Electricity Distribution

Transmission update for DG

Welcome, the webinar will begin in a few minutes:

- Please use the Q&A button to post your questions, but don't post any commercially sensitive question as all attendees can see your posts.
- Please use the chat facility for any technical queries.
- We will try to answer as many questions as possible in the Q&A session.
- Please note there are different view options in Zoom.

nationalgrid

6th December 2022

NGED Webinar: Transmission update for DG

Presenters and Q&A Panelists

National Grid Electricity Transmission (NGET)	Electricity System Operator (ESO)	National Grid Electricity Distribution (NGED)
• **John Twomey - Head of Customer Management.**	• **Susana Neves e Brooks - Head of Connections Networks.** • **Djaved Rostom - Connection Operability Assessment Manager.** • Andrew Wainwright - Whole Electricity System Senior Manager. • Laura Henry - Connections Policy and Change Manager.	• **Andrew Akani – Primary System Design Manger.** • Ben Godfrey - Director of Distribution System Operator. • David Tuffery - Network Modelling & Whole System Manager.

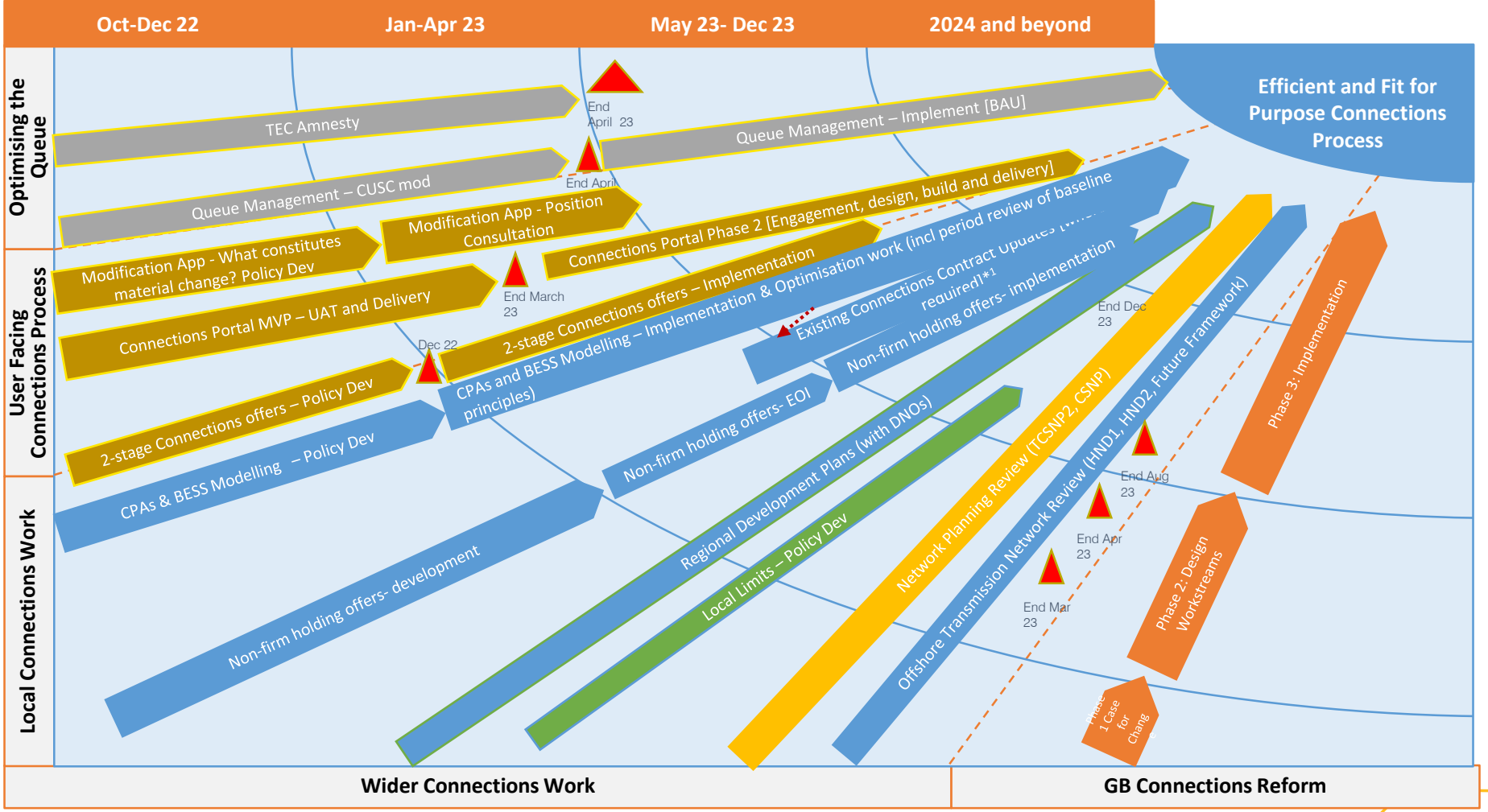
Agenda

1. **ESO update**
   - TEC amnesty and Queue Management.
   - Technical Initiatives (CPA review and treatment of storage)
   - Development of non-firm solutions
   - 2 Stage Offer Process
   - Connections reform overview
2. **NGET update**
3. **NGED Update**
4. **Q & A Session**
   - Please avoid specific scheme questions

ESO connections initiatives

Su Neves e Brooks

ESO



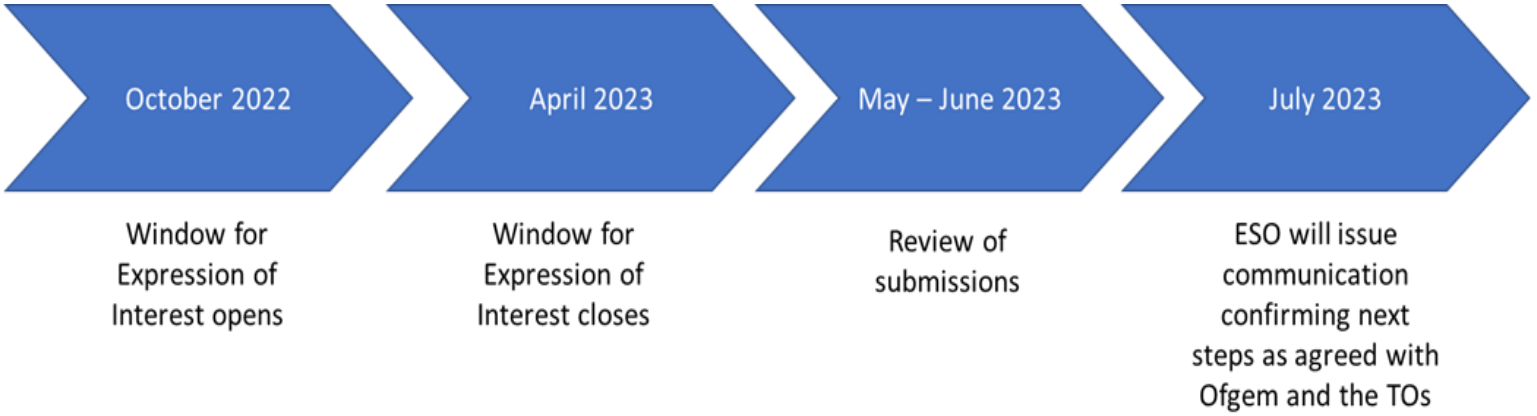
*1 where CPA and Storage modelling review and optimisation of existing contracted background results in a revised scope of works, enabling works and connection date

