

# Climate Change and Nature

This session will start at 12pm

Welcome & introductions

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@SupplyCSSchool



# SSEN Climate Academy

- This is the fourth of six sessions in the SSEN Climate Academy:
- There are two more *Climate Change* sessions:
  - *Climate and People* – 23<sup>rd</sup> February
  - *Climate and Resource Efficiency* – 2<sup>nd</sup> March

Recordings of previous sessions are available and will be sent out following this session

# Session 4 - Agenda

- ✓ Scene setting: Chris Bratt, Director of Asset Management, SSEN Distribution
- ✓ By the end you will know
  - ✓ Why biodiversity and nature is important
  - ✓ The impact of climate change on nature
  - ✓ How impacts can be mitigated
  - ✓ What SSEN is doing to help biodiversity

# POLL QUESTIONS

## HOUSE RULES



- Use the chatbox for questions



- Share your feedback at the end



- Slides will be shared



**CHRIS BRATT  
DIRECTOR OF CUSTOMER OPERATIONS, SSEN**

**PLEASE SEE FOLLOWING LINK FOR THE PRESENTATION BY CHRIS BRATT:**

**[HTTPS://YOUTU.BE/MJ934HZOTZW](https://youtu.be/MJ934HZOTZW)**



**Scottish & Southern  
Electricity Networks**

# First Principles





# Biodiversity – First Principles


- A **species** is a type of plant or animal e.g. *a badger*.
- A **habitat** is the environment in which a particular animal lives e.g. *woodland*.
- An **ecosystem** is the system in which a community of groups or animals live and interact with each other e.g. *deciduous woodland, which badgers are part of*.
- **Biodiversity** is the term which describes the number of and diversity within species, or variety of life in an ecosystem e.g. *deciduous woodland is a highly biodiverse ecosystem*.



# Why is Biodiversity Important?



The food we eat,  
the clothes we wear etc..



Maintaining the  
earth's life  
support  
systems




Protection from  
extreme  
weather –  
flooding, storms  
etc..

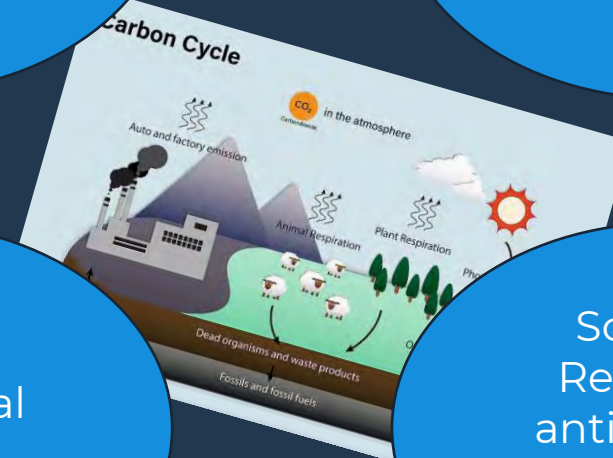


Absorbing CO<sub>2</sub>

Our mental  
health



Scientific  
Research –  
antibodies in  
Llama blood can  
neutralise C-19



# The interconnectedness of everything

## WOLVES KEEP YELLOWSTONE IN BALANCE

**WOLVES KEEP YELLOWSTONE IN BALANCE**

IN THE 1920S, government policy allowed the extermination of Yellowstone's gray wolf — the apex predator — triggering an ecosystem collapse known as trophic cascade

IN 1995 — through use of the Endangered Species Act — the conservation community reintroduced the gray wolf to restore balance. The impact is dramatic

Elk populations exploded without their primary predator, resulting in severe overgrazing of willows and aspen needed by beavers for food, shelter and dam building.

Without wolves, the coyote became an apex predator, driving down populations of pronghorn antelope, red fox and rodents, and birds that prey on small animals.

As the wolf returns, coyote numbers drop by half, allowing antelope, rodent and fox populations to increase.

Various scavenger species suffered without year-round wolf kills to feed on.

Today, biodiversity is enriched and scavenger species reap the benefits of regular, wolf-supplied meals.

Beavers virtually disappeared in the northern range. Dams disintegrated, turning marshy ponds into streams. Massive loss of mature willows and aspens. Heavy stream erosion. Many plant and animal species were affected.

After wolf reintroduction in the northern range, elk numbers drop and beaver colonies increase from 1 to 32. Insects, songbirds, fish, and amphibians thrive.

©2008-2010 US Trophic Cascade Program, RFP, NRDG. Photos: Bottom: "The Wolf's Tooth" (1/10/09) - www.nrdg.com

### A stream comes back to life

Across the U.S. West, scientists and land managers are using beaver dam analogs (BDAs) to heal damaged streams, re-establish beaver populations, and aid wildlife. In some cases, researchers have seen positive changes in just 1 to 3 years.

**Incised stream** vs **Restored stream**

**Adding dams**  
Beaver trapping and overgrazing have caused countless creeks to cut deep trenches and water tables to drop, drying floodplains. Installing BDAs can help.

**Widening the trench**  
BDAs divert flows, causing streams to cut into banks, widening the incised channel, and creating a supply of sediment that helps raise the stream bed.

**Beavers return**  
As BDAs trap sediment, the stream bed rebuilds and forces water onto the floodplain, recharging groundwater. Slower flows allow beavers to recolonize.

