

Thank you for your patience

We will begin the presentation shortly...



This webinar is going to be **recorded** and uploaded to our website. The link to slides and recording will be circulated.



Please post any questions in the Q&A and will answer these at the end of the presentation



Technical Limits Webinar

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DSO Head of Modelling & Analysis

7th May 2024 13:00 -14:00

national**grid**



Agenda

1.	Technical Limits overview
2.	Connection Reform and 2-step offer update
3.	Phase 1a and 1b update
4.	Phase 2 Launch <ul style="list-style-type: none">- Eligible GSPs- Timeline- Expression on Interest (EOI)
5.	Technical Limits variations and curtailment reporting
6.	Next Steps
7.	Q&A



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Technical Limits Overview

Why do we need to change how Transmission and Distribution coordinate connections?

DNOs are required to seek permission from the ESO ahead of connecting any Distributed Energy Resource above 1MW

The transmission queue is now over 700 GW

We have 12GW of Distributed Energy Resource already connected to our network

We have 48.9GW of Accepted-not-yet connected schemes

Nationally there are constraints on the transmission system with reinforcement connection dates out to 2038

The ENA 3-step Action Plan

ACTION 1

Reforming the distribution network connection queue

- **Spring clean. Migrate pre 2017 offers to milestones contracts**
- **First ready, first connected.** Prioritise 'shovel ready' connections

ACTION 2

Changing how Transmission and Distribution coordinate connections

- **Clear & consistent boundaries. Create technical boundaries.**
- **Co-ordinating the queue. Reallocate capacity.**

ACTION 3

Greater flexibility for storage distribution customers

- **Flex capacity.** Connect battery customers more quickly and improve the network's ability to manage capacity

Technical Limits have been developed under Action 2

What are Technical Limits ?

Gives DNOs the ability to accelerate the connection of generators subject to wider Transmission Reinforcement Works

Provides distribution customers with the option of an interim non-firm connection arrangement

The interim non-firm arrangement will be curtailable and uncompensated

Enables more agile and shovel ready customers lower in the connection queue at GSPs to connect earlier

Releases capacity that is not currently being utilised

Technical Limit Example

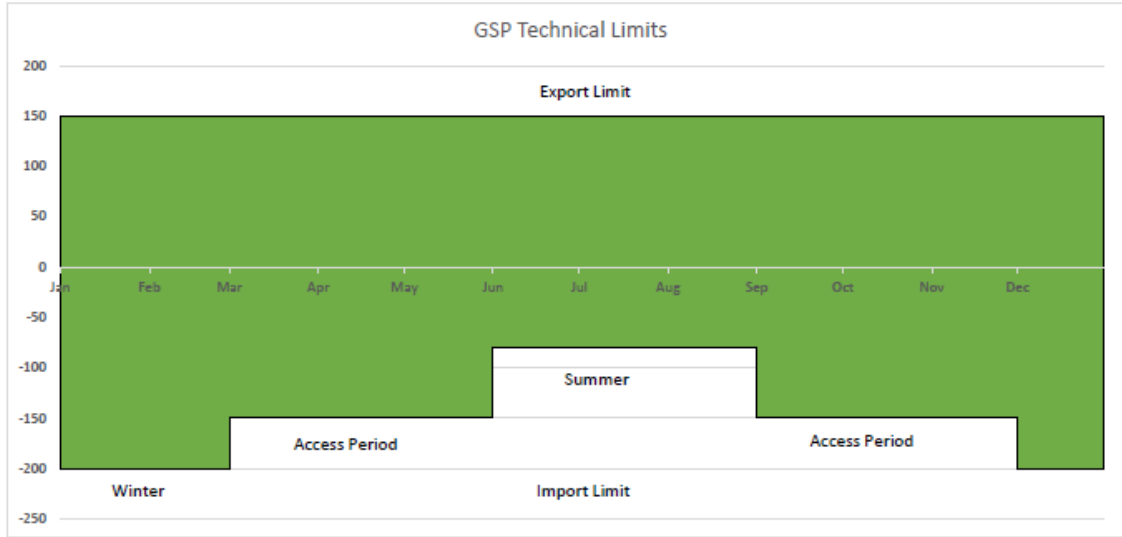


Figure 1: Technical Limits applied through the year (green areas represent compliance against limit)