ESO

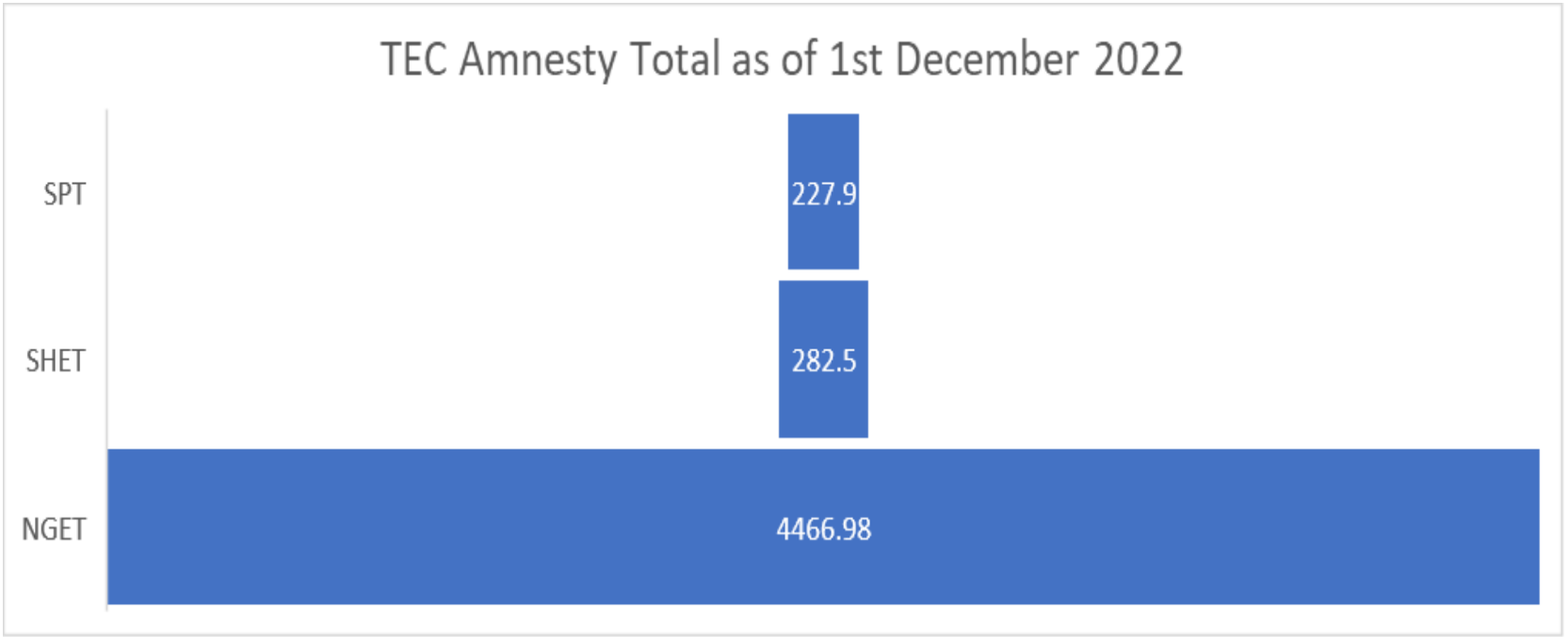
TEC Amnesty

TEC Amnesty

- Expression of interest window opened on the 1st October 2022
- ESO with agreement from Ofgem extended the window from the 30th November 2022 to the 30th April 2023
- Those who applied during the original timeframe will still have their applications assessed within the original timeframe
- Applications will be assessed on a rolling monthly basis with Ofgem and the TO's



TEC Amnesty Position as of 1st December 2022



Transmission Queue Management

CMP376

ESO

Summary of Proposal

Milestones

Date back from contracted completion date (note that the milestone duration time period is the contracted completion date to the effective date of the agreements)

Evidence

Evidence for each milestone set out in the CUSC

Process to submit/validate evidence set out in guidance.

Termination

Will apply to missed milestones if the evidence is not provided within 60 days of the missed milestone. *Projects will not be moved down the queue – they will be terminated*

Scope and Implementation

All new applications and Modification Applications for parties who are requesting TEC (except BEGAs and non radial offshore connections) after the implementation date, which is 10 working days after Ofgem's decision.

Exemptions

Force Majeure; Planning appeals (M2) in relation to the User's Consents; Any delay from Transmission Licensee or The Company or CUSC 6.19

Mod App

First mod app post CMP 376 will receive QM Milestones. All QM milestone dates stay fixed unless exception provided.

Introduction of Queue Management

There is also a need to implement more effective Queue Management (QM) arrangements. To that end, the ESO has raised a code modification, CMP376, under the Connection and Use of System Code (CUSC), to formally introduce QM arrangements. This modification is subject to approval.

QM will mean that projects which are ready to connect can do so ahead of those customer projects that may have applied earlier but are not ready or able to progress – currently the ESO are unable to prioritise the queue based on readiness to connect.

At the simplest level, if implemented, QM will introduce contractual milestones that customers must meet to retain their place in the connection queue, which will benefit everyone.

Timeline for CMP376V5b as at 3 October 2022

Milestone	Date	Milestone	Date
Workgroup Nominations (15 working days)	Closed	Panel sign off that Workgroup Report has met its Terms of Reference	24 February 2023
Workgroups 1 – 5	28 October 2021, 13 December 2021, 28 January 2022, 6 September 2022 and 27 September 2022	Code Administrator Consultation(15 Working Days)	27 February 2023to 20 March 2023 (5pm)
Workgroup 6 – Agree the Milestone timings; Agree how Modification Applications impact on the Milestones set out in the Construction Agreement; Clarify the Original proposal and confirm if any possible alternatives; Review updated version of Legal Text; and Note possible questions to be raised as part of the Workgroup Consultation	21 October 2022	Draft Final Modification Report (DFMR) issued to Panel (5 working days)	23 March 2023
Workgroup 7 – Clarify solutions to be consulted upon, check in on Transmission vs Distribution differences, finalise Legal Text, finalise Workgroup consultation (including agreeing Workgroup Consultation questions), check in on progress vs Terms of Reference	17 November 2022	Panel undertake DFMR recommendation vote	31 March 2023
Workgroup Consultation(20 Working Days)	25 November 2022 to 23 December 2022 (5pm)	Final Modification Report issued to Panel to check votes recorded correctly (5 working days)	4 April 2023
Workgroups 8 and 9- Assess Workgroup Consultation Responses, further review of Original and alternatives (including legal text) and carry out Alternative Vote	9 January 2023 and26 January 2023	Final Modification Report issued to Ofgem	12 April 2023
Workgroup 10 - Finalise solution(s) and legal text, agree that Terms of Reference have been met, Review Workgroup Report and hold Workgroup Vote	8 February 2023	Ofgem decision	TBC
Workgroup report issued to Panel(5 working days)	16 February 2023	Implementation Date	10 working days after Authority Decision