**A complex haven**  
Re-established beavers raise water tables, irrigate new stands of willow and alder, and create a maze of pools and side channels for fish and wildlife.

Beavers can prevent flooding (amongst other things!)

Wolves benefit Yellowstone National Park

# What is Happening (WWF Living Planet Report)

**Changes in land and sea use** resulting in habitat loss and degradation

**Species over-exploitation** through direct hunting and loss of non target species

**Climate Change**  
Species need to adapt to the changing environment. Changing seasons

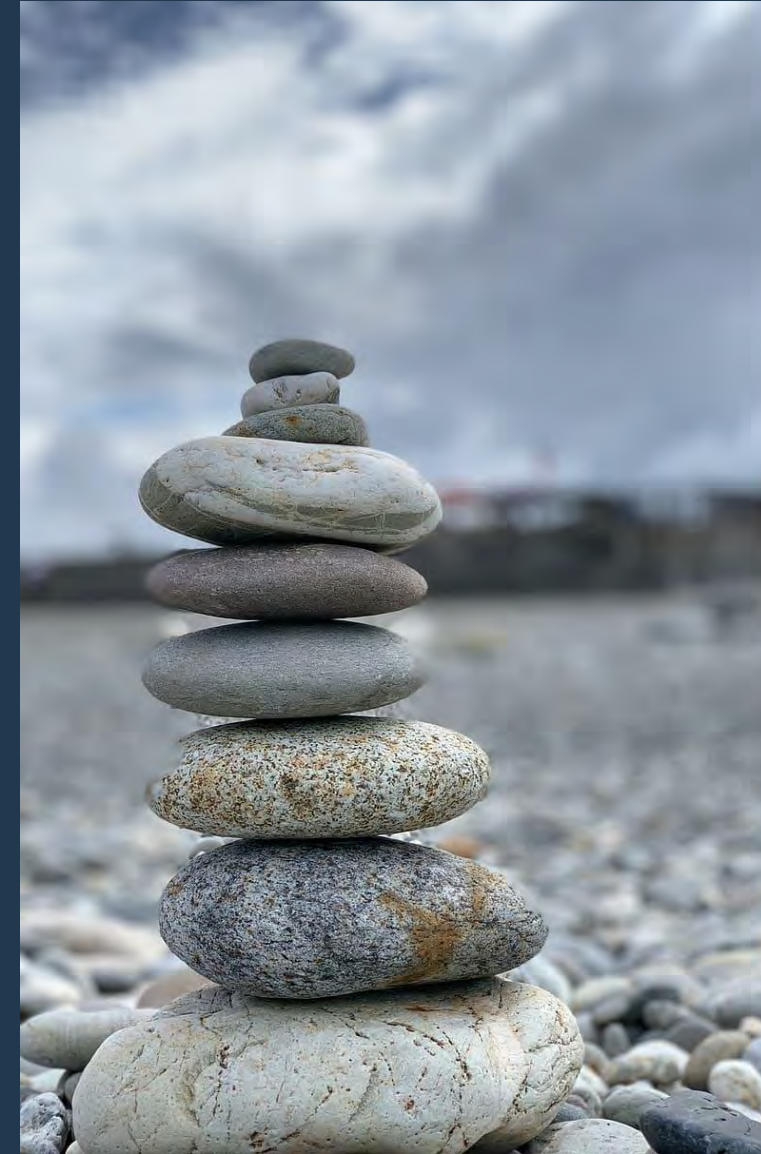
**Invasive species and disease**  
Which compete with native species for space and resources

**Pollution**  
Making an environment unsuitable for survival, food ability or biology



# Things are now out of balance.....

- Invasive species (grey squirrel, signal crayfish) out compete native species
- Global fisheries catches peaked in 1996 (FAO)
- Amazonian rainforest deforestation has been increasing since 2013. In the period 2018-2020 it has increased by 47% (Nature)
- Germany – overall insect biomass decline of 76% between 1989 - 2016
- In the UK studies show that spring is “springing” earlier. This includes birds laying their eggs and trees coming into leaf
- Mental health problems are on the increase





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## Birds and insect species are heading north in the UK as climate warms

ENVIRONMENT 18 July 2019  
By Adam Vaughan

**Nature needs to be able to cope with change and a biodiverse world gives it the flexibility to do just that – e.g. climate change adaptation**

**ScienceNews**  
ESTABLISHED 1921

**NEWS** PLANTS  
**Climate change is bringing earlier springs, which may trigger drier summers**  
Longer growing seasons mean more soil moisture is lost through evapotranspiration, a study says



Taskbar icons: File Explorer, Microsoft Edge, Google Chrome, Firefox, and other applications.