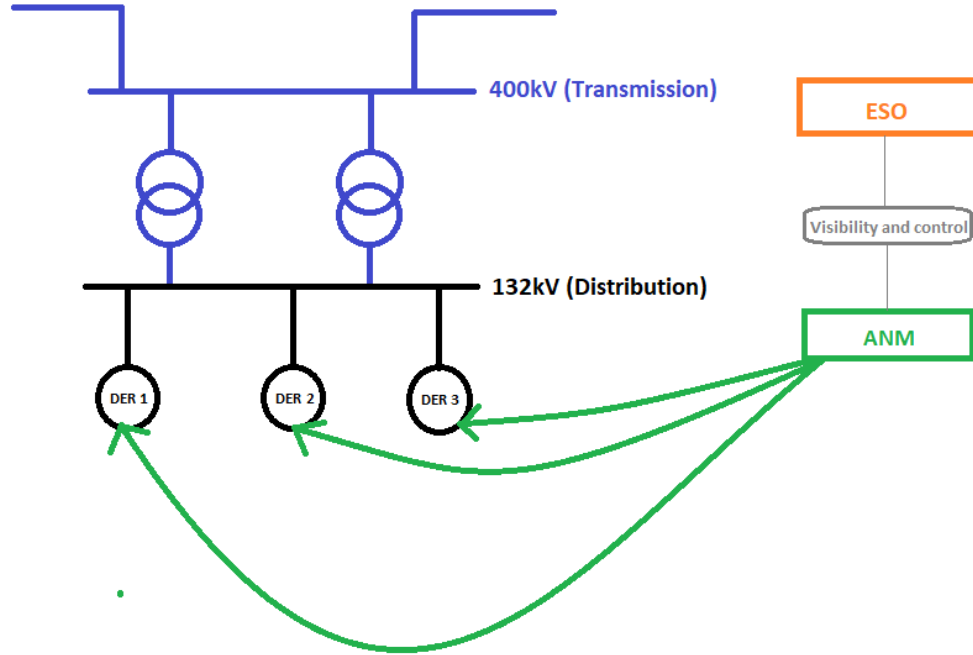
Note: the above Figure is for illustrative purposes only and may not be specific to each site.

	Winter (01 Dec – 28 Feb)	Access Period (01 Mar – 31 May and 01 Sep – 30 Nov)	Summer (01 Jun – 31 Aug)
Export Technical Limit	150 MW (export)		
Import Technical Limit	200 MW (import)	150 MW (import)	80 MW (import)

Technical Limit key points:

- Pre-agreed limits based already approved NGET assessments
- There is a single export Technical Limit
- The import Technical Limit is seasonal
- They don't replace existing Connection Asset Reverse Powerflow (CARFL) limits
- The Technical Limits are refreshed on a yearly basis

How are Technical Limits managed?



- ❑ Using our Active Network Management (ANM) system to manage the transmission boundary flow within the pre-agreed limits
- ❑ Incorporating visibility and control as an additional layer to ensure the whole system remains operable

Securities and Liabilities

- Securities and liabilities will remain as per the outcome of issued mod-offers
- Securities will fall away upon energisation
- One-off attributable costs will still be applicable
- As part wider Connection Reform, transmission works and securities and liabilities may be subject to change

Technical Limit Clarifications

- This is only offered as interim arrangement prior to transmission firm works been completed
- Schemes must have signed onto firm transmission works before they can be accelerated under Technical Limits
- Distribution constraints and delivery will need assessing before a scheme are able progress on a transmission non-firm arrangement
- Where a scheme requires a bay or SCS database changes at an infrastructure site, an accelerated date will be subject to ESO approval and may require a mod-app
- If a scheme has triggered a new GSP then we will engage with ESO to review if an acceleration is possible

