Circular Economy Action Plan

Our actions for efficient resource use

June 2025

ScottishPower

Introduction

If everyone in the world consumed as we currently do in the UK, we would need three planets to support us – the earth's finite resources and ecosystems cannot keep up with our demands.

This excessive extraction and consumption of raw materials is a significant driver of greenhouse gas emissions, biodiversity loss and environmental degradation. Global resource demand has never been greater, and the risks of disruption across interconnected supply chains never more tangible.

Yet the story of circularity is also one of global collaboration and innovation and inhabits a sweet spot as not only an enabler of climate and nature action, but as a real opportunity for greater business efficiency and productivity. As a major UK energy company with renewable generation, storage, customer supply and network interests, ScottishPower has the opportunity to both drive, and benefit from, the circular transition as we invest up to £24bn between 2024 and 2028 and help accelerate a just transition to Net Zero.

This plan lays out ScottishPower's commitments, targets and actions to align our business model with a circular economy and achieve our circular economy vision for 2030:

ScottishPower has minimised resource use and waste and established circular processes that keep materials in use at high value for the long term.

It reflects the potential contribution of everyone at ScottishPower to make a positive impact, highlights the vital role of our partners and is an invitation for others to join us and help build a ***better future quicker.***

Kate McGeoch
Circular Economy Lead

This plan lays out the actions we are taking to enhance the circularity of our business to help tackle the nature and climate crises in line with global best practice.

These actions are designed to deliver on the commitments made in our sustainable development strategy, Action 2030: Powering a sustainable future.

These actions cover all aspects of our materials footprint, across Networks, Renewables, Customer business and Corporate functions.

We would like to thank the following people for their insightful contributions to the development of this plan:

- **Dr Lucy Wishart** – Lecturer in Circular Economy and Sustainable Transformations, University of Edinburgh
- **Net Zero Infrastructure Team** – Zero Waste Scotland

Contents

The resource use challenge

Increasing global resource use is driving climate change and biodiversity loss
Global resource extraction has more than trebled in the last 50 years, including a 159% increase in fossil fuel use[1] . Resource extraction is responsible for 50% of global carbon emissions and 90% of global biodiversity loss[2] and is set to more than double again by 2060 if business-as-usual prevails[3].

A high percentage of resources are wasted, lost, or remain unavailable for reuse
We are still too often choosing to extract virgin materials rather than reusing existing materials, and this trend is unfortunately worsening, with global circularity steadily decreasing from 9.1% in 2018 to only 6.9% in 2021[4]. According to the Circularity Gap Report 2023, 'this means that more than 90% of materials are either wasted, lost or remain unavailable for reuse for years as they are locked into long-lasting stock such as buildings and machinery'.

High resource use and low circularity are driving vital earth systems towards collapse
These actions have driven humanity to breach six out of the nine key planetary boundaries[5], putting the systems we rely on dangerously close to collapse. We need to move to circular models of resource use to meet people's needs whilst staying within the safe limits of the planet – indeed, greater circularity in the global economy could reduce material extraction and use by a third[6].

The clean energy transition is vital to solving climate and nature crises, but requires the use of finite resources
While the clean energy transition is crucial to achieving net zero, the scale of resource use required to achieve it is significant. Although green generation technologies have significantly lower lifecycle impacts than fossil fuel generation technologies[7], the global energy transition could require around 6.5 billion tonnes of end-use materials by 2050, dominated by steel, copper, aluminium and smaller quantities of critical minerals including lithium, cobalt, graphite and rare earths[8].

For example, Zero Waste Scotland's Energy Infrastructure Materials Mapping suggests that up to 230 million tonnes of selected materials will be required for Scotland's low carbon energy sector by 2050[9], representing a 12% increase in the use of these resources compared to those directly consumed in 2018[10].

Added to this, increased competition for finite resources, some of which are geographically isolated, could put strain on supply chains of raw materials critical to the transition[11].

From a UK perspective, the UK's Clean Power 2030 Action Plan[12] targets a trebling of offshore and onshore wind capacity and battery capacity within five years[13] which must also be supported by the requisite energy network capacity. ScottishPower is fully committed to playing its part in delivering this target, but none of this can happen without the deployment of significant resources.

[1] CGR 2025
[2] Facts and Figures | United Nations
[3] CGR 2025
[4] CGR 2025
[5] Planetary Health Check 2024
[6] CGR 2023
[7] LCA_final.pdf
[8] ETC-Materials-Report_highres-1.pdf
[9] Including resources related to hydropower plants
[10] Energy Infrastructure Materials Mapping
[11] Critical_point_securing_the_raw_materials_needed_for_the_UKs_green_transition2.pdf
[12] UK's Clean Power 2030 Action Plan
[13] UK Wind energy database (UKWED) | RenewableUK

