



Deploying CDR at scale and speed in Finland

Roadmap

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A collaboration between

carbon gap

SWECO 

Disclaimer

This document was developed to propose a roadmap for implementation of various Carbon Dioxide Removal (CDR) pathways in Finland. The Roadmap is based on the findings and analysis presented in the Background Report on Finland’s potential for the deployment of CDR methods and the results of the stakeholder engagement performed through a series of interviews and a one-day workshop, held in Helsinki on the 4th of September 2025, addressing the main barriers and enablers for CDR deployment in Finland. This Roadmap presents an action plan which can be used as a reading material for policy makers and stakeholders involved in CDR development in Finland.

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Carbon Sink Finland, Hiilensidonta ry	Baltic Sea Action Group (NGO)
Natural Resources Institute Finland	Energy Industries (association)
Prime Minister’s Office	UPM (forestry company)
WWF Finland	Technology Research Centre VTT
Nordea bank	Carbon Culture
Business Finland (government innovation fund)	Technology Industries of Finland
The Central Union of Agricultural Producers and Forest Owners (MTK)	Forest Industries (association)
Ministry of Economic Affairs and Employment	Metsä Group (forestry company)
City of Helsinki	Gasgrid
Carbonaide	Ministry of the Environment
Bioenergy Association	Bioenergy Association
New Sustainability Company	UPM (forestry company)
Green Carbon	

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List of abbreviations

BECCS	Bioenergy with carbon capture and storage
CDR	Carbon dioxide removal
CRRA	Carbon removal readiness assessment
DACCS	Direct air carbon capture and storage
LUKE	The Finnish Natural Resources Institute
STN	The Strategic Research Council
SYKE	The Finnish Environment Institute
VATT	Valtion talouden tutkimus keskus
VTT	Technology Research Centre

Executive summary

This roadmap outlines key actions to accelerate the deployment of carbon dioxide removal (CDR) in Finland, aiming to unlock the country's full carbon removal potential by its 2035 carbon neutrality target. The CDR potential is expected to grow through 2050, supporting Finland's longer-term ambition of becoming carbon negative. While the roadmap provides strategic direction for the 2035-2050 period, it does not include specific actions for that timeframe.

The roadmap builds on the Carbon Removal Readiness Assessment (CRRA) report for Finland and its core findings:

1. CDR is essential to help Finland close the remaining carbon gap to reach carbon neutrality by 2035.
2. Forest harvesting levels remain one of the most decisive factors in achieving Finland's climate neutrality, no matter how advanced or diversified the CDR portfolio becomes.
3. Geological storage capacity is the primary constraint for deploying technical CDR methods such as BECCS and DACCS.
4. Finland's social geography supports the deployment of CDR.

Building on the key messages from the background report, and stakeholder insights (collected through semi-structured interviews and a national CDR workshop held in September 2025) this roadmap proposes the following strategic approach for Finnish society:

1. **Build a solid foundation of research and political will.** Unite existing CDR stakeholders and inform both the current government and the 2027 parliamentary elections to build support for the next government programme. Utilise strategic research programmes to close data gaps specific to Finland's CDR conditions.
2. **Prioritise strategic planning and targeted implementation.** To maximise limited time and financial resources, efforts must focus on what matters most. Whilst the Finnish government might currently not be keen on establishing new thematic strategies, it is critical to establish a shared understanding of priority CDR actions. This could take the form of a national vision and a more elaborated description of the Finnish CDR ambition, confirmed through dialogue between key industry actors, civil society and government, ensuring the country can unlock its full CDR potential with limited time and monetary resources.
3. **Learn from pilots and scale up existing solutions.** Finland is not starting from scratch in CDR deployment. Several government-supported instruments already exist that could support especially those CDR methods that are rooted in nature, such as forest management, wetland restoration and farming practices. Rapid deployment of pilot projects for carbon capture, transport, and storage is essential, and lessons learnt must be shared widely within Finland and internationally to accelerate progress.
4. **Focus early on large-scale deployment and international collaboration.** Technologies like BECCS and DACCS require years of planning, permitting, and construction before they become operational. With only a decade remaining to meet Finland's carbon neutrality target, these projects must begin within the next few years. Given Finland's limited geological storage capacity, international agreements for CO₂ transport and storage are a critical part of the solution.

An indicative timeline for the key activities is provided in Figure 1.