CONSTRUCTION PLANNING ASSUMPTIONS REVIEW

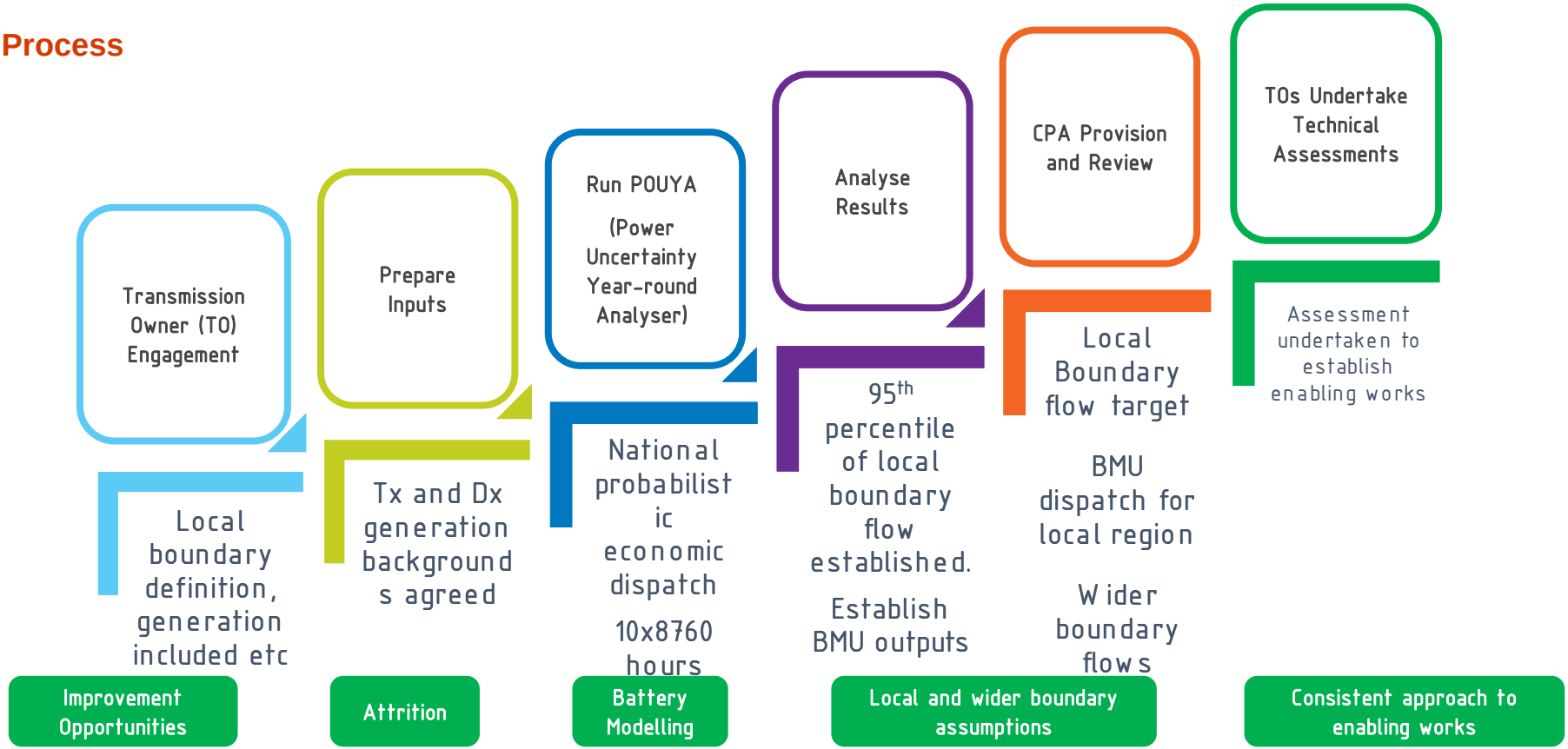
Djaved Rostom

Rationale for CPA review

- Oversubscribed generation background
- Studies indicating that the network will be constrained
  - Drives the need for substantial enabling works
  - Causes late connection dates as a result
- Common goal is to achieve net zero together.
- ESO is taking on more risk whilst ensuring network remains operable, economic and efficient.

Current Construction Planning Assumptions

Process



Attrition

Data Review

- Contracted parties tracked across 10 years of TEC registers
- Projects tracked from application status to connected or terminated status
- Challenge to undertake this assessment for Distribution projects

Observation

- 1/3 contracted MW actually connected
- Fairly small sample size, especially per technology group
- Could be dominated by large parties and vary over time

Proposal

- Proposal for local and wider regional attrition percentages to be applied
- Attrition to be applied at both transmission and distribution level

Implement

- Discuss and agree approach with Network Owners
- Review risks of the proposed approach and identify mitigation measures

New Transmission Reinforcement Works (TRW) Review required

Local Region

- 50% Attrition rate applied to MW capacity
- Applied to projects without consents
- Applied by fuel type
- Applied to projects in the queue and projects with a connection offer

Wider Region

- 66% Attrition rate applied to MW capacity
- Attrition by fuel type
- Opportunity to align wider background with FES
- Wider boundary capability limits applied

Distributed Energy Resources

- 66% attrition applied to local and wider regions
- Mixture of appendix G data and FES
- DER output from POUYA
- Implication of DNO ANM Schemes

