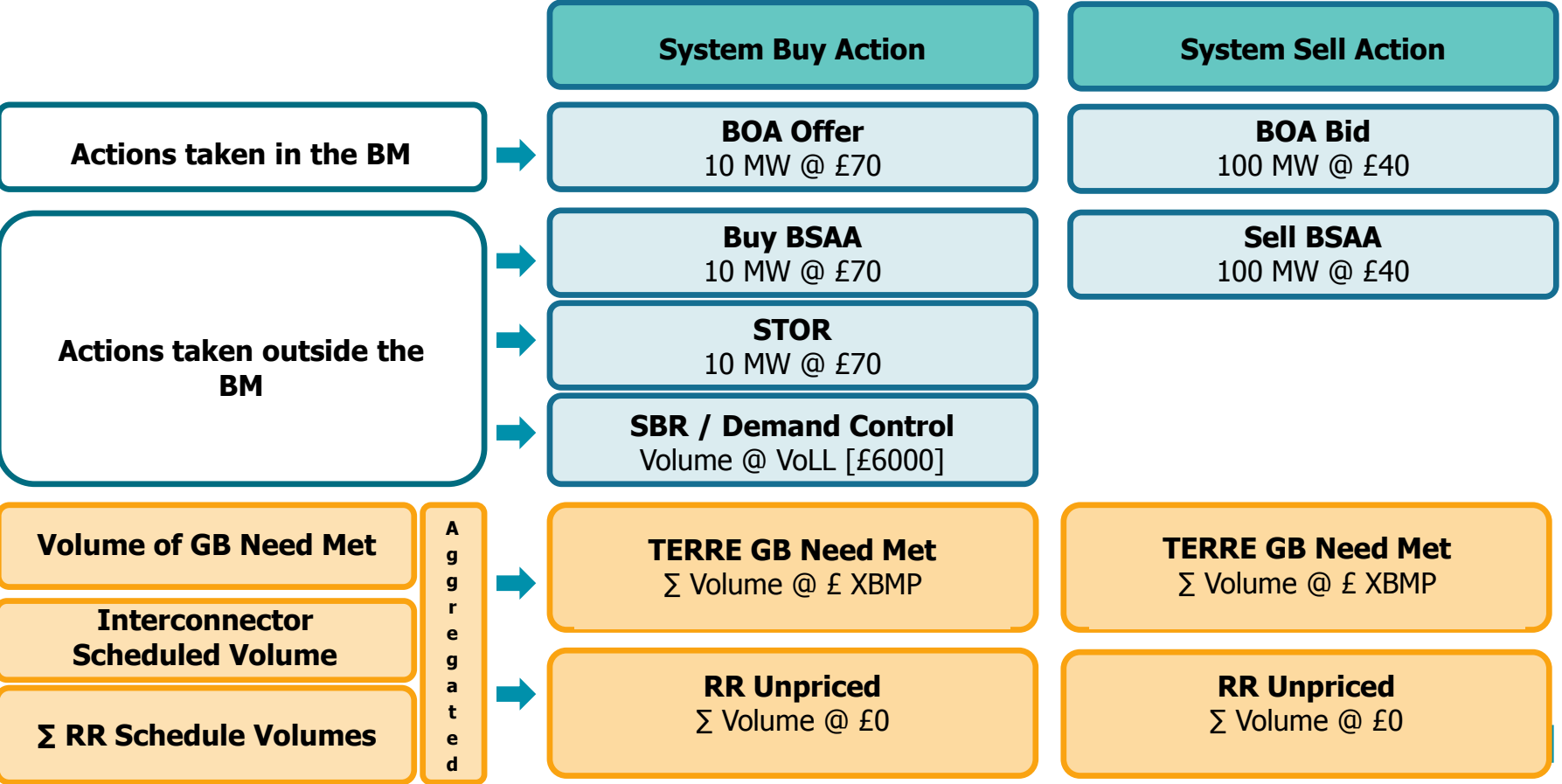


### Why is it needed?

- National Grid have indicated they will not always issue a full RR Instruction.
- Settlement needs to account for all activated TERRE volumes. Therefore the SAA will construct an 'RR Schedule' for use in settlement to account for the instances where a RR Instruction is not received.










