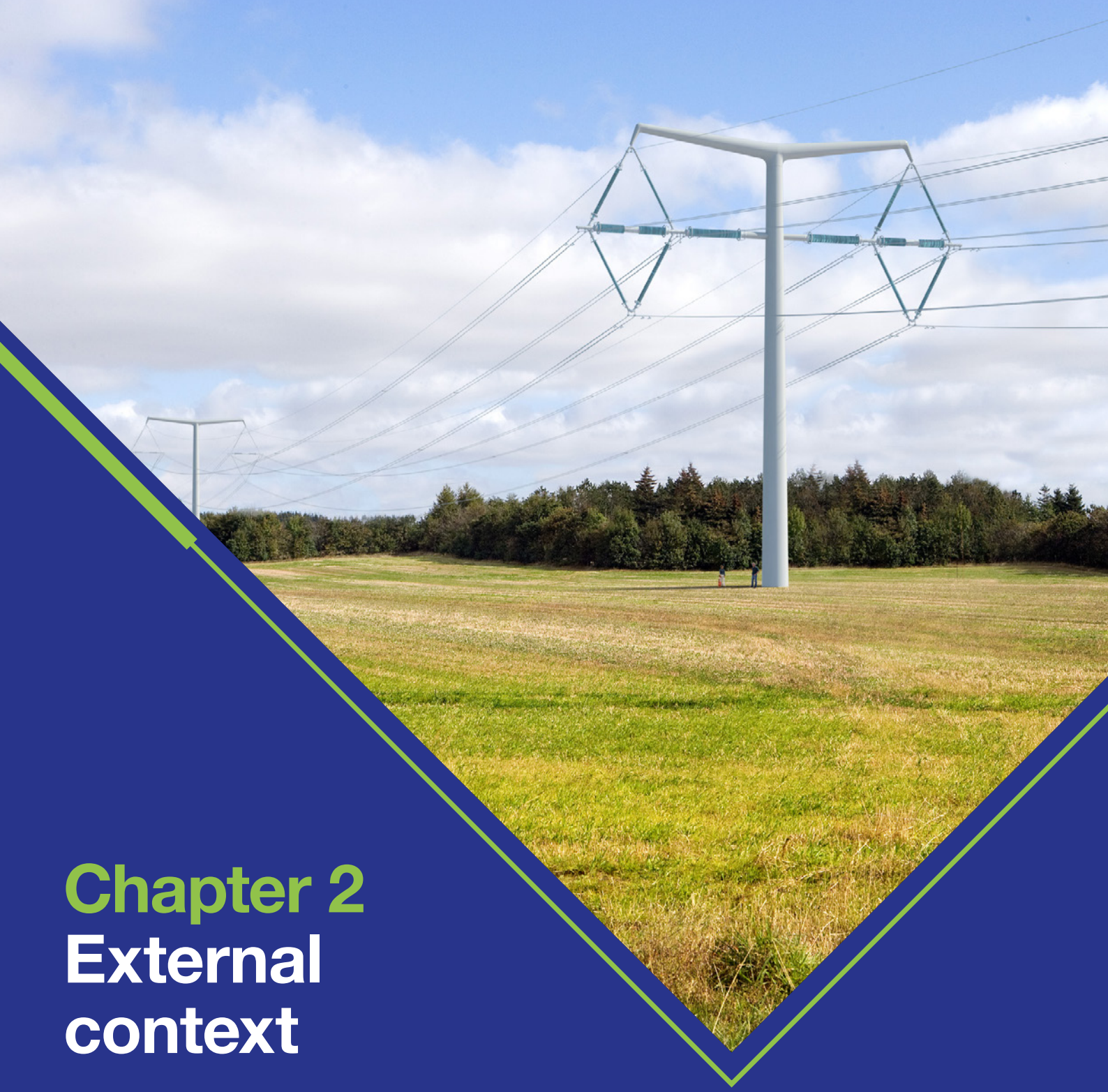


Chapter 2
External context

Electricity Transmission

nationalgrid

2. External context

The electricity industry, in which we operate, has made considerable progress in reducing its environmental impact over the past decade. This has occurred amid a backdrop of significant and rapid change.

The energy landscape used to be defined by large, centralised thermal power generation. Energy consumption followed the same patterns, whether prices were high or low. Today, the picture is very different. Supply is more diverse, and demand more flexible, than ever before.

The electricity system, as a result of this transition, is well placed to play a key role in decarbonising other sectors of the economy, such as transport and heat.

Two overarching challenges in the RIIO-2 period

As electricity transmission owner in England and Wales, we sit at the heart of the nation's energy system. We are working with our stakeholders to address the challenges brought about by changes in our industry. We aim to find solutions that maximise the benefits for consumers and society overall.