ENERGY STORAGE MODELLING & NON-FIRM OFFER DEVELOPMENT

Djaved Rostom

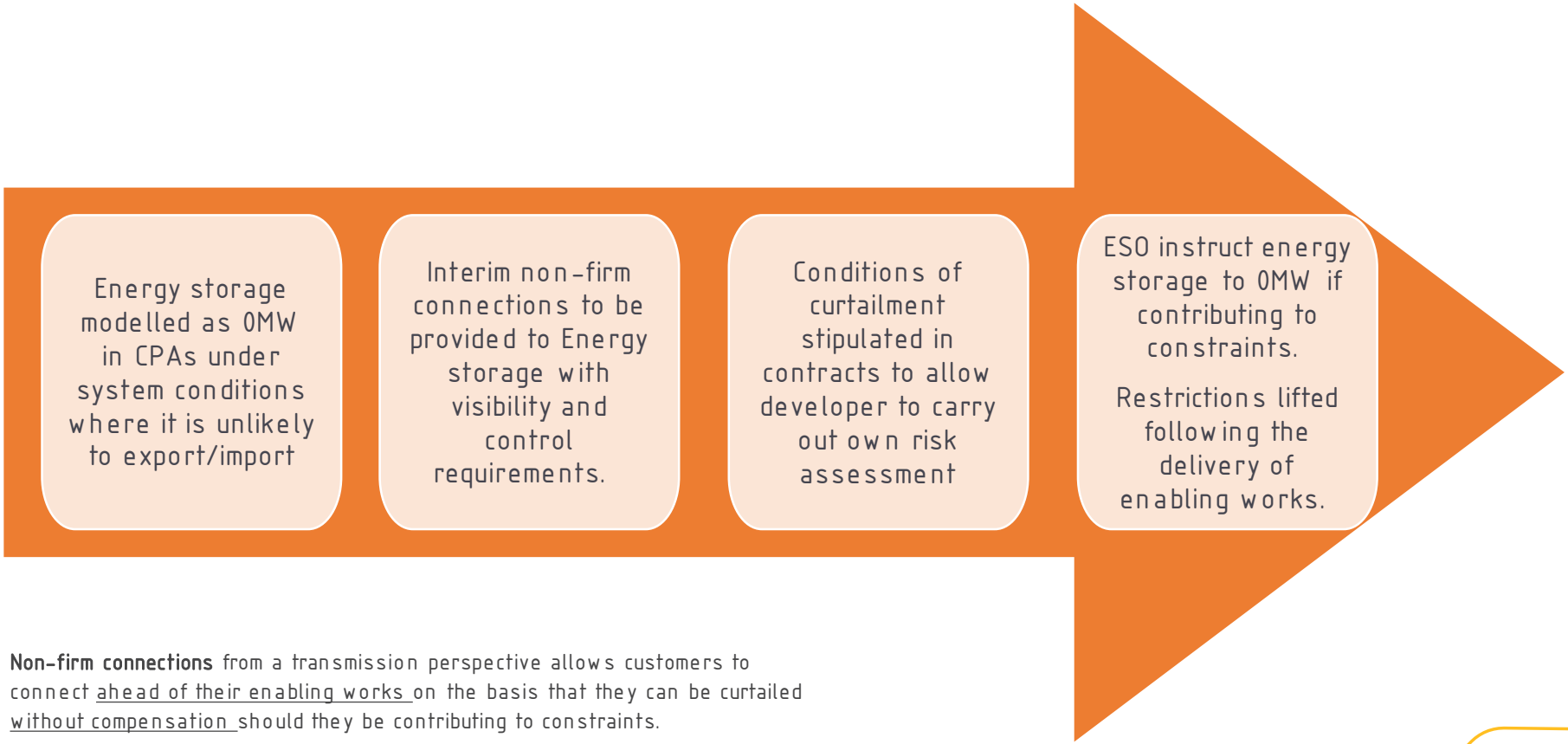
TRANSFORM | CONNECT | ENABLE NET ZERO

Energy Storage Assumptions

- Energy storage can play an important role as enabler of renewable energy penetration and facilitate the transition to net zero.
- Such operation can have a negative correlation with system constraints.
  - Times of high renewable output – storage unlikely to be discharging
  - Times of high demand – storage unlikely to be charging
- A working group has been set up to explore news way of assessing energy storage connections that better reflects how the assets operate.
- We have engaged with selected energy storage developers to understand the business model for their assets.
- Further engagement planned with the Electricity Storage Network (ESN) and DNOs

What have we learnt so far?

Energy Storage proposal



Non-firm connections from a transmission perspective allows customers to connect ahead of their enabling works on the basis that they can be curtailed without compensation should they be contributing to constraints.

Non-firm offer development for Energy Storage

Network Owners/ ESO Connections

- Improved modelling of energy storage
- Understand implications of curtailment on service provision.
- Define contractual terms for non-firm connections and associated network restrictions.
- Establish data to be provided to energy storage to enable calculation of curtailment risk
- Undertake assessments to determine works for firm connections.

ESO- Electricity Network Control

- Processes established to ascertain when and how energy storage can be curtailed.
- Establish optimum time (Day Ahead/ within day) for providing curtailment signals
- Development of IT systems to issue instructions to energy storage at both T&D
- Systems to establish when curtailments are compensated v/s not compensated.

Storage Developers

- Carry out assessment of risk of curtailment frequency and duration of curtailment.
- Understand implications of curtailment on service provision.
- Work with Network owners/ ESO to sign up to appropriate systems to receive curtailment instructions.
- Enact upon instructions in appropriate timescales.

We aim to address the above ESO development activities on non-firm connections by March 2023.
In parallel we are also be exploring opportunities for non-firm connections for other types of generation

