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A Grid Guide to...
**Accelerating
UK Connections**

London, 8 February 2024



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Overview

John Pettigrew
Chief Executive



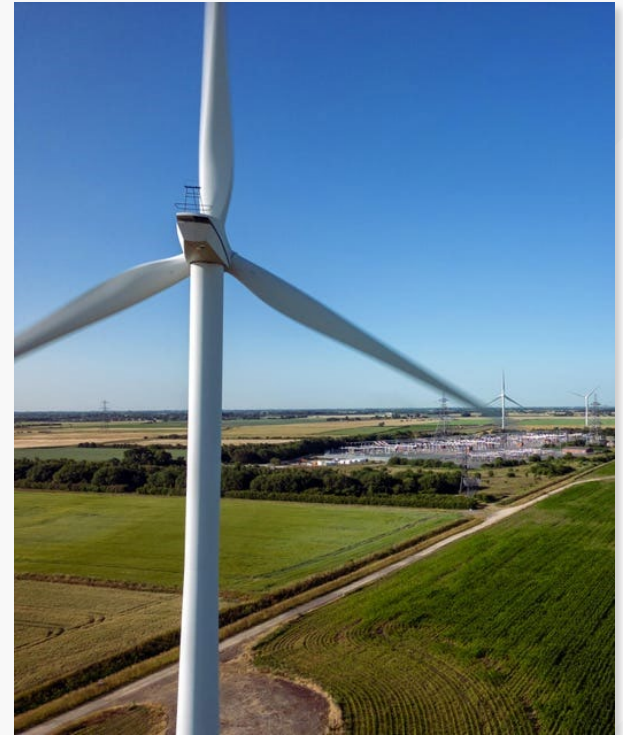
UK electricity connections: overview

Electricity industry has changed enormously

- Policy and regulation needs to reflect increased connection requests and changes in the types of projects
- Significant increase from
 - renewable generation wanting to connect at transmission and distribution voltages
 - demand connections including electrifying manufacturing, data centres, EV charge points and heat pumps

We're focused on enabling change

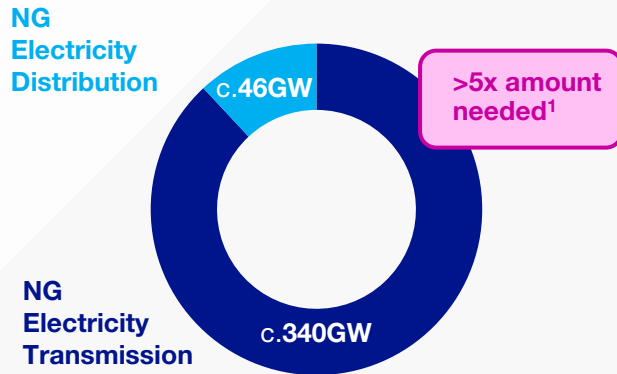
- Smarter networks providing two-way flows and greater flexibility
- Building new infrastructure faster than ever before



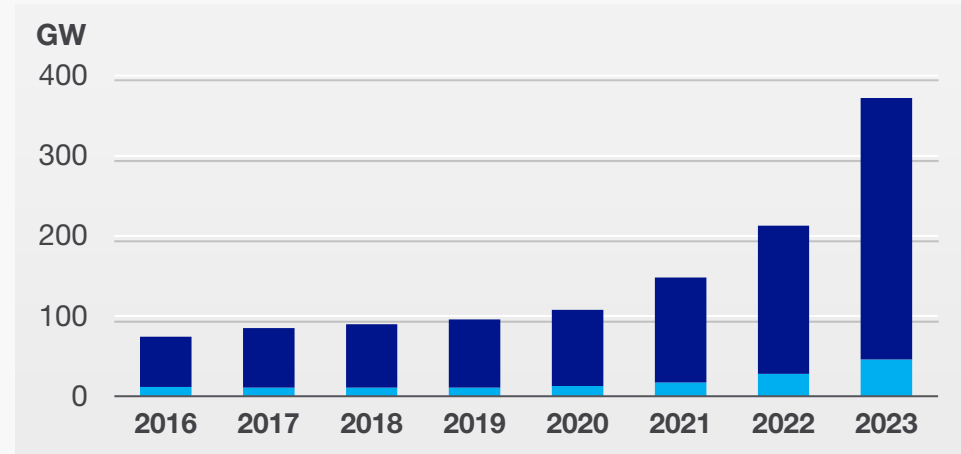
UK electricity connections: overview

Nearly 400GW of projects in the pipeline across our UK networks

Current pipeline



Exponential pipeline growth



The challenge is industry wide and we're playing our part

- Connecting new generation every day
- Working with Government, Ofgem and industry on near-term tactical and longer-term strategic reforms