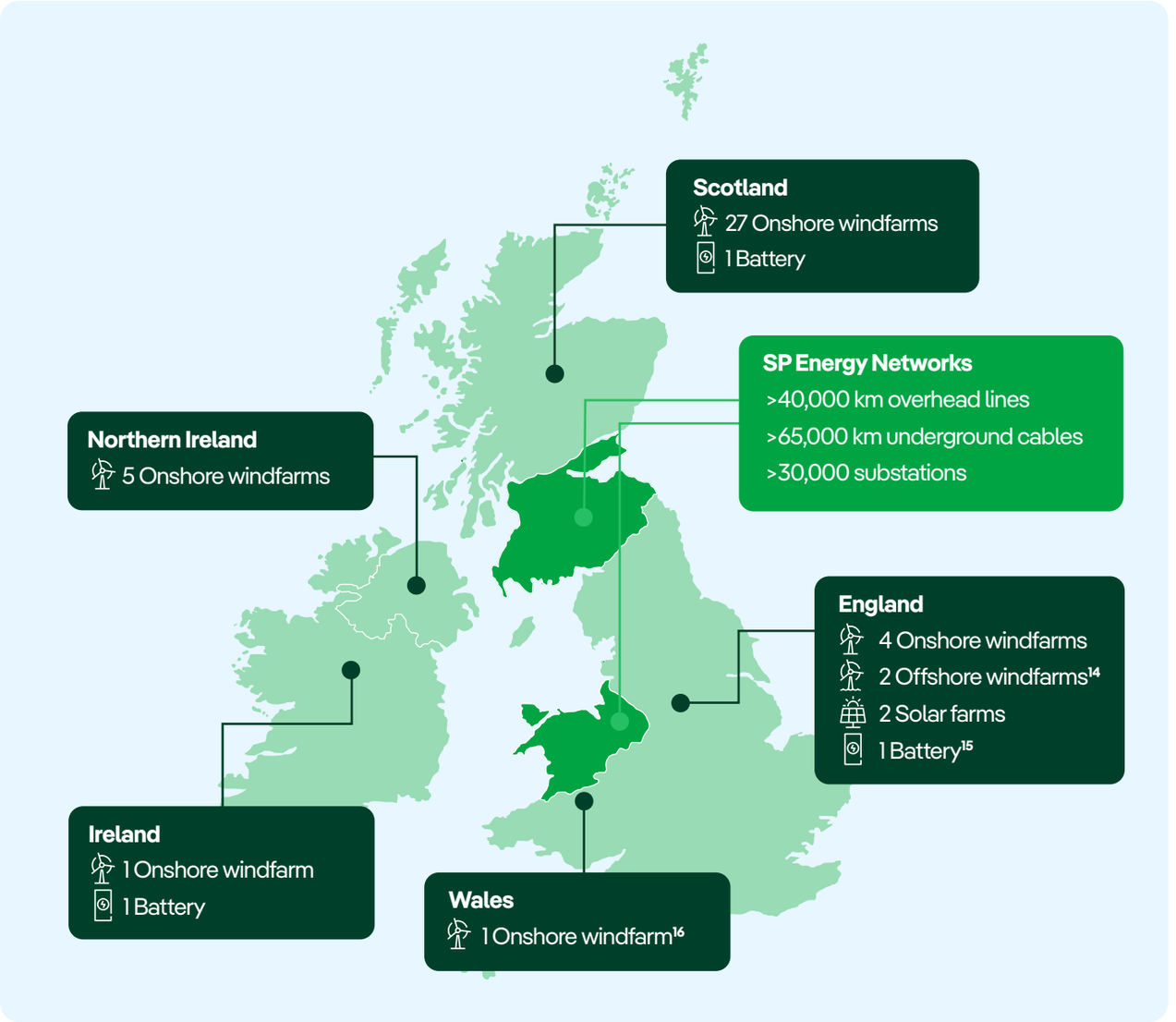
Our resource impact

As a developer, owner and operator of large infrastructure, we have significant potential resource impacts, both negative and positive.

Our scale, geography, planned investment and ability to influence and partner give us the opportunity to enhance circularity at a nationally significant level. We are a leading developer of wind power across the UK with around 3GW of installed capacity and a pipeline of more than 18GW of renewable power. We are part of the Iberdrola Group, a global energy leader and the world's leading wind energy producer.

We have onshore and offshore assets under construction and in operation across many areas of the UK. These span from our networks in Southern Scotland, Northwest England and North Wales to our onshore windfarms and solar farms from County Antrim to Caithness to Cornwall. We have green hydrogen sites planned in East Renfrewshire and Cromarty and offshore windfarms operational and planned in several locations around the British Isles. We have over 30 office and depot sites and we supply electricity and gas to over 4 million customers. In 2025 the distribution company Electricity North West (ENW) became part of the ScottishPower group of businesses. The licence area for ENW geographically links our two existing network areas through Northwest England.

We operate facilities and networks representing hundreds of thousands of tonnes of resources. Planning timelines for our projects may range from two to ten years and the resulting assets may have lifespans of up to 50 years. We source products and materials from global and local supply chains, and we engage and partner with a wide range of interested parties and local communities throughout the lifecycle of our projects.



[14] Gross capacity - West of Duddon Sands 50% of total 389MW. East Anglia ONE 60% of total 714MW.
[15] Carland Cross Battery is a joint operation with Centrica
[16] P&L Windfarm is a joint venture with Eurus Energy

A recent project carried out with the support of Zero Waste Scotland and Eunomia, supplemented by our own further analysis, identified that the following materials are relevant to ScottishPower's products and services. The production of these materials has the potential to cause a number of upstream environmental impacts during extraction and processing[17]. We have categorised these as high, medium and low quantities by weight, but we also aim to better understand the value and risks associated with the materials we use. See **Measuring our performance** and **Our actions for circularity** for our actions to improve our understanding of these aspects.

In high quantities

Steel

Recycled steel makes up around **40%** of steel produced globally[18].

Uses: Turbine towers, nacelles, foundation ferrules, switchgear, transformers, cables, overhead line conductors and towers, solar mounting structures.

Potential impacts:

- Air pollution
- Greenhouse gas emissions
- Habitat loss
- High energy use
- High water use
- Soil pollution

Concrete

The most used human-made material globally, responsible for around **8%** of global CO_2 emissions[19].

Uses: Foundations, cable troughs, mounting structures, buildings.

Potential impacts:

- Erosion
- Greenhouse gas emissions
- Habitat loss
- High energy use
- High sand use
- High water use
- Natural resource depletion
- Recycling challenges
- Sedimentation

Aggregates

28% of aggregates in the UK come from aggregate recycling and **>95%** of aggregates used in the UK are from domestic production[20].

Uses: Foundations, cable troughs, mounting structures, buildings, access roads, lay down areas.

Potential impacts:

- Air pollution
- Erosion
- Habitat loss
- High energy use
- Sedimentation
- Water/marine pollution

Natural gas

Currently the **dominant heating fuel** in the UK[21].

Uses: Used by our customers primarily for heating and cooking.

Potential impacts:

- Air pollution
- Greenhouse gas emissions
- Habitat loss
- Water pollution

[17] This infographic is not exhaustive.
[18] Iron and steel recycling: Review, conceptual model, irreducible mining requirements, and energy implications - ScienceDirect
[19] Making Concrete Change: Innovation in Low-carbon Cement and Concrete | Chatham House – International Affairs Think Tank
[20] Environmental Impact of Aggregate Mining & Dredging | UKGBC
[21] Heat decarbonisation guide - Energy Systems Catapult

In medium quantities

Cast Iron

Used in situations requiring **high hardness**, abrasion resistance and compressive qualities.

Uses: Nacelles, gearboxes, rotor hubs, foundations, transformers.

Potential impacts:

- Air pollution
- Greenhouse gas emissions
- High energy use
- Natural resource depletion
- Water/marine pollution

Fibreglass

A composite made by reinforcing plastic with glass fibres. **Lighweight, strong and durable.**

Uses: Nacelles, blades, nose cones.

Potential impacts:

- Air pollution
- High energy use
- Natural resource depletion
- Recycling and reuse challenges
- Water/marine pollution

Timber

50% of forest area in the UK is certified by FSC and PEFC. **38%** of timber is sourced within the UK, the rest is mostly imported from Europe[22].

Uses: Overhead line poles, blades, buildings, paper use.

Potential impacts:

- Community impacts
- Deforestation
- Disruption of water cycle
- Erosion
- Habitat loss
- Land use change
- Soil compaction

Aluminium

35% of global aluminium is recycled[23].

Uses: Transformers, overhead conductors, switchgear.

Potential impacts:

- Community impacts
- Disruption of water cycle
- Erosion
- Habitat loss
- Soil compaction