# Recap – First Principles

In this section we talked about:

- **What biodiversity and nature is**
- **Why biodiversity is important**
- **What is happening now – WWF Living Planet Report**



# The Impact of Climate Change on Nature





# Impacts

## Direct Impact

*Species are no longer able to survive in the environment due to environmental change.*

*Coral reef – a temperature change of 1-2 °C can cause bleaching and death*

## Secondary Impact

*Species are affected by changes as a result of climate change.*

*Migrating birds – breeding impacted by changes in caterpillar emergence due to climate change*

# We all have limits

## 60°C

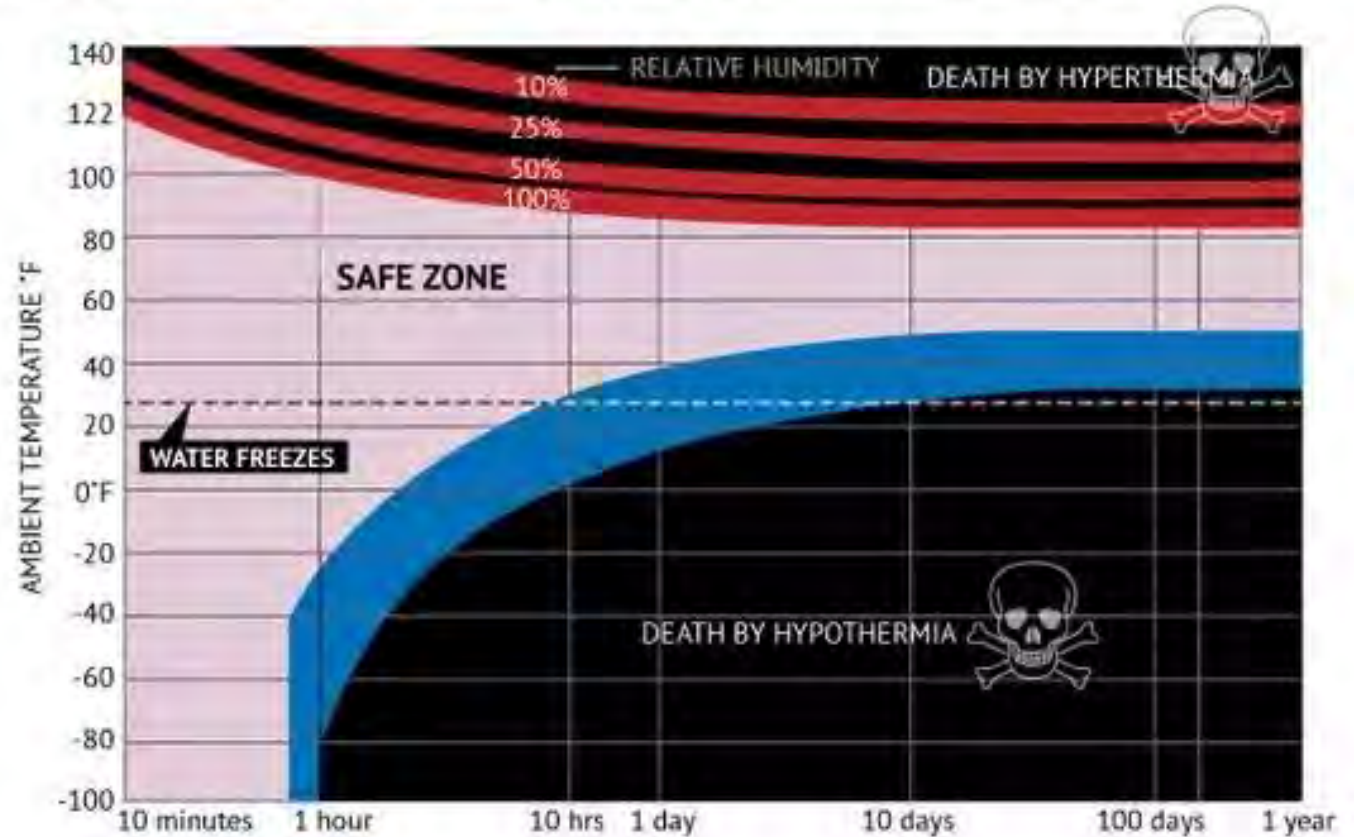
Furnace Creek, Death Valley, USA 1913 – 57 °C

## -73°C

Vostok Station, Russia, 1983 – -128°C

## Extremes of temperature and humidity

Most people will suffer hyperthermia after 10 minutes in extreme humidity and heat – 140 degrees Fahrenheit (60 degrees Celsius). The effect of cold is more variable, but death is inevitable once the body's temperature drops below 70 F (21 C) for a period of time. In the chart below, the blue and red bands represent areas of uncertainty, where the effects of temperature vary depending on differences between individuals.



Human "safe zone" roughly between 26 °C and 4 °C

# It's not just about temperature!

Climate change is driving a number of weather and climatic changes, not just temperature rise.

- Rainfall
- Flooding
- Extreme events – high winds, storms
- Ocean chemistry – acidification
- Sea level rise

These changes impact both **species** and **habitats**.