# Imbalance Price Calculation



# Imbalance Price calculation

The Imbalance Price calculation process remains unchanged:

## Process (in order)

- 1 Report BOAs and Disaggregated BSAD
- 2 System Operator flagging 
- 3 Emergency Flagging 
- 4 Ranking
- 5 CADL Flagging 
- 6 De Minimis tagging 
- 7 Arbitrage tagging 
- 8 Classification
- 9 NIV tagging 
- 10 Replacement Price
- 11 PAR tagging 
- 12 Price Calculation (including TLM)
- 13 BPA/SPA



# BMRS Settlement Reporting

The screenshot displays the ELEXON website's 'BM Reports' section, specifically the 'Balancing' tab. The interface includes a top navigation bar with the ELEXON logo and various menu items like 'Electricity Data Summary', 'REMIT', 'Transparency', 'Transmission', 'Demand', 'Generation', 'Balancing', and 'Help'. Below this, a breadcrumb trail shows 'Balancing'. The main content area is divided into several sections: 'MARKET DATA' (Market Depth, Market Activity, Credit Default Notices), 'SYSTEM PRICES' (System Sell and System Buy Prices, Detailed System Prices, Market Index Data, Imbalance Prices (B1770) - 17.1g), 'BALANCING MECHANISM DATA' (NETBSAD, DISBSAD, NON BM Instructed Volumes, Amount Of Balancing Reserves Under Contract (B1720) - 17.1b, Prices of Procured Balancing Reserves (B1730) - 17.1c, Accepted Aggregated Offers (B1740) - 17.1d, Activated Balancing Energy (B1750) - 17.1e, Prices of Activated Balancing Energy (B1760) - 17.1f, Aggregated Imbalance Volumes (B1780) - 17.1h, Financial Expenses And Income For Balancing (B1790) - 17.1i, Rules Of Balancing (B1710) - 17.1a), and a bottom section with links for Physical Data, Bid Offer Data, Balancing Services Volume Data, Dynamic Data, Derived Data, Trading Unit Data, and System Zone / BM Unit Mapping. A red box highlights a text area stating that BMRS shall be updated to include: BM Unit TERRE Bid Data, Aggregated TERRE Bid Data, RR Auction Result Data, and Derived Indicative BM Unit RR Data.

**BMRS shall be updated to include:**

- BM Unit TERRE Bid Data
- Aggregated TERRE Bid Data
- RR Auction Result Data
- Derived Indicative BM Unit RR Data

## SAA-I014: Settlement Report

The SAA-I014 is a widely distributed settlement report, produced by SAA, that contains settlement information for each Settlement Run for each Settlement Date.

New data under TERRE will be reported to BSC Parties via the existing SAA-I014 Settlement Report and shall be based on existing BM data items (i.e. period and daily):

- RR Bid Data
- RR Activations
- BM Unit RR Cashflows / Volumes
- Total System RR Cashflows / Volumes
- And all other supporting information (e.g. GBP/EUR rate, BEDP etc)



SAA-I014 v10  
is available on  
the TERRE  
release page  
on the ELEXON  
website

# Industry testing

Presenters

**Isobel Squire** (ELEXON)

**Partho Pal** (NGESO)

# Test objectives

## NGESO

- Verify market participants connectivity to National Grid
- Validate National Grid business processes to enable TERRE
- Validate data submissions from test participants to ensure common understanding of rules
- Validate conversion of test participants offers into appropriate formats
- Verify interoperability with the central Libra platform
- Validate creation, issue and receipt of dispatch instructions to market participants