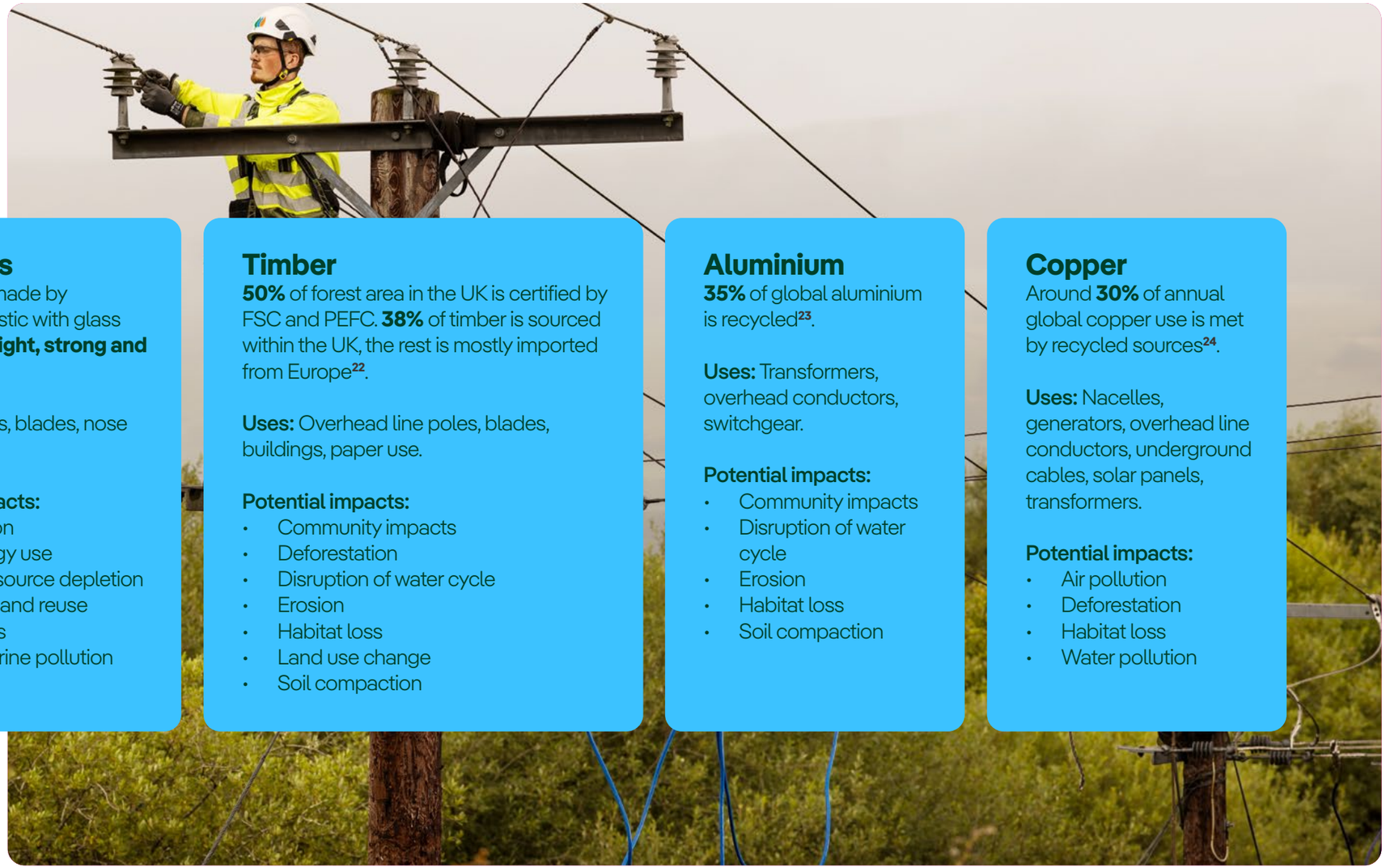
Copper

Around **30%** of annual global copper use is met by recycled sources[24].

Uses: Nacelles, generators, overhead line conductors, underground cables, solar panels, transformers.

Potential impacts:

- Air pollution
- Deforestation
- Habitat loss
- Water pollution



[22] Environmental Impacts of Timber Logging for Construction
[23] Environmental Impacts of Aluminium & Bauxite Mining | UKGBC
[24] Copper Recycling - International Copper Association

In lower quantities

Resins
Can be used in coatings, adhesives and plastics. Traditionally oil-based, but bio-based alternatives are gaining popularity.

Uses: Cable joints, blades, insulators, coatings, encapsulation, bonding, adhesives.

Potential impacts:
- Air pollution
- Greenhouse gas emissions
- Recycling and reuse challenges
- Water/marine pollution

Plastics
Less than **10%** of plastic produced to date globally has been recycled[25].

Uses: Packaging, insulators, underground cables, overhead line conductors, coatings, encapsulants, structural components, bearings.

Potential impacts:
- Greenhouse gas emissions
- Habitat loss
- Recycling and reuse challenges
- Resource depletion
- Risks to human health
- Water/marine pollution

Nickel
Around **40%** of nickel used each year comes from recycled sources[26].

Uses: Batteries, green hydrogen production.

Potential impacts:
- Air pollution
- Deforestation
- Erosion
- Habitat loss
- Resource depletion
- Water/marine pollution

Rare earth elements
Use in clean energy applications makes up over **20%** of global demand[27].

Uses: Battery storage, hydrogen technologies, magnets.

Potential impacts:
- Air pollution
- Deforestation
- Habitat loss
- Conflict & inequality
- Soil pollution
- Water/marine pollution

Silica
Solar and micro-chip grade silicones require a very high level of silica purity.

Uses: Solar panels, microchips, insulators, batteries.

Potential impacts:
- Air pollution
- Habitat loss
- Risks to human health

Zinc
Around **30%** of zinc comes directly from recycled sources[28].

Uses: Batteries, corrosion protection, coatings.

Potential impacts:
- Air pollution
- Deforestation
- Habitat loss
- Soil pollution
- Water/marine pollution

Chromium
Highly resistant to corrosion.

Uses: Solar panels, gearboxes, batteries.

Potential impacts:
- Air pollution
- Erosion
- Habitat loss
- Resource depletion
- Risks to human health
- Water/marine pollution

Paints
Used to protect and extend longevity.

Uses: Turbines, towers, substations

Potential impacts:
- Air pollution
- Resource depletion
- Risks to human health
- Water/marine pollution

[25] Visual Feature | Beat Plastic Pollution [26] Nickel: from 'devil's metal' to the holy grail - Brunel [27] Global Critical Minerals Outlook 2024 [28] Why zinc is sustainable - Galvanizers Association UK & Ireland

Our track record

This **Circular Economy Action Plan** lays out our commitments and actions to optimise materials use and enhance circularity in our company and supply chain, drawing on our long-standing efforts to reduce consumption and optimise resource use.

We are proud of our track record, from the use of flexibility services to reduce the need for resource intensive network upgrades, to our mature component refurbishment and reuse programmes.

97%

Diversion of waste from landfill in 2024

>3000 tCO2e

Emissions avoided through transformer refurbishment and reuse since 2019

88

Key actions underway for circularity

£13.3m

Long term benefit to society from low voltage monitoring and contracting flexibility to defer network reinforcement

Commended

UN Global Compact UK SDG Innovation Accelerator for Young Professionals identified a new process to enhance reuse of offshore batteries with potential benefits across offshore industry. Project selected for showcase at annual UN Global Compact UK summit.

9.5m

Pieces of communication sent to domestic customers promoting home energy efficiency.

Digital twin

ENSIGN innovation project underway to develop a digital network twin to optimise asset management and develop smart grid solutions, maximising lifespan and minimising the need for network reinforcement

Engagement

Engaging with industry bodies to develop sector knowledge and support research

Blades

Supporting industry in developing blade management solutions and embedding maintenance regimes to prolong life expectancy.

Our actions align with the agreed definitions of circularity and resource use laid out in the EU Corporate Sustainability Reporting Directive (CSRD):

EU Corporate Sustainability Reporting Directive definitions of circularity and resource use

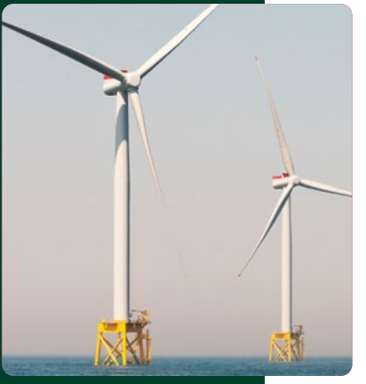
'Circular economy means an economic system in which the value of products, materials and other resources in the economy is maintained for as long as possible, enhancing their efficient use in production and consumption, thereby reducing the environmental impact of their use, minimising **waste** and the release of hazardous substances at all stages of their life cycle, including through the application of the **waste hierarchy.** The goal is to maximise and maintain the value of the technical and biological resources, products and materials by creating a system that allows for **durability,** optimal use or re-use, refurbishment, remanufacturing, recycling and nutrient cycling.'