# Species Perspective - Oak

Direct climate change Impact

Secondary climate change Impact

Spring is 'springing' earlier

More CO<sub>2</sub>, may increase growth

**Acute Oak Decline**

Extreme weather - storms

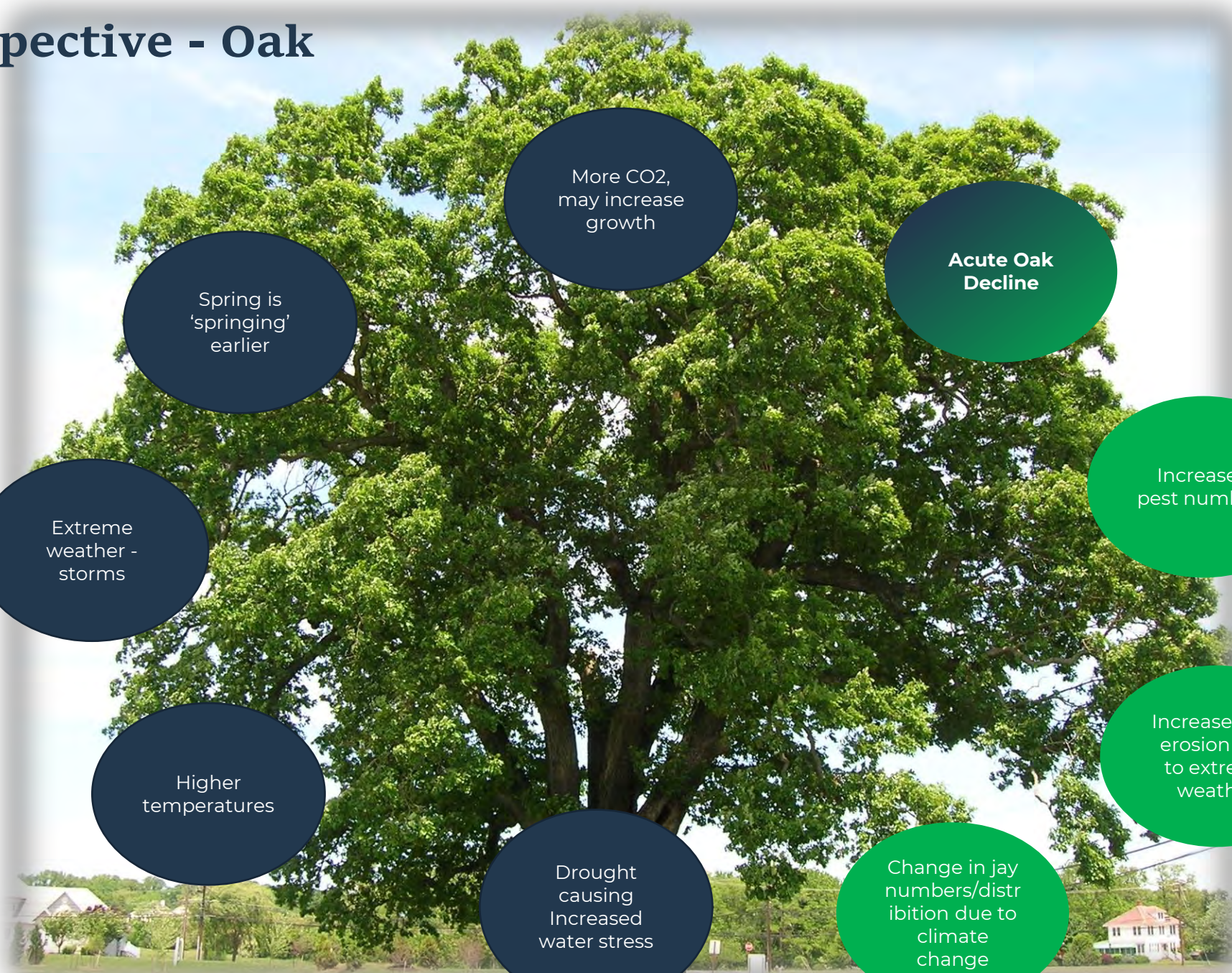
Increased pest numbers

Higher temperatures

Increased soil erosion due to extreme weather

Drought causing increased water stress

Change in jay numbers/distribution due to climate change



# Habitat Perspective – Oak Woodland



2,300 species supported by Oak

326 depend on Oak for survival

229 species rarely found on trees other than Oak

Oak Woodland can also drive local climatic conditions

## Impacts on habitats



*Around ½ of the oak trees in UK woods are thought to have been planted by jays*

# Adaptation

Species & Habitats are already adapting to climate change impacts

- Species may shift their ranges towards the poles or increase altitude (where they can). Over time habitat distribution may change too
- Genetic diversity may also help species adapt in the longer term

However

- Habitat fragmentation makes moving more difficult
- Habitat destruction reduces genetic diversity in wild populations making adaptation more difficult
- Speed of climate change



# Recap - Impacts

In this section we talked about:

- **How different species have different limits, and how climate change is changing the environment**
- **The many impacts that climate change can have on species and habitats**
- **How interconnected species and habitats are**
- **How species may adapt to climate change**