1. To meet UK Government's 2035 decarbonised electricity sector target. Based upon latest NGET and NGED projections, using ESO's latest FES scenarios and DFES scenarios

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UK Electricity Transmission

Alice Delahunty

President, UK Electricity Transmission



UK Electricity Transmission

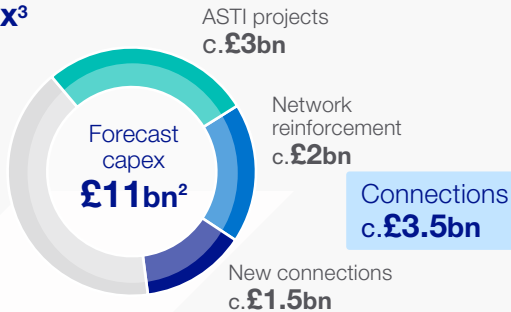
Own and operate the network across England and Wales

- >300 substations and nearly 22,000 pylons
- 10GW connected over the last 5 years

Rapid growth in the number of connection requests

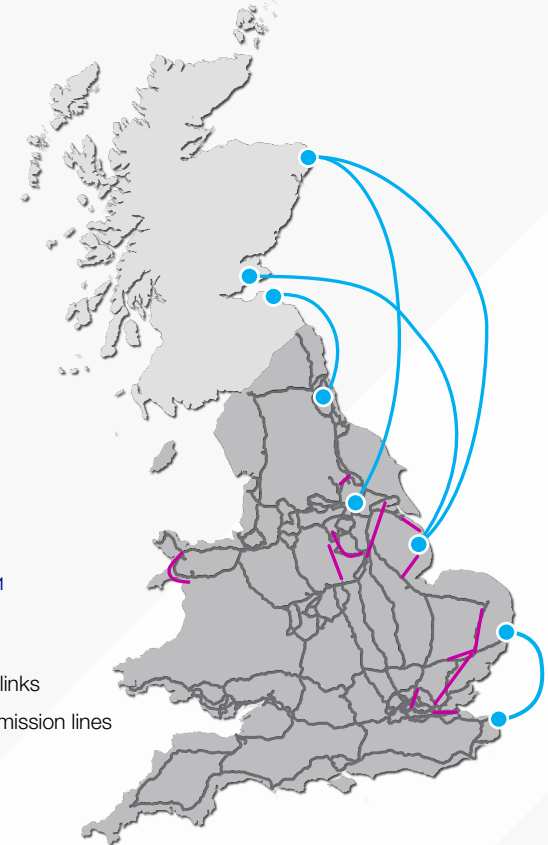
- Focused on accelerating the connection of viable projects through regulatory and policy reform

RIIO-ET2 Capex³



NGET network¹

- ASTI onshore lines
- ASTI offshore HVDC links
- Existing 400kV transmission lines



1. NGET: National Grid Electricity Transmission. Illustrative map. Includes all 17 x ASTI (Accelerated Strategic Transmission Investment) projects
 2. Estimated capital investment in line with 5 year framework provided at HY24 results
 3. Price control from 1 April 2021 to 31 March 2026

The current connections pipeline

Electricity System Operator (ESO)