'Resource use is a major driver of other environmental impacts such as climate change, **pollution,** water and **marine resources** and biodiversity. A **circular economy** is a system that tends towards sustainable use of resources in extraction, processing, production, consumption and management of **waste.** Such a system brings multiple environmental benefits, in particular, the reduction of material and energy consumption and **emissions** into the air (greenhouse gas emissions or other pollution), the limitation of **water withdrawals** and **discharges** and the **regeneration** of nature limiting the impact on biodiversity.'

We have a strong track record of enhancing efficiency in resource use across our value chain, as exemplified by the following case studies.

Redirecting batteries to reuse

In 2024, a cross-disciplinary team from SP Renewables Offshore participated in The UN Global Compact UK SDG Innovation Accelerator for Young Professionals, an initiative aimed at driving business innovation to achieve the UN Sustainable Development Goals. During the programme, teams of innovators tackled company-specific challenges to enhance sustainability. The team explored circularity within East Anglia One (EA1) Windfarm, identifying that the batteries providing uninterrupted power supply to wind turbines are replaced approximately every three years, leading to around 26 tonnes of batteries being disposed of in each cycle. The team then proposed a solution, which was to develop and implement a test for retired batteries, to check and verify functionality, enabling the batteries that pass the test to be redirected for reuse rather than disposal. The team was one of five selected to showcase their solution at the annual UN Global Compact UK summit in London.



Repair and refurbishment of transformers

As SP Energy Networks continues to develop and operate its transmission and distribution networks, there are assets which have the potential to be reused through repair and refurbishment. SP Energy Networks' Transformer Workshop in the SP Manweb licence area refurbishes and reconditions obsolete secondary substation transformers to extend their life and reduce waste, aligning with circular economy principles. Transformers removed from the network are assessed for refurbishment suitability based on age, condition and compliance. Suitable units undergo rigorous performance and electrical testing, after which necessary repairs are made, including replacing bushings and creating new gaskets from recycled materials. Transformer oil is also regenerated, minimising the need for new resources. Refurbished transformers are redeployed, with post-refurbishment tests confirming service readiness. Since 2019, this process has saved 3,326 tonnes of CO_2 equivalent emissions, with 647 tCO_2e saved in regulatory year 2023/24 alone (equivalent to 216 one-way flights from London to Australia).

Customer and community energy efficiency

Since launching in 2021, ScottishPower and WWF have worked together to publish thought-leading research and policy recommendations for how the UK can get to net zero more quickly and in a way that helps people reduce their bills. The partnership engages governments, the private sector and ScottishPower customers on how best to achieve net zero homes in the UK, with a strong focus on energy efficiency. One output has been the Warmer Homes, Better Living report, which focuses on the wide-ranging benefits of energy efficiency and home decarbonisation, particularly from a health, community, financial and environmental perspective, with the aim of broadening support for home decarbonisation within political thinking.

Our Smart Solutions team are supporting communities and organisations on their path to net zero, ensuring that nobody is left behind. The team has developed an innovative partnership with SP Renewables Onshore, working with communities in receipt of wind farm community benefit funding to support their net zero ambitions. Through positive engagement the partnership is providing advice and supporting communities to deliver energy efficiency initiatives including the installation of low-carbon technologies such as heat pumps and solar panels.

Responding to the resource use challenge

Drivers for action

Global

A number of useful multi-lateral frameworks for circularity have been developed in recent years, mainly with the aims of highlighting the impact of the linear economy and outlining how policy makers and organisations can move towards greater circularity.

- UN Sustainable Development Goal 12 aims to 'Ensure sustainable consumption and production patterns' by 2030[29];
- The Planetary Boundaries Framework has defined the boundaries within which humanity must stay to 'continue to develop and thrive for generations to come', and the six out of nine boundaries which have already been breached[30];
- The Circular Transition Indicators provide a framework for how companies can consistently measure their own circularity[31]; and
- More recently, work has begun to develop a Global Circularity Protocol[32], which is hoped will provide a voluntary framework for assessing circularity that will support companies in a similar way to the long-established Global Greenhouse Gas Protocol .

Whilst no global target has been agreed to date on circularity similar to the Paris Agreement or the Kunming-Montreal Protocol, it is accepted as a key enabler for the achievement of the targets set by the UN Convention on Climate Change and the UN Convention on Biological Diversity.

National

Recent renewed focus on resources in the UK has led to the introduction and development of a number of strategies and legal instruments aimed at enhancing circularity, including:

- Launched in 2016, the Scottish Government's Making Things Last: a circular economy strategy for Scotland[33] has since been followed by the 2024 Circular Economy (Scotland) Act[34] and Scotland's circular economy and waste route map to 2030[35], which sets out key actions to 'maximise progress towards a circular economy'. These will be followed by a refreshed circular economy strategy for Scotland;
- Launched in 2021, Beyond recycling – a strategy to make the circular economy in Wales a reality[36] with a focus on innovation and infrastructure;
- Part of the 25 Year Environment Plan[37], the Resources and Waste Strategy for England[38] was launched in 2018 and has since been followed up by the creation of a Circular Economy Taskforce[39] charged with supporting the government in creating a circular economy strategy for England; and
- In 2023, the Department for the Economy launched a public consultation on the draft Circular Economy Strategy for Northern Ireland[40].

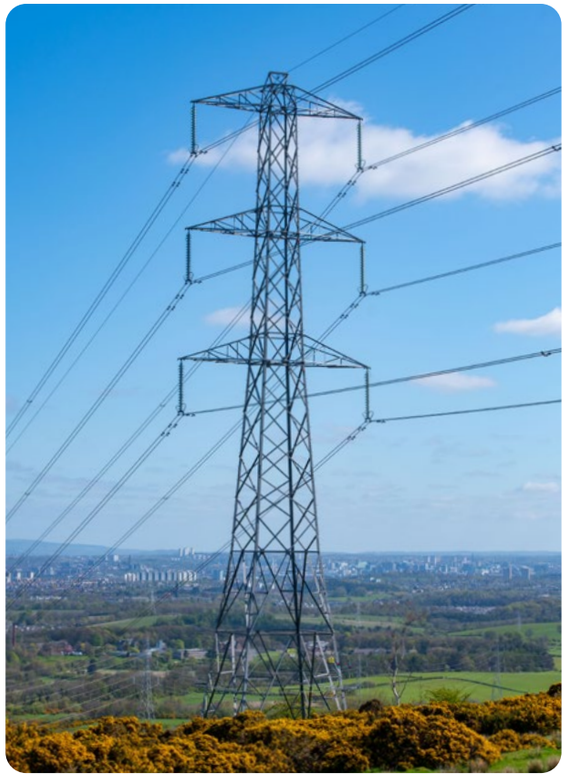
These policies and strategies align around themes of improving recycling, upscaling prevention and reuse and innovation in resource use.

Reporting & financial disclosure

Alongside the global frameworks above, new enhanced reporting requirements for businesses including the EU Corporate Sustainability Reporting Directive now require companies to disclose and manage risks, impacts, opportunities and actions related to resource use and the circular economy more transparently than ever before. These requirements are further cemented by the requirements of the Task Force for Nature-related Financial Disclosures (TNFD) and the Taskforce for Climate-related Financial Disclosures (TCFD), which both strongly encourage consideration of value chain impacts.

