# LUNZ HUB Exploratory workshop: Enabling transitions to net zero in land use in Scotland – what works?

SUMMARY REPORT

## 1. Introduction

An online exploratory workshop was held with land use stakeholders in Scotland. Invitations were targeted to relevant land use stakeholders and 12 participated representing organisations working in: forestry, environment, livestock, arable, financial economics, climate research, farmland nature, farm advice, research (including land managers, rural business consultants, land use decision makers and researchers). This is one of four national workshops being facilitated by the Enabling Transitions Topic Advisory Group of the Lunz Hub.

### *Workshop aims and objectives*

Overall aim: to establish how the research community can support transitions to net zero in land use.

The objectives:

- To agree a framework of key enabling conditions
- To harvest success stories and identify common factors/levers/principles
- To identify gaps in the evidence and priorities for research

After a presentation of the current understanding of enabling transitions, responses to the two online questions participants were asked when they registered were presented. Following this an interactive session identified and discussed successful and non-successful on the ground interventions.

It is important to note that the findings reported here reflect the opinions and experiences of those who participated in the workshop and should not be interpreted as objective conclusions or facts, although where evidence to support (or counter) views was available this is mentioned. The insights gathered are intended to inform further discussion and exploration.

---

## 2. Feedback from participant pre-workshop responses

Participants responded to these two questions:

1. What are the most important factors/mechanisms enabling or constraining land use net zero transition on the ground in your sector?
2. What are the gaps in research with respect to enabling conditions in your sector?

The responses demonstrate the need for a systemic approach to understanding enabling. They support the views expressed in the Hub Kick Off meeting TAG session and previous workshops and the underpinning literature. The responses are summarised below.

### *Q1a: What are the most important factors/mechanisms enabling land use net zero transition on the ground in your sector?*

The responses highlight a mix of systemic, financial, and behavioural factors influencing the net zero transition in land use. While policy incentives, knowledge sharing, and private sector engagement provide strong support, uncertainty, financial risk, and gaps in skills and frameworks remain significant hurdles. Addressing these challenges will require cross-sector collaboration, stable policy frameworks, and financial mechanisms that de-risk the transition for farmers and land managers.

**Public and private schemes and incentives**

- Agroforestry grants, organic conversion payments, agri-environment schemes
- Private sector initiatives (e.g., supply chain sustainability schemes)

**Knowledge Sharing, Support Networks, peer influence**

- Advisory services supporting transition/ helping with knowledge gaps and best practices
- Peer-to-peer knowledge exchange

**Governance**

- Cross-sector collaboration and planning need to drive transition

## *Q1b: Most important factors/mechanisms constraining land use net zero transition on the ground in your sector*

**Policy and Financial Uncertainty**

- Unclear future policy and payment structures
- Financial risks for farmers during transition
- Inflexibility of government grant schemes

**Farmer buy-in**

- Lack of single or recommended frameworks/guidance regarding carbon standards cost-effective MRV
- Managing risks; low financial margins
- Lack of confidence, knowledge, and skills among farmers
- Resistance to change among some farmers
- Low awareness of risk management strategies

**Economic and Market Challenges**

- Low financial margins in farming
- High land prices and availability constraints
- Cost-effective measurement, reporting, and verification (MRV) at scale

**Sector-Specific and Practical Barriers**

- Transitioning vehicle fleets to low-carbon alternatives (e.g., challenges with electric machinery in remote settings)
- Land-use change strategies and priorities right tree in right place has many meanings)
- Competition for ‘green’ claims along the supply chain- forestry has plenty of carbon stored but all the downstream users also want to claim 'green' when using timber
- For rural people in general the reason they do not transition to low-carbon lifestyles is because of capital costs (e.g. retrofitting insulation, need to remove VAT), and because of anxiety that the new versions will be less reliable (important given the number of recent storms)

## *Q2: Research Gaps in enabling conditions for land use net zero transition on the ground in your sector*

**Behavioural and Adoption Challenges**

A key research gap is understanding **how to drive behaviour change** among farmers transitioning from conventional to sustainable or regenerative practices. This includes:

- Understanding farmer decision-making and barriers to adoption
- Better linking scientific research to real-world farm conditions
- Exploring incentives and policy mechanisms to support transition

**Emissions Reduction and Carbon Sequestration Potential**

There are significant uncertainties regarding the **emissions reduction potential of various farming practices** and how they interact. Specific gaps include:

- Emissions reductions from **different farm practices or combinations of practices**
- The role of **intercropping** in emissions reduction
- **Feed additives** for methane reduction in grazing systems, methane inhibitors, low-carbon fertilizers
- Carbon removals via **soil, woody biomass,** soil carbon sequestration potential across soil/land use types to determine the net impact and trade-off, linking management to soil carbon and its co-benefits
- More research into **peatland carbon under conifer** forests. One participant raised concerns about the drains and ditches are flushing the carbon into the rivers, “acidifying them, killing the salmon, infilling the reservoirs”. However, in post-workshop feedback another participant pointed out that there is extensive research and increased regulation on these issues (which have been significant problems in the past) and these views are not evidence based. They provided updates regarding perceived impacts on carbon[1], acidification[2] and water[3].

**Measurement, Accounting, and Verification Challenges**

Accurate **measurement, reporting, and verification (MRV) of carbon removals** is a major gap, including:

- How to **account for carbon** across different land uses (soil, woody biomass, tree-to-timber-to-product lifecycle)
- Scientific uncertainties in **soil carbon dynamics and sequestration potential**
- Trade-offs and **net impact assessments** of different agricultural and land-use practices
- How carbon is accounted for from tree to timber to product and who gets to claim it

**Economic and Policy Mechanisms**

Several gaps exist in understanding how to design and implement economic incentives and policy mechanisms to support the transition, including:

- Methods to address constraints in funding based on Land Capability for Agriculture categorisation; PES valuation for biodiversity led (focusses) initiatives,

---

[1] The rules on planting on deep peat sites have changed considerably in recent decades On harvested sites there has also been significant research on when and when not to restock - this guide from 2015 sets out the key points and research https://cdn.forestresearch.gov.uk/2022/02/afforested-deep-peatland-management-options.pdf

[2] The primary drivers of acidification was a combination of 1970's and 80's atmospheric pollution and poor forestry site planning, in particular planting too close to riparian zones - This 2014 publication clearly explains the issues https://www.forestresearch.gov.uk/publications/managing-forests-in-acid-sensitive-water-catchments/

[3] If forestry does follow basic guidelines then there is minimal impact on water, even in sensitive sites - as demonstrated in this 20 yr long study on the Halladale River https://www.sciencedirect.com/science/article/abs/pii/S037811272100706 4#:~:text=Concerns%20over%20the%20potential%20for,suitable%20for%20supporting%20salmonid%20fish.

**Summary**

The research gaps highlight a need for **more integrated, field-level studies** that connect scientific findings with practical farming applications. Key priorities include improving **carbon accounting, understanding emissions trade-offs, linking research to farm realities, and designing effective policy and financial mechanisms** to drive adoption.

### *Q3: Can you provide a brief example of an effective net zero intervention or initiative?*

- Reducing N fertiliser, integrating trees, legumes in arable rotations
- Peatland ACTION is very effective but needs more resource to boost capacity
- Increasing soil carbon because there are co-benefits linked to nutrient and water management and soil emissions reduction. It is the single best intervention to mitigate and adapt to climate change while also improving food and water security, and reducing biodiversity impacts, increasing plant diversity, maintaining soil cover, and reduced, or zero, tillage
- Greater Glasgow Council initiative for tree planting
- Tree Planting - selection of fast-growing species, to lock up carbon but can also be used as timber in construction so the timber/carbon stays locked up. A post workshop comment extended this point[4]

---

## 3. Success stories: summary of plenary discussions

Participants discussed examples of interventions/initiatives that had been successful or unsuccessful. They annotated a miro board, indicating whether the intervention led to a quick win or a transformative shift and responded to a series of questions:

- What are the interventions and their characteristics?
- Why and how did they (not) work?
- At what scale do they operate?
- Do these aim to bring about quick wins or more transformative changes?
- How are they transferable to other contexts?