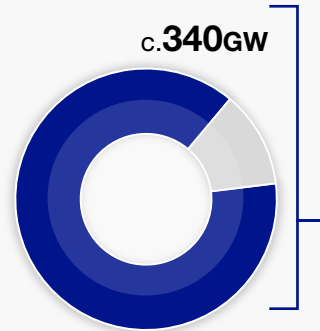
- Manages the connections pipeline

UK Electricity Transmission

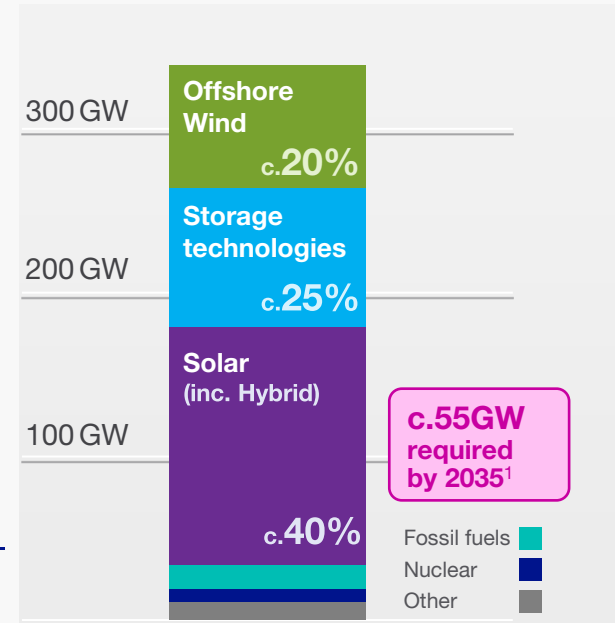
- Applies modelling assumptions provided by ESO
- Designs and delivers physical connections

The pipeline is growing exponentially

- c.340GW in our transmission pipeline
 - vs c.65GW installed capacity today
- >6x the capacity actually needed to enable UK's 2035 decarbonisation target



Current NGET² pipeline



1. To meet UK Government's 2035 decarbonised electricity sector target. Based upon latest NGET projections, using ESO's latest FES scenarios

2. NGET: National Grid Electricity Transmission

Growth in connections pipeline

1. Low barriers to entry

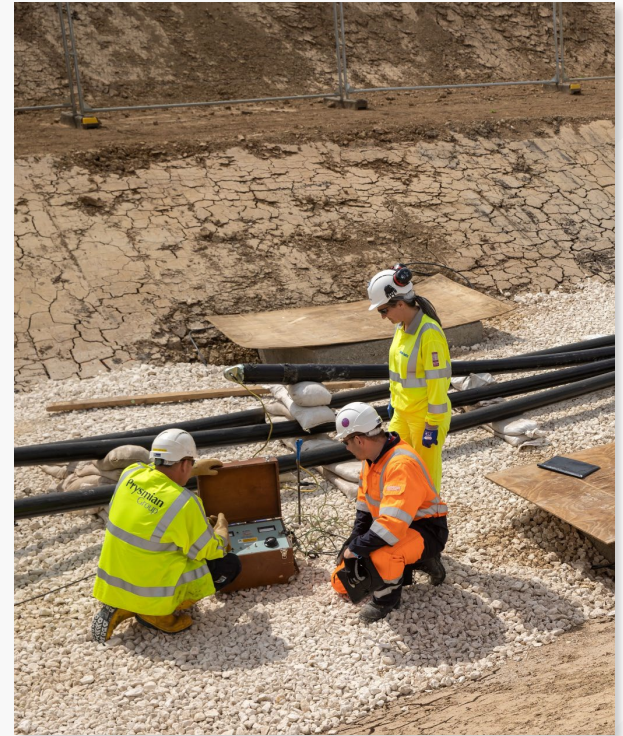
- A large volume of highly speculative applications

2. A 'first come, first served' approach

- Stalled projects delay those ready to connect
- Removing non-viable projects critical to reducing lead times

3. Queue position retained too easily

- No project milestones
- Delayed projects can push back connection dates impacting subsequent lead times



Connections reform – progress to date

Our work with ESO accelerated 10GW of battery storage

- 19 projects expedited by an average of 4 years
- Represents c.90% of battery storage projects required by 2035¹

Amnesty in 2023 had limited success – only 3GW released

- Further action needed to remove non-viable projects

Queue Management proposal approved

- Milestones introduced for projects to retain queue position
- Although will take several years to make a meaningful impact

ESO's reformed connection process to go-live in 2025

- Will enable a 'first ready, first connected' approach



1. To meet UK Government's 2035 decarbonised electricity sector target. Based upon latest NGET projections, using ESO's latest FES scenarios

