WELCOME

SSEN FUTURE NETWORKS
GROUNDS FOR CHANGE AND CREOS-OUT WEBINAR

Wednesday, 24 June 2026

Scottish & Southern Electricity Networks

HOUSEKEEPING

- Please ask questions throughout the session using the Q&A function
- Today's session will be recorded and will be made available after the event, along with the slides. Q&A sessions will not be published.

AGENDA

Scottish & Southern Electricity Networks

SSEN DISTRIBUTION

WHO WE ARE

We're Scottish and Southern Electricity Networks (SSEN) Distribution. We're the Distribution Network Operator (DNO) responsible for delivering power to almost 4 million homes and businesses across central southern England and the north of Scotland.

We serve some of the UK's most remote communities - and some of the most densely populated. Our two networks cover the greatest land mass of any UK DNO, covering 72 local authority areas and 75,000km² of extremely diverse terrain.

We're also at the forefront of delivering the decarbonised electricity system of the future, connecting new low-carbon technologies to the network. Through this, we're helping support sustainable economic growth for decades to come.

SSEN DISTRIBUTION NETWORK AT A GLANCE

Nearly **4 million** homes and businesses

Over **128,000km** of overhead lines and underground cables

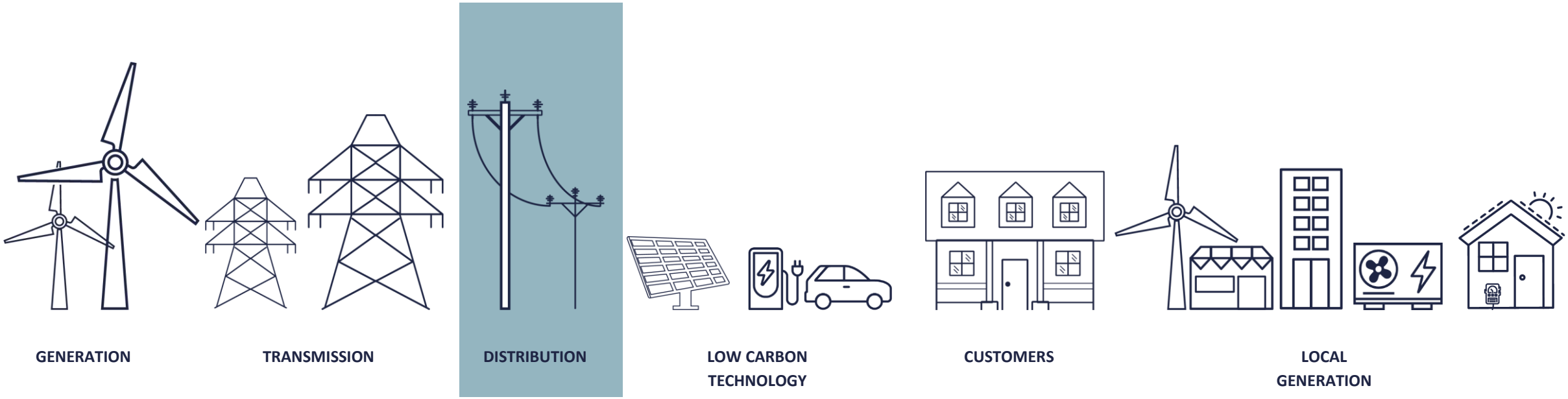
Over **460km** of subsea cables powering our island communities

Over **4,400** employees across the country

OUR ROLE IN THE ENERGY SYSTEM

As a Distribution Network Operator, our role in the energy system is to carry electricity from the high voltage transmission grid to industrial, commercial and domestic users via a network of cables and poles.

We provide this service for every home and business in the north of Scotland and central southern England regardless of who you pay your energy bills to.



We are regulated by Ofgem, the energy regulator, through a 5-year price control cycle. Our latest business plan, for RIIO-ED2, runs until March 2028, and we are currently developing our business plan for the 5-year ED3 period which runs from April 28 until March 33.

GROUNDS FOR CHANGE

Gemma Ennis, SSEN Distribution
Eliot Smith, Energy Innovation Centre

Scottish & Southern Electricity Networks

WHAT IS GROUNDS FOR CHANGE

- Upgrading electricity cables often requires digging trenches, which can be slow, disruptive, and messy.
- With more electric vehicles and heat pumps, these works will increase significantly.
- Grounds for Change is exploring faster, cleaner ways to install and replace electricity cables

WHY DOES IT MATTER?