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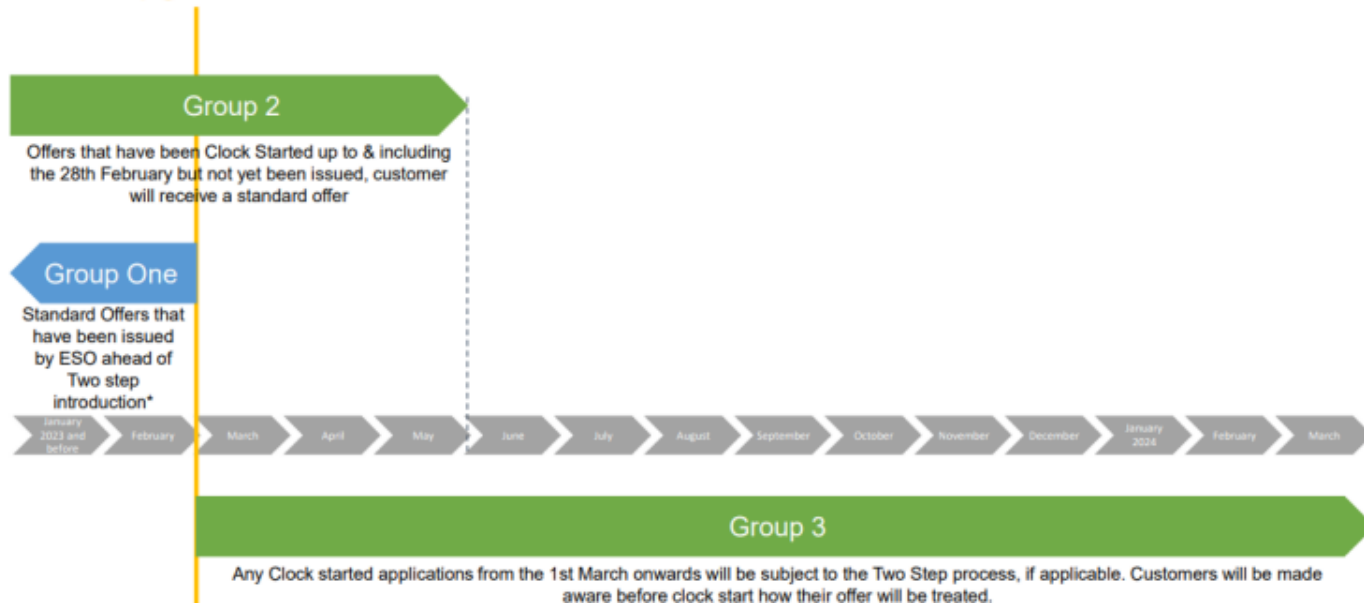
2-Step Mod Offers and Connection Reform

Original 2-Step Process

- Closing date for receipt of 2-step Offers from ESO was originally 29th February 2024:

Timeline to introduce Two Step

Two Step go live – 1st March



2-step Offers

- Ofgem have granted ESO a 3 month extension to the 2-step process
- Meaning all 2-step offers will be issued to NGED by the 31st May
- We have already received some offers and are starting to issue variations to customers
- Post 27th November offers will also experience this delay

View of offers received to-date

- Connection dates have not improved, with most dates being circa 2037
- We are seeing a number of new Grid Supply Points (GSPs) triggered, which limits our ability to accelerate those customers under Technical Limits

Connection Reform TMO4

- ESO have proposed a change to their original preferred option of Target Operating Model 4 (TMO4)
- TMO4 would only have been applied to new connection applications and significant Modification Applications received from 1st January 2025.
- In practice, due to the fast-growing nature of the queue, this would not improve dates in the timescales needed

Find out more:

[ESO GB Connection Reform April slide deck](#)

[ESO Connection Reform webinar 20th May, 3pm](#)

TMO4+

This revised approach model is called TMO4+. Proposed changes:

- Only projects that meet the Gate 2 criteria will be provided with a queue position. This approach will be applied to projects in the existing queue, as well as to new projects applying for network connections.
- Capacity freed up by the TMO4+ approach will be used to offer better connection dates to existing projects that have met the Gate 2 criteria
- Current minded-to position for Gate 2 criteria is:
 1. Having secured land rights for the proposed location;
 2. Dates for submission of applications for planning consent
- Subject to approval by Ofgem in CMP434 and CMP435 CUSC mods

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Phase 1a and 1b Update

Phase 1a and 1b GSPs

- Phase 1a includes 23 of 56* NGED's GSPs

South Wales	West Midlands	East Midlands	South West
Cardiff East 132kV	Bustleholm 132kV	Berkswell 132kV	Alverdiscott 132kV
Grange 66kV	Feckenham 66kV	Bicker Fen 132kV	Bridgwater 132kV
Pyle 132kV	Kitwell 132kV	Staythorpe 132kV	Exeter 132kV
Rassau 132kV	Nechells East 132kV	Stoke Bardolph 132kV	Indian Queens 132kV
Upper Boat 132kV	Penn 132kV		Sandford 132kV**
Upper Boat 33kV	Port Ham 132kV		Taunton 132kV
	Willenhall 132kV		

