

**Optimising Carbon Sequestration
Opportunities in Argyll & Bute, Work
Package 7.2**

Requirements for Highlands and Islands carbon market turn-key funding platform

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This report is part of a wider project led by Highlands and Islands Enterprise (HIENT) exploring nature-based carbon trading opportunities in Argyll & Bute. It focuses on the operational and governance requirements of a Special Purpose Vehicle to unlock those opportunities. To identify these requirements, we interviewed land managers, industry and stakeholders in the region to explore barriers to and opportunities for engagement; and leaders and participants in related projects in Scotland and around the world, to learn lessons. An SPV is a subsidiary company formed to undertake a specific activity.

Global and Scottish context

Section 2 of the report provides a summary of other work packages, and analysis of the carbon and economic context for this project.

Global economic interest in carbon is rising rapidly, driven by the Paris Agreement, and the commitment of financial markets to decarbonised investments. Recent publication of global guidance on land-based carbon accounting is likely to result in far more companies measuring their land-based supply chains, meaning **the economic opportunity from producing low-carbon food and materials is likely to rise**. Offset initiatives should not displace this potentially larger opportunity.

The voluntary carbon market provides an opportunity for companies or individuals to demonstrate climate action by funding activities to cut carbon, in place of carbon in their own supply chain which they cannot control – for example, due to the need for developments in technology or infrastructure on which they rely. At best, voluntary offsetting raises awareness, incentivises carbon accounting, and funds decarbonisation. At worst, it can ‘greenwash’ a lack of real climate action, and result in perverse outcomes. Certification schemes are providing confidence: both for offsets, to ensure they have positive impact; and for offsetters, to demonstrate that they are on a genuine journey to cut carbon. **The carbon trading market is likely to evolve and grow, as part of the wider carbon economy. Engaging with it now and building capacity will be good investment for the future as it becomes more diverse and complex.**

In Scotland, interest in low-carbon supply chains is already growing, but much land is too marginal to support intensive, high-value production. Carbon trading can provide one alternative income stream, if it complements rather than competes with production. Public subsidy for rural production is likely to reduce overall, although may be better focused to support transition to more profitable, low-carbon systems. The carbon economy – both offsetting and production – has been a significant factor in increasing land values, sometimes providing opportunities for farms to raise investment capital by selling poorer land; or sometimes creating significant land use change threatening the viability of the existing rural economy.

The natural capital of Argyll & Bute is unique in the UK. Its multiple islands and lochs host rare and important ecosystems, although they create challenges for transport and communication. Its soil and climate are poorly suited to agriculture: historically areas were cultivated to provide food for inhabitants, but most farming in the region is now livestock on permanent pasture. The region produces between a quarter and a third of Scotland’s timber. Large areas of the region are semi-natural ecosystems, including important marine and Atlantic rainforest habitats.

It is difficult to find comparative figures to understand the place of rural businesses in the wider economy of the region. However, employment figures imply that farming contributes more to the region’s economy than its low profitability would suggest. **A high proportion of farming income is spent in the region**, in contrast to other businesses which are often owned elsewhere. **Forestry, by contrast, is a profitable and important**

component of a low-carbon economy, but little of the wealth it creates stays within the region.

Carbon is already traded in Argyll & Bute. UK offsets generally command a considerable premium over global alternatives as they provide an attractive carbon narrative for UK companies. It might seem likely that, due to the limited supply of UK carbon credits, their price might rise significantly as demand increases. However, as long as it remains a voluntary market, this is unlikely. If the price rises too high, companies will buy less carbon in the UK and more from cheaper global projects, or will use non-offsetting narrative to tell a strong carbon story. **Carbon trading is likely to remain a useful component in land management, but is unlikely to provide a sufficient income stream on its own.**

Industries in the region produce a range of valuable commodities and services, including whisky, salmon, timber, meat, dairy, energy, tourism, and aggregates. These support employment, and are largely exported, bringing wealth into the region. However, **opportunities for economic growth are missed due to the limited level of value added to products in the region.** The strength of the whisky industry in this regard is the exception proving the rule. **As part of a holistic strategy for low-carbon economic growth in the region, it is vital that carbon trading supports, rather than detracts, from investing in higher-value low carbon production.**

Business stakeholders in Argyll & Bute

Previous work packages engaged with community, environment, scientific, and public sector stakeholders. This report adds the voices of business stakeholders, including land managers, industry, and professional advisors, analysed in section 3.

We interviewed representatives of farming, forestry, sawmilling, distilling, salmon farming, haulage, accountancy and architecture. We asked about their experiences of carbon accounting and management, and their interest in carbon trading.

Carbon management is now an important part of industrial business management. The approach of COP26 in Glasgow was a key moment for many to get involved, and since 2019 when knowledge and activity have escalated. **Many industries employ dedicated carbon or sustainability professionals, who are an important resource of knowledge and applied experience. Common carbon challenges emerged across industries,** such as road and sea haulage, renewable energy generation and hydrogen, use of waste heat, organic wastes, and the shortage of low carbon affordable housing. However, none of the industries we spoke to had yet engaged significantly with others, or with the public sector, on tackling carbon challenges. **None of the industries we interviewed were interested in buying carbon offsets.** They were more interested in reducing the carbon footprint of their supply chain, and making impactful internal investments in the region to help deliver this, along with other natural capital interests such as water or biodiversity.

Farms in the region are undertaking carbon audits, although there is relatively low engagement with the process: family farms have been presented with it as a 'tick box exercise', while owners of land farmed by a contractor or tenant may not have considered carbon at all. **There is some interest in generating and trading carbon, as a diversified income stream.** However, there was a limited understanding of the process, how to find information, or assess the significance of perceived risks. **There was concern amongst forestry and farming stakeholders that offsetting would tie up land which would be better used for production.**

Professional advisors have greatly increased their understanding of carbon over the past few years. This is, in itself, likely to feed in to more and better carbon projects going forward as they provide advice to land managers. Professionals are also bringing to light systemic barriers to delivering the carbon economy in practice, such as the lack of clarity on taxation, or the over-specification of timber in construction. **Their reflective practical experience makes professionals an increasingly valuable source of information for policymakers in unlocking carbon opportunities.**

Case studies: special purpose vehicles to unlock the carbon economy

We interviewed individuals leading or participating in a range of carbon related projects, around the world and in Scotland, summarised in section 4. These included the American Family Forests Carbon Scheme, New Generation Plantations global carbon projects, the Nestlé LENs South Scotland dairy scheme, the COP26 House, and Meanwhile Homes. We have also included the example of CivTech, based on existing knowledge of the programme.

These case studies demonstrate the wide diversity of ways in which carbon can be stored in a landscape, and how environmental and business benefit can be aligned. This stands in contrast to some of the criticism of carbon discourse in the UK, that 'offsets' can displace production, and damage communities and local economies. In contrast to most carbon trading companies in the UK, a feature of these organisations is that **land managers are rewarded for carbon benefit through enhanced business income, not through a contract.** Carbon projects result in more profitable farm or forest businesses, enabling business owners not only to maintain the carbon store but to make further investment in the low-carbon economy beyond the original intervention.

Another key feature of the case studies is that **capacity building for the carbon economy is integral to every stage of the process.** Land managers or local businesses bring their knowledge of the environment, community, and farming/forestry systems to co-design projects. During the process, they gain carbon management and business development skills. Staged competitions to identify project developers means that many more are upskilled than the one which wins the final bid.

Digital innovation is a key tool in these projects, to restructure traditional processes to measure and maximise carbon benefit, and make best use of the skillsets and demographics of the modern workforce.

Proposals

Section 5 of the report outlines proposals for turn-key activities to unlock carbon investment in Argyll & Bute.

Developing knowledge and capacity is an important first step. While industry and the professions are rapidly increasing their knowledge of the carbon economy, other stakeholders including land managers are unsure how to access authoritative information, what terminology means, or how to assess risks and opportunities in the context of their wider business. We recommend developing expertise amongst policymakers, funding access to professional advice for land managers, and harnessing the growing expertise of local industries. An Argyll & Bute Carbon Economy Yearbook, synthesising statistical, scientific, policy and market information, could be a vital tool for businesses and policymakers. It is also important to engage businesses in co-design of low-carbon production systems, to ensure that proposals are developed on the basis of practical knowledge of agriculture, forestry and aquaculture in the region.

Establish an Argyll & Bute carbon scheme. We recommend the carbon scheme should start with a simple aim: to work with farmers and landowners to develop woodland and

peatland carbon projects. We recommend it be delivered by a private sector provider with existing skills in this field. It is proposed that, instead of land managers being paid directly for offsets, and tied into a contract, they are paid through a premium on their farm product, enabling carbon and production benefit to be integrated. Carbon would be marketed outside the region as a high-integrity offset, to bring in investment. The stakeholder group developed through this project will be essential for ensuring the strong design of projects and facilitating their implementation. Public or private sector backing to guarantee a market for carbon offsets will be a key to de-risking the scheme.

Develop an Argyll & Bute Challenge Fund. While trading carbon through existing codes can unlock some economic potential in the short term, this will be limited, and a narrow focus could have unintended negative consequences for the wider economy. A challenge fund can provide the opportunity to begin a staged development of the wide range of other opportunities: accessing new carbon codes as they are developed, generating inward investment from industry, adding value to production, investing in research and development, tackling low-carbon infrastructure challenges, or developing and trading innovative carbon offset opportunities. It is recommended that the starting point for this project is to bring together engaged industry stakeholders, along with representatives of relevant case studies, to share expertise and develop proposals.

Table of Contents

Executive summary	1
Global and Scottish context	2
Business stakeholders in Argyll & Bute.....	3
Case studies: special purpose vehicles to unlock the carbon economy.....	4
Proposals	4
1. Introduction.....	8
1.1 The brief.....	8
1.2 Galbraith	8
2. Context.....	10
2.1 Developments in the carbon market.....	10
2.1.1 Global: The IPCC and the Paris Agreement.....	10
2.1.2 Scotland’s Climate Act	10
2.1.3 The response of global business.....	10
2.1.4 Development of the carbon offset market	11
2.2 Economic context	12
2.2.1 Commodity markets.....	13
2.2.2 Carbon within commodity markets	13
2.2.3 Government support payments.....	13
2.2.4 Land values.....	14
2.3 Summary of previous work packages	14
2.3.1 Work package 1 – natural carbon stores and current market activity	14
2.3.2 Work package 2 – stakeholder engagement	14
2.3.3 Work package 3 – carbon trading technical potential	14

2.3.4 Work package 4 – carbon trading economic potential	15
2.3.5 Work package 5 – business model	15
2.3.6 Work package 6 – pilot projects	15
2.3.7 Work package 7.1 – Review of process	15
2.3.8 Work package 7.2 – creation of a natural capital investment vehicle	16
2.4 Natural capital and economy of Argyll & Bute	16
2.4.1 Natural Capital	16
.....	20
2.4.2 Economy and society	20
3. Stakeholders.....	24
3.1 Stakeholders interviewed.....	24
3.1.1 Land	24
3.1.2 Industry	24
3.1.3 Professional	24
3.2 Existing carbon activity	24
3.2.1 Auditing.....	24
3.2.2 Managing.....	25
3.2.3 Offset trading	25
3.2.4 Other interventions	25
3.2.5 Synthesis with wider business resilience	25
3.3 Carbon ambitions	25
3.3.1 Low carbon production	25
3.3.2 Low carbon infrastructure	25
3.3.3 Climate resilient environment.....	25
3.3.4 Thriving economy and workforce	26
3.4 Barriers to offsetting	26
3.4.1 Knowledge	26
3.4.2 Technical	26
3.4.3 Policy & governance.....	26
3.4.4 Ideological	27
3.4.5 Financial	27
4. Case studies	29
4.1. Case studies	29
4.1.1. American Family Forests	29
4.1.2. New Generation Plantations	29
4.1.3. Nestlé LENS	30
4.1.4. COP26 House	30
4.1.5. Meanwhile Homes	31