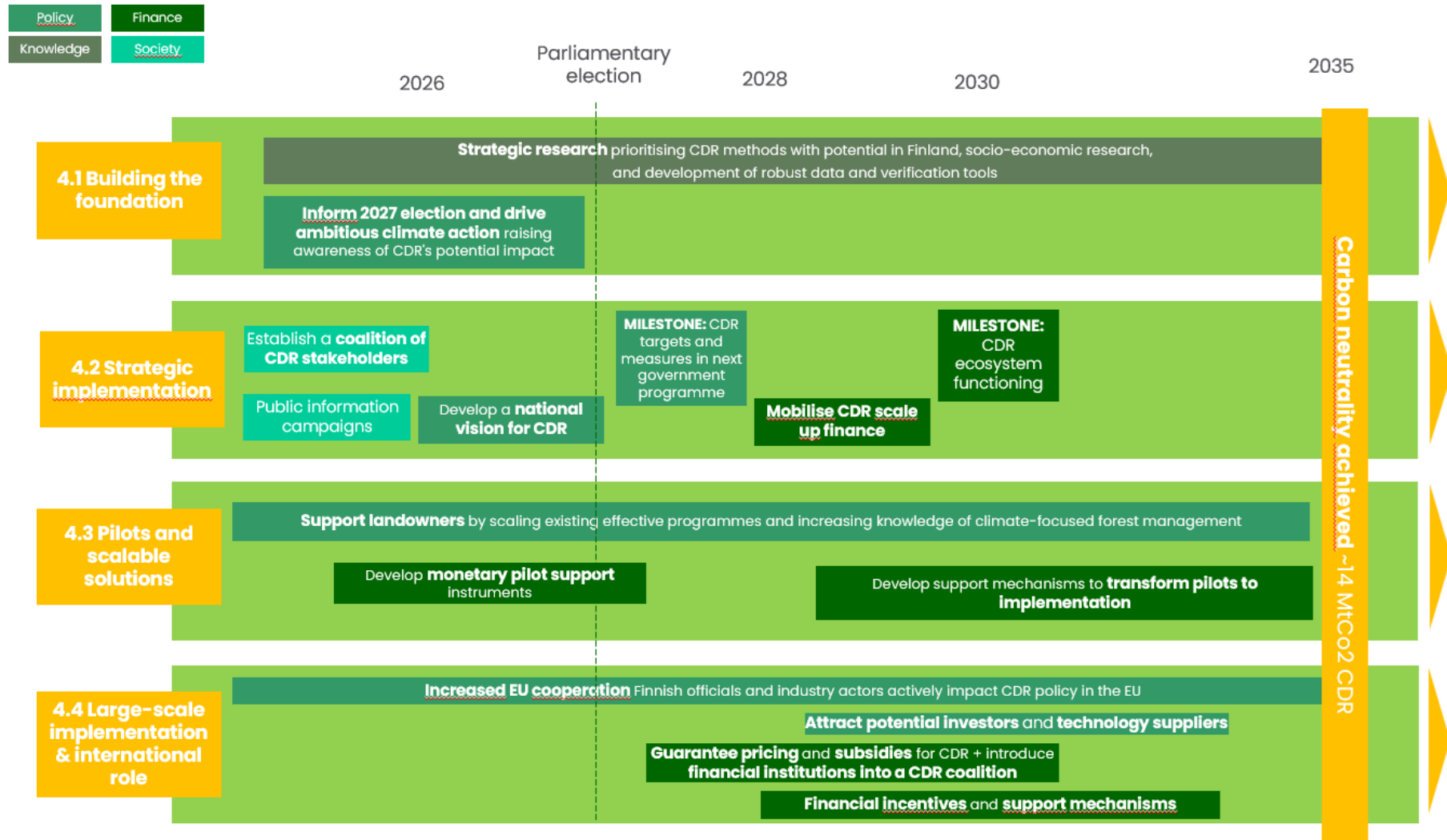


Figure 1. The Finnish CDR roadmap leads to increasing activities in the next ten years to reach the full CDR potential by 2035 carbon neutrality target. Most of the activities should be conducted in parallel and iteratively.

1. Introduction

The Finnish CDR Roadmap - developed by the project team with input from key Finnish stakeholders - outlines priority actions to overcome barriers and accelerate the systematic deployment of CDR in Finland. It is part of the Carbon Removal Readiness Assessment (CRRA) project, a broader initiative led by Carbon Gap to evaluate the real-world deployability of various CDR methods across multiple countries, primarily in the EU.

Methodology

The roadmap builds on extensive background research into Finland's CDR potential, as presented in the accompanying Background Report, on stakeholder consultations held between spring and autumn 2025, and on an interactive workshop organised in Helsinki in September 2025.

1. **CDR industry stakeholder interviews:** Fifteen semi-structured stakeholder interviews explored the feasibility of deploying CDR technologies at scale in Finland, covering topics such as policy environment for CDR, current knowledge base, technical readiness, resource availability, and barriers to implementation. The aim was to understand the potential, challenges, and necessary actions to facilitate the adoption of CDR methods, including evaluating existing policies and incentives. Insights on these interviews are detailed in section 6.2 and Annexe C of the background report.
2. **Stakeholder workshop:** A half-day workshop brought together 28 stakeholders to discuss large-scale CDR deployment in Finland, thereby laying the groundwork for the roadmap. The aim was to assist decision-makers in understanding the feasibility of different CDR methods and identify necessary steps for implementation for the next 5-10 years. Discussions focussed on required resources and infrastructure, policy frameworks, incentives, and social geography considerations. Four discussion groups were formed: policy and regulation; financial incentives, social geography; and research and knowledge needs. Since these themes are deeply interconnected, in this roadmap, the lessons learned in the workshop have been grouped differently.

The stakeholder consultations have been essential in shaping the key elements of this roadmap. By engaging with representatives from key research institutions, policy making, regulators, businesses, technology providers, funding agencies and NGOs, the roadmap identifies key barriers and enablers for successful CDR implementation in Finland.

This roadmap serves as a starting point for collaborative efforts to reduce the barriers and strengthen the enabling factors associated with CDR deployment in Finland. It invites all key Finnish stakeholders to jointly refine the role of CDR within the national carbon neutrality pathway and to co-develop practical next steps to unlock the benefits of CDR solutions. While not all systemic challenges can be resolved here, the roadmap focuses on actionable measures that can catalyse early CDR deployment especially with stakeholders who have interest in scaling CDR in Finland.

2. Realistic CDR pathways for Finland¹

There are numerous ways CDR methods could be deployed in Finland. The three realistic scenarios developed in the background report provide a systematic, logical and internally coherent framework to investigate potential pathways for deploying CDR in Finland in the coming years. Two scenarios focused on nature: **Scenario A1 (Focus on nature – higher felling, NH-HF)** and **Scenario A2 (Focus on nature – lower felling, FN-LF)**. The third scenario, **Scenario B (Leveraging technology – higher felling, LT-HF)**, explores the integration of technological CDR methods. All scenarios were modelled for two key milestones: 2035, aligned with Finland's climate target, and 2050, aligned with the EU's net-zero target.

¹ More detailed descriptions of the scenarios, the chosen CDR methods and their potential can be found in the background report.

Scenario	Potential 2035 and 2050	Rationale
Scenario A1 (Focus on nature – higher felling, NH-HF) <i>Pasture and cropland management, enhanced weathering, durable bio-based products, and various forms of forest management practices</i>	~4 MtCO ₂ in 2035 (22% of projected residual emissions) ~13 MtCO ₂ in 2050.	The harvesting level in this scenario is near the current level in Finland.
Scenario A2 (Focus on nature – lower felling, FN-LF) <i>Pasture and cropland management, enhanced weathering, durable bio-based products, and various forms of forest management practices</i>	~22 MtCO ₂ in 2035 (122% of projected residual emissions) ~37 MtCO ₂ in 2050	Single biggest impact on CDR potential is the harvesting level – if it is lowered, the potential rises greatly between the two scenarios.
Scenario B (Leveraging technology – higher felling, LT-HF) <i>In addition to the methods listed in scenarios A1 and A2, this scenario incorporates biochar, BECCS, and DACCS.²</i>	~14 MtCO ₂ in 2035 (77% of projected residual emissions) ~28 MtCO ₂ in 2050.	To reflect a higher level of ambition while maintaining realism, Scenario B assumes the same harvesting level as Scenario A1 , the growth of harvesting level is expected to continue in the future as well.

Table 1. Overview of the realistic CDR potential scenarios developed in the background report.