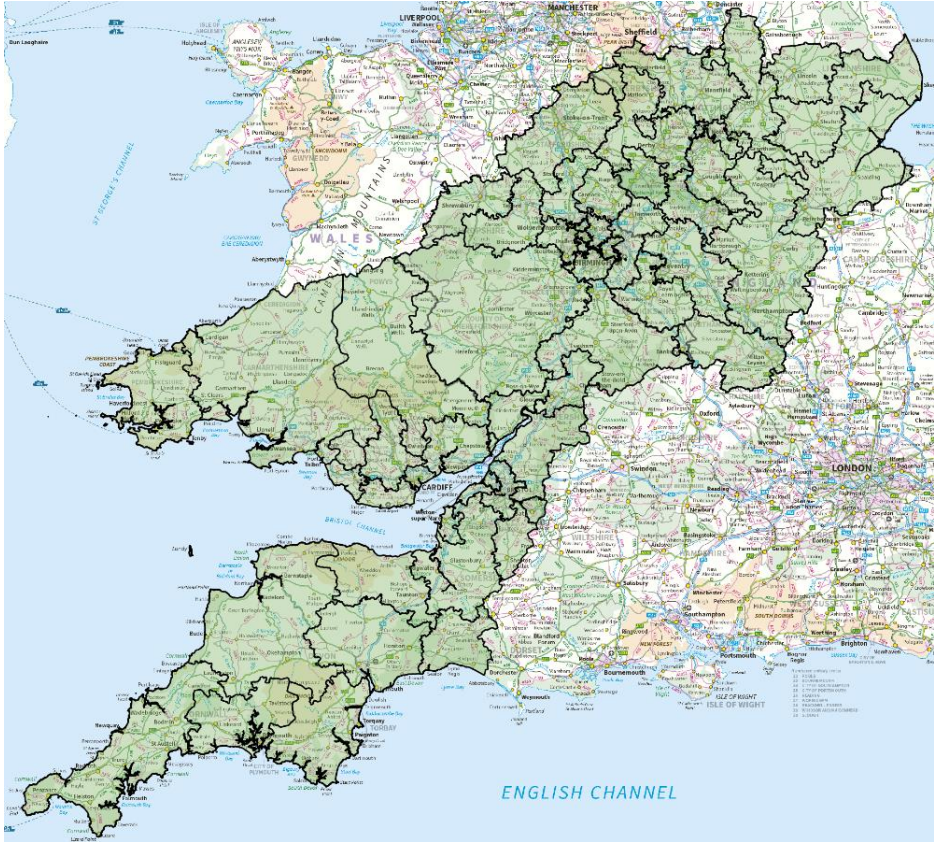
- Phase 1b includes 7 of 56* NGED's GSPs

West Midlands	East Midlands	South West
Bishops Wood 132kV	Chesterfield 132kV	Abham 132kV
Bushbury 132kV	Coventry 132kV	Landulph 132kV
	Enderby 132kV	