4.1.6 CivTech	31
4.2. Solutions for Argyll & Bute	32
4.2.1 Carbon storage in working landscapes	32
4.2.2. An intermediary body	32
4.2.3 Economic development	32
4.2.4 Capacity building	33
4.2.5 Digital innovation.....	33
5. Proposals	35
5.1 Knowledge and capacity	35
5.1.1 Understanding the carbon economy	35
5.1.2 Awareness of carbon opportunities.....	36
5.1.3 Knowledge about farming and forestry	36
5.1.4 Statistical information	37
5.2 An Argyll & Bute Carbon Scheme	38
5.2.1 Ground level: start simple.....	38
5.2.2 Farm level: a carbon premium.....	39
5.2.3 Regional level: owning the carbon.....	41
5.2.4 Out in the market: Selling Argyll & Bute Carbon	42
5.2.5 Governance.....	43
5.2.6 Carbon credits must not compete with conservation	43
5.2.7 Farming is a fragile industry: carbon could support or demolish it.....	44
5.3 An Argyll & Bute Challenge Fund	44
5.3.1 Taking carbon to the next stage	44
5.3.2 Investment for a challenge fund	45
5.3.3 Regional Industry is key to low-carbon growth, but not as offset buyers	46
5.3.4 Forestry is a valuable industry, but not adding enough value.....	46
5.3.5 Sustainable businesses.....	47
6. Conclusion.....	48
6.1 Assess the range of barriers preventing organisations engaging in carbon trading	48
6.2 Provide successful global examples of Special Purpose Vehicles in the carbon or nature-based solutions context and highlight lessons for HIE.	48
6.3 Identify the operational and governance requirements of a Special Purpose Vehicles, embedded within HIE’s priorities, or relating to that remit, that could source and fund turn-key activities	49
6.3.1 R&D to catalyse the carbon market in a responsible manner	49
6.3.2 Marketing of Argyll & Bute’s carbon trading potential in the context of the best use of land that balances economic, social and environmental objectives, with a view to informing the wider H&I region	49

6.3.3 Providing a conduit for green investments, primarily in the carbon market where there are mechanisms to transact ecosystem services	49
6.3.4 Providing a hub to attract, aggregate and manage investments in line with HIE's economic priorities and mission, noting due to the scale and size of businesses, social enterprises and organisations in Argyll, the supply of potential carbon will be provided by a large number of small volumes of carbon	49
6.3.5 Blending public and private finance to achieve those goals.	49

1. Introduction

1.1 The brief

This report has been produced by Galbraith for Highlands and Islands Enterprise.

The report forms part of a larger project to, in the words of the project brief, 'quantify the carbon sequestration potential of Argyll & Bute's natural resources and provide a vision and methodology for carbon sequestration to underpin the local economy, its replicability to the wider region, and to support green recovery plus articulate the potential of the area to attract green financial investment and understand its scale of impact'.

This report is the output of work package 7.2: Assess requirements for a Highlands and Islands carbon market turn-key funding platform. The other work is summarised in section 2.3 below.

The project 'seeks to articulate the scale of the opportunity for the area to attract green financial investment and scale of the return that this could deliver for the benefit of private and community organisations with land or marine assets in dealing with investors seeking to use sequestered carbon as a means to offset commercial activity'

The work tasks covered in this report comprise:

1. Assess the range of barriers preventing organisations engaging in carbon trading ([Section 3](#))
2. Provide 3 to 4 successful global examples of Special Purpose Vehicles in the carbon or nature-based solutions context and highlight lessons for HIE. ([Section 4](#))
3. Identify the operational and governance requirements of a Special Purpose Vehicle, embedded within HIE's priorities, or relating to that remit, that could source and fund turn-key activities, such as:
 - R&D
 - Marketing of carbon trading potential in the context of the best use of land
 - Provide a conduit for wider green investments
 - Hub to aggregate carbon
 - Blending public and private finance ([Section 5](#)).

1.2 Galbraith

Galbraith are a leading independent property consultancy with expertise covering a broad spectrum of services including sales and lettings, rural management, forestry and carbon, commercial property, renewables and utilities, leisure, and building consultancy. We have offices throughout Scotland and the north of England, with a geographic reach extending throughout the UK. Our work in rural property puts us at the sharp end of low-carbon challenges faced by agriculture, rural properties, transport and communities; and at the

forefront of development of nature-based carbon solutions around forestry, renewable energy, peatland restoration and regenerative agriculture.

This report is confidential to the party to whom it is addressed and for the purpose set out in the report. No responsibility is accepted to any third party. Neither the whole of the report, nor any part, nor reference thereto may be published in any document, statement or circular, nor in any communication with third parties without our prior written approval of the form and context in which it will appear.

2. Context

2.1 Developments in the carbon market

2.1.1 Global: The IPCC and the Paris Agreement

The International Panel on Climate Change (IPCC) provide a global synthesis of the scientific evidence on climate change, impact, and mitigation pathways. Their reports show that global temperature rise must be kept below 2°C to avoid major impacts, preferably at or below 1.5°C. To achieve 1.5°C, total global carbon emissions must be cut by 43% by 2030, and 84% by 2050.¹ It will also require carbon sequestration of residual emissions through natural and geological carbon sinks.

The 2015 Paris Agreement is a legally binding international treaty which commits the countries of the world to limiting global warming to the IPCC recommended limits: well below 2°C, preferably to 1.5°C. To deliver this, countries aim to reach global peaking of greenhouse gas emissions as soon as possible, and global net zero by 2050.² Parties to the Paris Agreement, of which the UK is one, must report on targets and progress at the annual Conference of Parties (COP) summits.

2.1.2 Scotland's Climate Act

The Climate Change (Scotland) Act of 2009 set a net zero target date of 2050. In 2019, this was brought forward to 2045, with interim targets of 56% reduction by 2020, and 75% by 2030. While electricity has been substantially decarbonised, there is slow progress in other sectors. The Climate Change Committee advise that there is an urgent need to scale up action on key areas including travel demand, heat in buildings, and agriculture to avoid undermining the credibility of Scottish climate policy.³

The Scottish Climate Change Plan 2018-2032 sets targets for woodland creation increasing from 12,000 to 18,000 hectares per year, and growth in the woodland carbon market. Degrading peatland is a significant source of carbon emissions in Scotland, and the plan notes that peatland restoration target of 20,000 hectares per year will need to be far higher to deliver emissions reduction targets.

2.1.3 The response of global business

A key lever for delivering net zero comes, not from governments, but from the commitment of financial markets to decarbonised investments. The Glasgow Financial Alliance for Net-Zero (GFANZ) was launched in 2021 at the COP26 summit in Glasgow. Chaired by former Governor of the Bank of England Mark Carney, GFANZ includes 450 international financial firms who have committed to align their lending and investing with net-zero goals. This will be achieved through sectoral pathways and transition plans agreed with NGOs, governments and businesses.

This intervention will cascade action throughout the economy. For example, supermarkets required by their investors to decarbonise, will in turn require the same of the farms which supply them. Similarly construction companies will require decarbonised materials like timber, steel and concrete.

Supply chain impacts are already felt, with more and more businesses being asked to measure emissions and set reduction targets. There has been significant increase in 'carbon literacy' throughout the business community, evident in our stakeholder interviews ([3.1.2 below](#)). Investment in decarbonised supply chains provides a significant opportunity

¹ Sixth Assessment Report: Climate Change 2022: mitigation of climate change, Summary for policymakers, IPCC 2022.

² The Paris Agreement. United Nations Climate Change website, accessed 12.10.22.

³ Progress in reducing emissions in Scotland, 2021 Report to Parliament. Climate Change Committee.

for economic development in primary production for example of milk, meat, timber, or marine products. On the other hand, there is a risk that, as low-carbon supply chains evolve quickly, more fragile economic sectors without access to information, finance and skills may be unable to adapt. There may be opportunity to combine net-zero supply chain and offset investment.

Measuring carbon in land-based enterprises such as farming and forestry and their supply chains is more difficult than in other sectors where it is largely a case of calculating fossil fuel use. Factors to be taken into account include the complex climate impact of methane from ruminant animals, emissions from soil or vegetation caused by land use change, and carbon sequestration in soil, trees, and long-lived organic products such as timber in houses. While calculators have been available, robust global guidance has been slow to develop, as the science behind the carbon balance is understood.

This is now changing. In September 2022, the Science Based Target initiative (SBTi) launched its Forest Land and Agriculture (FLAG) guidance. This means businesses with land-based production in their supply chain will, for the first time, be required to measure and report it to meet SBTi standards. In the same month, the Greenhouse Gas Protocol, the global body which sets standards for carbon accounting, launched the pilot version of its Land Sector and Removals Guidance, providing a robust framework for producing these accounts. These two developments mean that, in coming years, far more attention will be paid to land use practices, and the embodied carbon in products such as milk, meat and timber.

2.1.4 Development of the carbon offset market

The idea of carbon offsetting – financing an ‘easy win’ for decarbonisation to compensate for a ‘hard to reduce’ emission – is over thirty years old. A company – or an individual – can control some of their carbon emissions, for example by installing insulation or investing in electric cars. Other emissions, such as the manufacturing process of the car – are reliant on development by others which it can only partly influence. While waiting for these, to avoid complacency, they can fund activities to cut an equivalent amount of carbon outside their own supply chain. This mechanism is central to the carbon ‘cap and trade’ schemes set up under the 1997 Kyoto Protocol and subsequent climate agreements, and an important lever for accelerating climate action. These ‘compliance’ carbon markets, such as the EU Emissions Trading Scheme, aim for progressive reduction of emissions while funding clean development.

While compliance markets cover the biggest emitters, for the wider economy the voluntary carbon market provides an alternative. This enables payment to be made to offset residual emissions and make a ‘carbon neutral’ claim. Originally aimed at environmentally-conscious individuals, it was popularised by major global brands around 2006-2007, and has since focused on the business market.

The voluntary carbon market grew by almost 150% between 2017 and 2019. Globally, there are over 1 billion carbon credits for sale, of which around a third of these have been purchased and used. Just under 1% of global carbon emissions are currently offset. Offsets are not just about sequestration: renewable energy generation, energy efficiency improvements, and land-based carbon sequestration are the three most common offset programmes.

Voluntary carbon trading has provided a valuable mechanism for awareness raising, incentivising carbon accounting, and providing funding for climate change mitigation projects. However, they have been open to criticism on four main fronts:

1. They are a poor substitute for cutting emissions at source.
2. Planting trees (part of the global 'short carbon cycle') does not truly mitigate fossil fuel emissions (affecting the 'long carbon cycle').
3. Voluntary offsets are essentially PR, meaning their credibility comes from the presentation of the message, not the robustness of the climate action.
4. Offsetting can increase inequality if powerful offset buyers take over land, or poorly-designed schemes have negative environmental and social consequences.