- Less disruption to homes, roads, and communities
- Faster and more efficient upgrades
- Lower costs and environmental impact
- Supports wider UK decarbonisation.

WHAT DID DISCOVERY FIND?

No single solution works on its own — a “toolbox” of methods is needed

ELECTRIC-POWERED INNOVATION LTD

Innovator 1: Electric narrow-slot cable installation

What it does

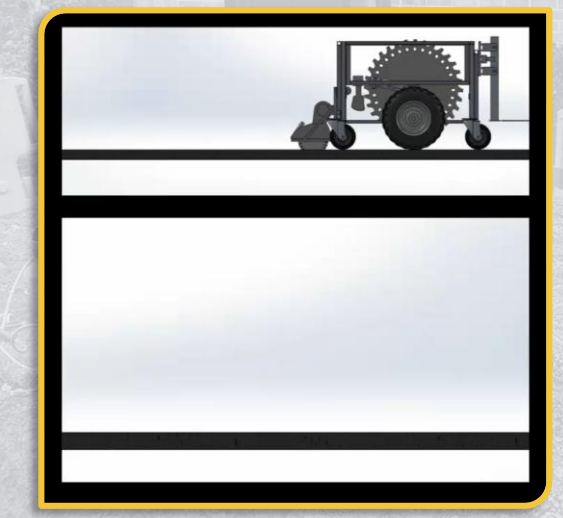
Cuts a narrow guided slot using twin diamond saws, then follows that route to create a deeper LV service path.

Where it fits

Short LV service routes through asphalt, concrete or resin where full open trenching would be disproportionate.

Alpha focus

Test whether it can reduce trench width, spoil, reinstatement and disruption while keeping the route visible and controlled.



SOILDRI

Innovator 2: Towable soil processing and reuse

What it does

Uses a road-towable mixing machine and SoilDri SEM/SB compound to condition excavated spoil on site.

Where it fits

Open-cut works where soil would normally be removed from site and replaced with imported backfill.

Alpha focus

Evidence whether it can reduce lorry movements, disposal, imported material and improve reinstatement consistency.