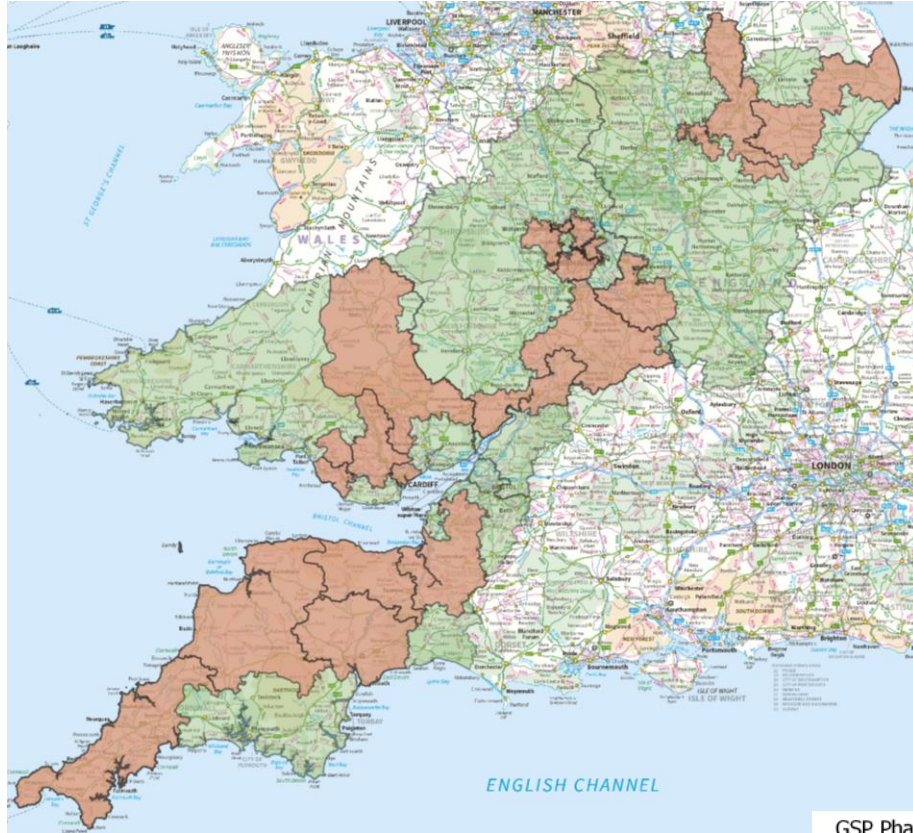
* Includes shared sites

** Sandford was added to Phase 1a after main EOI

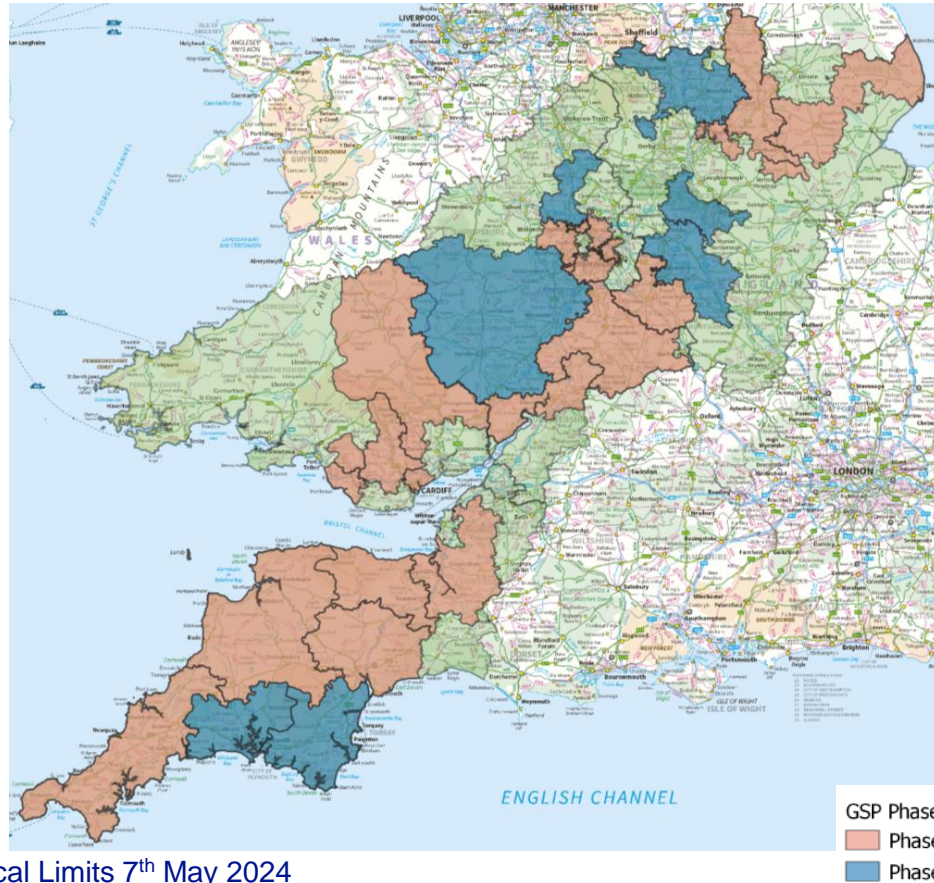
NGED Licence Area



Phase 1a Coverage



Phase 1a and 1b Coverage



Phase 1a and 1b in Numbers

Phase	Eligible EOs Received	Variations Issued/Offered (pre 2-step)	Variations Signed	GWs Accelerated (signed contracts)
1a	149	66	30	1.14
1b	72	22	5	0.145

1.29 GW with signed Technical Limit variations

We have accelerated customers by an average of **5.8 years**

We have already **energised a 20 MW** scheme under Technical Limits

Phase 1a and 1b Next Steps

- Where a customer are pending a 2-step offer but have already submitted an EOI, then we will issue Technical Limit variations once your transmission firm works offer is signed
- Where schemes have not submitted an EOI then we will be opening Phase 1a and 1b again following the phase 2 EOI

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Technical Limits Phase 2 Launch