Business risk and resilience

Supply chain shocks and price rises have the potential to translate into financial risks. It's now not a matter of if – but when – resource, climate and nature related risks and dependencies will negatively affect organisations who are unprepared. Now is the time for businesses and policy makers to account for their resource use and value chain impacts to reduce risk and enhance resilience.



[29] Goal 12 | Department of Economic and Social Affairs
[30] Planetary boundaries - Stockholm Resilience Centre
[31] Circular Transition Indicators (CTI) | WBCSD
[32] Global Circularity Protocol (GCP) | WBCSD
[33] Making Things Last: a circular economy strategy for Scotland - gov.scot
[34] Circular Economy (Scotland) Act 2024
[35] Scotland's circular economy and waste route map to 2030 - gov.scot
[36] Beyond recycling | GOV.WALES
[37] 25 Year Environment Plan - GOV.UK
[38] Resources and waste strategy for England - GOV.UK
[39] Circular Economy Taskforce - GOV.UK
[40] Circular Economy Strategy for Northern Ireland | Department for the Economy

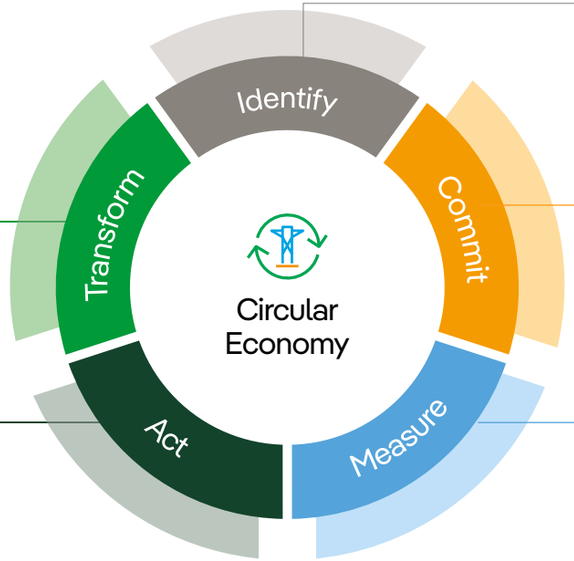
Our commitments for circularity

It is clear that while we invest to tackle climate change, we must take account of the full lifecycle impacts of our actions, minimising the use of virgin materials and maximising the reuse of existing materials.

Moving to a more circular economy has the capacity to provide us with the resources we require, when and where they are required, whilst also enhancing the security of supply. This section outlines the strategic approach, vision and targets for efficient resource use we have developed to respond to the drivers above.

Strategic approach

We have used the following strategic approach to shape our vision and targets, guide the delivery of our actions and drive continual improvement. This strategic approach builds on the Measure, Act, Transform model used by Iberdrola, expanded to include Identify and Commit phases.



Identify / Locate
Identify the resource impacts of our activities

Commit
Commit to ambitious, time-bound, achievable goals and set out action plan

Measure / Value
Use approved metrics and methodologies to measure impacts and value circularity

Act
Apply Circularity Hierarchy across all phases of the project lifecycle

Transform
Embed circularity in our business processes and value chain

Vision

Development of our vision started by identifying the impacts of our actions upon resource use and the related opportunities.

Aligned with the Iberdrola global Circular Economy Plan, ScottishPower's Action 2030 sustainable development strategy sets a 2030 vision where:

ScottishPower has minimised resource use and waste and established circular processes that keep materials in use at high value for the long term.

Targets

To support the achievement of this ambitious vision, we have committed to the following headline targets:

100% wind turbine blade recycling by 2030*

100% solar panel recycling by 2030

Zero waste to landfill by 2030

Specify 50% sustainable steel used by 2030 and 100% net zero steel by 2050

The actions laid out in this plan support the delivery of these targets, but will also enable us to improve our understanding of our resource use and existing level of circularity. This improved understanding may allow us to set more specific targets to maximise circularity in future.

* This target is subject to the existence of a commercially feasible solution

Delivering a positive impact

Our circularity approach
In the Measure and Act phases, the circularity hierarchy guides the prioritisation of our actions for resources through the lifecycle of our sites and assets.

Refuse – we take action to avoid the need for resource use in the first place by exploring other options e.g. network flexibility.

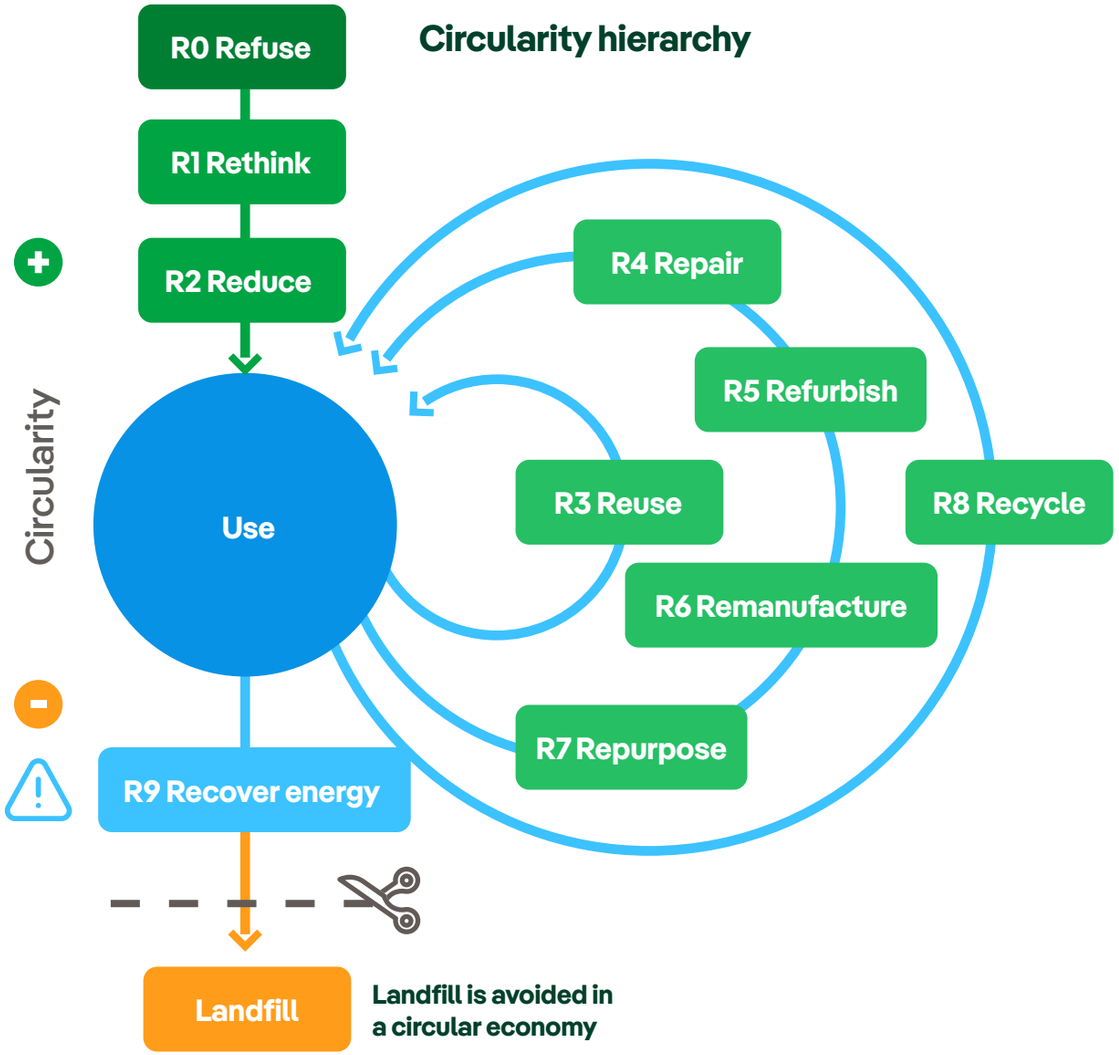
Rethink/reduce – where it is not possible to avoid impacts, we minimise them e.g. by minimising the footprint of a project, through strategic investment to avoid future upgrades and by reducing the use of virgin materials.