# Mitigating Impacts



# The Biodiversity Mitigation Hierarchy

Most Preferable



**AVOID** direct impacts to species & habitats

**MINIMISE** any impacts you will have, e.g. during de-vegetation

**RESTORE** any habitats that are destroyed

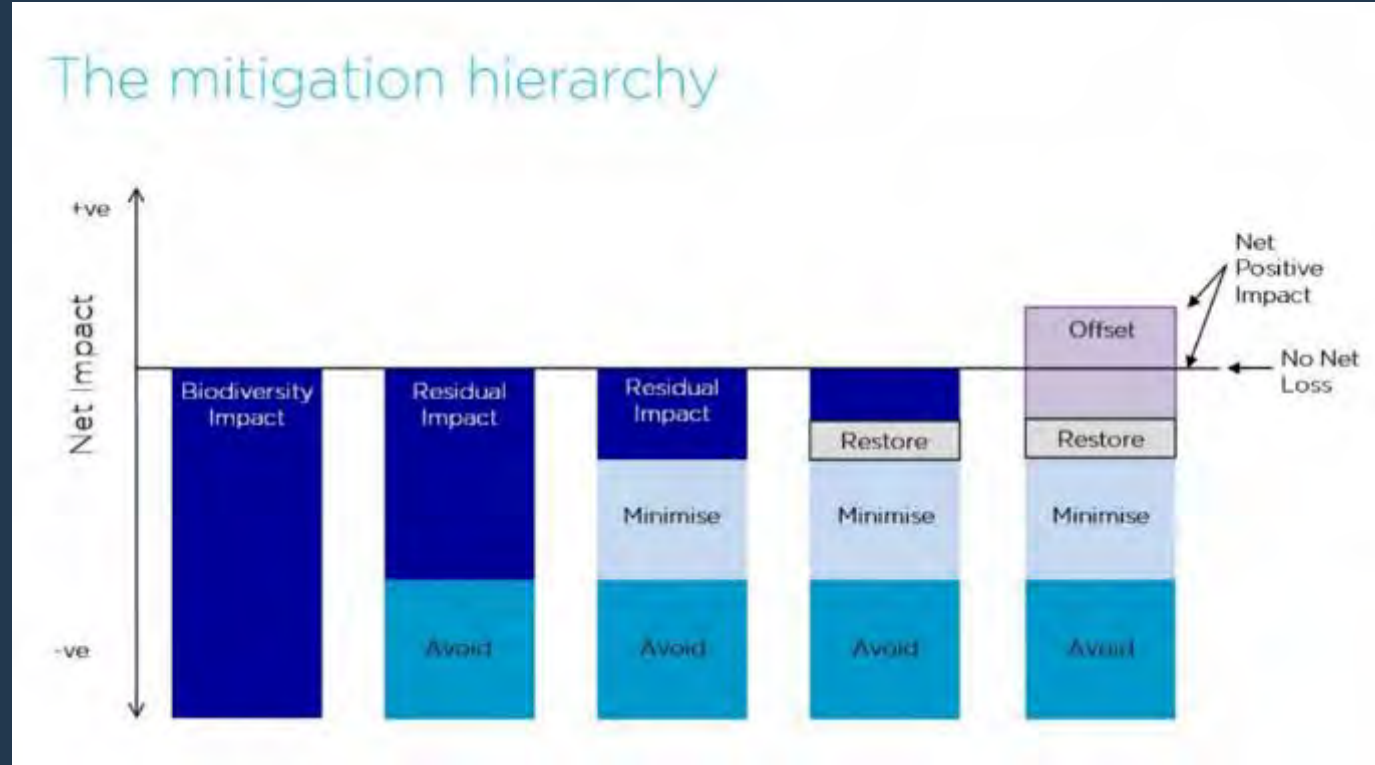
**OFFSET** impacts based on the number of biodiversity units lost



Least Preferable

# Net Gain

- Understand the baseline –Defra Biodiversity metric 3.0
- Prioritise your activities using the biodiversity mitigation hierarchy
- Engage stakeholders as early as possible!
- Does not apply to “irreplaceable habitat”
- “Positive Effects for Biodiversity” – NatureScot