Scenarios A1 and A2 showcase Finland’s potential for CDR if only methods rooted in nature are deployed. In this report, these two scenarios include **pasture and cropland management, enhanced rock weathering, durable bio-based products, and various forms of forest management practices**. Both scenarios apply the same suite of methods, with the key variable being the level of forest harvesting levels: Scenario **A1 (FN-HF) with higher felling levels** and **A2 (FN-LF) with lower felling levels**.

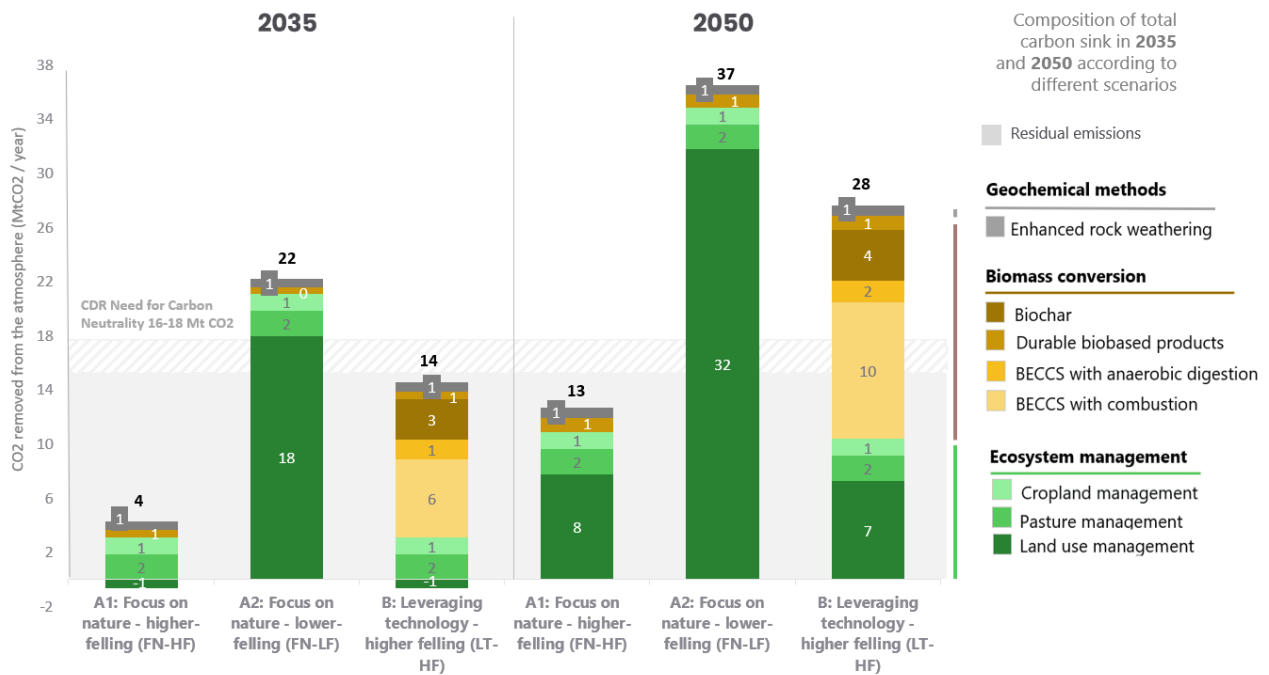


Figure 2. The practical potential of CDR in Finland by 2035 and 2050.

² Note: Although DACCS was included in the potential calculation, Finland does not have adequate storage capacity to accommodate both DACCS and BECCS. BECCS was prioritised for practical reasons over BECCS and thus DACCS is not part of the end results of this scenario.

Scenario B (LT-HF) outlines a more diverse pathway that involves deploying both conventional CDR methods included in scenarios A1 and A2 and novel CDR methods. **In addition to the methods listed in scenarios A1 and A2, this scenario incorporates biochar, BECCS, and DACCS.** To reflect a higher level of ambition in technical CDR methods while maintaining realism, Scenario B assumes the **same harvesting levels as Scenario A1**, where the growth of harvesting levels is expected to continue in the future. Once the calculation was finalised, BECCS overruled the deployment of DACCS due to limited storage capacity and other factors such as energy efficiency and political will favouring BECCS. For these reasons, DACCS is not utilised in the realistic scenarios even though it was included in the calculations and in theory could be deployed in Finland.

While the realistic potential scenarios presented in the background report should not be taken as forecasts, they provide a pathway to climate neutrality and to negative emissions. Although all three scenarios should be feasible, the actual level of CDR achieved in Finland by 2035 and 2050 will depend on significant investments, strategic political choices, and the evolution of relevant markets. This roadmap intends to outline actions needed to unlock this potential.

3. Enablers and barriers for developing CDR in Finland

This section summarises the main enablers and barriers affecting the deployment of selected CDR pathways in Finland. While some factors are common to all CDR methods, others are specific to certain approaches. For example, the absence of a clear national CDR strategy creates uncertainty around market demand, limiting investment appetite and hampering commitment to long-term planning by key actors. Meanwhile, the lack of geological storage particularly hits actors focused on BECCS and DACCS. Understanding the types of barriers is essential for designing effective policy instruments and incentives and engaging the necessary stakeholders for addressing those barriers.

General enablers

- **Strong Climate Policy Commitment:** Finland has one of the most ambitious climate neutrality targets globally, aiming for net zero by 2035. This policy commitment provides a supportive framework for deploying CDR solutions.
 - Climate targets agreed parliamentary – no changes foreseen in the future
 - Current government added CDR into policy toolbox
 - A new monetary support instrument for BECCS under development, tough support level was dropped during the preparation of the instrument.
 - CDR is framed as part of the green transition, included in the priority procedure to ease investment decisions.
- **Pre-existing and working policy instruments for forest management:** updated [Tapio's forest management guidelines](#) include climate-informed forest management
- **Abundant natural resources:** extensive forests and biomass resources, essential for CDR methods like BECCS and biochar.
- **Cultural and Societal Support for Climate action:** widespread public and stakeholder support for environmental sustainability and climate action that could be transferred to support for CDR activities if they are explained and proved efficient. Currently, the understanding of CDR as a concept is still relatively low, so increasing support for CDR specifically will require specific activities.
- **Technological Expertise:** Finland has strong expertise in engineering, forestry, and biomass management, which can be leveraged to develop and deploy CDR technologies.
- **Ambitious climate roadmaps of Finnish industries** have aligned major sectors towards climate action and fostered a growing awareness of their role in supporting CDR deployment in Finland.

- **Industrial Integration:** existing coalitions and industrial ecosystems to foster business cases for CDR and enhance industrial integration.
- **Bio-Based Products Potential:** shifting towards higher-value long-term wood products is seen as an opportunity for economic growth, aligning with Finland's existing strengths in the forest industry.