Two Stage Offer Process

Su Neves e Brooks

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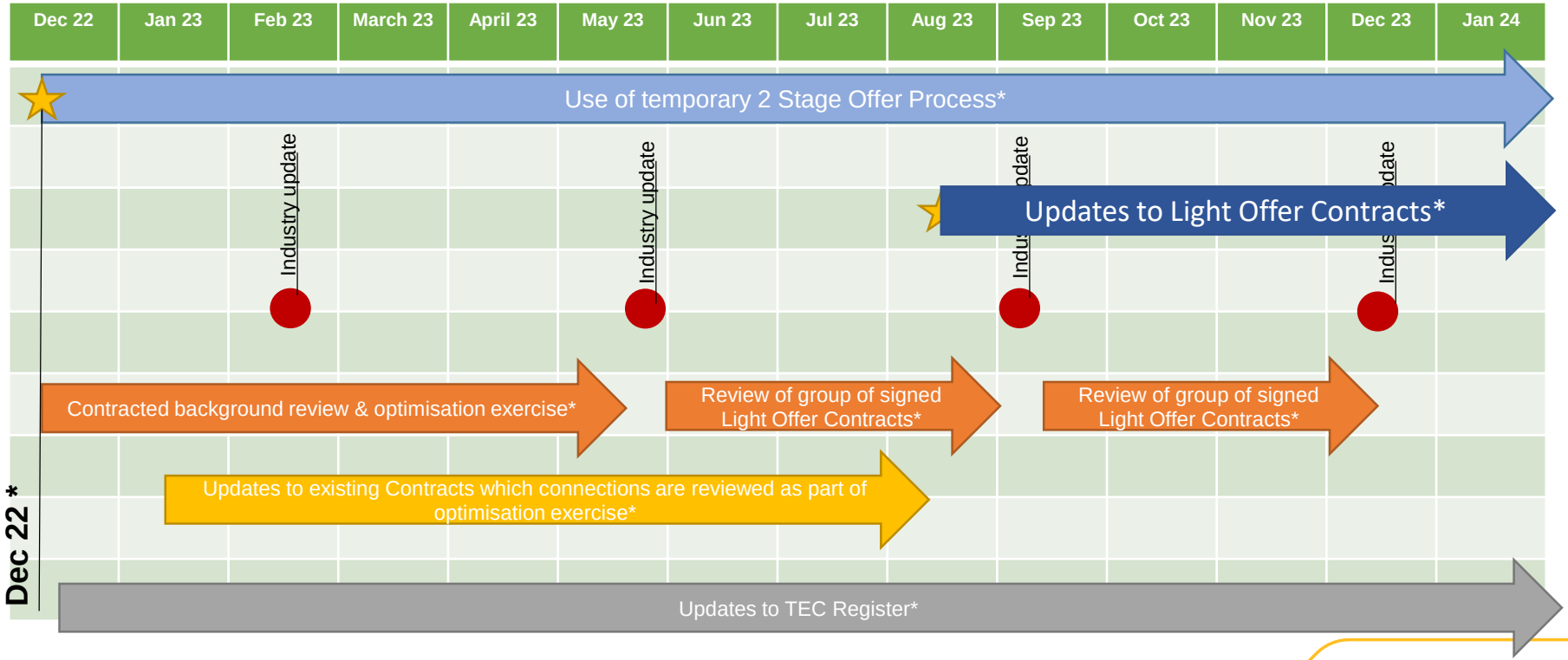
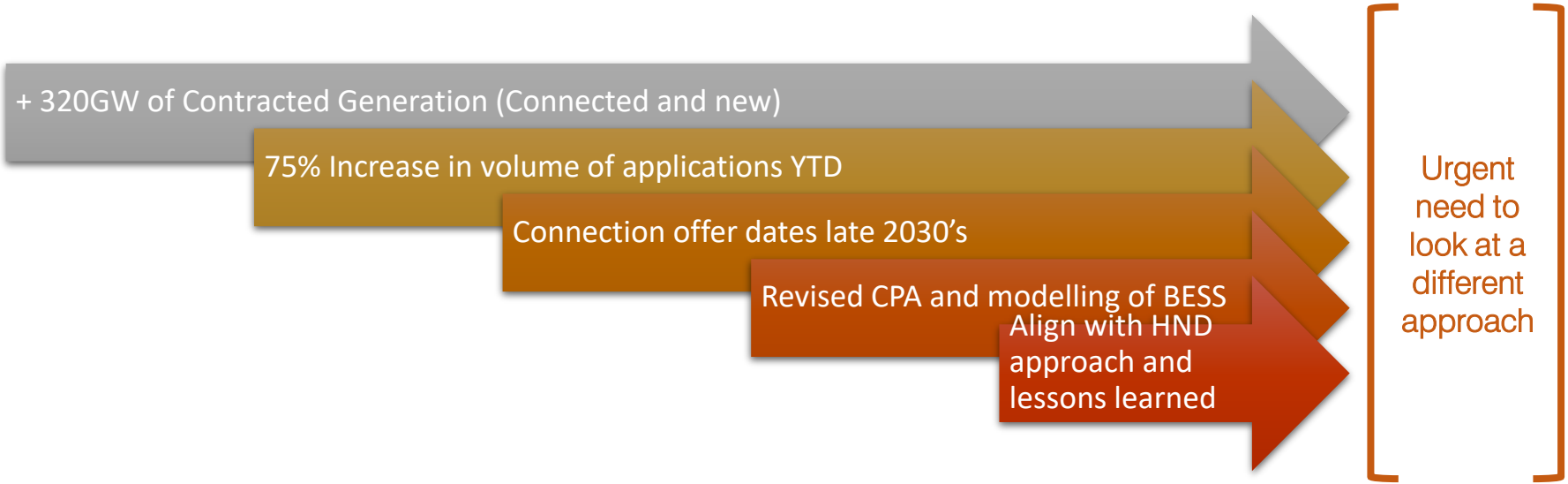
Why are we proposing a Temporary Two-Stage Offer Process

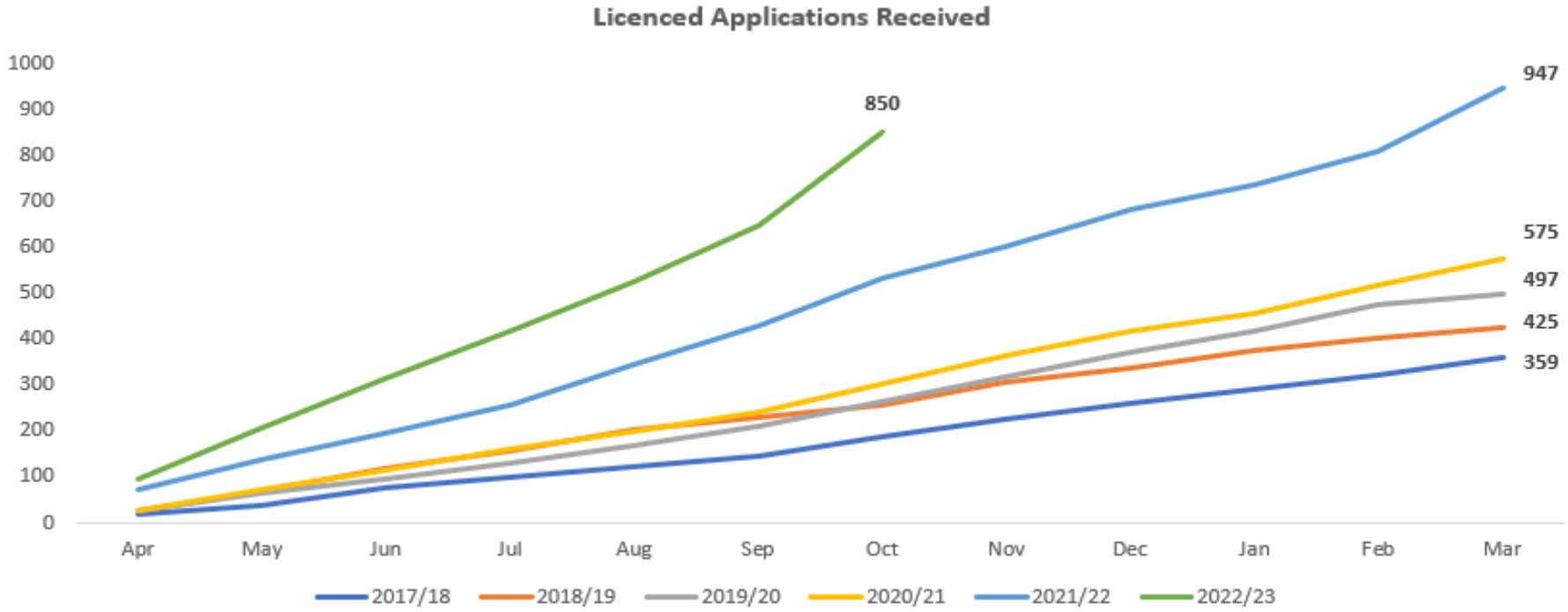


*dates and duration of activities to be confirmed & agreed, key dependency on when 2 stage offer is introduced