Robust global certification schemes such as VCS and Gold Standard have been developed to ensure carbon credits do represent genuine carbon benefit and avoid negative social and environmental impacts. The UK Woodland Carbon Code has global accreditation through the ICROA programme.⁴ These schemes only certify the offset, not the way it is used by the company.

Certification schemes have also developed for companies seeking to make robust carbon claims, which cover how they set targets for emissions reduction, what kind of offsets they can use, and what claims they can make about them. The BSI PAS 2060 Carbon Neutral Standard, launched in 2009, specifies that a company must measure emissions, develop a target-driven plan for reductions, purchase carbon offsets from a PAS 60 approved scheme, and publish their documentation. This allows a company to claim to be 'carbon neutral'.

More recently, SBTi launched their more rigorous Net Zero standard. It includes the condition 'no net-zero claims until long-term targets are met'. Up until that point, purchased carbon credits are not 'offsets', but 'beyond value-chain mitigation'. The company can publish their compliance with the Net Zero Standard, but not claim they are 'net zero' or 'carbon neutral' until they meet ambitious reduction targets of up to 95%.

How will carbon markets change in future? Some predict that offsets will grow and grow, driven by increasing numbers of companies aiming to offset emissions from a limited area of land, and perhaps with voluntary offsetting becoming mandatory, or effectively mandatory, for example if it becomes required by investors or an industry standard. Others point to the accusations of 'greenwash' around carbon neutral claims, and see the voluntary carbon market as a bubble that could burst as companies focus on low-carbon supply chains. Another possibility, given the number of 'unpurchased' carbon offsets, is that as more carbon sellers register an increasing diversity of schemes, they could outpace demand for offsets.

The rise of increasingly robust standards which do incorporate offsetting or 'beyond value-chain mitigation', suggest that carbon trading is more likely to 'grow up' than to 'blow up'. Carbon offsets seem set to remain in demand, with codes for accreditation and platforms for development continuing to diversify and develop in sophistication. In October 2022, for example, the London Stock Exchange launched its own voluntary carbon market, enabling carbon project developers to sell shares which return dividends in either cash or carbon credits. In the same month, the Climate Change Committee published its review of voluntary carbon markets and offsetting in the UK, highlighting many of the considerations considered here. This suggests that building capacity in the carbon market in its present form, will be a good investment for the future.

2.2 Economic context

Carbon offsets cannot be considered in isolation. A range of other factors including commodity prices, supply chain carbon, government subsidy regimes, and land values, affect how land is managed. While it is not the place of this report to provide complete

⁴ International Carbon Reduction Offset Alliance

analysis of these, it is important to be aware of them when considering the role carbon offsets can play.

2.2.1 Commodity markets

Strong farm- and forest-gate prices give increased focus to production. For example, timber prices rose as people embarked on building projects when Covid restrictions eased, while wheat prices strengthened following the Russian invasion of Ukraine. Commodity markets are subject to a wide range of factors and are volatile – for example in 2022 Storm Arwen, availability of imports, and the downturn in construction caused a significant dip in timber demand. Whereas arable farms can respond relatively quickly to fluctuations in demand by varying rotations, forestry and livestock farms are more exposed to price fluctuations.

Over time, it is likely that commodity prices will increase. Global development means that more people are able to afford meat in their diets and good-quality housing, increasing demand for commodities. Major climate impacts – such as the recent flooding in Pakistan – are increasingly likely to disrupt global food supply. Environmental constraints, such as the high priority for zero-deforestation supply chains in carbon reporting,⁵ limit the global area of land available for production. The demand for more renewable resources, such as timber and biofuel to replace cement and oil, put additional pressure on land. In time, innovations such as vertical farming may break some of these geographical limits, but these have a long way to develop. The ability of the Argyll & Bute region to produce low-carbon, high-quality meat, milk, timber, seafood, and other commodities, is likely to be of increasing economic importance.

2.2.2 Carbon within commodity markets

Input costs of nitrogen fertilizer, diesel, and feed, have also increased, limiting profitability. While the reasons for this are due to a range of global factors, these are also trends we can expect to see on the path to a net-zero world. For resilient businesses, this can be an opportunity to drive change and innovation, switching to lower-carbon methods. However, more fragile businesses which cannot adapt may be forced out of production by such costs. Initiatives are already developing to help businesses keep ahead of the rising cost of carbon, for example through government-supported carbon auditing and funding, and supply-chain projects like the Nestlé LENS programme (4.1.3 below). In some cases, land use change may represent the best economic and carbon outcome, whether to a different form of production (such as from livestock to timber), or from production to conservation (such as from grazing to peatland restoration). There is a risk that, without intervention, this will occur in ways which are detrimental to environmental or social outcomes. Managing carbon offsets may provide one lever to facilitate more just transition, for example by facilitating diversification to increase profitability and avert whole-farm land use change.

2.2.3 Government support payments

The Scottish Climate Change Plan commits to rural support payments which support, and are contingent on, a transition to low carbon farming. This will include advice, investment into new farming methods and equipment, and support for land use change where appropriate. While the details of Scottish agriculture policy remain unclear, it is unlikely that this broad direction will change. It is also likely that overall public funding for agriculture will reduce.

At best, public funding for agriculture could evolve from a one-stop support payment to a lever which unlocks and channels private income streams, whether through increased

⁵ Land Sector and Removals Guidance, Draft for pilot testing and review, GHG Protocol, 2022.

productivity or diversification into carbon and other benefits. However, there is also a risk that it competes with private funding, or adds extra layers of complexity to an already increasingly complicated farm business picture.

2.2.4 Land values

Land values, particularly of more marginal agricultural land such as hill ground, have increased significantly in recent years. This is partly driven by rising timber prices, partly by carbon offsetting, and partly by a more intangible sense that land is a good investment, whether as a secure asset, or as an opportunity to develop rewilding or other environmental projects which may in future attract income streams such as Biodiversity Net Gain.

For an individual farmer, this can be an opportunity to transform low-value ground into a valuable windfall through a land sale. However, for farming landscapes, too many sales resulting in land use change can threaten the viability of the remaining holdings.

2.3 Summary of previous work packages

2.3.1 Work package 1 – natural carbon stores and current market activity

Assess and analyse the natural capital and current activity within A&B to establish a baseline for the natural carbon stores and the current market for carbon sequestration

An assessment conducted by SAMS Enterprise confirmed the rich potential of terrestrial and marine carbon stocks. Carbon benefit can be monetised both through new carbon capture and storage in ecosystems, and through protecting existing carbon stocks from loss.

Two existing mechanisms exist. The Woodland Carbon Code (WCC) provides verified carbon capture through new woodland creation. The Peatland Code (PC) rewards protection of vulnerable carbon stored in deep peat, through restoration to prevent erosion. Carbon investment is facilitated through government grant funding covering the capital cost of projects: woodland creation grants through Scottish Forestry, and peatland restoration grants through Peatland Action. The grant and code providers collaborate to align monitoring, reporting and verification between public sector officers and independent auditors, to ensure high-integrity carbon projects.

Projects are increasing in number. Since the WP1 report was published, the number of WCC projects in Argyll & Bute has increased from 34 in development and 11 validated, to 37 in development and 14 validated. The number of PC projects has increased from 3 in development and 0 validated, to 10 in development and 0 validated. The lack of PC validations is explained by the newness of the scheme: this number is likely to rise soon.

2.3.2 Work package 2 – stakeholder engagement

Establishment of a steering group led by HIE to engage with local stakeholders –public, private and community to identify a range of potential opportunities for carbon sequestration across A&B.

This work package is being delivered by Imani. Stakeholders from the public sector, environmental, and farming communities came together at an engagement day in Oban on 4 October. Through our work package, we have engaged in addition with a number of business stakeholders who it is hoped can add value to this network going forward.

2.3.3 Work package 3 – carbon trading technical potential

Expert review to establish the technically viable opportunities for carbon sequestration in the Argyll and Bute in the context of the existing Woodland

Carbon Code and Peatland Code, and to identify any approaches under consideration for the development of soil and marine codes.

This was delivered in conjunction with WP1 by SAMS Enterprise.

Restoring all eroding peatland in Argyll & Bute is calculated to have potential carbon benefit of 164 kilotonnes of carbon dioxide equivalent per year. The potential of woodland creation depends on the area afforested.

Hedgerow, soil, and saltmarsh carbon codes are in development which may provide additional opportunities in future.

The report explores the current state of science around the marine environment (blue carbon). The report notes that carbon benefits of seagrass, seaweed and shellfish are potentially significant, but more research and development is required to understand the complex dynamics of these carbon stores in a UK context, before carbon trading can be developed.

2.3.4 Work package 4 – carbon trading economic potential

Using the material gathered from the technical scoping work, an economic exercise will be undertaken to quantify the potential value of A&B's carbon sequestration capacity, how this is predicted to grow, and what impact it could have on the economy of A&B.

This work package, being delivered by Ekosgen, is testing scenarios at different levels of ambition to determine the potential carbon credit revenue and potential jobs created over the life of the projects. These include different levels of peatland restoration and woodland creation at different carbon prices. Early results suggest carbon values range from £8.7 million to £3,224 million over the life of the project, although the wider economic implications of these scenarios are still under consideration.

2.3.5 Work package 5 – business model

Development of a proof-of-concept business model which will enable landowners to meet market demand for carbon sequestration while also generating long-term social and environmental benefits for local communities.

This work package, being delivered by Azets, suggests that there are challenges for developing a facilitation agency for carbon trading, as the payback time for a carbon project increases to 27+ years, compared with 15-25 years for directly selling carbon offsets from the projects. It is not clear whether this accounts for existing government capital grants for woodland and peatland projects.

2.3.6 Work package 6 – pilot projects

The development and delivery of three pilot projects to test this proof-of-concept plan, providing opportunities for assessment and revision

This project, being delivered by Ekosgen, is developing facilitation for carbon projects, including farm-based and community-led schemes.

2.3.7 Work package 7.1 – Review of process

Review of this process, with the intention to establish a working model which can be adapted for use across the UK.

This work package is being delivered by Ekosgen, facilitated through the stakeholder day on 4 October. This work package is being completed in parallel with 7.2 as other pieces of work are finalised.

2.3.8 Work package 7.2 – creation of a natural capital investment vehicle

Investigate the potential to create a national capital investment vehicle, and the identification of key stakeholders, to support this programme of work.

The full brief for this work package, undertaken by Galbraith, is summarised at the head of this report. Co-ordinating with other work packages has been a challenge, as our involvement commenced at a late stage, and with many work packages reporting at the same time, we are unable to build on their work. We are grateful to the leaders of other work packages for their sharing of information and clarification of key questions through the process.

This report therefore stands alongside, rather than at the culmination of, the other work. We were encouraged to use this work package to bring a business perspective to the project. Through our own networks, including farming, timber, industry and tourism, we have been able to bring new voices into the conversation on how carbon investment can underpin the regional economy.

2.4 Natural capital and economy of Argyll & Bute

2.4.1 Natural Capital

The natural capital of Argyll and Bute is unique, and shapes its society and economy in distinct ways. It is the second largest local authority in Scotland, an archipelago of over 30 significant islands and divided by over 40 sea and freshwater lochs (*Figure 1*). Its towns, such as Helensburgh, Dunoon, Oban, Campbeltown, and Tobermory, vary greatly in character from satellites of Glasgow, to some of the remotest communities in the UK. In many places, journey times to Ireland are shorter than to the rest of Scotland.