Use – we use materials and products efficiently, managing and maintaining them to extend their useful lives.

Recirculate – we reuse, repair, refurbish, remanufacture, repurpose and recycle materials and products to keep them in valuable use for as long as possible.

Recover energy – only when materials reach the end of their useful life with us and cannot be recycled, they may be sent for energy recovery.

Landfill – landfill is avoided in a circular economy and is therefore only used where required for compliance purposes, or where no other better options exist.



Source: PBL Netherlands Environmental Assessment Agency

Delivering through the lifecycle

We apply the circularity hierarchy through the full project lifecycle, from concept to decommissioning and renewal. The potential influence of each level of the hierarchy varies through each stage of the lifecycle. The diagram below shows which levels are in play and their relative levels of influence at each stage.

Concept and design

- Initial plan or intention for a project or initiative
- Creating a plan to achieve the required project / initiative outputs

Refuse / Rethink / Reduce

- Seek alternative option to avoid the need for the project where feasible e.g. through whole systems solutions or flexibility/real time ratings.
- Design to minimise required resource use and maximise circular content.
- Design for circular inputs, longevity, reusability and recyclability where economically feasible.

Project development, planning & land

- Creating a detailed execution plan for a project or initiative
- Applying for relevant consents, land/seabed purchase or lease

Rethink / Reduce

- Minimise land use change.
- Optimise project footprint and resource requirements.
- Engage with supply chain to identify opportunities for circularity and repair, reusability and recyclability of products and resource inputs.
- Plan to maximise circularity through project operation, maintenance and decommissioning.

Construction, delivery, project & contract management

- Managing initiative from start to finish.
- Tracking deliverables and deadlines laid out in contracts.

Use

- Engage with contractors to minimise resource use and waste during construction and ensure accurate project data.
- Track and report resource inputs and outputs where data is available.
- Collect and communicate learnings to influence future projects.
- Manage materials and waste in line with the Circularity Hierarchy.

Operation, performance tracking and reporting

- Operating, maintaining and monitoring the site and assets
- Tracking and reporting performance of the project and partners

Use / Recirculate

- Track the materials embedded in assets where data exists.
- Operate, monitor and maintain assets efficiently to maximise lifespan.
- Maintain strong risk management, testing and certification regimes to enable efficient use of secondary products.
- Manage materials and waste in line with the Circularity Hierarchy.

Decommissioning and renewal

- Deconstructing and removing assets
- Restoring the site or looping back to the start of the lifecycle to renew assets

All

- Implement waste management plans to minimse resource impacts.
- Prioritise reuse and recirculation of materials.
- Where recirculation is not possible, ensure recycling keeps materials at as high a value as possible.
- Send materials to energy recovery or landfill only where required for compliance or where no better option is available.
- Restart the project lifecycle for asset renewal or repowering.

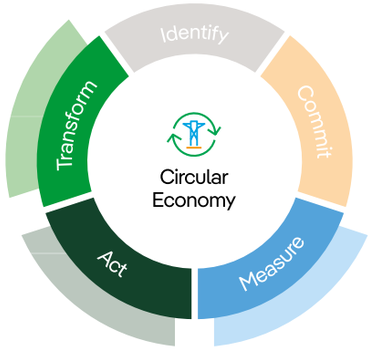
Key:

- R0 Refuse
- R1-2 Rethink / Reduce
- Use
- R4-8 Recirculate
- R9 Recover energy
- Landfill

Main hierarchy phase

High potential | Medium potential | Low potential

Measuring our performance



Accurate data and meaningful performance measurement are essential if we are to be able to credibly deliver on our targets for circularity. While we have extensive and accurate data relating to our waste streams, we must improve the maturity of our data relating to resource inputs and the productivity of the materials we use to track and improve our performance.

Circular Transition Indicators

It is our ambition to fully align with the Circular Transition Indicators (CTI), which are widely accepted as the leading global indicators relating to the circular economy, influencing both the CSRD indicator requirements and the development of the forthcoming Global Circularity Protocol. They provide a set of indicators that companies can use to assess their progress towards circularity and understand the impact of their actions.

The four CTI indicator modules:

Close the loop
- % material circularity
- % water circularity
- % renewable energy

Optimise the loop
- % critical material
- % recovery type
- Actual lifetime
- Onsite water circulation

Value the loop
- Circular material productivity
- CTI revenue

Impact of the loop
- GHG impact
- Nature impact

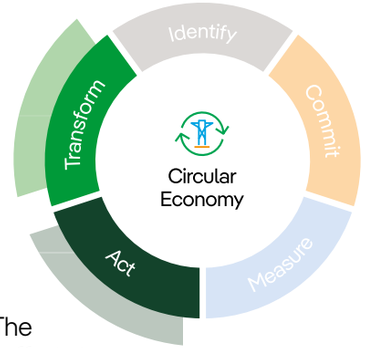
Strategic and enabling actions

The following table outlines our current status and planned actions in relation to the indicators.

Module	Indicator	Current status	Planned action
Close the loop	% material circularity (weighted average of circular inflow and outflow)	Data on circularity of resource outputs is mature, circularity of resource inputs is not yet fully known	**Implement processes for tracking resource inflow circularity for key materials and key assets by 2028**
	% water circularity (weighted average of circular inflow and outflow)	Water is not currently a material resource use for ScottishPower	**Reassess water circularity in light of new green hydrogen projects**
	% renewable energy	100% renewable energy purchased for own GB based operations.	**Continue to seek renewable energy outcomes for sites based in Northern Ireland and Republic of Ireland.**
		Science-based targets set for the gas and electricity we sell to customers.	
Optimise the loop	% critical materials (as a % of total inflow)	Data on critical material inflows is not yet mature	**Continue to research critical material inputs and implement supply chain requirements to identify critical materials**
	% recovery type (% of each recovery end destination for resource outflows)	Data on circularity of resource outputs is mature, with end destinations for recovery identified.	
	Actual lifetime (difference between average expected and actual lifetime)	Robust asset management and life extension programmes in place	**Complete an assessment of actual lifetimes versus average expected lifetimes for key assets or components by 2029.**
	Onsite water circulation (facility reuse and recycle)	Water is not currently a material resource use for ScottishPower	**As above, reassess water circularity in light of new green hydrogen projects.**
Value the loop	Circular material productivity (revenue/ total mass of linear inflow)	This has not yet been assessed	**Consider the merits of this indicator for key materials and assets once inflow data is available.**
	CTI revenue (revenue adjusted for % material circularity)	This has not yet been assessed	**Consider the merits of this indicator for key materials and assets once inflow data is available.**
Impact of the loop	GHG impact (emissions savings which can be made through greater circularity)	Greenhouse gas impact is currently estimated using expenditure and environmentally extended input-output factors, and we are working to further refine GHG impact as actual data relating to key materials inflows matures.	
	Nature impact (land use impacts related to extraction or cultivation of material inflows)	Nature risks and opportunities have been assessed for our own assets, but not yet for the extraction or cultivation of material inflows.	**Carry out an initial study of climate and nature risks and impacts related to key supply chain resources by 2027**

Resource dependencies, risks and opportunities

All businesses depend upon natural resources, whether in their own operations or in their value chain.