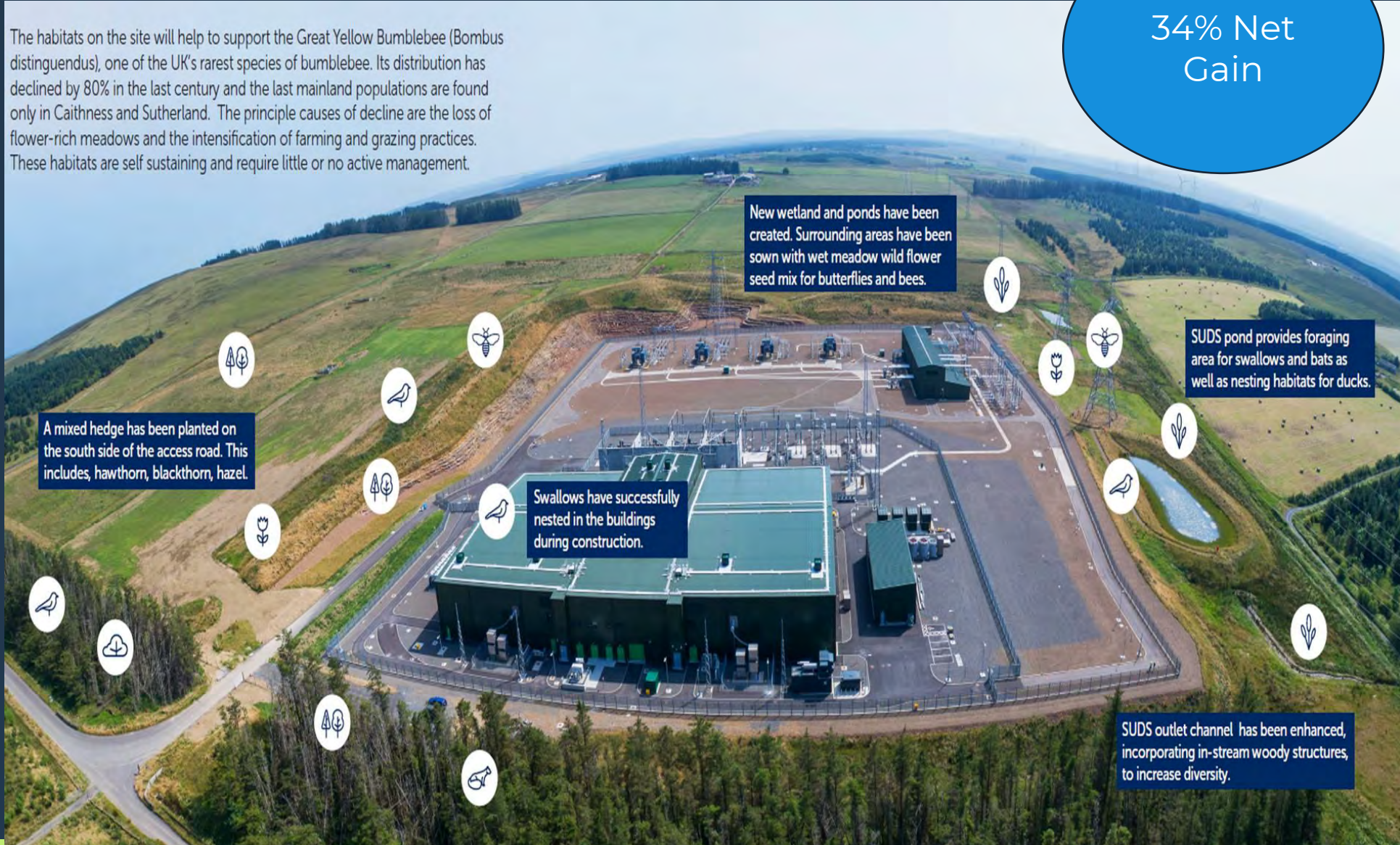


# Spittal Substation

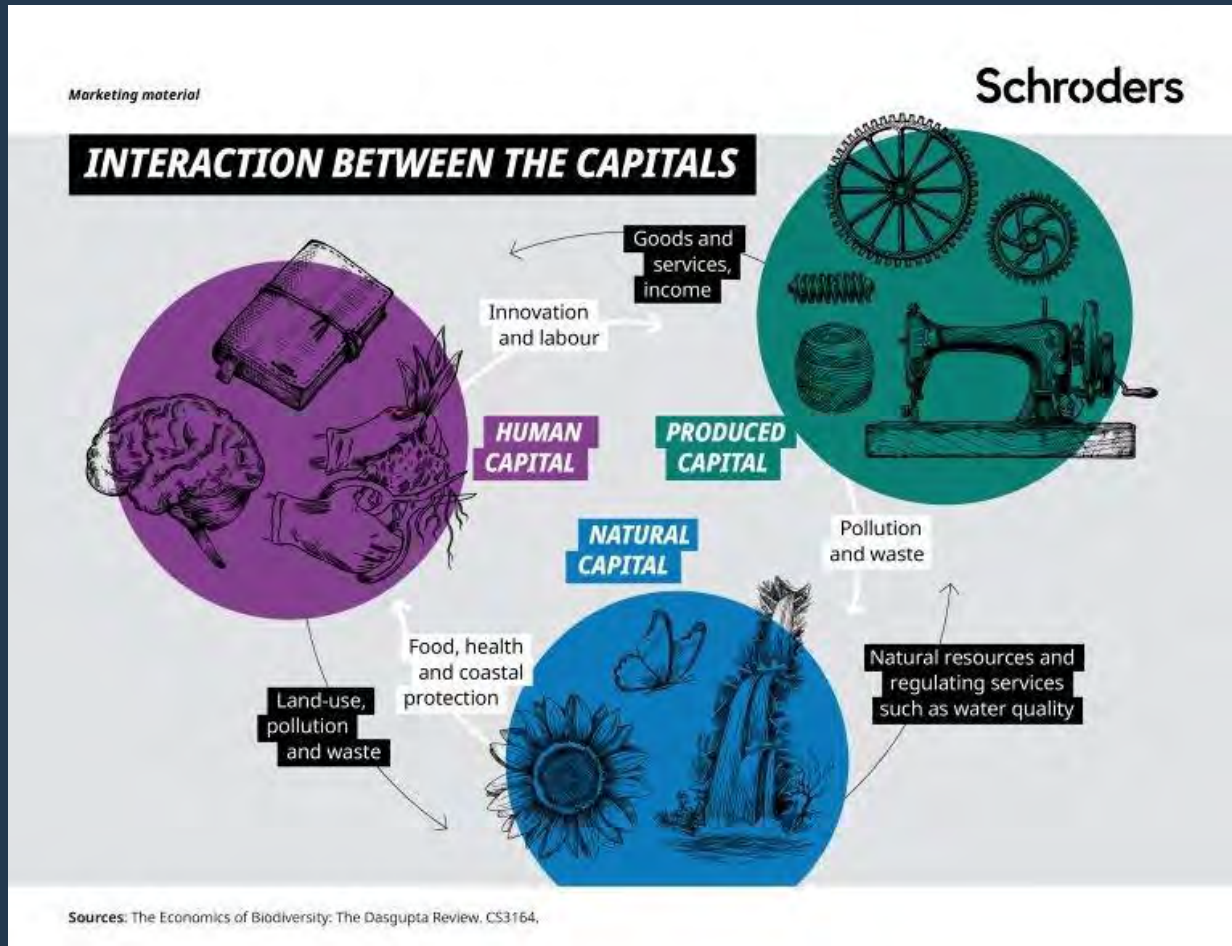
Before development the site was defined as 'improved grassland'.