Barriers

- **Lack of a clear national CDR vision for Finland:** The Government's goal is to contain all climate policy in the three official climate policy plans (Energy and Climate Strategy, Mid-Term Climate Plan for burden sharing sector, and Land use climate action plan) instead of having separate topic-related strategies.
 - CDR can and should be part of all three plans, but the main one is the Energy and Climate Strategy.
 - Most measures mentioned in the strategy refer to EU-level initiatives rather than national actions.
 - The energy strategy prioritises CCU over CCS.
- **Lack of CDR ecosystem:** CDR deployment depends on a broader ecosystem of carbon management approaches (e.g. CCS, CCU), which remains underdeveloped.
- **Limited Geological Storage:** Finland's geology offers minimal geological CO₂ storage capacity, limiting BECCS and DACCS viability.
- **Competing Uses of Biomass:** Biomass is in high demand for bioenergy production and other industrial applications, limiting availability for CDR.
- **Economic and Financial Constraints:** High costs and limited funding mechanisms hinder investment in capital-intensive methods like DACCS and BECCS.
- **Regulatory Limitations:** Current legal restrictions, such as bans on the use of silicate minerals for carbon mineralisation, restricts deployment of certain geochemical methods.
- **Underdeveloped infrastructure:** Transporting and storing CO₂ will require new infrastructure investments.
- **Public Trust and Acceptance:** Concerns about greenwashing and the ecological impact of CDR methods may reduce public acceptance and support, especially for ocean-based methods.
- **Forest Policy Complexity:** Fragmented ownership and strong economic reliance on forestry complicate efforts to change forest management practices to prioritise carbon sinks over economic yield.

Method	Enablers	Barriers
Forest management	<ul style="list-style-type: none"> Available funding for private forest owners, policy instruments from EU. Metso programme provides monetary compensation for increasing carbon sinks. However, current funding falls far short of demand. 	<ul style="list-style-type: none"> Forest ownership and use are highly polarised and politically sensitive. Private forest owners lack knowledge of forest management practices and rely on associations or companies for forest management decisions. Lack of support instruments to gain monetary benefits from conserving or moving to continuous-cover silviculture. Forest products are a key sector in Finland and account for about 16.8 % of total goods exports, making harvesting levels economically significant and politically sensitive.
Pasture and cropland management	<ul style="list-style-type: none"> Finnish CAP plan includes provisions for pasture and cropland management, but more is needed at the EU level to truly reach its full potential. 	<ul style="list-style-type: none"> The CAP currently acts as a barrier due to misaligned incentives and underdeveloped support mechanisms, though it has strong potential to enable CDR approaches like carbon farming.
Durable bio-based products	<ul style="list-style-type: none"> Research and pilots about wood construction have been made. Data is available. Established companies are ready to scale, with startups providing complementary innovation and support. 	<ul style="list-style-type: none"> Previous assessments and large-scale pilots of wood-based construction (e.g. multi-apartment buildings) revealed cost and skilled workforce limitations, and life cycle assessments showed wood was not the most sustainable option.
Enhanced rock weathering	<ul style="list-style-type: none"> Finland has functioning mines and plans to increase mining activities in the future providing resources. Neutral to positive views on this rather new and unknown method for Finland. Room for building support with transparent and rigorous process. 	<ul style="list-style-type: none"> Mining activities continue to be controversial, and this can be viewed as greenwashing by the public. Lack of active actors in the field in Finland
Peatland restoration	<ul style="list-style-type: none"> Political debate around energy peat production is largely settled, with declining output and strong support for restoration efforts. Peatland restoration in Finland is supported by the Just Transition Fund. Political decisions have been made, funding has been secured, now it's a matter of executions. 	<ul style="list-style-type: none"> Results can vary and do not match expected rates of restoration for now. Shortage of skilled workers able to restore peatland and earn a livelihood from it.
BECCS	<ul style="list-style-type: none"> Possible capture sources have been identified. Demonstration projects ongoing. Monetary support instrument available. 	<ul style="list-style-type: none"> Lack of geological storage. High investment costs. Lack of providers and skills to implement BECCS investments. Value chain not functioning for storage.
DACCS	<ul style="list-style-type: none"> Availability of resources. 	<ul style="list-style-type: none"> Lack of geological storage. High investment costs. Lack of current ecosystem.
Biochar	<ul style="list-style-type: none"> Pre-existing producers and users. Existing industry for pyrolysis. Interest in using biochar for the built environment. Availability of resources. 	<ul style="list-style-type: none"> Value chain between biochar producers and possible end users is underdeveloped. High costs and inconsistent biomass supply make biochar unaffordable for most large-scale customers. Price of biomass is not profitable for biochar producers.

Table 2. Enablers and barriers per CDR method.

4. Actions required to accelerate deployment of CDR in Finland

The barriers and enablers identified in the previous section will shape Finland's CDR landscape in different ways. Critically, the absence of clear regulations and policy incentives have a large impact on scaling up the CDR supply. To address these challenges and reinforce key enablers, the roadmap proposes four strategic pillars (as already shown in Figure 1):

1. Building the foundation
2. Strategic implementation
3. Pilots and scalable solutions
4. Large-scale deployment and international role

Given the urgency of Finland's 2035 carbon neutrality target, multiple actions must advance in parallel and persist throughout the decade. For each thematic action area, the following sections provide a brief overview of the current status and rationale, followed by a description of key activities, relevant stakeholders, and implementation readiness. These activities are not intended to occur sequentially.³

BOX 1: ACTIONS RECOGNISED IN THE DRAFT ENERGY AND CLIMATE STRATEGY

The Finnish Government is currently revising its Energy and Climate Strategy.³ The draft includes several measures that support CDR deployment:

- Advancing EU regulation to recognise biogenetic CO₂ as negative emissions
- Promoting EU-level funding instruments for technical CDR methods, with encouragement for Finnish actors to apply
- Strengthening the national knowledge base on technical carbon sinks (e.g. BECCS, DACCS)
- Allocating €90M (revised from €140M) for BECCS/BECCU pilot projects
- Developing CO₂ infrastructure in Finland and exploring joint EU storage solutions
- Establishing legal basis to transport CO₂ to Norway and Denmark for permanent storage
- Securing biogenetic CO₂ and renewable energy for hydrogen production (Note: primarily relevant for BECCU instead of BECCS, though listed under technical sinks)

4.1 Building the Foundation

CDR is still considered an emerging topic in Finnish climate policy, with limited understanding across industry, government, and civil society. Clear societal structures on how to govern and guide the CDR industry are largely absent. There is also a lack of CDR specific policy instruments and monetary support instruments, reflecting a broader lack of political will to invest and deploy CDR in Finland.