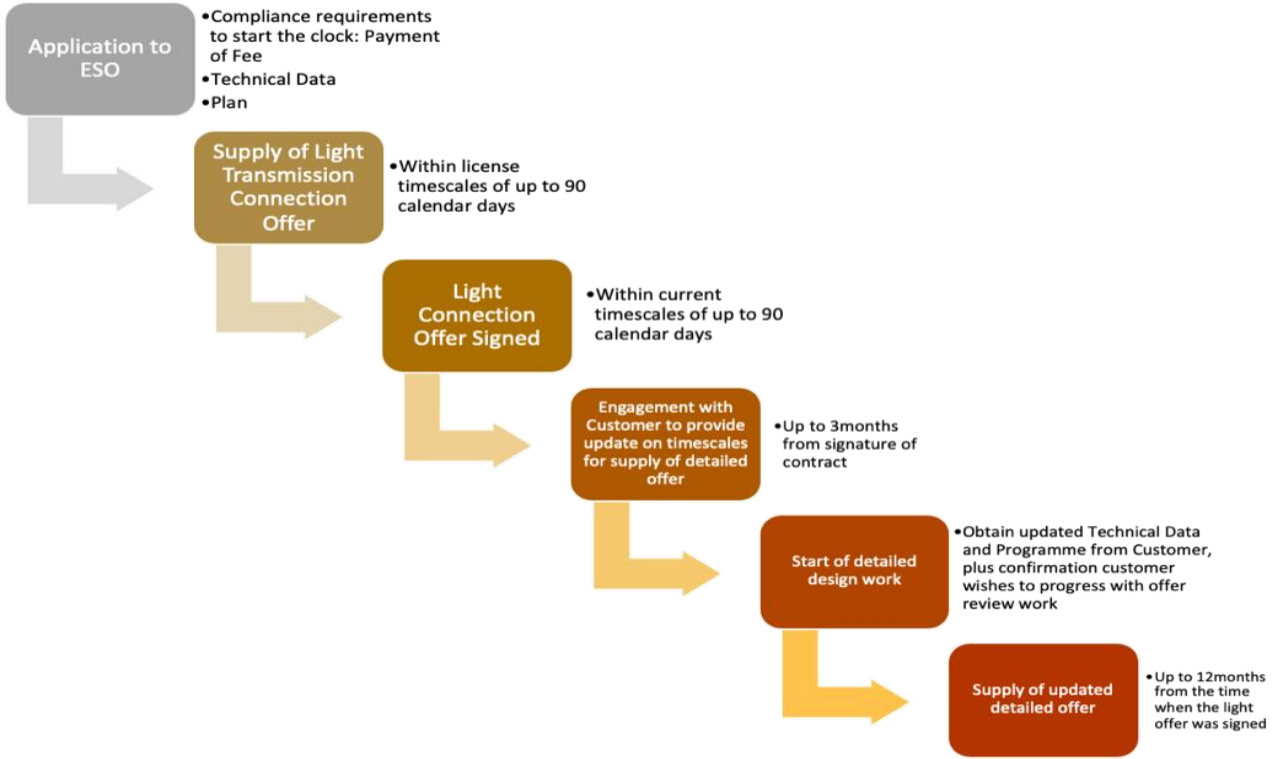
Current Situation



Connection applications showing unprecedented growth in applications to the NETS



Proposed Two-Step Offer Process



What will the new offers look like?

Step 1 Interim Offer

- Full legal BCA / CONSAG front end, with interim specific offer clauses added
- Connection Point (where applicable)
- Connection date based on current contracted background & enabling works
- £0 securities as no works listed in offer & TEC queue confirmation

Step 2 Updated Offer

- Updated BCA / CONSAG as needed, ie delete Interim clauses
- Full suite of populated Appendices, including new reinforcement works and milestones
- Securities value will be updated, based on reinforcement works required

Benefits that we expect the new process to bring

- Updated Studies based on new TRW
- Release Capacity from the Network
- Revised Network reinforcement works
- Reduced Securities for new connections
- Improved Connection dates

GB CONNECTIONS REFORM [GBCR]

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ESO

Why do we need connections reform?

Current State

Current process is not fit for purpose: over 320GW has a generation connection agreement, connections for new projects as late as 2036:

- queue for applications to connect to the network at both distribution and transmission level has increased exponentially
- not all projects in the queue will progress - first come first served process and low barriers to entry mean 'ready to go' projects delayed

The connections processes (eg 90 day offer) were not designed for the volume, complexity of network assessments and agility now required

The current requirements for network studies and modelling of future connections (to support offer connection solution minimum requirements) is driving an unprecedented level of reinforcements required on the system, creating system planning challenges

Potential for delays, wasted effort and unnecessary spend to enable the build of the transmission network

Challenge

The pace we need to transform our energy system, including encouraging the right mix of technologies, means that this challenge is likely to increase

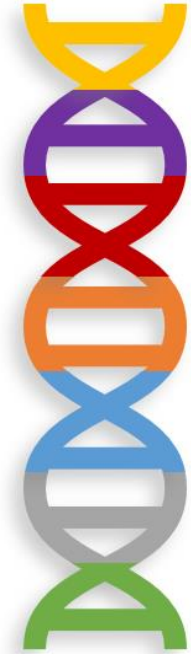
The current process doesn't align with wider strategic or whole system planning initiatives (eg network planning review, offshore coordination)

Need for better visibility of contracted demand and generation across GB, for both Transmission and Distribution and greater alignment of Transmission and Distribution Connection processes

Progress to enable decarbonisation of the GB Energy system will be inhibited should nothing change