Figure 1 Argyll & Bute. Contains OS data © Crown copyright and database right 2022.

The wet maritime climate, and a water-rich topography (*figure 2*), give Argyll & Bute a distinctive ecology. Maritime, coastal, freshwater, forest and bog habitats are abundant. Their carbon storage potential is explored as part of this project in the report on Work Package 1 and 3.



Figure 2 Water on Argyll & Bute. Contains OS data © Crown copyright and database right 2022.

Over half the soil in the region is carbon-rich peaty gleys and podzols, or deep peat (*Figure 3*). Deep peat in degrading condition is a priority for restoration and carbon benefit can be traded through the Peatland Code. Shallower peat soils like gleys and podzols cannot be used for Peatland Code projects, but may be suitable for afforestation, if trees are likely to establish fast enough to counterbalance any loss of soil carbon. This trade-off can be calculated through the Woodland Carbon Code. Existing woodland on peat soils is usually a net carbon sink, but requires care in management to avoid soil erosion. Mineral soils, are likely to be the best sites for both farming and forestry: decisions about the best use of this scarce resource are complex.

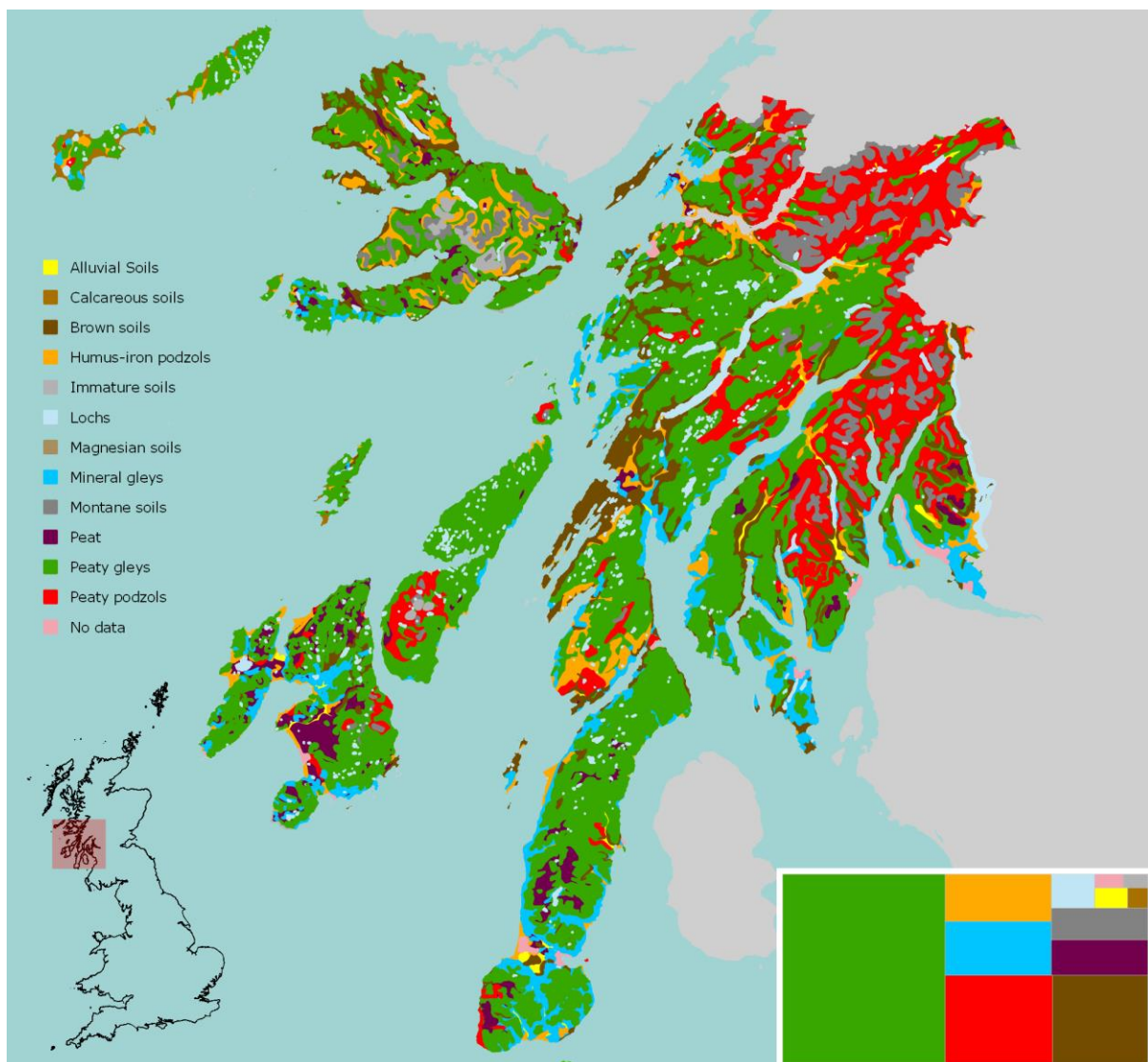


Figure 3 Major soil types in Argyll & Bute. Soil maps of Scotland at a scale of 1:250 000 copyright and database right The James Hutton Institute 2014-03-31. Soil Survey of Scotland Staff (1981). Soil maps of Scotland at a scale of 1:250 000. Macaulay Institute for Soil Research, Aberdeen. DOI: 10.5281/zenodo.4646891. Contains public sector information licensed under the Open Government License v2.0 | Contains OS data © Crown copyright and database right 2022. Soil types are shown across the map and (bottom right) as proportions of the whole area.

Figure 4 shows habitat types across the Argyll & Bute area. This is striking for its diversity of semi-natural habitats, with extensive areas of grassland, woodland, bog and heather (heathland), and very little arable or developed land.

Carbon benefit can be delivered either by switching from one habitat type to another (for example, from grassland to woodland) or by restoring the condition of habitats (for example peatland). As our knowledge of carbon management in natural habitats grows, it is likely that more diverse opportunities will arise for monetising carbon benefit.

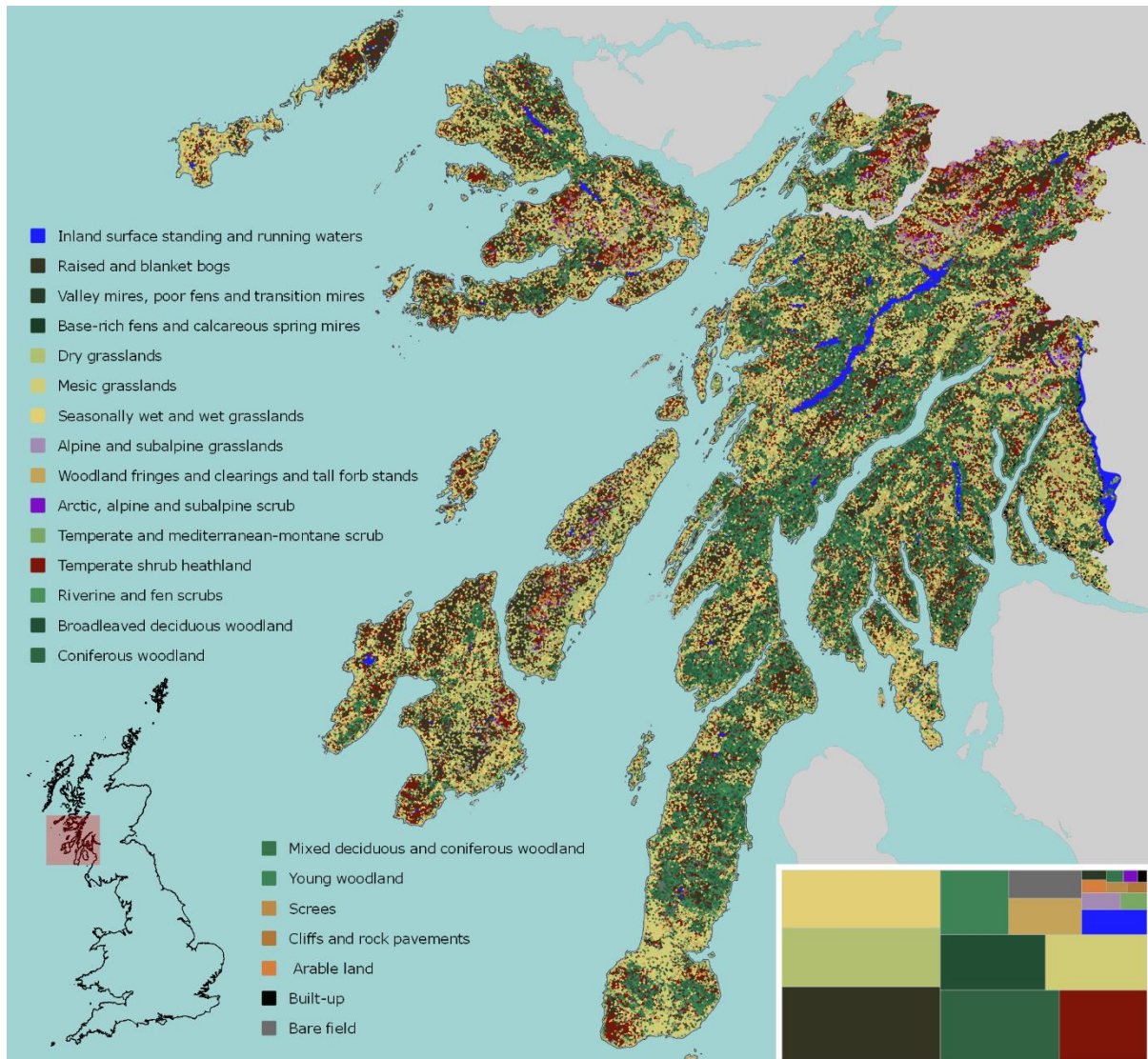


Figure 4 Habitat in Argyll & Bute. © Space intelligence Ltd. Contains public sector information licensed under the Open Government License v3.0 | Contains OS data © Crown copyright and database right 2022. Habitat types are shown across the map and (bottom right) as proportions of the whole area.

2.4.2 Economy and society

Figure 5 shows employment types in Argyll & Bute.⁶ 43 per cent of the workforce, highlighted in orange are occupied in professional and management roles. This is slightly lower than the Scottish average.

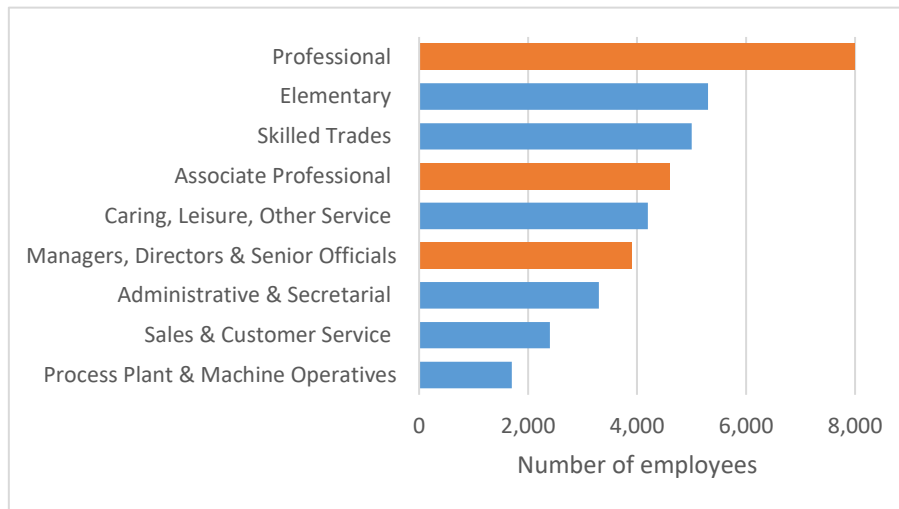


Figure 5 Occupation types in Argyll & Bute. SOC 2020 Major Group 1-3 in orange.