Phase 2 GSPs

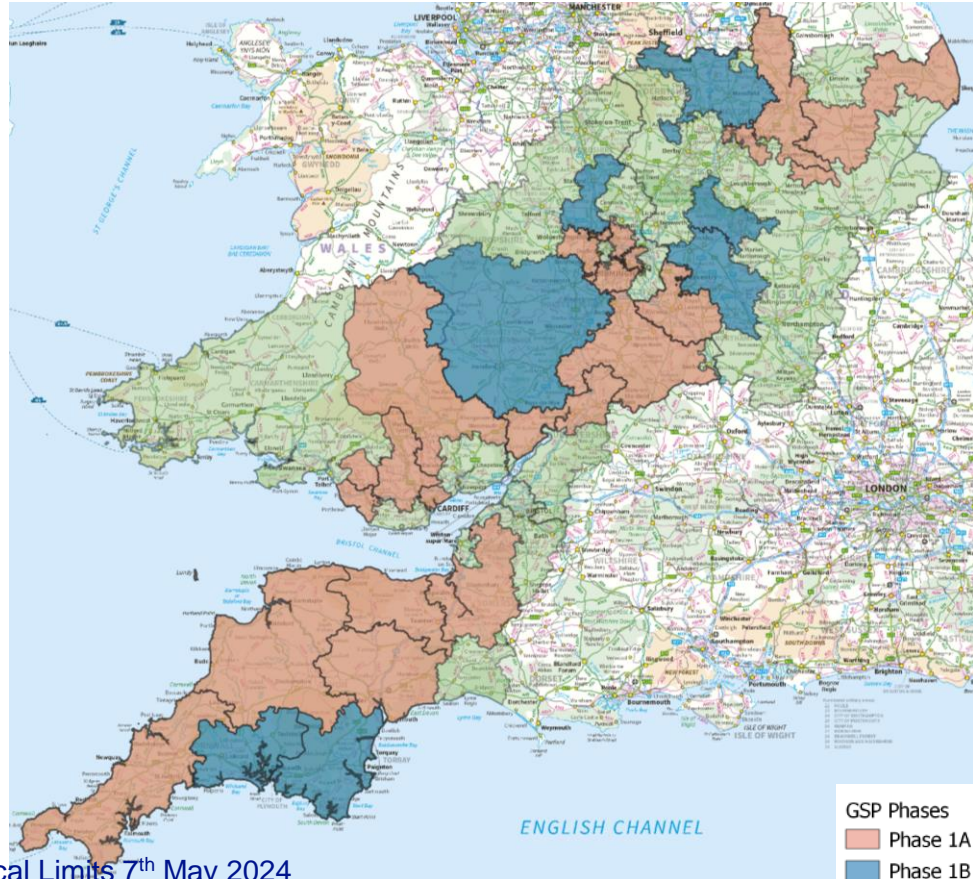
Phase 2 includes 21 of the 56* NGED's GSPs:

South Wales	West Midlands	East Midlands	South West
Pembroke 132kV	Ocker Hill 132kV	Drakelow 132kV	Seabank 132kV
Aberthaw 132kV	Lea Marston 132kV	Grendon 132kV	Axminster 132kV
Swansea North 132kV	Oldbury 132kV	Lea Marston 132kV	Iron Acton 132kV
Uskmouth 132kV	Iron Acton 132kV	Ratcliffe 132kV	Melksham 132kV
-	Cellarhead 132kV	Walpole 132kV	-
-	Ironbridge 132kV	West Burton 132kV	-
-	Shrewsbury 132kV	-	-

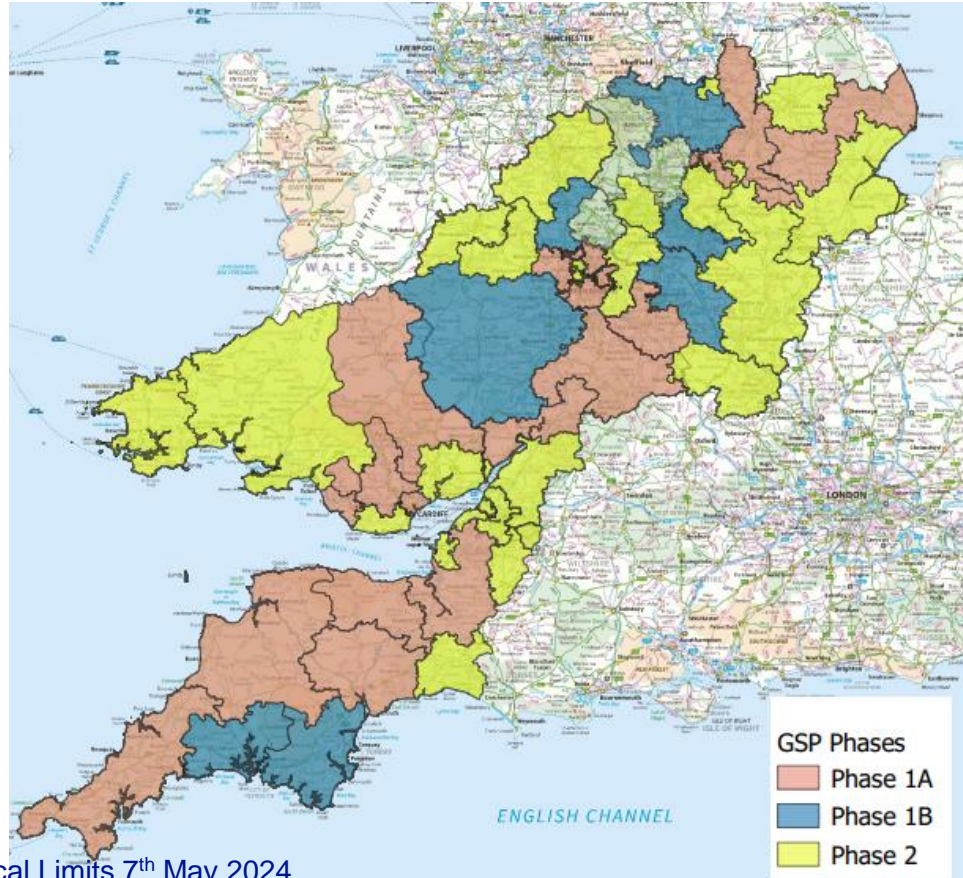
* Includes both licenced areas of shared sites