The term intervention is understood here to include all social, technical, economic and polity-based initiatives and mechanisms (formal and informal). The outputs are summarised below.

### *Interventions/initiatives that had been successful or unsuccessful*

*1. Incremental*

Examples

- Indirect effect- local abattoirs – farmers in LFA been able to farmers can relocalise their food production and spare land for more environmental activities because having a local abattoir has enabled them to change how they market their outputs (e.g. meat instead of live animals).
- Indirect effect – GPS collars for cattle allows flexible use of pasture – so positive for biodiversity, and for net zero-reducing imported inputs for crofters

[4] The carbon benefit of using timber isn't simply in locking up carbon in the tree or the wood product, but more significantly in the avoided emissions by using sustainable timber instead of higher energy materials such as concrete, plastic or steel. When considering Net Zero we need to be looking at the whole life cycle of carbon. I recommend this research https://www.forestresearch.gov.uk/publications/quantifying-the-sustainable-forestry-carbon-cycle-report-download-page/

- Producer/supplier groups negotiating with buyers for premium for lower carbon/environmentally beneficial products - insetting in action
- Programmes like KTIF and RISS, funding and facilitating innovation and trials, linking research and practice – have been shown to be beneficial
- Interest from crofters in sequestration on common grazing but tenancies and no legal framework for distribution of benefits - so the risk is that they do not see carbon payments. Nature Scott has done some work in this area. Crofting was never designed with the concept of carbon trading in mind and question of who owns the carbon units, or who is entitled to benefit is raised
- Scottish Water helping crofters with peatland restoration[5]: Uist-peatland. This is part of SW's net zero plan but also has benefits for water treatment/biodiversity

General enablers/ideas

- Support for succession planning can be incremental, or transformational when bigger changes are considered
- Addressing barriers for new entrants that have climate/nature objectives at the core of their business plan
- Tackle tenure related questions/issues as these are inhibiting effective restoration/conservation in action - Agricultural tenancies/crofting tenancies
- Integration of legacy/open data sources for mapping peatland restoration prioritisation
- Offering area-based opportunities for example you could go into a crofting area and offer to reprofile the peat in this general geographic area. No payment, just the opportunity to agree to having it done on your land, along with your neighbours. This would take away the hassle of having to find somebody to do it
- With only 10% of land is prime agricultural land, need to be cautious if facilitating access to carbon markets that take land out of food production. However, post workshop a participant pointed out that little of Scotland's prime agricultural land is currently being used for food production for people, much of it is growing either barley for alcohol production, animal feed or AD crops. Also woodland creation applications face severe difficulties of getting approval to plant on prime agricultural land[6].
- Be aware of interlinkages,- there's an untapped potential for biodiversity, possibly more than net zero with crofting but corn crakes are struggling in areas where there was no cattle.

### *2. Between incremental - transformative*

Examples

- SRUC Kirkton - woodland planting, buffer strips, biodiversity monitoring-
- Cora Cooper using peatland restoration and still being able to have a large sheep farm[7]
- Dreel burn project in Fife (transferable land governance model) - example of public/private finance + direct community involvement + structures for farmer collaboration. Integrating the community in a very well-advanced way, giving them real agency in that process, but also putting in place structures that allow for that collaboration across farm holdings and attracting public and private finance in the process
- The UK Forestry Standard (UKFS) provides a basis for regulation and monitoring, including national and international reporting. 44% of the managed woodland in the UK are certified as managed to higher level of sustainable standards according to UK Woodland Assurance Standard (See footnote for further explanation)[8].