## ELEXON

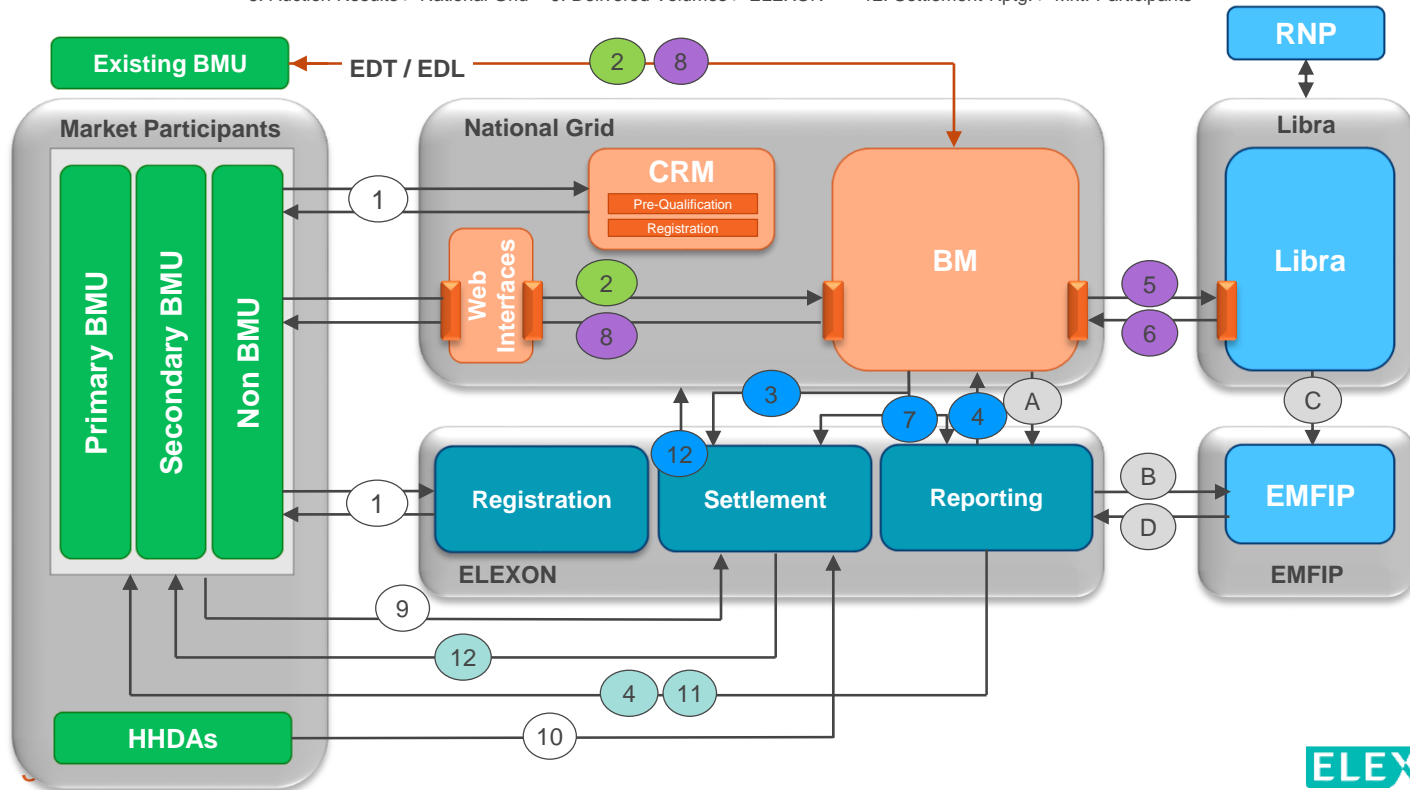
- Verify ELEXON's connectivity to National Grid for receiving RR data
- Validate publication of the daily GBP-EUR exchange rate to National Grid and other participants
- Validate ELEXON's processes for calculating the RR schedule and including RR data in settlement
- Validate publication of RR data to participants via BMRS messages and in settlement reports
- Enable market participants to design and test changes to their interfaces with ELEXON

## JOINT

- Enable market participants to understand the processes and systems involved
- Verification of data Interfaces between **NGESO** and **ELEXON** (including currency exchange rate)
- Validate TERRE-BM interaction rules agreed as part of P344 consultation both **dispatch** & **settlement**
- Ensure that systems and processes not impacted by TERRE remain unaffected by changes
- Validate new and amended interfaces between **NGESO** and **ELEXON**, confirming that our assumptions about data content and format are aligned