However, Finland is not starting from zero in CDR deployment in 2025. The current government has introduced technical CDR into its climate policy toolbox and provided monetary support for BECCS. Industry actors and research institutions have built a solid knowledge base of the possibilities and needs of CDR in Finland and both large companies and start-ups are active in the CDR market.

³ Draft strategy available [here](#).

4.1.1 Finland-specific strategic research programme

Key activities

- **Prioritise CDR methods with potential in Finland but with limited data and knowledge** such as ocean alkalinity enhancement, enhanced rock weathering, and biomass sinking.
- **Integrate socio-economic research** to assess the broader impacts of different CDR methods on Finland's economy.
- **Develop robust data and verification tools** to improve accuracy in calculating removed carbon.

Key stakeholders

- The Strategic Research Council (STN) under the Finnish Academy could lead the programme call. Key knowledge institutions - such as VTT, VATT, SYKE and LUKE – are well-positioned to contribute. Additionally, the governments and ministries' joint R&D initiative, VN Tutkiva, could serve as an alternative host or coordinating body.

Readiness: Good. Possible RDI instruments and organising entities have been identified, along with key research institutions. Recent research programmes have produced valuable insights into the potential of various CDR methods. Notable examples include [CO2CREATION](#) (STN) and [NEGEM](#), led by VTT and LUT University.

4.1.2 Inform 2027 election and drive ambitious climate action

Finnish policy makers remain largely unfamiliar with CDR and face little pressure to have a stance on it. With parliamentary elections set for 2027 and party platforms forming in 2026, the coming year offers a strategic opportunity to raise awareness and position CDR as a key element of Finland's climate strategy.

Key activities

- **Provide political parties (2025-2026) with clear, evidence-based materials on CDR**, highlighting both climate and economic benefits.
- **Engage citizens and civil society** to discuss CDR publicly and build a shared vision for its inclusion within Finnish climate policy. This could be done through informational campaigns and events and by engaging media outlets to make content around CDR related topics.
- **Challenge current climate inaction and drive renewed demand for ambitious policy action**, similarly to the momentum built in the 2018/2019 elections, when the IPCC report galvanised public and political engagement.
- **Raise awareness of CDR's potential impact** on Finnish industry, climate targets and broader societal benefits.

Key stakeholders

- There is no single actor currently positioned to lead national dialogue on CDR in Finland. However, this document and its background report can serve as foundational resources to inform and spark discussion.
- In addition to Sitra and the Climate Leadership Coalition (CLC), Finnish environmental NGOs, such as WWF and Luonnonperintösäätiö, citizen movements such as Protect our Winters or Climate Move and influential individuals could play a role in initiating public conversation and raising awareness around CDR.

Readiness: High. Efforts to shape the climate agenda ahead of the 2027 elections must happen in the next 6-9 months. Some political parties, such as SDP, have started requesting materials i.e. from the Climate Panel, signalling early interest in CDR, especially BECCS and its potential.

4.2 Strategic implementation

Strategic implementation in Finland naturally encompasses all elements in this roadmap, so this should not be considered as a separate action, but as an umbrella that brings all CDR activities together.

4.2.1 Create a national CDR strategic ambition

The current government does not support developing separate strategies for specific topics such as CDR or hydrogen. Instead, it favours centralised programmes, as outlined in section 3 on barriers. Existing strategies are under review in 2025.

Key activities

- **Establish a coalition of CDR stakeholders interested in developing Finland's CDR industry.** The coalition should include actors from the climate space, the forest industry, on value creation, carbon markets and CO₂ infrastructure. While no clear leader currently exists, Bioenergy ry or the Climate Leadership Coalition for instance have strong networks and industry expertise but discussions on who could serve as a coordinating body need to happen amongst interested parties. This coalition does not necessarily need to involve state actors.
- **Develop a national vision for CDR,** outlining its potential role in Finnish climate policy and the societal and economic benefits of large-scale deployment. Vision should include a clear articulation of industry needs, serving as a practical guide for policy makers. The vision should be created in collaboration with government and policymakers, and include national CDR targets, specifying how much should be deployed, how, by whom, using which tools, and clarifying the roles of public institutions, industry actors, and market actors.

Key stakeholders

- Since the government is not willing to lead the development of a national CDR vision, it falls to industry actors to form a coalition and take the initiative.

Readiness: Low. Currently, CDR actors are not well connected and organised and lack a platform necessary to collaborate effectively. This fragmentation limits their ability to jointly shape a national vision or influence policy.

4.2.2 Create Social License

Support for climate action has declined in the 2020s compared to the peak in 2018-2019, when momentum was strong across Finland and Europe. Although one Finnish government pursued ambitious climate targets and climate action felt relevant to almost all Finns, since then political and national focus has shifted toward security and economy concerns. As climate issues are increasingly seen as costly, unnecessary, and detrimental to the Finnish economy, deploying CDR is not on top of Finnish people's mind. Large-scale deployment in particular will require clear, proactive communication.

Key activities

- **Communicate clearly what CDR is and how it may contribute** to the Finnish economy and Finland's climate neutrality target.
- **Develop a cost benefit analysis of different CDR solutions** to highlight the economic benefits to Finnish society. This could be done as part of the strategic research programmes proposed in 4.1.1.
- **Engage private forest owners** as key stakeholders in all relevant discussions.
- Communicate to the general public the role of CDR solutions in addressing climate change as approaches that do not rely on changes to individual lifestyle choices, helping to reduce polarisation in public climate discourse.

- **Consider land use questions** of deploying certain CDR solutions, such as those related to forest management.

Key stakeholders

- Since the government is not willing to lead on creating a social license, it falls to forestry industry actors and other civil society stakeholders to form a coalition and take the initiative.

Readiness: Medium. Since public discourse around CDR in Finland is limited, opposition is currently minimal. This presents a strategic opportunity to proactively shape the narrative and address potential concerns before they gain traction.

4.3 Pilots and scalable solutions

Pilots and their scaling represent the next major category of actions for advancing CDR in Finland. As noted earlier, piloting should be happening already now and not wait for actions in previous categories to conclude. Some view pilots as part of the foundational work. Here they are treated as a distinct category of actions. Scalable solutions refer to approaches already in use, though not yet as targeted CDR measures – or solutions implemented at a limited scale that are now ready to be deployed and scaled.