[5] https://www.scottishwater.co.uk/About-Us/News-and-Views/2025/03/40325-Uist-peatland

[6] ". Avoiding tree planting on prime farm land has been a Scottish Govt position for many years https://www.ruralpayments.org/media/resources/GuidanceAboutWoodlandCreationOnAgriculturalLand.pdf

[7] :https://www.nfus.org.uk/news/blog/autumn- conference-speaker- proud- to- be- a- farmer

[8] Any woodland being actively managed in Scotland and requiring a felling licence or a planting grant should be compliant with UKFS. Forest owners and managers tend to get certified to UKWAS if they have larger

- One participant suggested that The Woodland Carbon Code doesn't work properly in peaty areas (e.g. Wales, Galloway, Argyll); it tends to encourage people to keep draining more peaty soils and planting more conifers. However in post workshop feedback another reported that planting and drainage of peaty soils for forestry planting is closely regulated under the UKFS. The rules on additionality in the woodland carbon make it virtually impossible to plant commercial conifers and make a carbon claim using the WCC[9].
- The vast majority (>70% of timber produced) of Scottish commercial forestry is now certified to both of the main international standards for sustainable forest management (PEFC and FSC) and this was felt to be one of Scotland's biggest success stories.
- Peer- to- peer learning - e.g., *Agroecology: enabling the transition*[10] project (2022-2023) facilitated practical knowledge exchange on agroecology across Scotland. Building on previous project – *Agroecology: facilitating mindset change* – the goal was to 'widen and deepen understanding of agroecology specifically through a farmer to farmer/crofter to crofter cooperative learning programme'. It has a series of regional groups; followed by 12 online KE events, can target local needs and brings different groups together
- Regional Land Use Partnerships[11]- Phase 1 established a partnership to deliver a collaborative approach to land use decision-making involving national and local government, landowners and managers, communities and other relevant stakeholders; Phase 2. used a natural capital approach to identify and agree upon current and potential land use opportunities and priorities
- Evidence that restoring peatland (blocking ditches, removing conifers) retains carbon in the peat.
- When a well trusted landowner sets an example, others will follow (e.g. Buccleuch, in Dumfriesshire)
- Soil Association Exchange platform - example of environmental and climate baselining and monitoring at a farm level with > 200 farms in Scotland. Providing the farmer with a level of detail about whole farm baselining across lots of different metrics under key areas like soil carbon, biodiversity, water welfare, (and one to one bespoke advice). Offering understanding of what is already happening on their holding is very beneficial in terms of taking that next step towards thinking about the changes to management practices or how the different enterprises on a farm might relate to one another. We do not have it yet at scale nationally with standardised approaches and metrics. In an ideal world, we would all be using the same metric and understanding where each farm is starting from.
- Small woodland scheme - project Soil Association did with Woodland Trust Scotland. They developed policy options (asking farmers and crofters what they wanted) for low density small scale integration of trees and farms and crofts, hopefully translate into next AES grant (doesn't exist either from the forestry grant scheme, agroforestry options)
- Tools like Global Farm Metric and Grass Check GB have supported the farmers to help them understand their measurements and often the capacity building is integral
- Soil literacy training (Sarah Buckingham) is a bit of a gap, BASIS have started a carbon management course, but it is quite a lengthy course less suitable for farmers more for advisers and those working in that space. It is evolving, there are gaps there and opportunities to make that more accessible and integrate that into kind of the CPD plan as well
- Arc Zero in Northern Ireland, where each farmer had an advisor and they worked together to develop a plan works far better than just requesting a carbon audit, which goes into the system, particularly with supply groups

General enablers/ideas

---

volumes of timber to sell. According to FR Statistics, the figure in Scotland is circa 60% of the woodland area is certified - see section 1.2 https://cdn.forestresearch.gov.uk/2024/10/Ch1_Woodland-WA-amendment.pdf

[9] https://www.forestry.gov.scot/news-releases/blog-new-additionality-rules-for-the-woodland-carbon-code

[10] https://www.soilassociation.org/our-work-in-scotland/scotland-farming-programmes/current-scotland-programmes/agroecology-enabling-the-transition/

[11] https://www.gov.scot/publications/regional-land-use-partnerships-phase-1-process-evaluation-final-report/pages/6/