During the T2 period, the industry faces two overarching challenges:

1. The need to decarbonise at the lowest cost possible for consumers.
2. The need to build trust with our stakeholders and consumers through greater transparency and by taking responsible action.

These challenges reflect our stakeholders' feedback and the public debate about the role of network companies. The first reflects the shifting energy landscape, while the second is a response to changing public attitudes about energy companies and other utilities.

The changing energy landscape – three main trends

The way energy is generated, transported and consumed is changing. This can be summarised by three main trends:

Figure 2.1 The changing energy landscape

Decarbonisation – Britain's electricity system is changing at a rapid pace as we move towards a low-carbon future. This transition is being led by the electricity sector, and particularly low-carbon generation. A 60% reduction in greenhouse gas emissions has been achieved in the past four years alone.

Since 2011, around 15 GW of fossil-fuel-powered generators have closed and been disconnected from the system. This has largely been driven by Government decarbonisation policies.

Looking to the future, the electricity system is likely to play a substantial role in decarbonising both transport and potentially heat. However, exactly how that will happen, and the speed at which it will occur, remain uncertain.

Decentralisation – Traditionally, electricity flowed from large generators, connected to the transmission system, through passive distribution networks to the consumer.

Technology has advanced, particularly in the areas of smaller generation such as solar and small-scale wind farms, and storage. This has created significant changes in supply and demand patterns.

For example, distribution networks are playing a more active role in managing supply and demand regionally because larger amounts of electricity are being produced closer to where it is consumed.

Digitisation – The world is becoming increasingly connected. This is empowering consumers and disrupting traditional business models across almost every sector.

In energy, we are seeing new businesses capitalising on everything from smart meters to the use of sensors, data collection and analytics (otherwise known as the 'internet of things').

These new business models have the potential to transform how we consume electricity. This will increase both the flexibility and volatility of demand.

Drivers behind this change

In our consultation on the Future of Electricity Transmission in September 2018, we identified the main reasons behind decarbonisation, decentralisation and digitisation in the energy sector:

1. **Government policy –** The Climate Change Act 2008 requires Britain to reduce emissions by at least 80% from 1990 levels by 2050. This, combined with consumers becoming more energy efficient, is decarbonising supply and reducing demand for electricity. The Government's Road to Zero Strategy – and its emerging policy direction on the decarbonisation of heat – is likely to lead to an increase in overall electricity demand in the longer term.

2. **Rapid reduction in the cost of distributed generation –** Since 2009, the cost of wind and solar photovoltaic generation has fallen by 66% and 85% respectively. Energy storage solutions (batteries) have seen similar cost reductions. The Government expects these trends to continue (see BEIS Electricity Generation Costs report).

3. **Changes in consumer behaviour and advances in digital technology –** Consumers are having ever closer interaction with the energy system. They're adopting electric vehicles (EVs), and increasingly using in-home technologies and energy management tools, such as Nest and Hive. They have access to new, smart tariffs tied to their smart meters, opportunities to work with demand aggregators, and other new retail business models to exploit.