Figure 6 summarises economic activity in the region for key strategic Scottish sectors by GVA.⁷ These types of activity in turn support services such as education, housing, transport, retail, and health. Food and drink, energy and renewables, and tourism are all significant sectors.

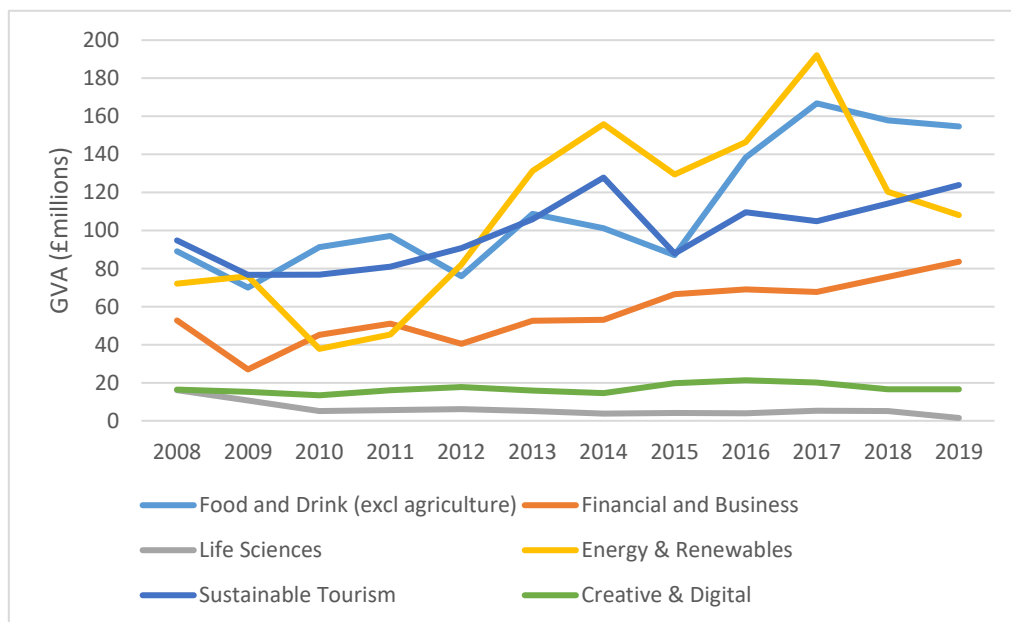


Figure 6 GVA in Argyll & Bute by sector, 2008-2019. The sectors are those identified in Scotland's Economic Strategy as those in which Scotland has a distinct comparative advantage.

⁶ Labour market profile – Argyll & Bute. [Nomis](#), ONS, accessed 7.10.2022.

⁷ Local authority area statistics database, Growth Sector Statistics, Scottish Government, 2022.

2.4.2.1 Farming

Figure 7 shows employment by sector in Argyll & Bute.⁸ Figures on economic value of agriculture, forestry and fishing are difficult to source. Business income from agriculture is low, with farm profitability relying heavily on government subsidy. As figures 3 and 4 shows, the soil and habitat in the region are not suitable for agricultural intensification. However, employment figures and other evidence suggests that a high proportion of income from agriculture is reinvested locally. This means that in economic terms, farming in the region has a significant role as a stewardship services, as well as a production business. Farming delivers a range of benefits to the region, including job creation, biodiversity and water management, landscape management, culture and sense of place.

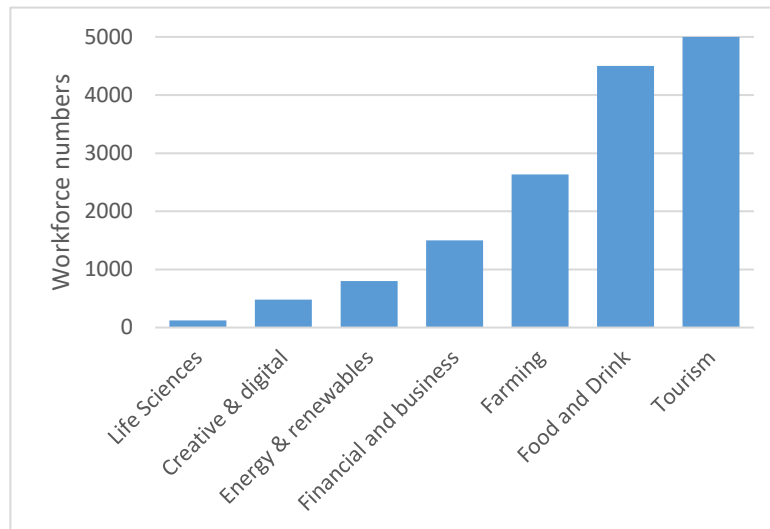


Figure 7 Employment by sector. Note that farming is from a different source, and includes self-employed business owners, so comparisons should be made with caution.

2.4.2.2 Forestry

It is said that 'anything you can make from a barrel of oil you can make from a tree', and timber is a key commodity for a regenerative, low-carbon world, turning atmospheric CO₂ into a versatile material. Argyll & Bute has a favourable climate for growing high-quality timber. In the past, conifers were sometimes planted on sites which were too wet or windy to grow well, or too inaccessible to extract economically. However, this does not detract from the value of the timber resource as a whole, and the potential for expanding it.

A recent report by Forest Research build on a growing body of evidence to demonstrate that, taken over the whole cycle of a forest from planting to final use of the wood, conifers harvested for timber in the UK have a greater carbon benefit than unharvested native woodland (Figure 8).⁹ This is both thanks to the faster growth of trees, and to the carbon benefit of harvested wood.

Forestry is already a low-carbon and profitable industry, but a big economic opportunity is missed because little of its value remains in the region. Woodland owners are often non-resident, and most timber is exported out of the region as unprocessed logs. There are opportunities to increase value to the region at both ends of the wood supply chain.

⁸ Scottish government, growth sector statistics; Scottish Agricultural Census.

⁹ Matthews et al, Quantifying the sustainable forestry carbon cycle, Forest Research, June 2022.

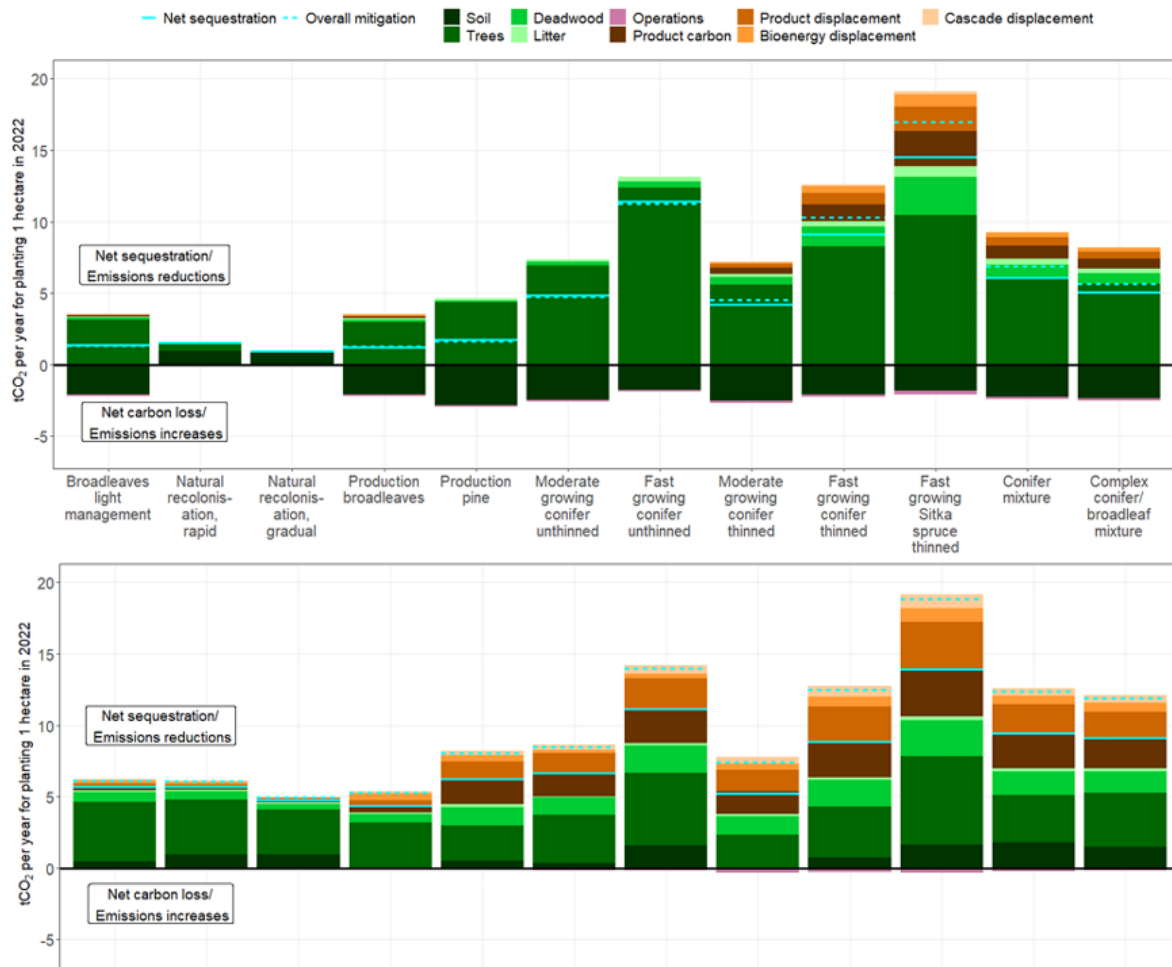


Figure 8 Annualised CO₂ uptake and GHG emissions avoided for 12 illustrative woodland options, assuming 1 hectare planted 2022, to 2050 (top) and to 2100 (bottom).

2.4.2.3 Carbon

Previous work for this project developed some scenarios for carbon, including peatland restoration, afforestation, and silvopasture, using existing carbon codes. This identified annual income from carbon from under £90,000 to over £40 million. It also identified potential for creation of between 100 and 7,500 jobs; however, at average Scottish wage levels, the projected income would only cover a small fraction of the cost of these. Income scenarios were based on carbon prices of £12.50-£85.

How are prices for carbon likely to change? Our experience of carbon unit trading in practice is that prices are ranging between around £15 and £45 per unit. Global prices for voluntary carbon units currently range from around £1.90 to £7.50. Companies wishing to offset will often use UK credits as a 'headline' component, which already commands a considerable premium. If the price becomes too high, companies will find other means to make claims to be an environmentally-responsible company. It is likely that demand for offsets will be sustained, but prices are unlikely to escalate.