Connections reform – further action needed

Connections Action Plan

- Collaboration between Government and Ofgem
- Aims to raise barriers to entry
- Supports a ‘connect or move’ approach
- Prioritisation of strategic demand projects

Support for a Strategic Spatial Energy Plan

- Enable more anticipatory approach to network planning
- Viewed as a key role for the Future System Operator

Sector is moving faster than reforms

- More connections being added to the queue than removed
- Connections Delivery Board to drive further change



Wider reforms also required

Advocating for planning reform and community benefits

Chancellor's Autumn Statement - Transmission Acceleration Action Plan

- Streamline planning to shorten delivery of new infrastructure to 7 years
- Strategic Spatial Energy Plan commitment
- Updated National Policy Statements
- 'Minded to' position on community benefits for new transmission projects



Delivering connections

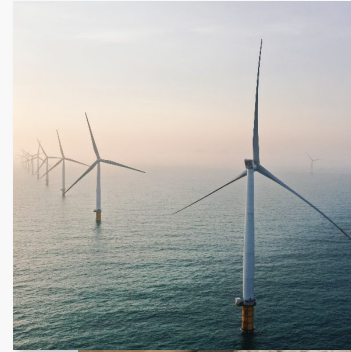
>3GW

connected to our ET network across 2023

Record breaking connections

- World's largest offshore wind farm – Dogger Bank
- World's longest subsea interconnector – Viking Link
- UK's first transmission level solar farm – Larks Green

Enough to power c.8.5 million homes,
once assets at full capacity



Delivering connections

Innovative technology connected

- Clean system-stability solution at Lister Drive substation

Delivery ahead of need to facilitate net-zero

- Hinkley Connection Project will be ready ahead of plant commissioning

Upgrading infrastructure to accelerate connections

- Bramley to Melksham scheme
 - Will remove bottleneck in connecting low carbon projects
 - To expedite 175 clean energy projects

Enabling high-tech demand connections

- Partnering with industry to deliver connections for gigafactories, data centres and green steel production



Summary

Connections are critical in ensuring a secure, affordable energy future

- 1. Further reforms are required, and must be delivered at pace**
- 2. The grid is changing. We're building new transmission infrastructure at a rate and scale never seen before**

We have line of sight to net-zero

- We are connecting at record levels
 - 3GW in HY24¹
- Early reforms are working
 - but we must go faster and further