Phase 2 will be rolled out in tranches to align with ESO/NGET assessment and contractual signing

Phase 1A and 1B Coverage



Phase 1A, 1B and 2 Coverage



Technical Limits Phase 2 GSPs

Tranche 1	Tranche 2	Tranche 3	Tranche 4
Drakelow 132kV	Swansea North 132kV	Grendon 132kV	Ratcliffe 132kV
Seabank 132kV	Ocker Hill 132kV	Lea Marston 132kV (EM)	Walpole 132kV
Pembroke 132kV	Uskmouth 132kV	Lea Marston 132kV (WM)	West Burton 132kV
Aberthaw 132kV	-	Oldbury 132kV	Cellarhead 132kV
-	-	Axminster 132kV	Ironbridge 132kV
-	-	Iron Acton 132kV (WM)	Shrewbury 132kV
-	-	Iron Acton 132kV (SW)	Melksham 132kV

All this information will shortly be available on our website [here](#)

Phase 2 Timeline

Step	Description	Tranche	Tranche	Tranche	Tranche
		1	2	3	4
Intro Webinar	Webinar to explain technical limits and EOI process		07/05/24		
EOI opened	Contact Customers within scope by email and direct to EOI	17/05/24	17/05/24	17/05/24	17/05/24
EOI closed	Phased closing of EOI	14/06/24	12/07/24	09/08/24	06/09/24
Eligible schemes identified	Initial assessment of EOI submission eligibility complete	28/06/24	26/07/24	23/08/24	20/09/24
Eligible schemes notified	Confirmation via email for all schemes eligible to be taken to next stage assessing distribution impact	01/07/24	29/07/24	27/08/24	23/09/24
Start Distribution Assessment	Connections team assessing distribution impact of accelerating connection	05/07/24	02/08/24	30/08/24	27/09/24
Webinar update	Follow-up Technical Limit webinar		Summer 2024 (Date TBC)		
End Dx Assessment & Issue Variations	Target variation issue date	16/08/24	13/09/24	11/10/24	08/11/24

All this information will shortly be available on our website [here](#)

Expression of Interest

- The invite will be send to customers in the 21 phase 2 GSPs.
- EOI will be send to customers that have:
 - received outcome of transmission delays
 - Customers who are pending a transmission outcome –including ESO 2-step offers

The purpose of EOI:

- To understand which customers would like to accelerate their connection date on a non-firm basis
- Help NGED understand the short-term need for acceleration
- We will include a question on land-rights, to help identify shovel-ready schemes

GSPs not in Phase 1 or 2

- Once phase 2 rollout is complete, we will have Technical Limits at 51 of our 56 contracted GSPs*
- One of the GSPs without Technical Limits is a single user site, with no requirement for limits
- The remaining 4 contracts where we have not rolled out Technical Limits are:
 1. East Claydon (East and West Midlands)
 2. Willington
 3. Rugeley
- These are all due to fault level constraints. As part of the ENA working group we continue to progress options for Technical Limit rollout at these GSPs

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Technical Limits Variations and Curtailment Report

Technical Limit Variations

- **Variations will be issued where a scheme is:**
 - *Eligible for transmission acceleration under Technical Limits*
 - *The distribution assessment confirms that an accelerated connection can be accommodated*
 - *NGED curtailment scenarios shows that low scenario is <70% curtailment*

In the EOI we would like to understand your desired connection date, this may not be the date you receive in your offer depending on distribution works required and outage availability