Post development, the site has

- Native broadleaf planting
- Scrub planting
- Hedgerows
- Wetland creation



# Natural Capital



*“The world’s stocks of natural assets, which include geology, soil, air, water and all living things. From this capital humans derive a wide range of services (ecosystem services) which make human life possible”*

# Stocks

Oak  
Woodland

# Services

- Flood protection
- Carbon sequestration
- Reduce air pollution
- Soil formation
- Etc.....!

# Benefits

- Reduced Flooding
- Reduced climate change impacts
- Improved air quality
- Timber
- Mental health



# Recap – Mitigating Impacts

In this section we talked about:

- How we can reduce the impact of climate change on nature, including:
  - The biodiversity mitigation hierarchy
  - Net Gain
  - Natural Capital



# SSE's Approach





# SSE's Group-wide Approach

## Three Core Themes:

- Protecting, restoring and enhancing biodiversity
- Contributing to knowledge & research
- Connecting people with the natural world



# Protecting, Restoring and Enhancing Biodiversity



- SSE Thermal Work with the Trent Rivers Trust to improve habitat for eels. Removal of 1,800m<sup>3</sup> of materials to improve habitat for marginal plants and eel refuge areas.

- Peatland restoration. Active management of peat bogs in Scotland through the SSE Renewables Habitat Management Plan. 2020 nomination for the sustainable development award at the Scottish Green Energy Awards



# Dunmaglass Peatland Restoration



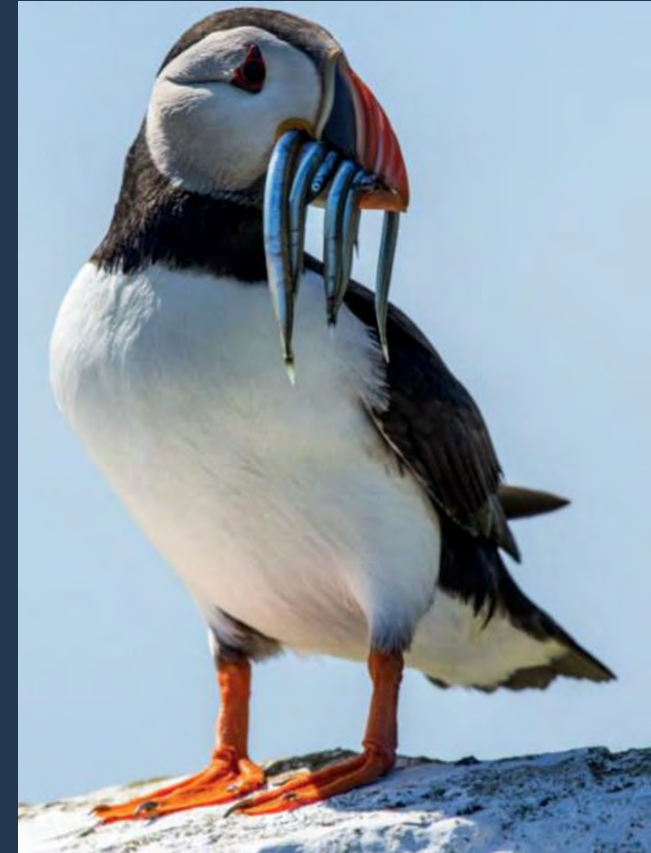
**Before**



**After!**

# Contributing Knowledge and Research

- **Biodiversity Net Gain Toolkit** **Biodiversity Net Gain** approach applied at the Rothienorman substation in Aberdeenshire. Landscaping around the station included 11ha of wildflower rich grassland, 4ha of new broadleaved woodland and 3ha of scrub and ponds. Has delivered Net Gain for Transmission Projects.
- **Partnership with Microsoft** to monitor puffin numbers on the **isle of May** in the Firth of Forth as part of the Beatrice offshore wind project



# Connecting People with the Natural World

- **Galway Wind Way** – 48km of recreational trails, designed with and for the local community
- **Pitlochry Dam visitor centre** - £4m, promotes heritage and future of hydro. Site has installed swift boxes, bug hotels and bee habitat. Visitors encouraged to explore biodiversity exhibits.