2.4.2.4 Economic growth

Industries and businesses may bring economic growth into the region in a range of ways, summarised in figure 8 as four key pathways: primary production, value add, export, and reinvestment. Economic benefit is summarised as high (green), medium (yellow), or low (red). Increasing value at each stage adds greater value to the next.

Primary production is where the land itself generates wealth. It is important to understand how far this is true primary production or whether it relies on imported inputs such as feed from elsewhere. Value-adding might include the processing and packaging of materials, or their manufacture into high-value products. Exporting goods (or experiences, in the case of tourism) to customers outside the region, brings their wealth into the area. Finally, businesses may reinvest their profits into the region, for example by creating jobs, spending on infrastructure, or through local ownership.

This analysis suggests that the biggest economic opportunity being missed in the region is in value-adding, which feeds in to lower opportunities for export and reinvestment. It suggests a similar Community Wealth Building approach to initiatives such as the 'Preston Model', going beyond traditional 'regeneration'. The importance of distilling in the region demonstrates how vital this stage is to economic growth. It is vital that carbon offsetting supports, and does not detract, from local industries enhancing their core value to the region in providing low-carbon, nature-friendly commodities and services for a regenerative, circular global economy.

Sector	Primary production	Value-added	Export	Reinvestment	Natural Capital and social risks
Whisky	Little barley produced in the region	High value luxury product	Major global export	Employment and local investment. Shareholders often elsewhere.	Peatland, energy, water
Salmon	Farmed in the region but feed is imported	Processed locally but mid-range commodity	Major global export	Employment and local investment. Shareholders often elsewhere.	Marine pollution and disturbance, transport
Timber	High-yield production in the region	Largely processed elsewhere	Significant export but low value	Land management. Employment. Woodland owners often elsewhere.	Land occupation, intensification, transport
Farming	Largely non-intensive primary production	Largely processed elsewhere	Significant export but low value	Land management, employment, associated services. Business owners usually resident.	Land occupation, intensification, carbon emissions
Energy	Significant & growing renewables	Distributed to grid	Significant export	Use within the region. Mixture of local and absent business owners	Land occupation, local impacts on peatland, freshwater, marine
Tourism	Visits to the region	Growing spend per visitor	Income comes from outwith the region	Employment, business owners often resident	Transport, housing,
Aggregates	High-quality granite aggregates	Exported direct	Major global export	Employment. Separate infrastructure, shareholders elsewhere.	Removal of non-renewable resource. Light pollution and visual damage.

Figure 9 Sectoral contributions to economic growth in Argyll & Bute

3. Stakeholders

Previous work packages had engaged with a wide range of community, environment, scientific and public sector stakeholders. Our aim in this report was to broaden the discourse by bringing the voices of as wide a range of business stakeholders as possible, including land managers, industry, and professional advisors. Industry were of particular interest, having been identified in earlier stages of the project as potential buyers of carbon.

Stakeholders were interviewed about their experiences of the carbon economy, of carbon offset trading in particular, and on what they considered to be the most important interventions and turn-key activities required in the region.

3.1 Stakeholders interviewed

3.1.1 Land

1. **Landholding in a mixed business:** The owner of around 750 hectares of land next to the coast, including livestock farms and former industrial land. A contract manager runs the farm, and a commercial developer is being sought for the brownfield industrial site.
2. **Family farm:** The owner of a 2,500 hectare livestock farm, with a further 1,500 acres leased out. Approximately 200 hectares is thought to be deep peat.
3. **Woodland owner:** The owner of a small amenity estate with around 800 hectares of wood-producing forestry and 500 hectares sheep grazing. Since the estate was purchased, arable farming has ceased. The management objectives are amenity enjoyment and financial sustainability.

3.1.2 Industry

4. **Small sawmill:** A small to medium sawmill located in the region, and sourcing from both Argyll & Bute and central Scotland. The main output is sawn fencing, largely exported to England.
5. **Distillery:** A company with distillery operations in Argyll & Bute and elsewhere, producing single malt, largely exported overseas.
6. **Salmon farm:** A large salmon farming operation working across Scotland's coastal areas and freshwater systems. Scottish salmon is the UK's largest fresh food export, and the industry is a significant employer in the region.
7. **Haulage:** A professional working with timber transport interests. Argyll & Bute produces about 2 million tonnes of timber a year, between a quarter and a third of Scotland's output.
8. **Large sawmill:** A large sawmill not far from Argyll & Bute which sources material from the region and elsewhere, producing a range of wood products including construction timber.

3.1.3 Professional

9. **Accountant:** An accountant and tax advisor working with land-based businesses.
10. **Architect:** An architect interested in using Scottish timber to provide high-quality, affordable homes with high 'cradle-to-cradle' carbon benefit.

3.2 Existing carbon activity

3.2.1 Auditing

Many farms are now undertaking carbon audits, although there is some lack of confidence in their robustness and understanding of how they work, with a sense that they are a tick-box exercise, and a black box with different audits giving significantly different results.

The fish farm, distillery, larger sawmill, and haulage sector were all auditing their carbon. Most had only begun around 2019, but they had confidence in the robustness of the

exercise and felt they had good professional advice on the process. For some it was one element in a wider natural capital audit including impacts on biodiversity and water management.

The woodland owner, commercial business and small sawmill were not measuring carbon, and had not yet encountered an incentive to do so.

3.2.2 Managing

The industries auditing carbon all had plans in place for carbon management. The biggest activity was around reducing energy use through efficiency savings. Generating renewable electricity and better management of organic wastes were also important activities. The sawmill reported that the lack of guidance on accounting for wood products made robust carbon management difficult, which hopefully will be addressed by recently-published guidance.

Farm carbon audits have not yet translated widely into action. The nature of farming in the region, with low intensity livestock production on large areas of low-intervention landscapes means that farm carbon audits give carbon-positive results, providing little incentive to change.

3.2.3 Offset trading

None of the stakeholders we interviewed, either land managers or corporates, were involved in buying or selling carbon offsets at present.

3.2.4 Other interventions

Two of the land managers had made use of AECS funding to make environmental improvements on their land. The distillery was involved in research & development projects with a biodiversity and carbon angle. For the timber supply chain – forestry, haulage, sawmilling and construction – stakeholders were focused on resolving the barriers to more proactive carbon management, including quantifying carbon, and overcoming infrastructure barriers to low-carbon investment.

3.2.5 Synthesis with wider business resilience

The obvious tie-in between carbon and wider business resilience was through costs savings on energy. In the timber industry, stakeholders felt that there were stronger tie-ins: investing in bigger log lines to process large-sized timber from forests storing more standing carbon, and driving timber into construction to add more value and keep profits in the local economy. This was also felt to have good social outcomes by enabling workers to stay in the region and giving people healthier places to live. For distilling, carbon is one part of a wider natural capital story integral to the value of the brand and added value.

3.3 Carbon ambitions

3.3.1 Low carbon production

The larger industries all had clear carbon targets. The smaller businesses had not set targets, but were aware that they were likely to be required in future.

3.3.2 Low carbon infrastructure

Industries were interested in investing in a range of low-carbon infrastructure. These included solar and wind projects, green hydrogen, low-carbon housing, and better use of organic wastes. Some of these could be developed by individual companies, but many would require collaboration between industries and with the public sector.

3.3.3 Climate resilient environment

Climate resilience is a growing concern for businesses and communities around the world. It was not a major theme of stakeholders' responses, reflecting the relatively low impacts

of climate change on the area to date. The two areas which were mentioned were the need for resilient transport networks and housing stock, a need which will increase as extreme weather events become more common.

3.3.4 Thriving economy and workforce

The close link between climate action and economic development was a common theme of interviews. One commented that Argyll & Bute had missed out on the oil age: it should be first in the queue for investment to thrive in the net-zero future. For the farm, supported by subsidy, and the amenity estate, funded by private income, carbon represented one piece in a jigsaw of financially sustainable land-based businesses. Industries were important for supporting jobs and service businesses, particularly outwith the tourist season. Challenges noted were the ownership of businesses externally, with one stakeholder proposing more community ownership of business. Another challenge was the exposure of the timber supply chain to highly variable global commodity prices, which could become a challenge for farming if subsidy formed a smaller component of their income. Finally, the lack of affordable housing was mentioned by many stakeholders as something that needs to be addressed to deliver low-carbon economic development.

3.4 Barriers to offsetting

3.4.1 Knowledge

Carbon literacy in the business community as a whole is growing fast, but remains patchy.

For some there are 'unknown unknowns' – uncertainty about what carbon auditing is or why it might be useful; or where to go to find information about projects such as peatland restoration.

For others, there are 'known unknowns' – the lack of guidance on land-based carbon accounting, the lack of clarity on carbon sales from HMRC, the risks of entering into carbon offset contracts, or the absence of robust guidance on land based accounting. Growing knowledge brought growing awareness of the complexity of many decisions, such as the best way to use organic waste, or the difficulty of developing a functioning silvopasture regime.

Some were frustrated at others' lack of knowledge. For the architect, this was the tendency of engineers to over-specify timber grades in construction projects, resulting in projects being unable to use UK-grown timber. For forestry, this was the lack of understanding of the importance of timber as a low-carbon material, and for farming the low appreciation of their knowledgeable and responsible management; of natural environments, and role in the regional economy.

Overall, there was a widespread sense that, while there is still much to learn, business has been on a steep carbon learning curve. There has been, however, a lack of join-up between industries and the public sector. Capacity has been built in relative isolation, and the key need now is for knowledge exchange.

3.4.2 Technical

There was felt to be a mismatch between the offsetting options available and the carbon investment challenges being faced. There was some discussion as to whether demonstrating and trading carbon benefit could be used to tackle some of these, such as bringing woodland into better management, or retrofitting housing stock to Passivhaus standard.

3.4.3 Policy & governance

In terms of carbon offsetting, the biggest barrier seemed to be the need for collaborative action, within complex land management patterns including multiple landowners in an

ecological area, tenancies, contract farmers, shooting leases, deer management agreements, community groups, and so forth. Given the further hurdles involved in carbon trading, and the lack of penalty for not acting, this creates a significant inertia to project development.

Stakeholders were, however, more keen to draw attention to the barriers to wider low-carbon development caused by lack of capacity in public sector bodies.

The lack of clarity on carbon taxation from HMRC is another problem. It is recognised that this is politically difficult to resolve: taxing measures aimed at tackling climate change seems like a perverse incentive, particularly when there is no tax on carbon emissions; whereas confirming a tax break for an activity predicated on land ownership looks like a measure to benefit the wealthy.

Several infrastructure challenges, including electricity grid connectivity, data connectivity, transport infrastructure, and affordable housing, were cited by stakeholders as barriers which they could help to overcome, and indeed were prepared to invest, but which needed co-ordination at regional level by public sector agencies.

Finally, the stagnation of the planning system, resulting from the underfunding of the local authority, was cited by several as a barrier to low-carbon growth. The problem was not the planning laws themselves, but the lack of capacity to consider proposals and undertake stakeholder consultation.

3.4.4 Ideological

The landowners in the group did not cite ideological concerns about offsetting. It was felt to be a useful tool available for them to choose to use, or not, on their own land. The farmer thought that, as long as they were confident in the terms of the contract and the ethics of the buyer, farmers would largely be unconcerned as to whether the carbon buyer was local or not, and would be inclined to sell to the highest bidder.