4.3.1 Support instruments for landowners

Leveraging well-established programmes like [HELMI](#) and [MISU](#) offers a proven pathway to achieve significant carbon removals while enhancing biodiversity. These programmes provide valuable frameworks for conservation and restoration, backed by a strong track record of effective implementation.

Key activities

- **Scale up Metso and Helmi programmes.** METSO promotes voluntary forest conservation in Southern Finland to halt biodiversity loss and support sustainable forest management. Expanding METSO's reach and increasing incentives for landowners to protect or restore ecologically valuable forest habitats can enhance forest carbon sequestration and preserve biodiversity. Helmi habitats programme, led by the Ministry of the Environment and co-implemented with the Ministry of Agriculture and Forestry, aims to strengthen Finland's biodiversity and safeguard the vital ecosystem in Finland. Helmi works together with municipalities and NGOs to restore habitats locally. Encouraging temporary and permanent protection agreements, as well as active nature management and restoration efforts, can significantly boost carbon storage in forest ecosystems. Scale up measures could include:
 - Increasing funding and outreach to private forest owners.
 - Integrating carbon sink metrics into conservation agreements.
 - Promoting longer-term or permanent protection options in the Metso agreements.
- **Make the forest guidance for private forest owners more climate focused.** Climate and environmental recommendations were added to it recently, but it still focusses mostly on reaching the highest economical gain from the forest.
- **Increase the knowledge base within forest associations** who provide forest management services to private forest owners to support carbon capture through improved practices.
- **Implement the activities listed in the Land Use Sector Climate Plan (MISU).** While the activities listed in the plan alone are insufficient to changing the Finnish LULUCF emission status back to net sinks, they serve as a necessary starting point to addressing the Finnish forest and forest lands capacity to capture and store carbon.

- **Rewet peatlands for dual-use.** Supporting defence applications while delivering climate mitigation benefits.

Key stakeholders

- Local forest associations offer guidance and support to private forest owners on sustainable forest management.
- Tapio develops and maintains the official forest management recommendations.
- The Ministry of Agriculture and Forestry oversees the forestry sector and leads the MISU programme.
- Local municipalities play a role in regional implementation and land-use planning.
- MTK – the Farmers Association offers guidance on implementing different support instruments.

Readiness: Good. The instruments designed to provide financial incentives to reduce harvesting and to increase the carbon sinks in land areas are already designed and functioning. It is mostly a matter of effective communication of those instruments and securing they have sufficient levels of funding.

4.3.2 Pilot support to capture, transport and store biogenic CO₂

Biogenic CO₂ is the main resource in Finland that could be channelled to CDR due to the central role of the national forest industry. To unlock this potential, targeted pilot support for the capture, transport, and storage of biogenic CO₂, whether domestically (e.g. through in-situ mineralisation) or for export, will be essential. This will help deploy innovative technologies and strategies, offering valuable insights and scalable solutions for future climate action.

Key activities

- **Implement the planned investment support for BECCS without delay** by the Ministry of Employment and rapidly assess if it needs to be increased to accelerate deployment and deliver tangible results.
- **Assess the infrastructure and logistical requirements for transporting CO₂** within Finland and for potential export to international storage sites. Include assessment of emissions from transporting CO₂ outside of Finland to make sure it remains as the most sustainable solution.

Key stakeholders

- Forest companies are key CO₂ producers, with existing facilities that could host carbon capture installations. While they should be active participants in deployment efforts, they do not need to take responsibility for the downstream management of captured CO₂ if they choose not to engage in that aspect.
- The Forest Industries Association could serve as a coordinating entity, helping to align stakeholders and offering guidance on how forest sector companies can create value under evolving climate policies and market conditions.
- The Ministry of Economic Affairs and Employment is responsible for the funding instruments and policy development related to CDR.
- Business Finland and other funding bodies such as Tekes, ELY-Centers and Finnfund (see Chapter 5 in the background report) play a critical role in supporting innovation and scaling through targeted financial mechanisms.

Readiness: Medium. Support instrument for BECCS is underway but seen as insufficient to drive meaningful progress. While [a major BECCS pilot](#) was announced in 2025 – making an important step by one company - the initiative itself is only a fraction of what is needed, and the overall timeline remains too limited to meet urgent deployment needs.

4.4 Large-scale implementation and international role

Once the foundation is in place, with regulation, value chains and monetary support instruments, Finland must move quickly. Large scale investments to capture carbon, export it to geological storage sites internationally and policy changes in land-use sector should follow. Timing is critical. The gap between building the foundation and large-scale implementation must be short to have a chance to meet the 2035 climate neutrality target. Since the key hinderance of CDR deployment in Finland is the lack of geological storage, securing international storage capacity is essential. As a small country, Finland must stay ahead of EU regulation to ensure its specific needs are reflected - particularly regarding CDR methods like BECCS, the treatment of biomass feedstocks, and access to geological storage beyond its borders. At the same time, Finland should highlight its potential to contribute meaningfully to CDR.

4.4.1 Address the lack of investors and technology suppliers

A bottleneck identified by industry stakeholders in the field is the shortage of qualified contractors and technology suppliers capable of meeting the demanding requirements of CDR.

Key actions

- **Identify and attract potential investors and technology suppliers** to strengthen Finland's carbon removal ecosystem.
- **Leverage insights from previous green transition investments**, such as hydrogen plants and data centres to inform outreach and policy design in Finland.
- **Invest in Finnish start-ups** with the potential to close critical technology gaps through targeted funding and innovation programs.

Key stakeholders

- Regions and municipalities interested in positioning themselves as hubs for CDR innovation and deployment.
- Technology associations and companies interested in developing and scaling CDR solutions.
- Financial institutions and other private funding actors.
- The Ministry of Economic Affairs and Employment and the Ministry of Finance as responsible ministries for creating the policy environment for all kinds of green transition investments in Finland.
- Pool of providers and know how accessible in Nordic Countries.

Readiness: Low. Significant effort needed. To improve readiness, coordinated action is needed: targeted support for start-ups, strategic partnerships, workforce development, and alignment of regional and national efforts to foster innovation and scale deployment.

4.4.2 Value creation across the value chain

While Finland has abundant biomass and biogenic CO₂ resources, converting them into commercially viable products remains a significant challenge. This limits the effective use of biomass feedstocks and captured CO₂ in CDR methods such as biochar production or durable construction material. Moreover, CO₂ capture for permanent geological storage lacks a clear value proposition for stakeholders across the value chain, further hindering investment and deployment.