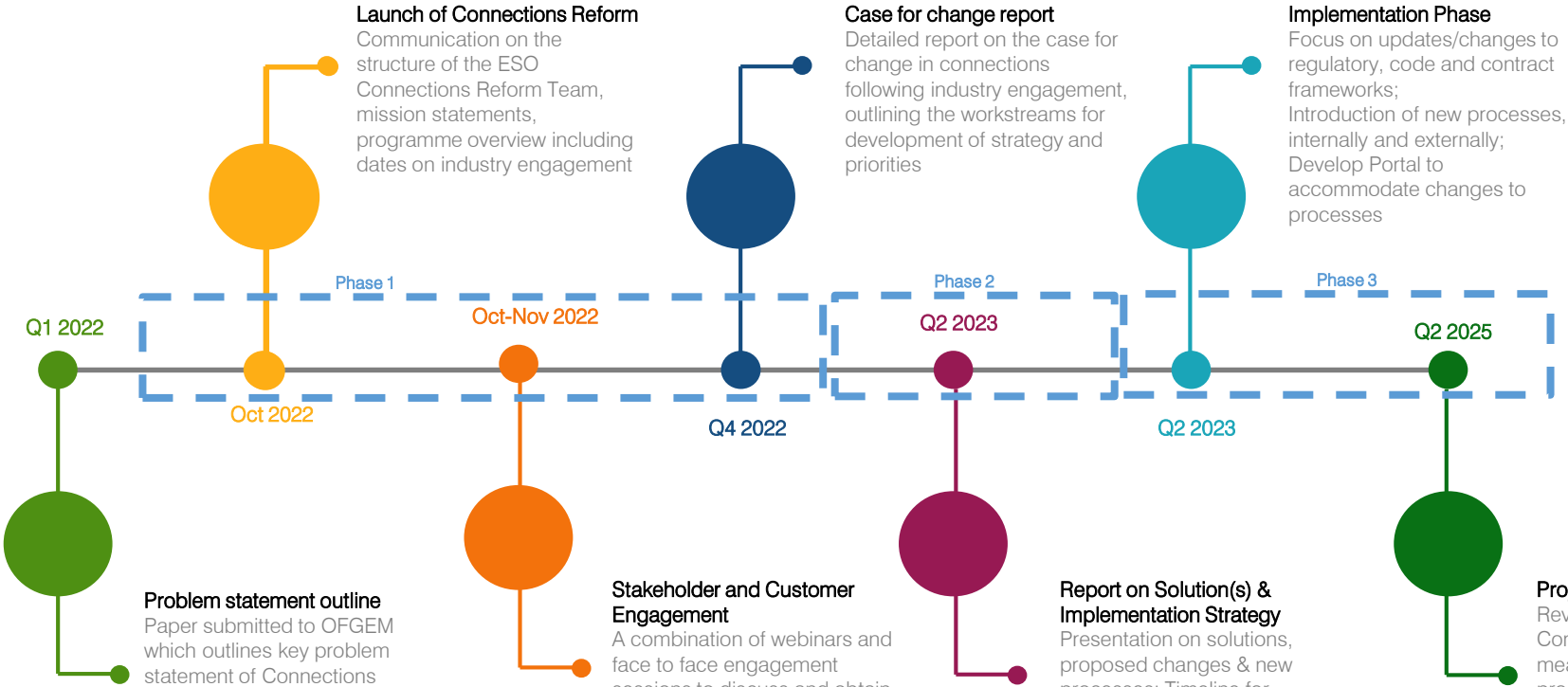
GB Connections Reform – Objectives

ESO CONNECTIONS REFORM



- Whole System Approach to Transmission Connections
- Improvement to Customer Experience & Engagement
- Alignment with GB Energy Strategy and delivery of value to end consumers
- Supports the delivery of NetZero
- Enable a process that advances the projects that are ready to connect
- Process that embraces diversity and complexity of Connections within an evolving Energy System
- Future proof process [new framework for periodic reviews & simplify change]

Connections reform – High level timeline



Summary Case for Change: GB Connections Reform

Themes identified through engagement workshops

	Before Application	During Application and Signing	After Contract Signing
Rapid connections progressed on their merits	ESO/TO Modelling to decide network requirements is based on worst case assumptions	Speculative applications, modifications, and re-offers lead to additional time / effort and hold up the queue	Delivery of reinforcement and enabling works too slow
	Asymmetric opportunities depending on level of understanding of the process	Limited ability to prioritise “shovel ready” applications	Few restrictions on milestone extensions, allowing projects that may not be built to remain in the queue
	Lack of alignment / coordination between connection application process and offshore leasing process	Limited ability to fast-track (e.g. based on asset type, size, or role on the system)	Limited ability to prioritise enabling/reinforcement works at projects which are progressing
A simple, transparent & coordinated approach to connections	Level of completeness of applications leads to rework	The process is overly complex (e.g. forms) leading to high effort	“Appendix G” process is complex and lacks transparency which leads to frustration and delays
	Variability in approach between ESO, TOs, and DNOs	Access to consistent and trusted data causing parties to do additional analysis, rework and delay	Lack of clarity as ‘mod app’ is with DNO and BEGA with Customer
	Mandatory timeframes impact quality of engagement and applications	Limited visibility of progress of applications	Lack of visibility and transparency of progress
	Clock start process being inconsistently applied	Long waits for engagement on any queries cause delay	ESO/TO/others lack of clarity in ownership of issues to progress programme
		One-size-fits all process limits ability to match effort to complexity of application	
		Contract elements are overly complicated/redundant leading to unnecessary effort	
To collaboratively develop options through the connections lifecycle	Limited opportunity for customer to understand optionality and shape their application	Mandated timeframes inhibit engagement on options	Network Planning reforms are driving uncertainties in contracts leading to rework, delays and additional costs
	Difficult to get pre-application meetings with all parties, varying quality	Inefficient arrangements for considering interdependencies between applications	
	Limited visibility of queue or reinforcements inhibits ability to target applications	Long waits for engagement on any queries cause delay	
	Limited data and self-serve tools to support customers planning their applications		

Key:

- Data & technology
- Process
- People and skills
- Regulation & codes

Consistent, skilled & well-resourced engagement

Easy access to self-service tools, consistent data and quality insight

ESO

ESO

NGET Update on facilitating connections

John Twomey
Head of Customer Management

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We are implementing short term changes – optimising within existing frameworks whilst starting wider reforms that will take longer to deliver

Short term changes

Improve the offer Product

- **Developing new product offer** to provide summary offer initially ahead of detailed engineering
- **increased transparency** on connection timescales
- Deliver **process improvements** within Customer Connections and in collaboration with ESO
- Work with Ofgem to agree appropriate **adjustments to offer time allowances** whilst designing a new offer product

Compress the queue

- Supporting ESO to implement Queue Management – a **change to the CUSC to enable contractual discipline**
- Create space in the queue through a **one-off TEC Amnesty** – enabling 'phantom' projects to leave the queue with no fine – and terminate projects hoarding capacity
- Review and communicate policies to reduce unnecessary flexibility in the offer process

Accelerate dates

- Free up capacity (longer term) through implementation of revised **Construction Planning Assumptions** e.g., different treatment for batteries
- Finalise regional strategies and **deliver 400/33kV design** across identified sites
- Develop and embed agile **procurement frameworks**
- Review policy to identify **enabling works** for customers

Wider reform

Prepare for Reform

- **Agree a set of Reform Design Principles** that work for customers and protect consumers
- **Impact assess Design Principles against existing connections frameworks** to understand the likely shape and scale of reform needed
- **Scope technical product solutions for different customer segments** e.g. plug & play for smaller connections, energy islands for offshore

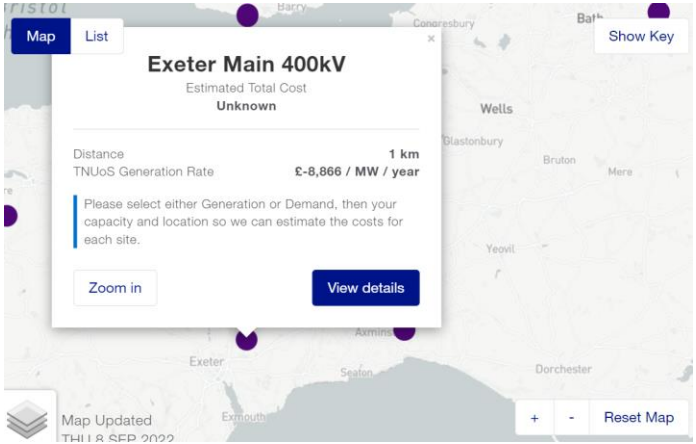
Key

Enabling activity
Optimisation activity

We working closely with the ESO to keep aligned

Our aim is to improve transparency of timeframes to connect and enable clear understanding of our strategy to create more capacity on the system

Over the Summer we released a series of regional videos, the aim is to provide better understanding of the demand for connections in each region. The videos also set out our strategy to facilitate more capacity in each area.