- Low or no interest finance to fund expenditure for low- carbon systems transformation? Cost-beneficial to promote action now, if capital can be made available e.g. capital grants scheme
- Focusing on credibility rather than new evidence in science/policy/farming interface- it doesn't matter how good your evidence is if you don't have credibility with the audience, building good relationships
- Good advice- new SAC people are very well versed in integrating agriculture with biodiversity and net zero- they're the ones that the farmers probably trust
- Forestry by its very nature is long term so quick wins are harder to come by however when change does happen it is highly transformative

### *3. More transformative*

Examples

- The Scottish Soil Framework (2009) was intended to bring an integrated approach to Scotland's soil management. Lots of interventions were proposed but there was no institutional ownership or coordinated action to intervene. National scale but with recognition of regional, local and field scale actions – so complicated. CXC fellowship is now preparing a route map to delivering healthy soils in Scotland (with a climate adaptation / CCC driver) to reset discussion; hope to publish in April 2025[12.] Soils are a very good example of a cross- sectoral/ transdisciplinary/ system issue that can only be addressed with coordinated action and leadership

### *4. General enablers and recent research findings*

- Integration of training and skills in relevant areas to educational and CPD programmes - supporting long term system knowledge
- There is lots of chat about the potential for green jobs and rural skills through a transition to net zero - but this research[13] flagged the lack of reliable data to understand the current position and the potential moving forward - lots of data but not much of it helps answer the key questions
- Discussion around interlinked practices - land use is one of several sectors examined in this research which looks at what works[14]
- Recent research[15] on how land managers engage (or not) with support systems-
- Recent research[16] on a fairness in a Just Transition

### *Summary*

The characteristics that lead to effective outcomes align with the literature and other Hub discussions and workshops. These show that there are a range of enabling interventions already operating across the system in a portfolio approach. These differ in nature, scale and impact but collectively can inform net zero transition.

Incremental changes, such as local abattoirs and GPS collars, demonstrate how small innovations can yield indirect benefits. Moving towards more transformative approaches, land use governance models like the Dreel Burn Project and LUP show the value of multi stakeholder collaborative approaches to land use decision-making. While peer-to-peer agroecology learning illustrates the power of facilitating learning in

[12] https://www.climatexchange.org.uk/interview- evidence- for- healthy- soils- policymaking/
[13] https://www.climatexchange.org.uk/projects/climate- change- the- land- based- labour- market- and- rural-land- use- in- scotland/
[14] https://www.climatexchange.org.uk/projects/interlinked- practices- for- effective- net- zero-policymaking/
[15] https://www.climatexchange.org.uk/projects/mapping- land- use- support- systems- and- access-pathways/
[16] https://www.climatexchange.org.uk/wp- content/uploads/2024/12/CXC- A- fair- distribution- of- costs- and-benefits- in- Scotlands- Just- Transition- May- 2024.pdf

enabling land management change. Multiple benefits (biodiversity and net zero) can be achieved through single interventions. Compliance with standards in the forestry and woodland sector has enabled best practice to improve.

Soils are a very good example of a cross- sectoral/ transdisciplinary/ system issue that can only be addressed with coordinated action and leadership. The Scottish Soil Framework experience underscores the complexities of and need for governance, institutional ownership, and long-term coordination. Key enablers across all levels include addressing tenure barriers, integrating financial support for low-carbon transitions, and fostering credible, science-backed decision-making, building trust with local land managers, developing cross-sectoral collaboration and building capacity and net zero literacy.

## 4. Conclusions

The enabling environment is the context in which individual land managers and organisations function. We know from the literature that enabling factors need to address the systemic impediments regarding political commitment and vision, and policy, legal and economic frameworks; public and private sector funding and processes; governance, power structures, incentive-systems and institutional linkages and social norms. These determine capacity and individual values and motivations of land managers and their organisations. As such a systems approach is needed for enabling transition in this complex environment. Discussions at the workshop supported this view and identified the need for a systems approach.

Experiences described are specific to the Scottish context include crofting (where tenancy arrangements are complex), pilot land use partnerships from the Land use strategy, support of peat restoration, the Soil Association Exchange[17] baselining project, as well as a large-scale forestry industry and timber supply chain where governance has been strengthened. Also, the Farm Advisory Service provides more coordinated support compared to the privatised and fragmented systems in England, and historically has been supported by farmer innovation programmes such as the Rural Innovation Support Service.