# Recap SSE's Approach

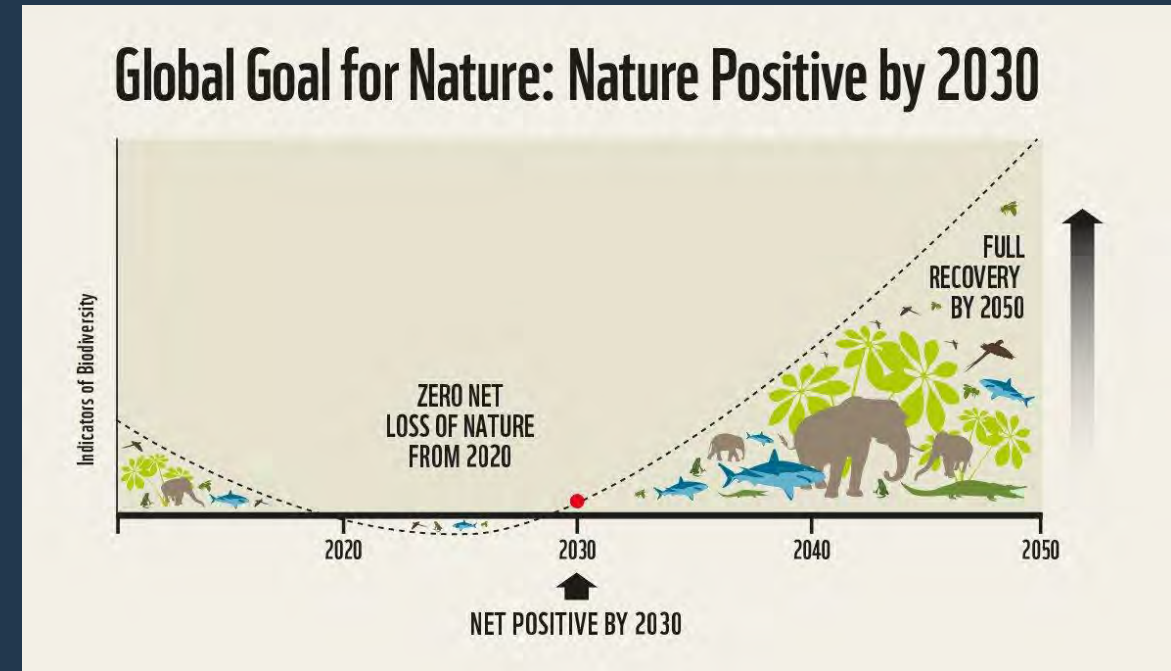
In this section we talked about

- The **three core themes** which define how SSE manages biodiversity
- **Case study examples** of what SSE has done



# What Next?

- Deliver **Nature Net positive** – a key challenge for SSE!
- Development Projects:
  - Net Gain
  - Optioneering, make biodiversity part of the solution
  - Biodiversity considered as early as possible in design process
- Business as Usual
  - Resources you consume
  - Lifestyle choices



# Summary

- Species and habitats on earth are continually adapting (and influencing) the earth's climate
- Key issue – rate of change
- Other human activities, such as habitat destruction, population fragmentation are putting increasing stress on biodiversity
- SSE has a strategy to reduce it's impact on nature
- **SSEN have included ambitious natural capital investment proposals in our ED2 plan, including peatland, native woodland and seagrass restoration.**
- There are things you can do at a **personal level** – produce less greenhouse gas, switch to a renewable energy tariff, buy less stuff!
- There are things you can do a **project level** – implement the mitigation hierarchy, design for nature





# SSEN Natural Capital Proposals

In RIIO-ED2 we are looking to achieve a Biodiversity Net Gain (BNG) approach which aims to leave the natural environment in a measurably better state than beforehand. Ultimately contributing to our credible net zero journey and achieving our biodiversity net gain requirements.

Part 1 - Developing a tool to baseline and monitor our biodiversity and enable cultural change required to enhance biodiversity

Part 2 - We will deliver 2,000 ha of woodland restoration and 1200 ha of peatland restoration which is expected to remove over 300,000 t CO<sub>2</sub>e by 2045, and provide 3000 biodiversity units by 2045.

## Protecting marine biodiversity: Life below water CVP

- We are exploring opportunities to **support Seagrass Restoration** across our two licence areas.
- Seagrass Restoration is something coastal communities, conservation charities and government agencies alike are currently **very keen on exploring**, but often the funds are lacking to pursue the myriad of opportunities which exist around the UK, as Seagrass Restoration is still in its relative infancy.
- Seagrass Restoration facilitates numerous benefits to people and wildlife, and helps to re-establish some of the areas lost historically **(92% of the UK's seagrass has disappeared)**.
- CVP is subject to Ofgem approval.



# POLL QUESTIONS

**THANK YOU**

**ANY QUESTIONS?**

SUPPLY CHAIN SUSTAINABILITY

**SCHOOL**



**0207 697 1977**



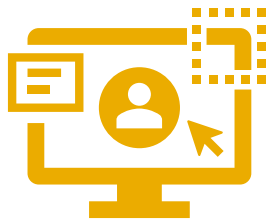
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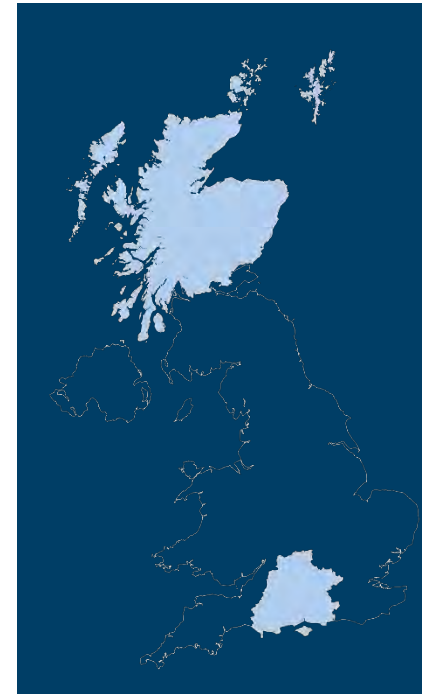
# WANT TO ENGAGE MORE WITH SSEN ON NET ZERO?

## Join our stakeholder database!



Register now at:

[SSEN.co.uk/StakeholderEngagement/HaveYourSay/](https://www.ssen.co.uk/StakeholderEngagement/HaveYourSay/)



We own and maintain the electricity networks across northern Scotland and central southern England.



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Electricity Networks