Key actions

- **Establish guaranteed pricing mechanisms** for CO₂ capturers, biochar producers, and other carbon removal stakeholders to ensure financial viability and market confidence.
-

- **Introduce feed-in tariffs or targeted technology subsidies** to support early-stage deployment and innovation in carbon removal solutions.
- **Include a financial group in the CDR coalition or ecosystem** to design funding instruments, de-risk investments, and align capital flows with deployment needs. Their involvement ensures bankability, market confidence, and faster scale-up of CDR.

Key stakeholders

- Industry actors who are either producing or using biogenic CO₂.
- Funding institutions such as public development, private banks, venture capital, private equity, European Investment Bank, European Investment Fund.
- Governmental bodies responsible for creating economic activities in new industries.

Readiness: Low. Significant effort needed. Initial steps toward building market incentives and value chains should include establishing a CDR coalition and ecosystem aligned with the national ambition outlined in section 4.2.1 and integrating economic analysis into the strategic research activities described in section 4.1.1.

4.4.3 Keep Finland in the European CDR map

The EU's CDR policy is crucial for Finland, as are bilateral agreements that enable geological storage of CO₂ captured in Finland. These are essential for reaching the country's CDR potential. To stay aligned with developments across Europe, Finland should strengthen its focus on EU policymaking and actively engage in CDR networks to remain at the forefront of progress.

Key activities

- **Increase participation in EU policy development and CDR-related networks**
- **Expand bilateral negotiations with countries that have significant geological storage capacity**, both existing and potential (e.g. Norway and Denmark)
- **Support EU-wide industry network** to foster collaboration and unlock business opportunities in carbon removal

Key stakeholders

- Finnish government officials.
- Seconded Finnish Experts in the European Commission, European Investment Bank, European Investment Fund.
- Finnish Commissioner.
- Members of the EU parliament.
- NGOs operating in Brussels.
- Business Finland representatives.

Readiness: Good. Finland is already actively engaging with EU institutions, including CDR specific workstreams. Improved coordination between country's representatives and government services was mentioned as one area of improvement to ensure Finland's voice is impactful.

5. Mobilising finance for the CDR transition

Broad national commitment to Finland’s CDR roadmap is essential to mobilise public support and unlock private financing, enabling priority actions to move forward at the necessary speed and scale.

While the Finnish government may face short-term budgetary constraints, there are significant opportunities to tailor and adapt existing funding programs and instruments for mobilising public, private, and blended finance at various stages of CDR technology development and deployment. Figure 3 highlights key public funding actors that can help shape credible financing solutions and catalyse private investment along the full CDR value chain.

Some of these funding actors were referenced in section 4.3 and 4.4., highlighting their potential role in various phases of CDR implementation (with the need for private finance mobilisation growing for each phase). By convening key stakeholders - including public funding agencies, private investors, impact investors, fund managers, technology providers - into a “funding ecosystem” specifically for CDR, it is possible to proactively bridge CDR specific funding gaps, help prepare funding pathways that enable rapid CDR scale-up that is crucially needed, if Finland is to reach its commitment to carbon neutrality by 2035.

FINANCIAL INSTRUMENTS: PILOTING AND SCALING-UP CDR-SOLUTIONS

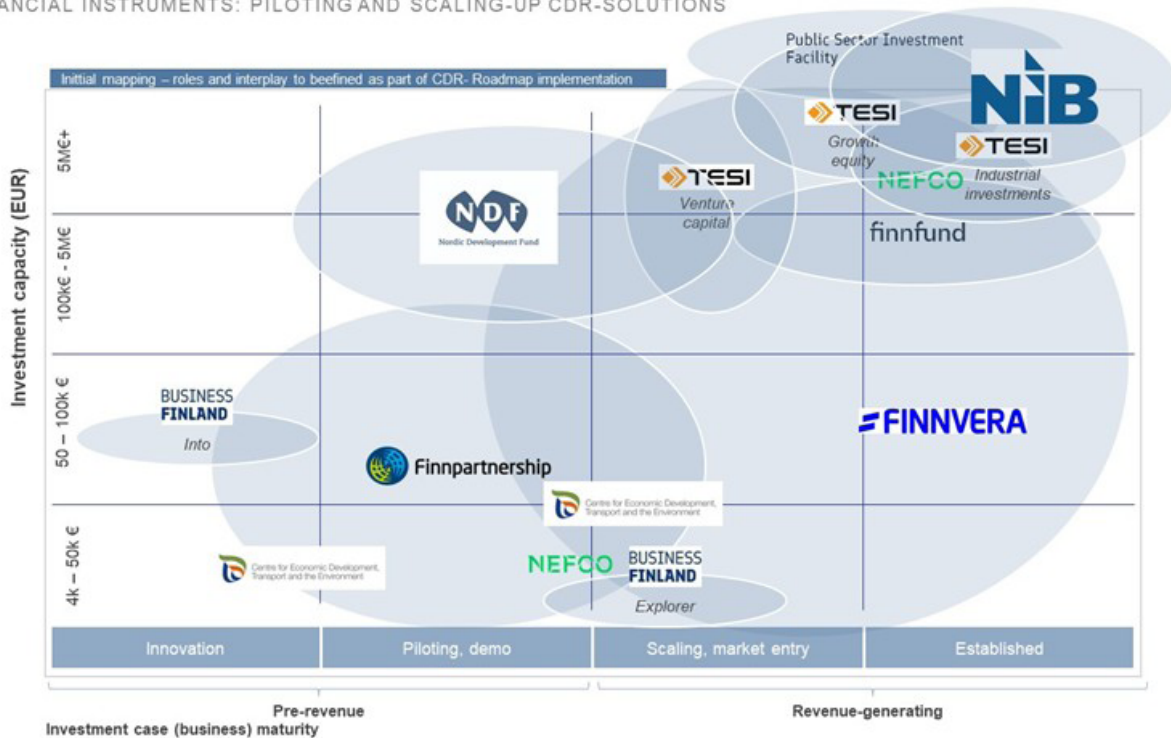


Figure 3. Public and semi-public funding bodies in Finland that the government can direct to actively support CDR deployment. These funding bodies can help pilot and scale CDR solutions by also mobilising private finance.

Finland has a rather limited but agile set of funding actors that can jointly create such an ecosystem, helping to develop and pilot promising CDR technologies as well as helping to upscale and access markets, also internationally. The stakeholders within this ecosystem know each other and have experiences in jointly building funding ecosystems on other national priority themes and technologies such as wind power and/or green hydrogen.⁴ E.g. while there seems to be sufficient finance available for early-stage technology development, there is a lack of finance for piloting and demonstrating CDR solutions, and in particular later-stage growth and scale capital domestically in Finland. It is likely that CDR solutions providers will within the next few years require large, patient capital rounds that Finnish venture capitalists and institutional investors rarely provide.