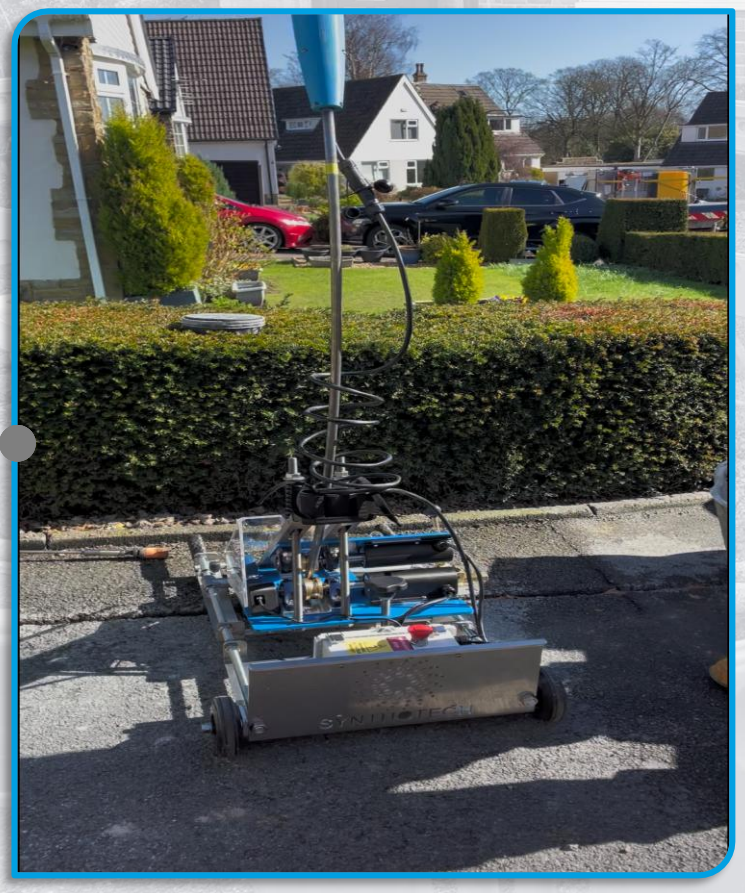
SYNTHOTECH

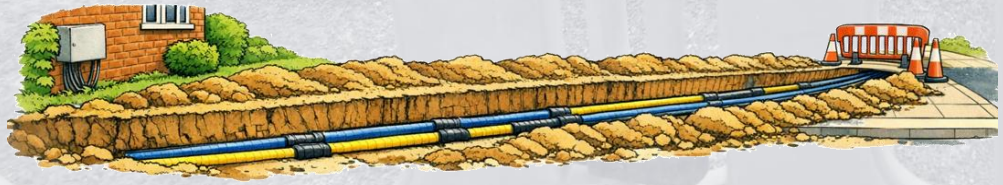
Innovator 3: Compact trenchless and route-reuse

What it does
Uses compact launcher units, battery-powered lateral drilling and route-reuse cable extraction for short service runs.

Where it fits
Gardens, driveways and street-to-property routes where preserving the surface and reducing reinstatement matters.

Alpha focus
Validate electricity-specific requirements including cable handling, route certainty, safety and operational practicality.





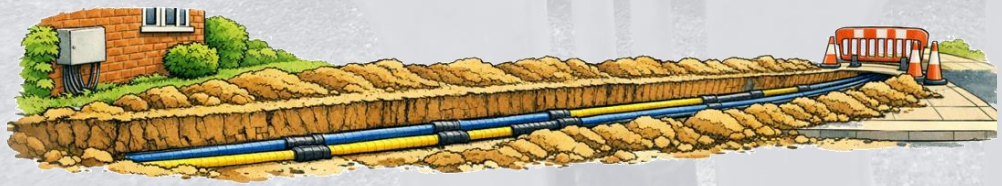
THE ATTACHMENT COMPANY

Innovator 4: Simex wheel saws, screening buckets and compact HDD

What it does
Combines excavator attachments: Simex wheel saws for narrow trenches, VSE screening buckets for reuse and Nandrill compact HDD for crossings.

Where it fits
Mixed LV work sites where crews may need trenching, short trenchless crossings and on-site material processing.

Alpha focus
Test whether one flexible contractor toolkit can reduce dig width, spoil movement and reinstatement burden.



NEO AIR

Innovator 5: AirLance lower-impact excavation

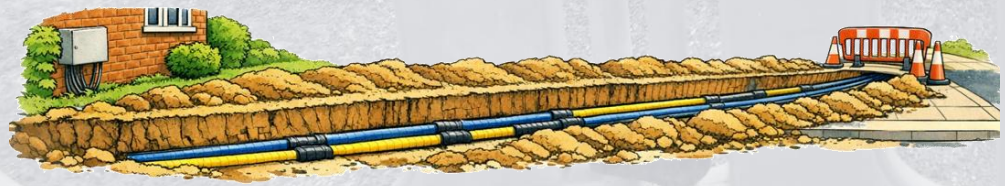
What it does
AirLance uses controlled air-powered excavation to loosen and remove material with less mechanical digging.

Where it fits
Sensitive or congested LV routes where manual digging is slow, disruptive or difficult to control around buried services.