Amongst the industrial stakeholders, it was perhaps surprising to find that none of the businesses we consulted were interested in offsetting. They had strong business reasons to tackle their carbon footprint, and many also wished to tell a strong story of responsible production. However, none felt that using offsetting to claim 'carbon neutrality', or to meet a future net zero position, was likely to be required, or desirable.

There was, on the other hand, a strong concern expressed by the distillery, salmon farm, large sawmill, haulage representative, and architect, that a focus on offsetting risked diverting attention from developing a genuine low-carbon economy in the region. It was felt that carbon activity should focus on public-private sector collaboration to tackle the infrastructure challenges inhibiting investment.

3.4.5 Financial

The main financial barrier to selling carbon offsets is the perception of risk. The different risks involved in Promissory Issuance Units (PIUs) and Woodland and Peatland Carbon Units (WCU's/ PCU's) are poorly understood, as is the difference in risk between WCU's and PCU's. The tax position is a genuine uncertainty, and, while not insurmountable, adds complexity and therefore cost to risk management.

Building on the concerns about offsetting cited in the previous section, several stakeholders felt that carbon trading was a financial and environmental 'red herring', distracting attention from potentially more profitable carbon investments. A particular concern of the sawmill was that trees planted for carbon offsets would tie up land which could have been used to greater carbon and financial benefit to grow timber.

There was also felt to be a lack of financial incentive to reward collaboration and joined-up thinking, a piece of abstract 'infrastructure' vital to the acceleration of the net-zero economy.



4. Case studies

This section reviews examples of existing vehicles facilitating carbon offsetting or sequestration which could provide useful models for Argyll & Bute. For all except the CivTech example, which is based on prior knowledge, stakeholders involved in these projects were interviewed as part of this research. We are grateful to them for their generosity in sharing their stories and lessons learned.

4.1. Case studies

4.1.1. American Family Forests

There are many family-owned areas of forest in the USA which were once actively managed, but have been neglected as owners live elsewhere or do not have the skills to maintain them. These forests are now at risk from impacts such as wildfire, pests and disease, invasive species and herbivore browsing; and their wood production for the low-carbon economy is reduced. The American Forest Foundation (AFF) works with owners to bring these woodlands into better condition, based on appropriate management plans developed for each region.

Owners are paid for individual management interventions such as thinning, planting or fencing, which are required occasionally, for example every 25 years. The outcome of these interventions is a forest which stores more carbon, has higher timber value, and delivers public benefits: reduced wildfire risk, better biodiversity habitat, cleaner water supplies, and increased employment.

The carbon uplift as a result of the management can be predicted across the region, and measured through remote surveys and site-based sampling. This nationwide carbon store increase is verified by Verra, and sold as offsets to fund the scheme. Forest owners do not sell the carbon themselves, and are not tied into a contract: they are simply paid for their management interventions.

The scheme works because the outcome is a more valuable asset for the owner: they now have a woodland with a management plan and a sustainable income stream from timber. This makes it unlikely that they will drop out of the scheme and allow their forest to lose carbon again. Even if some do, this can be accommodated in a risk buffer within the scheme.

4.1.2. New Generation Plantations

At best, afforestation can restore a degraded landscape and deliver multiple benefits for nature and people, while also delivering a valuable carbon-storing material. However, the forestry sector has suffered reputationally from historic practices of clearfelling natural forests and replanting them with timber crops of low ecological value. New Generation Plantations (NGP) is a movement developed by WWF in collaboration with wood fibre companies, to change the reality and perception of 'plantations' around the world, by showcasing and developing good practice, building on the work done by organisations like Forest Stewardship Council (FSC).

More recently, NGP have begun to develop their own projects through a company, NGP Technical Assistance (NGPTA). This special purpose vehicle uses carbon offset funding as a lever to deliver better new forests, based on four core principles: maintain ecosystem integrity, protect and enhance high conservation values, effective stakeholder engagement, and economic growth and employment. A carbon investor commissions a project, and NGPTA identify a suitable location, often in Africa or South America. Project development centres on community-led action, with local farmers and stakeholders proposing, developing and monitoring results.

NGPTA provides technical support and capacity building for developing projects, such as helping to set up a bank account, tree nursery, or customer base; or locally-relevant advice on appropriate tree species and agroforestry techniques. An accelerator scheme model is used, whereby many projects are given funding and support to develop their project to a stage to apply for further investment. This builds capacity and business skills in a wide range of stakeholders, and ensures that the projects chosen for investment are well-developed.

NGP measure and verify the carbon sequestered by the whole project, have these accredited through a global offset scheme, and sell these to the carbon investor to fund the project. The communities do not sell the offsets directly. Carbon is captured in trees as part of their business model, in which they are invested, and which, at the conclusion of the project, should provide a sustainable and profitable income stream through the sale of forest products such as fruit or timber.

4.1.3. Nestlé LENS

Landscape Enterprise Networks (LENs) are a system of buying and selling ecosystem services, developed by 3Keel. Development begins with 'network opportunity analysis', understanding what ecosystem services a landscape produces (commodities, carbon, biodiversity, amenity, water quality), what natural capital assets (viable farms, healthy soil, habitat, woodland, rivers) underpin production of those goods, and which beneficiaries will attach value to those goods (commodity buyers, water companies, tourism businesses, carbon offsetters).

The LENs body first aggregates the potential of supply (for example, farmers across a region), and demand (for example, the commodity buyer, carbon offsetter, and public sector body). They then develop a mechanism to collect payments for services and enable suppliers to deliver, and be paid for, the range of goods required in a joined-up way.

We spoke to dairy farmers involved in a LENs project run by Nestlé in south Scotland. This involves one investor – the milk buyer – interested in improving the overall sustainability of its product, such as reducing embodied carbon, improving animal welfare, improving water quality. This has the advantage of simplifying the network, and enabling the payments for wider goods to be paid as a premium on the commodity price of milk.

The farmer is given a 'menu' of options for different operations, each with a basic level and several enhanced levels. The basic level is the minimum standard required, and premiums are paid for achievement of enhanced levels. At the time of writing, the scheme had only been in operation for nine months. Farmers reported that, while the scheme was generally successful, they would like to have liked more consultation on the menu, to tailor them to individual farms. They were hopeful that there would be opportunity for this kind of feedback as the scheme developed.

Farmers liked the commodity premium payment model, because, unlike many environment grant schemes, it does not reward them for reducing production in favour of conservation. Rather, they are rewarded for increasing both productivity and sustainability. By increasing the profitability of their core business, the premium gave them the increased business resilience required to raise finance to invest further, and for further investment in increased productivity and sustainability further.

4.1.4. COP26 House

The COP26 House was designed by RJ Architects and manufactured by BSW sawmill in Fort William. The house is constructed entirely of Scottish timber, with the exception of some specialist components like timber window frames and doors, which could be made locally if manufacturing capacity were available. The one-bedroom home is not only

intended to provide a higher quality living environment than one constructed with plastic, chemical and concrete components. It also stores more carbon in its timber than was used in its construction, delivering net carbon benefit. The house was designed using components which could easily be disassembled at end of life and reused or recycled, unlike many existing building materials. This minimises the end-of-life carbon footprint of the house, and prolongs the carbon storage value of timber in future projects.



Figure 10 The COP26 House. Image: Roderick James Architects.

4.1.5. Meanwhile Homes

Meanwhile Homes are an innovative construction solution developed by Ecosystems Technologies in collaboration with Napier University, similar to the COP26 House. Based at their site in Invergordon, the company use digital innovation to develop engineered timber materials from Scottish-grown timber for use in construction.

A challenge for rural communities is that social and affordable housing projects take up to seven years to deliver, whereas accommodation needs for public sector or industry workers is immediate. Meanwhile Homes are timber houses for one person or a couple, which can be delivered on a lorry and installed instantly. They are designed to be high quality homes with a tight footprint, which can become a permanent home or be transferred to another site in future. The manufacturing plant for homes like these can be in a population centre, such as Oban, and delivered to remote communities where they are needed, surmounting the challenge of a lack of skilled trades in these areas.

The 'cradle to cradle' carbon footprint of Meanwhile Homes is kept low through circular design and efficiencies throughout the build; and the carbon storage of the modular, mass timber materials can be quantified, so each home can be measured as contributing to the carbon storage of the area.

4.1.6 CivTech

CivTech is a partnership funded by Scottish Government, which engages innovative businesses to solve public sector challenges through digital solutions.

The Innovation Flow begins with open challenges to which any organisation, team or individual can respond. Applications are assessed, and shortlisted proposals go into an Exploration Stage where they are developed further. The best go through to the Accelerator: four months of intensive work to create the solution.

As well as investment, a key part of CivTech is its Business Workshop System. This is designed to ensure teams developing solutions are tech-savvy and business smart. This not only de-risks the challenge, but creates lifetime learning for all who participate in the process, to whatever stage.

The CivTech model has several advantages over more traditional methods for distributing public funds, such as the tendering process or competitive grant. The inclusion of interviews and workshops in the selection process means there is less reliance on a paper

application, which is not always a good measure of business potential. The staged process means that many proposals which do not ultimately succeed gain feedback, contacts and skills for the future. It also means that the final proposal has been through several stages of development and 'de-risking', increasing the chances of a successful outcome.

The danger of this process is that it can become an opportunity for winning bids to 'steal' the best ideas from competitors, and use them to enhance the final product without their inventors being rewarded. If this is perceived as a risk, it can lower engagement with the process. This could be mitigated through measures to safeguard intellectual property, or systems of collaborative rather than competitive awards.

4.2. Solutions for Argyll & Bute

These case studies demonstrate a range of common features which could be valuable in the development of a special purpose vehicle for Argyll & Bute.

4.2.1 Carbon storage in working landscapes

The case studies demonstrate that there are a wide range of ways to store carbon in a landscape: in regenerative production systems, in timber buildings, through land use change, or altered land management. They also share in common the fact that these are all delivering 'provisioning' ecosystem services, sometimes called 'private' benefits because of their monetisation in the market: food, housing, and timber. The diversity of carbon opportunities, and the synthesis of environmental and business benefit, stands in contrast to some of the criticism of carbon discourse in the UK, that offsetting can displace production, and damage communities and local economies. Finding ways to develop a similar joined-up approach in an Argyll & Bute context will be essential to the success of a regional carbon project.

4.2.2. An intermediary body

A key feature of the AFF and NGP carbon programme is that land managers do not sell carbon units directly. Rather, a trusted intermediary body validates sequestered carbon at landscape scale and sells units into the market. This approach safeguards farmers and foresters, often families running micro-businesses, from being tied into contracts with large corporates. It enables small quantities of carbon to be aggregated into offset proposals large enough to interest buyers. It also delivers economies of scale in monitoring, auditing, and project design.

This model would be difficult to translate directly to Argyll & Bute using the woodland and peatland codes. Most private sector intermediary carbon platforms in the UK simply assist with project development and arrange for the sale of credits, but still setting up a direct contract between the land manager and the buyer. This is because it is difficult for an intermediary to take on the risk of a carbon contract, without removing any incentive from the land manager to maintain the project. A possible model for an intermediary approach which overcomes these constraints is explored in section 5 below.

4.2.3 Economic development

The AFF and NGP schemes work because carbon investment also results in a more profitable farm or forest businesses. Forests are brought into active management for timber with a valuable income stream which pays for ongoing maintenance; or locally-appropriate agroforestry techniques are established. The key is the shift in production methods to one with an uplift in carbon benefit.