We are working to better understand and manage our resource dependencies, risks and opportunities to increase our long-term resilience to physical, transition and systemic risks. The following actions will help continue our efforts to better understand our dependencies and reduce the risks connected to resource use:

Action: We will undertake a mapping exercise to better understand resource dependencies and risks associated with the clean energy transition by 2027.

Action: We will carry out an initial study of climate and nature risks related to key supply chain resources by 2027.

Action: We will engage with suppliers, standards bodies and other interested parties to increase confidence in the implementation of circular solutions and ensure that they meet relevant industry and company standards.

Enhanced circularity can also bring a number of significant opportunities:

- Waste reduction and maximised value of materials at end of first life
- Process, materials and cost efficiency – doing more with less
- Reduced dependency on raw materials
- Greenhouse gas emissions reduction
- Enhanced reputation
- Enhanced innovation and stimulation of new markets
- Stronger relationships with suppliers and contractors
- Greater knowledge of our assets

We will work to provide clarity on our position and procedures and ensure that our staff and supply chain have the relevant skills to continue to maximise the opportunities brought through greater circularity.

Action: We will release a supply chain position statement on circularity, outlining our priorities and expectations, by 2028.

Action: We will upskill our staff and supply chain on resource use and circularity.

Action: We will advocate for ambitious and supportive policy to drive circularity in the clean energy transition.

Engagement with interested parties

Our targets, this action plan and its delivery are informed by ongoing internal and external engagement via:

- The ScottishPower Circular Economy Working Group
- Regular engagement with Zero Waste Scotland
- The UN Global Compact UK Circular Economy Working Group
- SteelZero UK
- The Scottish Low Carbon Concrete Collective
- Collaboration with industry peers
- Collaboration with our supply chain

Our actions for circularity

The following table summarises all the actions above and our circularity initiatives, indicating business coverage and timelines.

Actions	Renewables	Networks	Customer Business	Corporate	2020-2025	2025-2030	2030-2035	2035 onwards
Advocacy, engagement & partnership								
Advocate for ambitious and supportive legislation, regulation and external policy for circularity	X	X	X	X				
Engage in technology-specific collaborations on resource use and circularity (e.g. wind industry circularity, infrastructure circularity)	X	X						
Engage in material-specific collaborations on resource use and circularity (e.g. aggregates, lower carbon concrete and steel)	X	X		X				
Design								
Further embed resource use minimisation and circularity into design processes and specifications	X	X						
Design to maximise reuse of foundation structures		X						
Design to minimise surplus materials		X						
Specification & procurement								
Embed circularity into minimum requirements and specifications for suppliers	X	X	X	X				
Continue to research critical material inputs and implement supply chain requirements to identify critical materials	X	X						
Update relevant internal procedural and project documents to further embed resource use and circularity requirements	X	X	X	X				
Operations, asset management & monitoring								
Continue to enhance and broaden monitoring for asset life extension	X	X						
Complete an assessment of actual lifetimes versus average expected lifetimes for key assets or components by 2029		X		X				
Continue to maximise opportunities for repair and life extension of assets	X	X						
Explore solutions to further enable the reuse of pole-mounted transformers		X						
Explore circular inputs for fleet, storage, generators and plant		X						
Further implement testing and recertification for reuse		X						

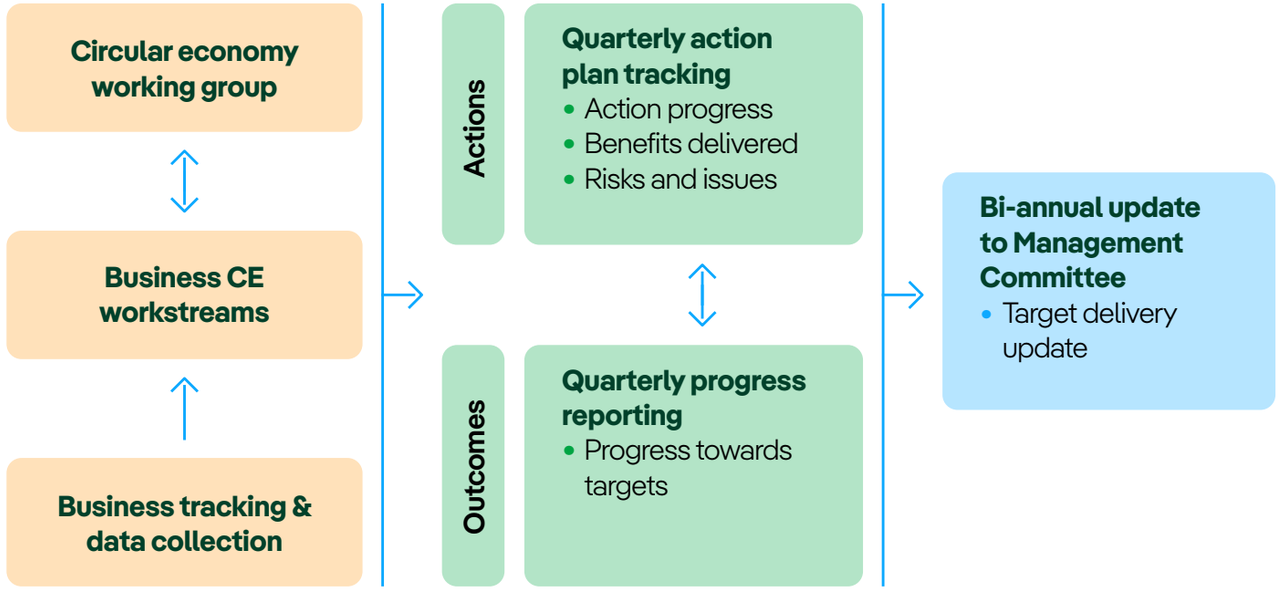
Actions	Renewables	Networks	Customer Business	Corporate	2020-2025	2025-2030	2030-2035	2030-2040
Assessment, tracking & reporting								
Implement processes for tracking resource inflow circularity for key materials and assets by 2028	X	X	X	X				
Further develop and embed the use of product material and carbon calculators and asset lifecycle assessments	X	X						
Consider the merits of circular material productivity and circular revenue tracking once material inflow data is available				X				
Decommissioning								
Continue to promote turbine blade end of life management in line with SP targets	X			X				
Maximise the reuse of retired offshore wind turbine generator batteries	X							
Continue to promote solar panel end of life management in line with SP targets	X			X				
Continue ongoing review of decommissioning approaches and procedures to promote circularity	X	X						
Explore and maximise enhanced material separation, recycling and recovery from cables and switchgear		X						
Secondary markets								
Explore and maximise the use of and contribution to secondary markets								
Materials								
Work with supply chain to promote critical raw material recovery	X	X						
Continue to deliver actions to enable customer energy efficiency			X					
Maximise the reuse and redistribution of aggregates		X						
Continue to recover and reuse waste oil		X						
Work with supply chain to explore and maximise recycled and reused steel in assets and maximise reuse and recycling opportunities.	X	X		X				
Work with supply chain to explore the use of recycled or lower impact materials in concrete and maximise concrete recycling & reuse	X	X		X				
Reassess water circularity in light of new green hydrogen projects			X	X				
Explore options for assessing the nature impact of key materials by 2027	X	X	X	X				
Continue to seek renewable energy outcomes for sites based in Northern Ireland and Republic of Ireland.	X							
Minimise the use of plastics and maximise their reuse and recycling	X	X						