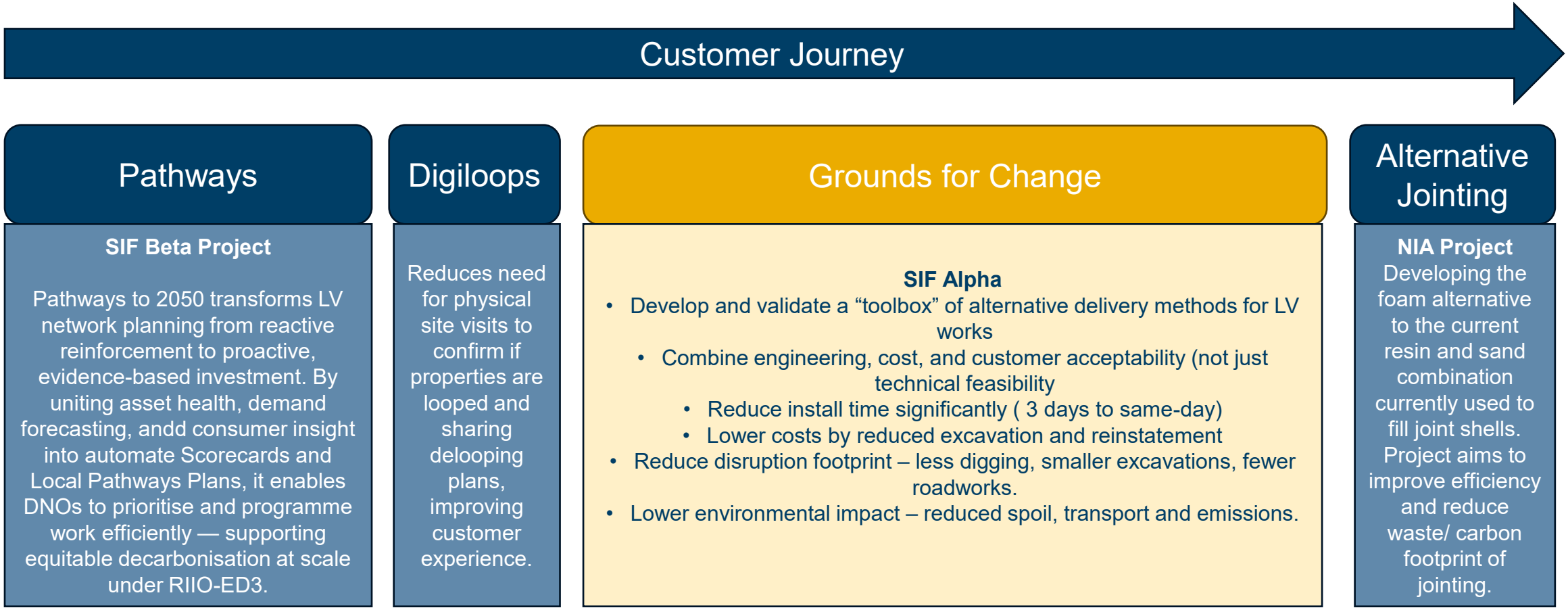
Alpha focus
Evaluate productivity, safety, excavation quality and how AirLance integrates into the wider toolbox.

neoair systems

neoair
air power, unplugged
www.neoairltd.com



SSEN PROJECT DEVELOPMENT



Scottish & Southern Electricity Networks

working with

ENERGY INNOVATION CENTRE

ELECTRIC POWERED INNOVATION LTD

SOILDRI® Sustainable Soil Technology

SYNTHOTECH

THE ATTACHMENT COMPANY

neoair systems

THANK YOU

Q&A

CREOS-OUT

Nyi-Lin Htet, SSEN Distribution

Scottish & Southern Electricity Networks

WHAT IS CREOS-OUT

Why We Use Creosote-Treated Poles

- Extends pole lifespan to ~45–60 years, reducing replacement frequency
- Protects wood from decay, fungi, insects and moisture
- Proven performance in harsh weather and ground conditions
- Cost-effective compared to steel, concrete and composite poles
- Lightweight and easy to transport, install and maintain
- Well-established, industry-standard solution across UK networks

Current Alternatives?

- Steel or composite poles avoid creosote treatment but have higher costs, carbon-intensive production, and increased transport costs due to heavier weight
- Copper-treated wooden poles can reduce environmental impact and improve handling, but have shorter service life, increased susceptibility to mechanical damage, and potentially higher upfront costs.

WHAT IS CREOS-OUT

Current challenges with creosote-treated wood

Creosote PAHs leaching

- PAHs pollution in soil, water, and air

Redundant pole storage

- Stringent storage conditions to prevent PAHs pollution
- Not safe for human use and handling