# Test scope

- |                         |                                    |                                     |  |
|-------------------------|------------------------------------|-------------------------------------|--|
| 1. Registration         | 4. GBP > EUR Rate                  | 7. Auction Results > ELEXON         | 10. HH Metered Volumes > ELEXON                        |
| 2. Bids > National Grid | 5. Bids > Libra                    | 8. Instructions > Mkt. Participants | 11. BM Reporting (incl. RR trades) > Mkt. Participants |
| 3. Bids > ELEXON        | 6. Auction Results > National Grid | 9. Delivered Volumes > ELEXON       | 12. Settlement Rptg. > Mkt. Participants               |



## Data Submission Testing

- Mkt Participants (Bids) > BM

## Libra Parallel Run

- BM (Bids, ATC, DFR, TSO Needs) > Libra
- Libra (Auction Results) > BM
- BM (BOA-RR) > Mkt Participants

## NG<>ELEXON Bilateral Testing

- Bids > ELEXON
- GBP-EUR Rate > National Grid
- Auction Results > ELEXON
- Settlement Reporting (CAB, ASB)

## ELEXON<>MPs Bilateral Testing

- GBP-EUR Rate samples > MPs
- BM Reporting samples > MPs
- Settlement Reporting samples > MPs

## End to End Interface Testing

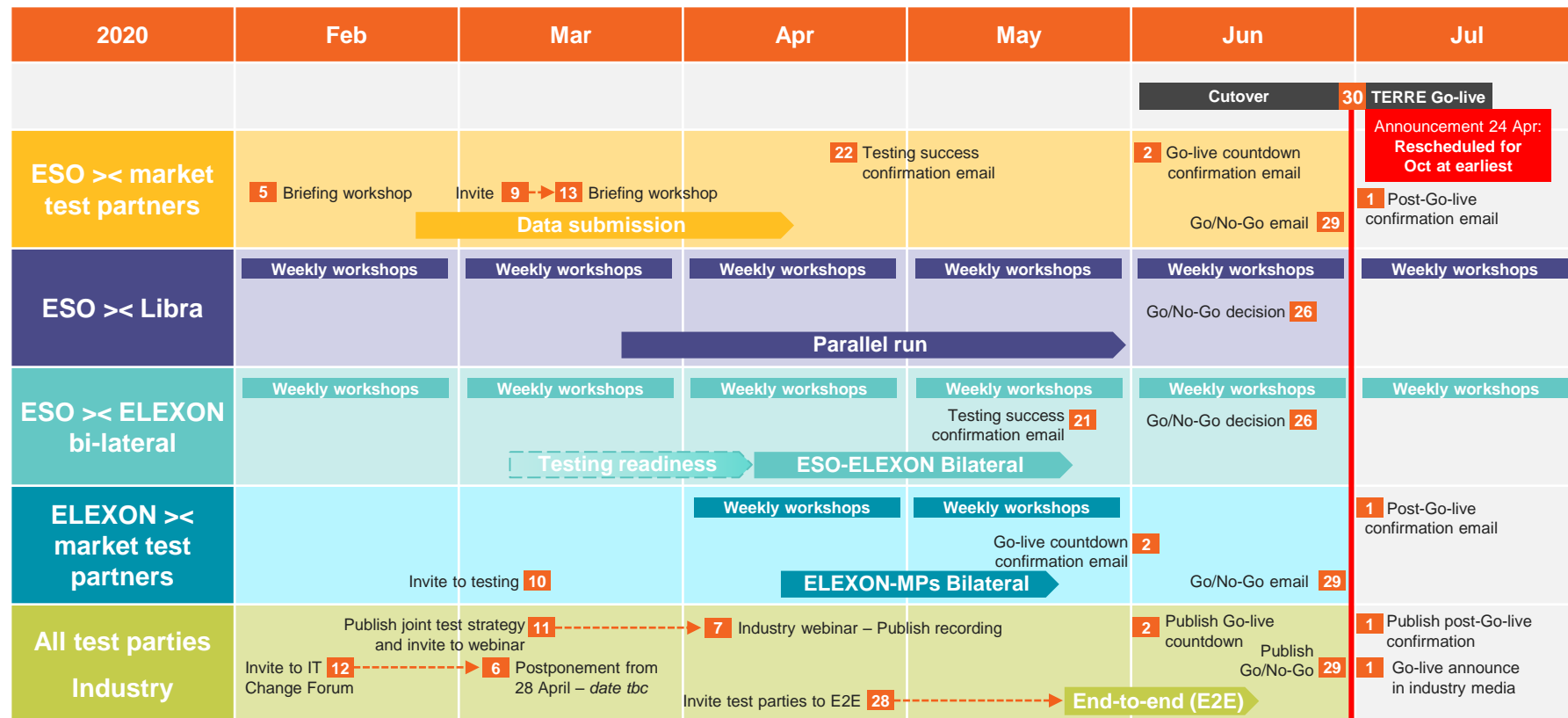
- Mkt. Participants (Bids) > BM
- IC (Schedule) > BM
- ELEXON (exchange rate) > BM (EUR)
- BM (Bids) > Libra
- BM (ATC, DFR) > Libra
- BM (TSO needs) > Libra
- Libra (Auction Results) > BM
- BM (Auction Results, Bids) > ELEXON
- BM Reporting > Mkt. Participants
- Settlement Reporting > Participants