The changing public debate on utilities

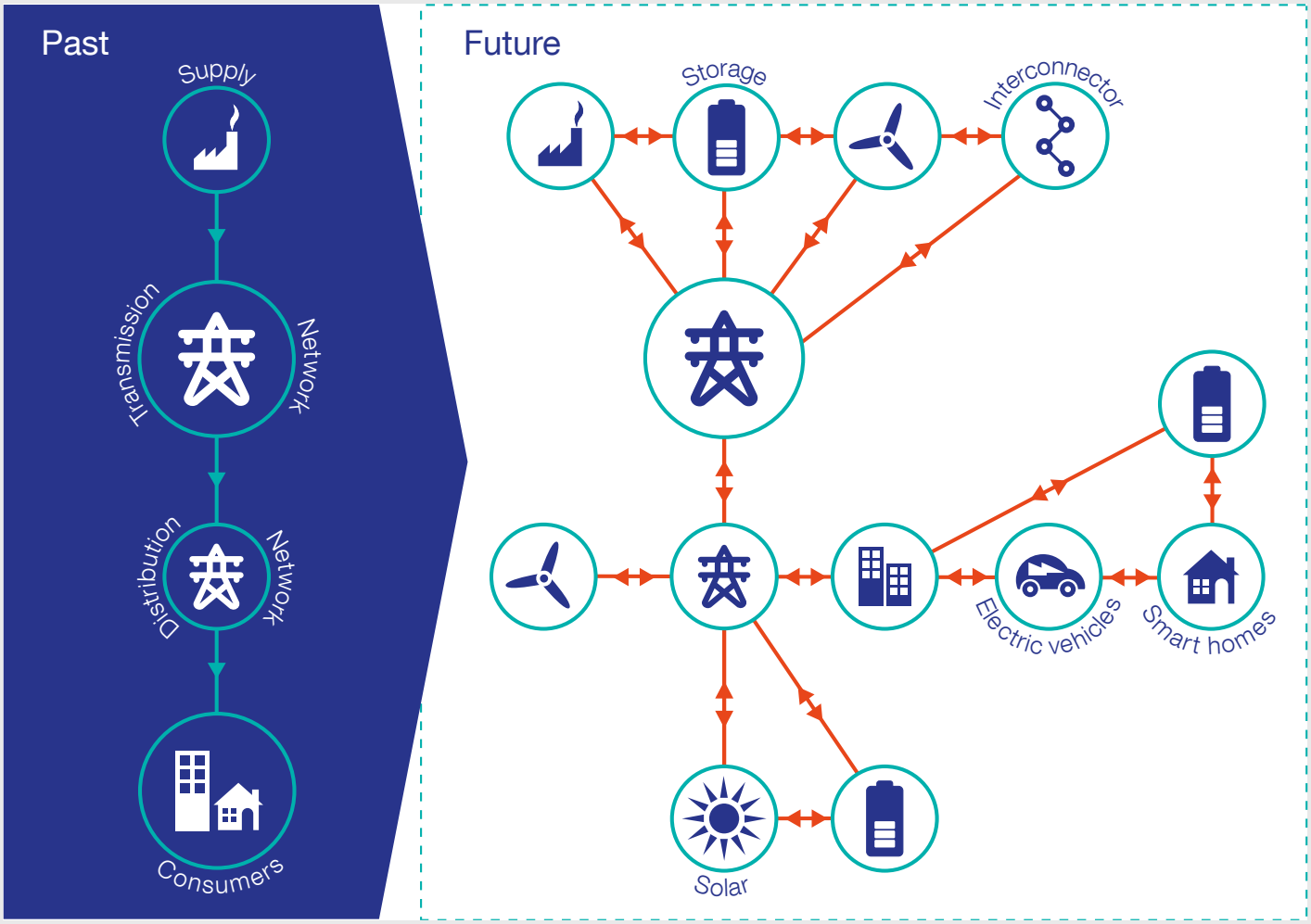
We are seeing increased public scrutiny of the performance of utility companies in the UK. Consumer bodies, regulators and customers care deeply about the integrity of companies' financial returns. They also want to know what companies have done for their consumers to earn those returns.

We have been listening to what you expect us to deliver in this period. You have told us that your expectations are increasingly being shaped by the total impact our activities have on society.

The consequences of the external environment for our future plan

Decarbonisation, decentralisation and digitisation are transforming the electricity system. In the future, electricity will flow far more dynamically between transmission and distribution-connected parties. This will include renewable generators, electric vehicles and battery storage.

Figure 2.2 The transforming electricity system



Greater interconnection – where our own power grid is linked with neighbouring electricity markets via subsea cables – will lead to more volatile flows across the transmission network. This is expected to increase from 4 GW to at least 10 GW in all of the future energy scenarios 2018.

The business plan we will submit this year will reflect the changing external landscape for transmission in the 2020s. We will take account of issues such as:

- The increased uncertainty of future supply and demand.
- The active role demand can play in solving network issues.
- Changing customer numbers, types and needs.
- The increasing need to work across organisations to deliver the best outcomes for consumers.
- The increasing risk of cyber-attacks.
- The greater expectation for transparency about our performance and returns.
- The ongoing need to address our impact on the environment and society.

How to use this document
We want your feedback

Who is this consultation aimed at?

We are interested in the views of all stakeholders who are impacted by what we do or interested in shaping the future of electricity transmission. This includes the views of all users of our network, government, regulatory bodies and energy industry professionals.

Tell us what you think

This consultation is open until 31 March 2019. You may give us feedback in the ways outlined below. We particularly seek your views in response to the specific questions we have posed. These are summarised on page 9. You may respond to all questions or just those relevant to your specific views.

Ways to feedback:

Make notes

Throughout the document, we have provided space for you to read and make notes at the start of each chapter (opposite). Use the section numbering as a way to reference accurately. You can then type up your notes and send them in an email or submit them online.

Interactive pdf notes

Alternatively, we will be sending out editable pdf versions of this document with note fields for you to type directly into.

Email

We have a dedicated email address specifically for your feedback to this document. We welcome your thoughts at: **gary.stokes@nationalgrid.com**

Alternatively, you can put your thoughts in writing and send to: **Gary Stokes, National Grid House, Warwick Technology Park, Gallows Hill, Warwick CV34 6DA.**

Online

You can go directly to the website and submit your comments here.

You can learn more about how we are working with stakeholders by visiting our website. This site makes it easy to follow our progress and shows you how to get involved.

Please share your thoughts:

Type here>