Incineration

- Costly
- Requires specialised, licensed facilities

CREOS-OUT

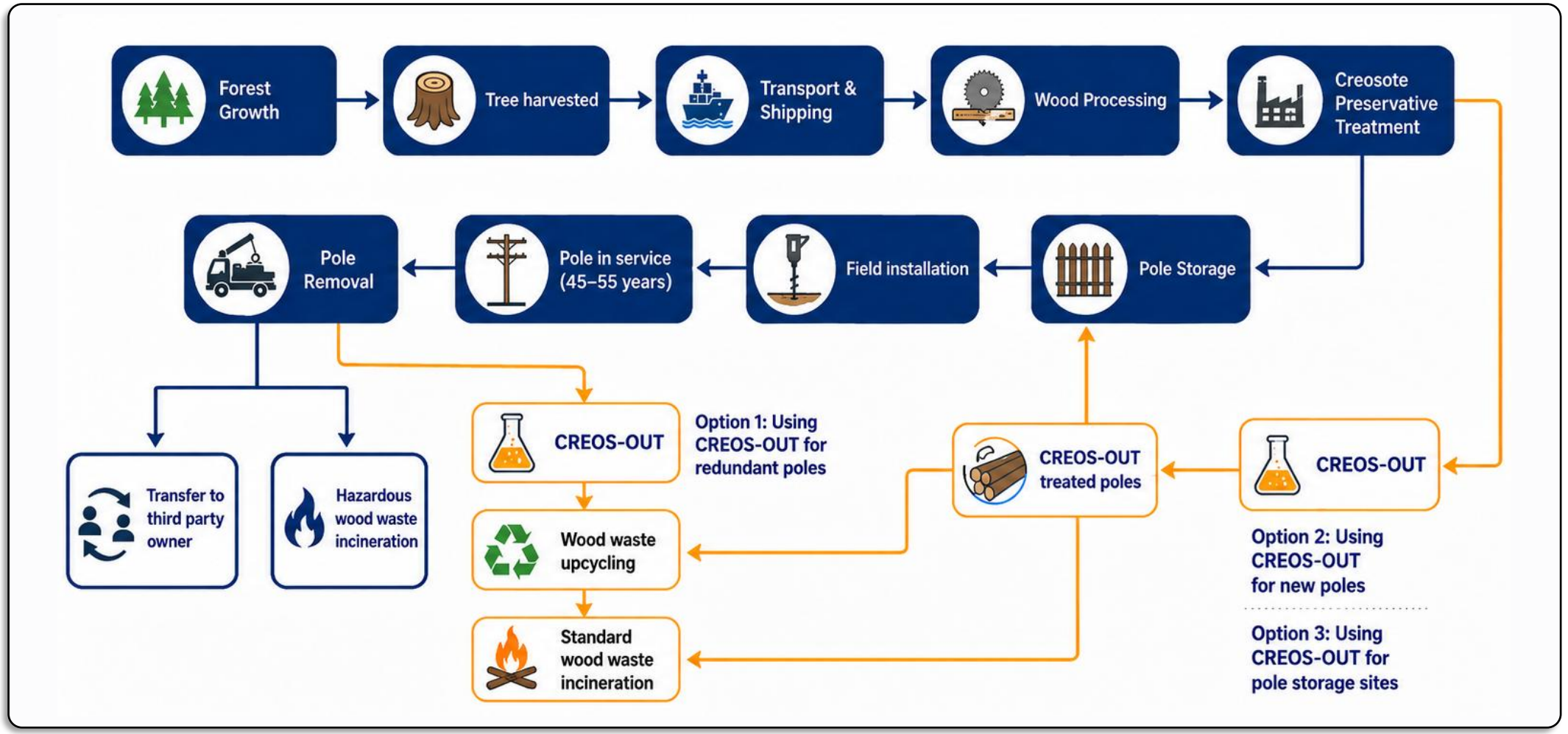
CREOS-OUT

Breaks down creosote contamination using natural enzymes derived from Microorganims.

Benefits of CREOS-OUT

- **Safer environment**
- **Promote grid expansion**
- **Safer and easier storage**
- **Improved consumer safety**
- **Recovery or upcycle**
- **Less costly compared to other treatment**

LIFE CYCLE OF WOODEN UTILITY POLES



DISCOVERY FINDINGS (TECHNICAL DEVELOPMENT)

From literature review to purified enzyme samples for Alpha-phase testing

What technical development has achieved so far

1. Literature review identified PAH-degrading microorganisms, remediation and degradation pathways and relevant to creosote-derived PAHs.

2. 52 recombinant enzyme targets were generated and screened in E. coli expression systems.

3. 28/52 candidates were recovered in the soluble fraction; 24 remained insoluble, including five tested in ArcticExpress.