⁴ See e.g. Developing Finland’s SDG finance ecosystems.

What is now required is that the key funding actors are brought together to ensure that the Finnish finance ecosystem is also CDR aligned, i.e. there is a plan for ensuring finance solutions for priority CDR technologies, considering their technology readiness, scale-up potential, including international market potential. Integrating into this plan and optimally harnessing EU funding opportunities, EIB resources, EU funds and instruments (such as the Innovation Fund, InvestEU, The Connecting Europe Facility etc.) naturally will be instrumental, also in addressing some of the common major infrastructural challenges and scaling up CDR at required speed.

For certain CDR technologies, existing funding mechanisms within Finland's finance ecosystem may be sufficient. However, e.g. biomass providers may need grants or technical assistance to adapt agricultural and forestry practices, while other CDR technologies will require additional de-risking due to significant remaining technical risks

Key activities

- Key funding actors to be brought together to ensure that the Finnish finance ecosystem is also CDR aligned.
- Recognised and address funding gaps.
- Combine EU funding opportunities, EIB resources, EU funds and instruments into national budgetary funding with private sector funding instruments to establish the possible funding levels.
- Recognise and address funding gaps.



6. Conclusion

To unlock Finland's full CDR potential and achieve carbon neutrality by 2035, this roadmap outlined the following recommendations:

- **Build a solid foundation of research** where socio-economic research is integrated to evaluate the impacts of CDR on the national economy supported by cost-benefit analyses of different solutions to demonstrate societal gains. Efforts should also focus on prioritising promising but under-researched methods and on developing robust data and verification tools to ensure accurate measurement of removed carbon. Together, these actions will build the evidence base and strengthen decision-making.
- **Build political will** by equipping political parties with clear, evidence-based materials on CDR that emphasise both climate and economic benefits, while citizens and civil society are engaged through campaigns, events, and media to build a shared vision. Given Finland's relatively near-term 2035 carbon neutrality target—much earlier than many countries aiming for 2050 - it is especially critical that the public and policymakers understand the role of CDR now, rather than later. Communicating CDR as both a climate solution and an economic opportunity can reignite demand for ambitious policy, while raising awareness of its potential for industry, national climate targets, and wider societal gains will ensure broad support and drive coordinated action across society.
- **Prioritise strategic planning and targeted implementation** by forming a coalition of industry, stakeholders from climate organizations, the forest sector, carbon markets, and CO₂ infrastructure to coordinate CDR development, with potential leadership from networks such as Bioenergy ry or the Climate Leadership Coalition. Private forest owners should be engaged as central stakeholders and land-use implications, particularly around forest management, must be carefully considered to ensure sustainable deployment. In parallel, a national vision for CDR must be crafted in collaboration with government and policymakers, clearly defining industry needs, deployment targets, responsible actors, and the societal and economic benefits of large-scale implementation. Together, these steps will provide both the coordination and strategic direction needed to embed CDR into Finnish climate policy.
- **Scale up existing solutions** such as the Metso and Helmi programmes and expand voluntary forest conservation, increasing incentives for landowners. Outreach and funding for private forest owners should be intensified, with forest guidance and management services refocused on climate outcomes alongside economic value. Carbon sink metrics must be embedded into conservation agreements, forest associations equipped with stronger knowledge, and measures from the Land Use Sector Climate Plan (MISU) implemented to build a solid foundation for change.
- **Use early learning** to support further roll-out by ensuring the Ministry of Economic Affairs and Employment quickly implements planned investment support for BECCS, rapidly evaluates whether funding levels need to be increased, and undertakes a comprehensive assessment of infrastructure and logistics for CO₂ transport both within Finland and for potential export. These steps will guarantee sustainable deployment and allow Finland to build on pilot experiences to accelerate large-scale carbon removal.
- **Foster innovation and attract investments** by actively engaging with investors and technology suppliers, while leveraging lessons from past green transition investments such as hydrogen plants and data centres to shape outreach and policy. Direct targeted funding and innovation programs toward Finnish start-ups to close critical technology gaps and build a resilient CDR industry. Ensure financial viability by establishing guaranteed pricing mechanisms, feed-in tariffs, and technology subsidies, while integrating a financial group into the CDR coalition to boost market confidence.
- **Strengthen international collaboration** by expanding Finland's participation in EU policy development and CDR networks, deepening bilateral negotiations with countries offering geological storage capacity, and supporting EU-wide industry collaboration to unlock business opportunities and position Finland as a leader in carbon removal.

Achieving these goals will require coordinated, society-wide action. Roadmap activities must advance in parallel and evolve iteratively, with the first step being to unite CDR stakeholders around a shared national ambition and vision. This collective effort will lay the groundwork for the policy, financial, technical, and societal capabilities needed to turn potential into reality.

These recommendations are informed by a comprehensive background report, extensive stakeholder consultations and a dedicated workshop with more than 25 Finnish stakeholders. Together, these inputs highlight the urgency of accelerating CDR deployment and the importance of building on existing solutions while preparing for large-scale implementation.

By following this strategic path, Finland can accelerate the deployment of CDR technologies, strengthen international collaboration, and ensure that its carbon removal potential is fully realised within the next decade.



ABOUT

Carbon Gap

Carbon Gap was established to be Europe's first philanthropically funded environmental advocacy organisation, focusing exclusively on CDR. The mission is to ensure that Europe becomes a leader in developing and deploying CDR solutions at scale in a safe and equitable manner to preserve a stable climate. Carbon Gap is coordinating the delivery of the project that has produced this report.

www.carbongap.org

Sweco

Sweco is Europe's leading engineering and architecture consultancy. Sweco Finland's Strategic Sustainability Consultancy was responsible for this report.

<https://www.sweco.fi/>

CREDITS

Authors: Heini Vassinen, Riina Pursiainen, Mikko Halonen, Ulla Värre (Sweco Finland)

Lead reviewer: Sylvain Delerce (Carbon Gap)

Editor: Martina Massei (Carbon Gap)

Reviewers: Alexander Mäkelä (Carbon Gap)

Designer: Clotilde Besson

Cover photo: [Geranimo via Unsplash](#)

Report photo: [Mauro Fossati via Pexels](#)

Back cover: [Rino Adamo via Pexels](#)