1. 1 April 2023 to 30 September 2023

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UK Electricity Distribution

Cordi O'Hara

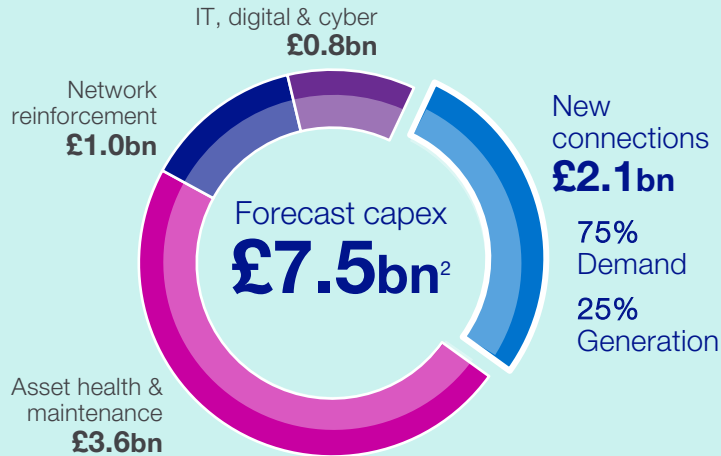
President, Electricity Distribution



National Grid Electricity Distribution: overview

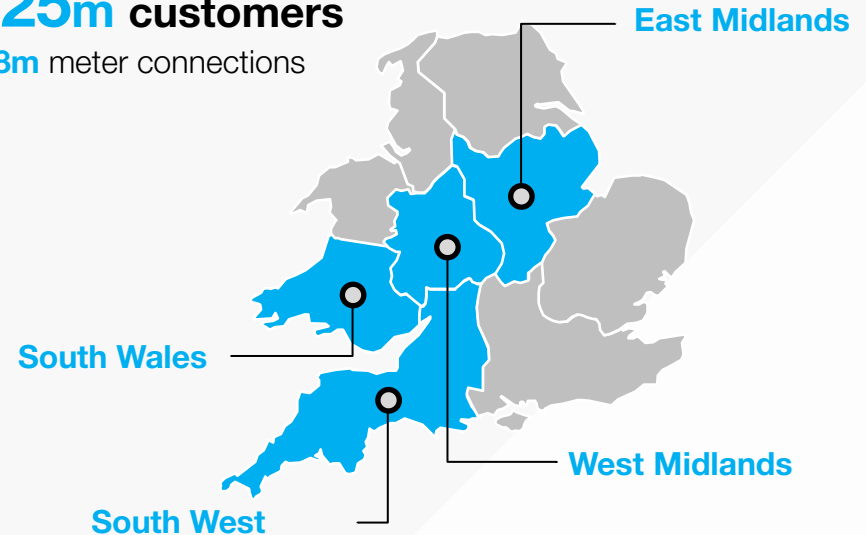
The UK's largest distribution network operator

RIIO-ED2¹ capital investment



~25m customers

~8m meter connections

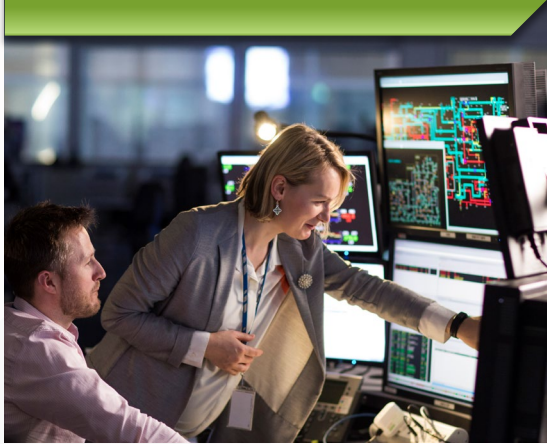


1. Price control from 1 April 2023 to 31 March 2028

2. Nominal capital expenditure, including capex funded by contributions and uncertainty mechanisms

Distribution connections: overview

Exponential increase in larger connection requests



- Enacting reform to connect 'shovel ready' projects

Steady rise in domestic demand connections



- Understanding consumer adoption of new technologies

The distribution grid is not full



- We're connecting everyday

Exponential increase in generation & industry-scale demand

> **156GW**
of distribution projects
in GB pipeline



c. **46GW** in NGED¹ pipeline
c. **12GW** installed capacity connected

Growth in connections pipeline

1. A legacy 'first come, first served' approach

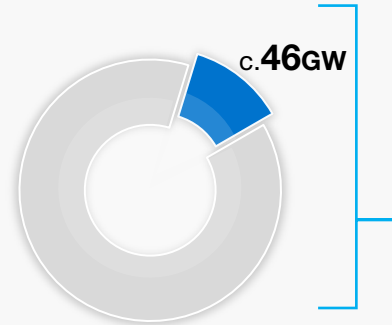
- New connections wait in line for their turn

2. Low barriers to enter the pipeline

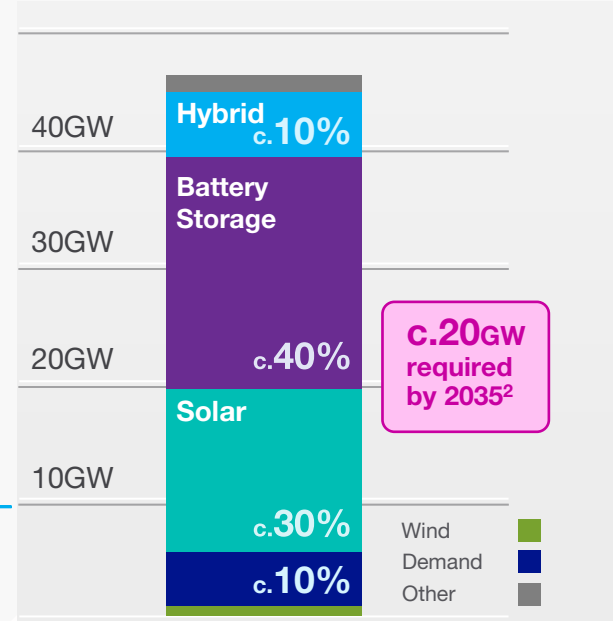
- No need to evidence land ownership, planning or project finance