4. The soluble panel includes early PAH-oxidation and downstream aromatic-pathway enzymes, including PcCYP_17a and NahB–NahF.

Pathway coverage achieved

PcCYP_17a → NahB → NahC → NahD → NahE → NahF

Six enzymes covering the naphthalene upper degradation pathway (P13–P18).

Purification outcomes and relevance

- Five of the six prioritised enzymes were successfully purified; nahE requires further optimisation.
- Purified proteins were prepared as neat and glycerol stocks, ready for Alpha-phase work and stored at –80 °C.
- Initial purification established a workable protein-production and purification pipeline and identified clear opportunities to improve yield.
- These results establish a practical enzyme toolkit and workflow for the next stage of functional testing.

Why this matters for CREOS-OUT

Discovery has converted literature-derived PAH-degrading candidates into purified enzyme samples, providing the technical basis for Alpha-phase functional testing and future formulation work.

REGULATORY LANDSCAPE REVIEW

Creosote Regulatory Status GB

- Category 1B Carcinogen
- Product Type-8 Wood Preservative

Approved to 2033

- *Railway Sleepers*
- *Transmission Poles*
- *Fencing*

- The Creosote (Prohibition on Use and Marketing) Regulations 2003
- GB BPR
- UK REACH

Waste Reclassification

- Creosote treated-wood classified as ‘hazardous’ in the UK
- Treated wood must be sent to specialist incineration facilities

- WM3 provides the legal framework for deciding hazardous classification
- Non-Hazardous classification possible if appropriate testing, POP limits and sampling strategy are met

Detergents Regulation

Detergents in the UK are regulated by The Detergents Regulation (Regulation (EC) No 648/2004 of the European Parliament and of the Council

The scope is to create ‘technical standards and requirements, that allow free movement in the UK

- ‘Ultimate bio-degradability testing
- Labelling Requirements

Contaminated Land and Soil/Water Protection Considerations

Land contamination is regulated under Part 2A of the Environmental Protection Act 1990

- Bio-detergents may support remediation or risk management of soils at pole storage or treatment areas.

- In a land context, the risk isn’t creosote as a single parameter, but the environmental or human risks it poses
- In Scotland, SEPA treats land contamination as a source–pathway–receptor problem

Key Implications for CREOS-OUT :

Regulation | Hazardous waste treatment | Innovation opportunities | Bioremediation

CREOS-OUT: ALPHA DEVELOPMENT PLANS

From Discovery evidence to Alpha validation and Beta readiness

To validate the CREOS-OUT bio-detergent for use on creosote-contaminated poles and soils, including its formulation, treatment conditions, safety, regulatory evidence and pathway to deployment.

Core objectives

1 — Technical development

Confirm protein candidates; develop enzyme–surfactant–stabiliser formulations; refine production conditions.

2 — Controlled performance testing

Assess PAH degradation in water, soil and wood under laboratory conditions.

3 — Evaluation procedures

Measure residual PAHs, transformation products, treatment conditions and application methods.

4 — Operational and regulatory readiness

Define waste reclassification evidence needs,
handling requirements and acceptance criteria.

Expected Alpha outputs

- **Prototype formulation and protein samples ready for testing**
- **Laboratory test procedures and outcomes report**
- **Post-treatment analytics and refined protein recommendations**
- **BAU transition, steering group direction and route-to-market plan**

End-of-Alpha decision point

Evidence package to determine whether CREOS-OUT is ready for Beta field demonstration, scale-up planning and future deployment.

- **Steering group review**
- **Evidence and analytics report**
- **Commercialisation roadmap**

BETA

Proceed to Beta field demonstration

Scottish & Southern Electricity Networks

working with

University of Strathclyde Glasgow

The James Hutton Institute

THANK YOU

Q&A

HOW YOU CAN REACH US

- Engage during regular innovation project calls
- Participate in stakeholder webinars and events
- Submit an innovation proposal via the official idea form
- Email the Future Networks team directly

Alternatively, you can engage with us through our social media channels:

twitter.com/ssencommunity

facebook.com/ssencommunity

instagram.com/ssencommunity

linkedin.com/company/ssencommunity

THANK YOU FOR JOINING US TODAY

futurenetworks@sse.com

Scottish & Southern Electricity Networks