The research gaps highlighted a need for more integrated, field-level studies that connect scientific findings with practical farming and forestry applications, although raising awareness of existing sectoral evidence was also flagged as important. Key priorities include improving carbon accounting, understanding emissions trade-offs, linking research to farm realities, and designing effective policy and financial mechanisms to drive adoption.

UK Research and Innovation | Department for Environment Food & Rural Affairs | Department for Energy Security & Net Zero | Scottish Government Riaghaltas na h-Alba gov.scot | Llywodraeth Cymru Welsh Government | Department of Agriculture, Environment and Rural Affairs

[17] https://www.soilassociationexchange.com/datatodecisions

# Appendix 1 Plenary discussion miro board: success stories

Facilitators: Please remember
to RECORD your breakout room!

Share success stories & unsuccessful cases that are transferable to other contexts

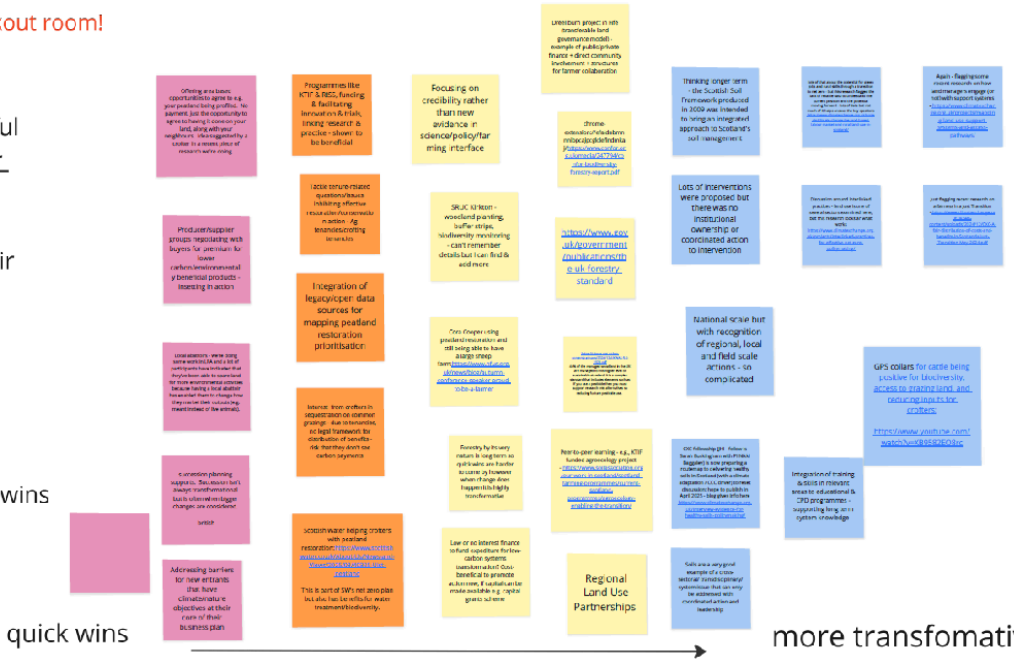
What are the interventions and their characteristics?

Why and how did they (not) work?

At what scale did they operate?

Do these aim to bring about quick wins or transformative changes?

How are they transferable to other contexts?



# Appendix 2 Programme

## LUNZ HUB Exploratory workshop: Enabling transitions to net zero in land use – what works?

**Online: 7 March, 2025, 10.00-11.30**

**Coordinators: Anna Sellars, Julie Ingram**

**Programme**

| |
|---|
| Introduction to the LUNZ hub and the Topic Advisory Group and workshop aims<br>Participants introduce themselves |
| Plenary – what do we mean by enabling conditions and how do we know when they have worked?<br>• present overarching framework (what we know already)<br>• present analysis of pre workshop questions |
| Plenary<br>Share success stories and identify common factors/principles that are transferable to other contexts. How can we best capture on the ground experiences? |
| Final summary, next steps, and farewell |