Where curtailment scenarios are showing over 70% curtailment (import or export), we will issue the data and reports and ask if you would like a variations

Curtailment Reporting and Data

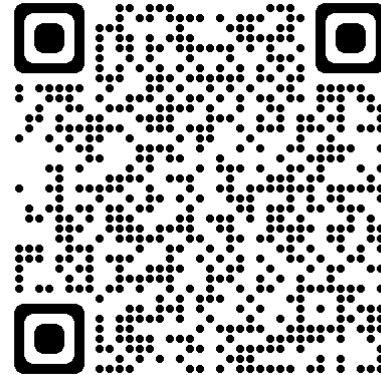
Based on feedback and engagement from phase 1a, we have enhanced the curtailment reports and data provided to include:

- Raw data to enable you to undertake your own curtailment assessment. This includes:
 - *Import and Export Technical Limits*
 - *GSP half-hourly loading data*
 - *Anonymised LIFO queue*
 - *Non-ANM connections not subject to TANM*
 - *Diversified generation profiles*
 - *Sensitivity factors for parallel GSPs*
- 3 curtailment reports for both import and export – with batteries ahead in distribution queue modelled at (100%, 50% and 0% output)
- Supporting guidance document detailing assumptions behind the calculations, will be available to download from our website shortly

ClearviewConnect

We have been talking to customers about connections reform

- Customers looking to develop new schemes wanted to better understand which connection points offered their best chance of an early and lowest cost opportunity
- Customers looking to manage their portfolios wanted to understand the position of their schemes in each pipeline



<https://connections.nationalgrid.co.uk/clear-view>

Information about the GSP provides details of capacity, reinforcement works and technical limit boundaries



GSP Overview

Connected Capacity to date (MW)	259.14
Developer Capacity Available (MW)	0
TD Boundary Capacity Notes	PHASE1B
Transmission Reinforcement Expected Completion Date	October 2032
Connection Asset Reverse Power Limits (MVA)	480
GSP Technical Export Limit*	437.23
GSP Technical Import Limit Winter*	-513.97
GSP Technical Import Limit Summer*	-410.23
GSP Technical Import Limit Access Period*	-491.96

**Technical limits for GSPs are currently under development and review, therefore the values published here may change*

Information about the GSP provides details of capacity, reinforcement works and technical limit boundaries



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Capacity connected today

Transmission headroom available

Acceleration Phasing

Transmission capacity uplift date

Capacity connected today

Technical Limits (where agreed) for use in non-firm modelling

**Technical limits for GSPs are currently under development and review, therefore the values published here may change*

Full data descriptions at the bottom of the ClearViewConnect report

An anonymised pipeline view shows the type and queue order of schemes

List of Schemes and rolling MW export capacity currently being developed in pipeline order

Use your reference number to see where you are currently in the pipeline:

Generator Type	Export Capacity (MW)	Position	Cumulative Export Capacity (MW)	Non Firm Transmission Curtailment (Worst Case) (%)	Non Firm Transmission Curtailment (Diversified) (%)
Stored Energy - Storage - Electrochemical Classic Batteries - Lithium Ion (Li-ion)	20	1	20	--	--
Photovoltaic	3.75	2	23.75	--	--
Photovoltaic	49.9	3	73.65	--	--
Stored Energy - Storage - Electrochemical Classic Batteries - Lithium Ion (Li-ion)	6	4	79.65	--	--
Photovoltaic	40	5	119.65	--	--
Photovoltaic	20	6	139.65	--	--
Photovoltaic	7	7	146.65	--	--

7

Next Steps

Next Steps

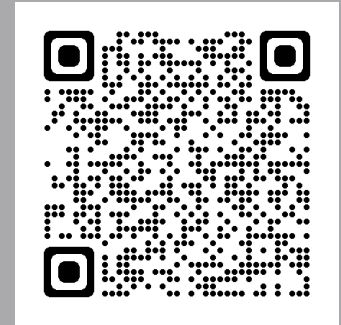
Want to know more about Technical Limits?

- Visit our [Technical Limit Accelerating Connection webpage](#)
- We will be updating this in the coming week to reflect the phase 2 rollout
- The ENA will shortly be releasing an external Technical Limit rulebook. We will add this to our website once available
- Wait for your EOI invite by the 17th May

Want to learn more about Connection Reform?

- Read the latest ESO view on TMO4+ and Connection Reform [here](#)
- Sign-up to the ESO webinar on the 20th May, 3pm

Want to take a look at ClearViewConnect



<https://connections.nationalgrid.co.uk/clear-view>

Q&A

Please post any questions in the Q&A function
Don't forget you can up-vote any questions you would like answering