Actions	Renewables	Networks	Customer Business	Corporate	2020-2025	2025-2030	2030-2035	2030-2040
Innovation & skills								
Standardisation and 3D printing of parts		X						
Explore the use of 3D printed concrete		X						
Upskill our staff and supply chain on resource use and circularity	X	X	X	X				
Dependencies, risks & opportunities								
Undertake a mapping exercise to better understand and manage our resource dependencies associated with the clean energy transition by 2027.	X	X	X	X				
Carry out an initial study of climate and nature risks and impacts related to key supply chain resources by 2027	X	X	X	X				
Engage with suppliers, standards bodies and other interested parties to increase confidence in the implementation of circular solutions and ensure that they meet relevant industry and company standards.	X	X	X	X				
Release a supply chain position statement on circularity, outlining our priorities and expectations, by 2028.	X	X	X	X				

Governance

The development, delivery and disclosure of this plan and its related initiatives is subject to strict governance:

- Our Circular Economy Working Group meets regularly to discuss progress, share best practice and deliver cross-business activities for circularity.
- Our Sustainable Development Committee receives regular target delivery updates.
- Our CEO receives a quarterly report tracking target delivery and, by exception, high materiality implementation actions, risks and issues.
- Our Management Committee receives a bi-annual update on circular economy target delivery.



Reporting

We will comply with all relevant circularity and resource reporting requirements and aim to align with global best practice. Our circularity-related activities will be reported annually in the ScottishPower Strategic Report and in the relevant Iberdrola annual reports. We will further develop our reporting as appropriate in line with circular economy reporting requirements as they evolve.

Key words

Word	Description
Access road	Often temporary roads built to provide access to network or generation assets during construction, maintenance or upgrade.
Assets	Generally used to refer to electrical installations or equipment, such as substations or wind turbines.
Battery storage	Devices that store energy from renewables for later use.
Bearing	Components which allow for smooth rotation, for example in wind turbines.
Blades	Components in a wind turbine designed to capture wind energy and convert it into rotational energy.
Cable joint	Where two or more electrical cables are connected together to create a continuous electrical pathway.
Cable trough	Durable systems which protect cables from damage and protect people from contact with the cables.
Circular economy	A sustainable system designed to eliminate waste and keep resources in use, creating economic, environmental, and social benefits.
Conductor	A cable, wire or other object that is able to carry electricity.
Critical minerals	Minerals essential for our economy, national security or essential technologies.
Deforestation	Purposeful clearing of large areas of forest
Doughnut economics	Theoretical framework proposing change to the current economic model to ensure that all people have access to the resources they need, whilst ensuring that consumption stays within the earth's regenerative capacity.
Encapsulation	A protective barrier, often made from resins or plastics.
Energy recovery	Generating heat or other energy from non-recyclable waste.
Environmentally extended input-output factors	A method of accounting that extends traditional input-output models to also take account of environmental data.
Erosion	The process by which soil, stone or other materials are gradually worn away by wind, water or friction.

Word	Description
Flexibility services	Changing where or when electricity is consumed or generated in order to use network and generation assets efficiently and avoid further reinforcement.
Gigawatt (GW)	A unit of power equal to one billion watts or one thousand megawatts.
Habitat loss	The loss of natural environments where plants and animals live.
Inflow	The movement of materials or resources into a place or organisation
Insulator	A substance or covering which inhibits electricity, heat or sound from travelling through it.
Kunming-Montreal Framework	A global biodiversity framework committing to halt and reverse nature loss by 2030.
Lay down area	A location on a construction site where materials or equipment are stored when not in use.
Lifecycle	The stages that an asset will go through, from concept and design to construction, to operation and maintenance to decommissioning.
Linear economy	An economy in which resources are extracted, processed, used then discarded, rather than being reused or recycled.
Nacelle	The streamlined casing around the generator and shaft of a wind turbine.
Natural resource depletion	The exhaustion of natural resources when consumption exceeds the earth's regenerative capacity.
Nose cones	The cone-shaped nose which rotates with the wind turbine blades.
Outflow	The movement of materials or resources out of a place or organisation
Overhead line	System of wires or cables and towers or poles used to transmit electrical power above ground.
Paris Agreement	Adopted in 2015, an international treaty committing to limit global warming to well below 2 degrees celsius above pre-industrial levels, with efforts to limit it to 1.5 degrees.
Planetary boundaries	Scientific thresholds within which human activity must stay to avoid potentially irreversible environmental change.
Poles	Wood poles used for overhead power lines

Key words

Word	Description
Remanufacture	Restoring used products to 'new' condition by renovating or reconditioning its components.
Repower	Replacing older generation assets with ones that provide greater capacity or efficiency, resulting in increased power generation.
Repurpose	Using materials, components or products for a different purpose.
Rotor hub	The connection between rotor blades and the rotating shaft within a wind turbine.
Scottish Low Carbon Concrete Collective	A collective of Scottish businesses working to support the development, adoption and scaling of low carbon concrete use in Scotland.
Sedimentation	Settling of particles which have been transported by water, wind, ice or gravity.
Soil compaction	When soil particles are pushed together, resulting in a loss of water infiltration and drainage.
SteelZero	'SteelZero is a global corporate initiative led by Climate Group bringing together leading organisations to speed up the transition to a net zero steel industry. Organisations that join SteelZero make a commitment to buy and use 100% net zero steel by 2050, latest.'
Supply chain	The network of organisations and individuals that optimise the flow of goods, information and money from raw materials to the delivery of final products to consumers.
Switchgear	Equipment used on electricity networks to isolate or control the flow of electricity.
Tower	Also known as pylons, these are tall structures which carry overhead lines.
Transformer	Equipment used to transfer electricity from one circuit to another whilst increasing or decreasing voltage.
Turbine tower	The tall structure which holds a wind turbine nacelle and rotor.

Word	Description
UN Convention on Biological Diversity	'The Convention on Biological Diversity (CBD) is the international legal instrument for "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources" that has been ratified by 196 nations.'
UN Convention on Climate Change	'The ultimate objective of the Convention is to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system." It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."'
UN Global Compact UK	'The UN Global Compact Network UK is an independent not-for-profit organisation. Our aims are to promote charitable sustainable development, relieve poverty, preserve and protect the environment, and promote ethical standards and conduct within businesses and the private sector in the UK.'
UN Sustainable Development Goals	'The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.'
Virgin materials	Raw materials, which haven't previously been used.
Water/marine pollution	When harmful substances including chemicals or microorganisms contaminate bodies of water.
Zero Waste Scotland	'Scotland's circular economy public body, working with government, business, and communities to rewire the economy from our current "take, make, waste" model to one where we make the most of the materials we have.'

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Contact

We hope you have found this plan informative and useful.

For more information or engagement, please contact sustainability@scottishpower.com

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