# Next steps

Presenter

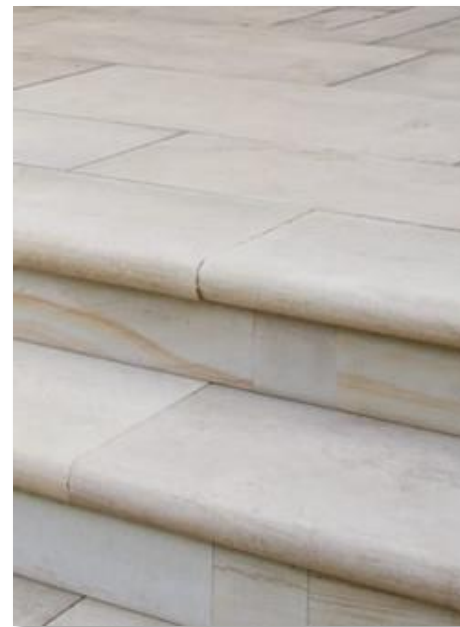
**Pradeep Ninan (NGESO)**

# Comms & engagement plan – TERRE testing



# What you can do next

- **Existing BM units** –
  - Register your interest to participate in TERRE.
  - Be aware of obligations as Virtual Lead Party (VLP), if applicable
- **Interested parties** – apply to Pre-Qualify as a primary or secondary BM unit and express your interest in TERRE
- **Existing EDT connection** – if you are using this, ensure you are able to submit the new RR offers
- **Internet-based API** – if you are using this, ensure you are certified and able to submit RR offers
- **ELEXON interfaces** – Be ready to receive TERRE data from BMRS and in settlement reports
- **Participation in testing** – get in touch with us if you would like to join our market participant group.



# Answers to your questions

Moderators

**Pradeep Ninan** (NGESO)

**Matt Roper** (ELEXON)



# More questions?

- **NGESO general**  
[Commercial.Operation@nationalgrideso.com](mailto:Commercial.Operation@nationalgrideso.com)
- **NGESO testing**  
[Box.ENC.NewMarketsTesting@nationalgrid.com](mailto:Box.ENC.NewMarketsTesting@nationalgrid.com)
- **ELEXON testing**  
[terre.testing@elexon.co.uk](mailto:terre.testing@elexon.co.uk)



# Thank you

[nationalgrideso.com](https://nationalgrideso.com)

Faraday House, Warwick Technology Park,  
Gallows Hill, Warwick, CV346DA

**ELEXON** national**grid**ESO