3. An absence of project milestones

- 'Zombie' projects hold up the queue



Current NGED¹ pipeline



1. NGED: National Grid Electricity Distribution

2. To meet UK Government's 2035 decarbonised electricity sector target. Based upon latest NGED projections using on DFES scenarios

Connections reform – progress to date

Collaborating with industry, Ofgem and Government

ENA's¹ 3-point plan

1. Reform the distribution pipeline

Promote mature projects close to delivery

- **60%** of all projects fail to materialise
- **Removed 45 schemes totalling 1.2GW** from our pipeline

2. Streamline coordination between transmission & distribution

Enhance customer connection experience

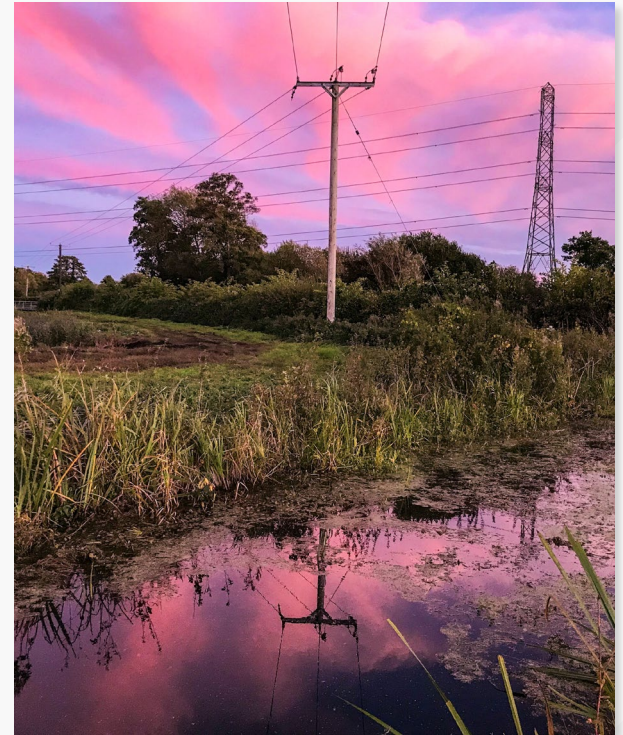
- **10GW of additional capacity released** via non-firm contract offers

3. Greater flexibility for storage connections

Refine how storage is modelled

- Complementary technology to manage peak demand and network constraints
- Now offering **new or accelerated storage connections**

1. ENA: Energy Networks Association



Connections reform – progress to date

Collaborating with customers to improve decisions and streamline applications

▶ clearviewconnect

- Consolidates connections data for customers and developers
- A single, accessible format
- Provides technical capacity data and information for Grid Supply Points
 - Customers can determine the most realistic, quickest and cheapest connection
 - And view potential timelines and connection terms



Steady rise in domestic demand connections

Energising an increasing volume of connections

- 900% increase in requests over the last 5 years
- More EV charge points connected in the last 2 years than all previous years combined
- 3x more heat pumps on network than 2019

New self-serve digital connection products

- 60% of EV charge point applications approved in 2 seconds

Flexibility solutions

- Equinox heat pump trial
- Exploring vehicle-to-grid opportunities



Delivering connections

HY24¹ connections

51

renewable generators

750

energy storage solutions

7.7k

EV chargers

3.5k

heat pumps

15.4k

solar installs

Totalling over 700MW

Delivering against ENA's² 3-point plan

- **Removed 45 projects** or **1.2GW** from pipeline
- **10GW of capacity released** for clean generation
 - **200** potential 'shovel ready' projects to move forward
- **'First ready, first connected'** model adopted in October
 - Average improvement in connection date of **5yrs**
- Growing **distribution system operator** capability
 - Largest procurer of **flexibility** last year



1. 1 April 2023 to 30 September 2023

Summary

Focus on accelerating reforms



Delivering action needed



Further collaboration with key stakeholders



Building the network of the future, today.

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Summary

John Pettigrew
Chief Executive



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Q&A



By phone

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In the event we do not have time for all questions,
we will respond **by email** as soon as possible