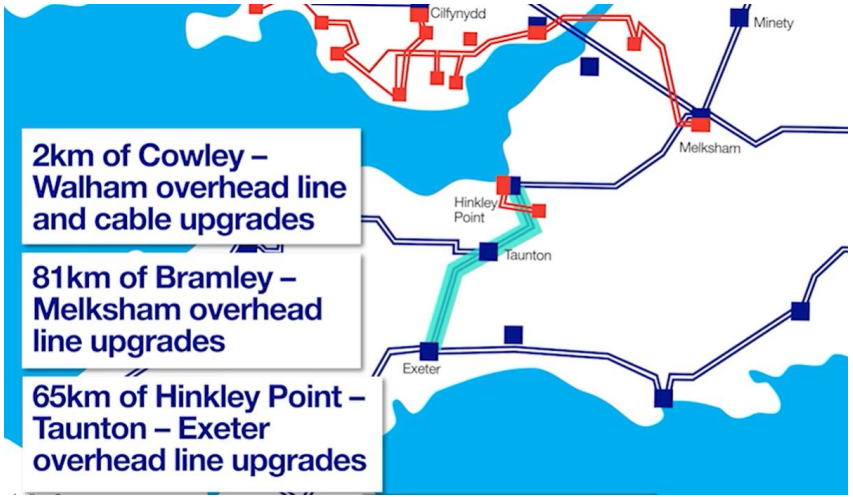


Our Research Assistant tool has now undergone updates to provide a live and interactive view on connection activity at each substation. The tool aims to provide –

- Connection timescales
- Overall Costs
- Information on use of system charges.

A specific focus on the South West & South Wales

- High volume of connections continue to contract in this region. Currently we have over 27GWs of contracted generation with another 10GWs currently out for acceptance. Current connection timescales in this area are now beyond 2030.
- The region continues to see a diverse set of technologies looking to connect from offshore wind (Celtic Sea), batteries and solar farms.



Two of the earlier reinforcement works we need to deliver include:-

- 81km of reconductoring between Bramley to Melksham
- 2km of cable and OHL upgrades from Cowley to Walham

Bramley to Melksham

- Currently bringing forward the works to deliver this schemes, Outages now planned for 2024 /2025
- Pre-work Sanction being prepared for Feb 23 to purchase materials
- Competitive Tender planned for delivery. Est. c.£100M Upgrade

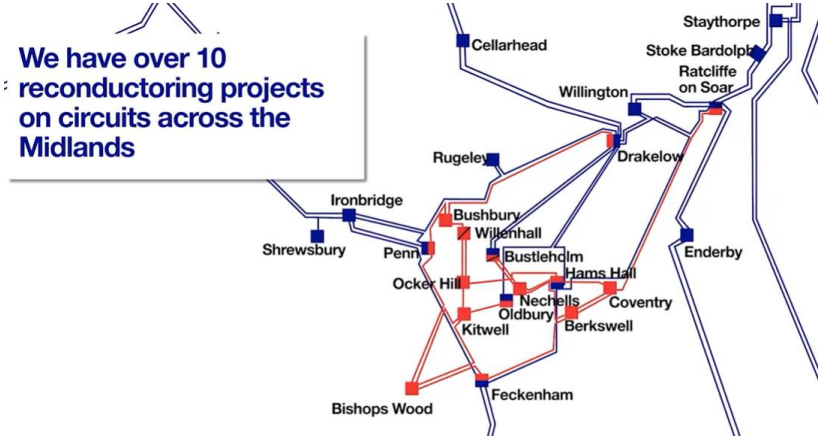
Cowley to Walham

- Outages indicatively planned for 2027
- Initial Development work progressing
- Competitive Tender planned for delivery

The acceleration of these schemes will release capacity earlier than expected. The exact amount and allocation of this capacity will be linked to the optimisation process intended to complete in Spring 2023.

A specific focus on the Midlands

- High volume of connections continue to contract in this region. Currently we have over 17GWs of contracted generation Current connection timescales in this area are now beyond 2030.
- The strategy to create more capacity in this region is linked to uprating existing circuits rather than delivering new infrastructure.



There are 10 reinforcement schemes required across this region, all of which are required to mitigate thermal constraints on the system. Key schemes that are required include :-

- Enderby - Partford Bridge – East Claydon
- Ironbridge - Feckenham
- Cellarhead - Dracklow

Focus is on how the Network Operability Assessment (NOA) supports the need for these reinforcements along with sequencing of the system outage plan.

Significant focus on the system access plan to coordinate the necessary package of reinforcement works within this area.

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NGED Update

Andrew Akani
Primary System Design Manager

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What does this mean for you (NGED customers)

Accepted Offers – Already Project progressed (SoW)

- Our contraction position with the ESO remains unchanged with regards to accepted Modification Offers.
- We are actively engaged with both the ESO and NGET to help expedite the various outlined initiatives.
- As the various initiatives nature over the coming months, we will provide further updates and details on how the contracted positions will be updated.

What does this mean for you (NGED customers)

Future Offers/Accepted schemes not yet Project progressed

- We still need to project progress (PP) your schemes in the interim to secure ‘your transmission queue’ position.
- We will continue to offer and utilise non-firm principles with our offers (ANM, intertrip, export limiting, timed, etc.), and will continue to look for opportunities to utilise these for some transmission constraints whenever possible.

What does this mean for you (NGED customers)

Planning Assumptions

- No change to our planning/modelling assumptions but we continually review and apply a pragmatic approach subject to local area clustering and mix of various DG technologies.
  - The key emerging challenge on some of our networks is not ‘BESS vs other technologies’, but simply ‘BESS vs BESS’.
- ANM will continue being offered which also allows customers to calculate their own curtailment assumptions.
- We are also utilising flexibility where it is economic to do so in lieu of conventional reinforcement or to temporarily facilitate quicker connection dates prior to completion of reinforcement.

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PANEL Q&A

- Please use the Q&A button (not the chat) to post your questions.
- We will try to answer as many questions as possible.
- If we run out of time or can’t answer your question on the call, we will get back to you individually

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Thank You for attending

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