The Nestlé LENs model does achieve a similar relationship with land managers in a Scottish context, although this is for carbon in the supply chain rather than offsets. Combining these two models might provide a way forward.

This starting point could form a platform for the development of more sophisticated models in future, such as woodland management for carbon, agroforestry, or the development of carbon-sequestering marine businesses. Where carbon funding could potentially overcome the hurdles posed by high labour costs and skill sets to develop these systems. While these can present attractive 'visions' for investment, they are in reality complex challenges which will require capacity building across the system to succeed, so are not recommended as a first step.

4.2.4 Capacity building

A key feature of many of these projects is that capacity building is integral to the process. The carbon economy is developing fast and there are few experts in the rural sector. The rural economy is characterised by a large number of small businesses with relatively low ability to invest in continuous professional development or specialist advice. Carbon in landscapes is particularly complex, and those who do develop carbon expertise quickly identify knowledge gaps, and become innovators.

The CivTech and NGP projects use the challenge fund and accelerator model to harness local knowledge and innovation, deliver training in key skills, and create robust outcomes with significant beneficial capacity-building 'collateral'.

This is in contrast to the experience widely reported by farmers of using farm carbon calculators and feeling they are a tick-box exercise, based on obscure methodology and with a result that means little. While carbon auditing is an extremely useful tool, it has only had limited success in educating farmers, or the advisors and agents delivering audits, in how the rural economy fits into the wider decarbonisation of the economy. By avoiding 'jargon' like 'scope 3' and 'Greenhouse gas protocol', rural stakeholders are left struggling to discuss carbon accounting with other sectors of the economy, such as corporates in their supply chain or potential offset buyers. Offsets are presented as an entirely separate system to carbon auditing, which translates into a perceived risk that offsets might be sold which would be required to decarbonise the business in future, without knowing how to assess the extent of this risk.

Designing in capacity building for the carbon economy as an integral part of any carbon process, would ensure that, whatever the outcomes in terms of carbon sales, the rural economy in the region becomes better equipped to grasp further carbon opportunities as they emerge.

4.2.5 Digital innovation

Digital innovation is a core part of both CivTech and Ecosystems Technologies. Rural carbon challenges are complex, and skills are in short supply. The CivTech programme sets challenges which can be resolved through digital solutions, for example to provide smarter flood warnings, to encourage young people to spend more time in nature, or to make better use of limited supplies of high-quality tree seed. Ecosystems Technologies bring digital innovation to the timber industry to ensure that a natural and therefore variable material – wood – is used to maximum benefit to deliver as much value as possible, create structural elements to appropriate specifications, manufacture easily-assembled and disassembled kit houses, and create modular designs which can be tailored to different sites and clients.

The maps in section 2.4.1 above were produced using Galbraith's own GIS tool ,which pulls data on a given area from a range of sources, speeding up desk-research and ensuring that expensive work such as site surveys or project designs are effectively targeted.

Understanding how digital tools could enhance an Argyll & Bute carbon project could be essential in reducing costs, while also providing another potential stream for carbon-based economic development in the region.



5. Proposals

This section outlines proposals for turn-key activities to unlock carbon investment in Argyll & Bute.

5.1 Knowledge and capacity

5.1.1 Understanding the carbon economy

A major barrier to developing the carbon economy is lack of knowledge. Huge global scientific, economic and political resources have accelerated carbon management, accounting, technology and investment at an increasingly rapid pace. It is a huge challenge for micro-businesses, regional industries, professional advisors, environmentalists, and the public sector to access the information they need. With the carbon economy arriving piecemeal, for example in the requirement to undertake an audit or hit a target, in the opportunity to generate offsets, or in rising cost of inputs, it is hard for stakeholders to understand the context, or assess potential development in future.

Many stakeholders have encountered carbon in some way: farms are undertaking carbon audits or thinking about offsetting; industries are beginning to manage carbon; professionals are endeavouring to develop relevant processes, such as tax advice, land valuation, or building design, in response to carbon impacts; local community concern about climate change is growing. There is a steep learning curve taking place, but it is often disjointed or isolated. Peer-learning pathways are at risk of misinformation or out-of-context analysis, and different vocabularies and experiences in stakeholder groups make it easy to miss what they increasingly have in common: the growing commitment in all sectors to tackling climate change.

One source of confusion is the inaccurate use of 'carbon jargon'. Words like 'sequestration', 'additionality', 'double counting' and 'scope' are loosely used in stakeholder discussions. One example from this project is the use of 'carbon offsetting', 'carbon sequestration', and 'nature based solutions' as almost interchangeable terms. This is partly due to an understanding of what an ultimate 'net zero' world would look like, with carbon capture balancing any residual carbon emissions. It is also due to the nature of the voluntary carbon market in the UK, which historically has been exclusively based on the ability of trees to capture carbon.

It is, however, a confusing and misleading link to make. Carbon trading often involves avoided emissions rather than carbon capture. This is the case, for example, with peatland restoration, where the carbon benefit is not the slow carbon capture by a healthy peatland, at the rate of around 1mm per year, but the avoidance of carbon emissions of degrading peatland, potentially at the rate of several centimetres per year. Emissions avoidance is a lower-risk form of carbon to trade, as an emission avoided in a given year is omitted from that year's carbon account permanently, whereas captured carbon can potentially be re-emitted in future.

It is also not the case that carbon offsetting must be associated directly with nature-based solutions. Globally, renewable energy projects associated with economic development are an attractive form of offsetting – for example, replacing charcoal cookstoves with solar to improve health and halt forest degradation. Conversely, nature-based solutions including sequestration may be part of the decarbonisation of supply chains, and not offsetting. For example, soil management on farms, and carbon storage in timber products, are likely to grow in focus significantly in coming years as land-based carbon accounting becomes required in carbon reporting.

The three interlinking elements need to be clear in an Argyll & Bute carbon strategy:

1. Nature-based versus fossil-based carbon
2. Sequestration versus emissions avoidance
3. Offsetting versus supply-chain benefit

Recommendation: ensure all delivery partners in carbon initiatives have a strong understanding of the carbon economy, are able to use terminology correctly in literature, and explain it in discussions with stakeholders.

5.1.2 Awareness of carbon opportunities

Lack of knowledge has been a significant barrier to carbon trading development. Land managers may be unsure how to develop projects at all; or unquantified uncertainties may make carbon projects too risky for a business owner. To some extent, this issue is resolving itself: professional advisors such as agents, accountants and lawyers have been rapidly increasing their knowledge of carbon trading and are now able to provide more robust and confident advice on everything from the creation of schemes to the risks and opportunities of selling carbon units. However, small project developers such as community groups or tenant farmers are less likely to have knowledge or access to advice. Being able to access this through a Special Purpose Vehicle could be an initial turn-key intervention for providing wider access to carbon offsetting.

Industries now routinely employ professional staff and consultants to audit and manage their carbon, and understanding of pathways to net zero is rapidly growing amongst industry leaders. Tapping into that expertise by facilitating low-carbon industry events involving other stakeholders such as land managers, policymakers and community groups, could help to disseminate 'carbon literacy' and relevant local expertise throughout the region.

Recommendation: Fund access to professional advice on carbon offsets to land managers at risk of being excluded, and tap in to industry expertise on carbon management.

5.1.3 Knowledge about farming and forestry

Knowledge about carbon is not the only barrier to nature-based solutions. Forestry and farming are complex land management systems, stewarding ecosystems to produce commodities through systems which have developed over many decades of location-specific practical experience, technical innovation and scientific research. Agriculture, silviculture and aquaculture are not widely understood in wider society, not least by stakeholders considering carbon. The carbon accounting of forestry and farming is multifaceted and complex compared with other sectors of the economy.

This knowledge gap and complexity has resulted in guidance arriving late, at global level, with Greenhouse Gas Protocol and Science Based Targets Initiative guidance only released in autumn 2022. These put land-based carbon accounting on a robust basis and global level playing field for the first time, but they will take time to become embedded in supply chains.

The knowledge gap also results in challenges for engaging farmers and foresters in carbon-related activities. Unless carbon schemes are co-designed with practitioners, there is a danger that they will be regarded as conflicting with production, or impractical. Various proposed agroforestry systems, for example, are subject to a wide range of technical difficulties such as the labour-intensive management of small areas of land (or even individual trees or animals), Scottish climatic factors, pests and predators, livestock management practices, limited resources of many Scottish farm businesses, and the long lead-in time for developing working systems. This has made it extremely difficult to

demonstrate the commercial viability of agroforestry. A Scottish Government grant scheme designed to promote it had low uptake.

Similar problems persist in timber production. Forestry is based on harvesting atmospheric CO₂ and turning it into useable material. This means carbon and economic benefits are closely aligned. Innovations by the industry to increase productivity and therefore profitability through species choice, genetic improvements, or management regimes, also increase carbon benefit. Whereas it is well understood that growth in the renewable energy sector is important to tackle climate change, the similar role of timber in displacing materials such as concrete is less well understood. Carbon benefit in forestry is not automatically aligned with ecological enhancements, or climate resilience. Forms of forest management such as Continuous Cover Forestry (CCF), Low Impact Silviculture Systems (LISS), natural regeneration, or wood production from native hardwood forests, can in certain circumstances deliver carbon benefit, provide ecological enhancements, increase profitability, and improve climate resilience – but the cost of implementing them is generally a costly, decades-long project, which in the wrong circumstances or sites can result in the opposite for any or all of these outcomes.

Our stakeholder interviews revealed a similar example in an aquaculture context: innovative symbiotic systems involving fish, mussels and seaweed have been demonstrated at lab scale, but struggled to become fully commercial. Whether the proposal is agroforestry, low-impact silviculture, or integrated multitrophy aquaculture, the pathway to realisation of complex, close-to-nature, carbon rich production systems, will be far more complex than simply urging businesses to adopt them. It was striking that, while the Nestlé LENS project was largely welcomed by farmers, their main criticism was that they had not yet been consulted on the 'menu' of actions they could take, some of which they felt were, as prescribed, contrary to efficient business practice and carbon management in their particular landscape context.

Engaging producers in co-design from the start should help carbon schemes deliver multiple benefits, including capacity building, carbon literacy, increased uptake of schemes, and peer recommendation.

Recommendation: Ensure schemes involving farm or forestry management are co-designed with practitioners from an early stage, and development towards complex systems is effectively staged and funded.

5.1.4 Statistical information

At present, information on farming, forestry, fishing, the rest of the economy, carbon emissions, and offsets, are produced by different government departments, in widely different formats. Many of these do include figures at regional scale, but it is extremely difficult to collate and compare these.

Collating an annual Carbon Economy Report for Argyll & Bute synthesising this information, and including key new developments such as the publication or update of carbon codes, developments in carbon accounting, scientific research, or guidance on matters such as taxation and contracts, could be a vital reference document to accelerate and direct carbon interventions, and understand the impact of activity on other sectors.

As a useful tool for businesses in the region, this could attract sponsorship funding to produce.

Recommendation: Collate relevant information into an annual Argyll & Bute Carbon Economy Yearbook to help businesses and policymakers understand opportunities and impact.

5.2 An Argyll & Bute Carbon Scheme

5.2.1 Ground level: start simple

The Carbon Opportunities project has highlighted the vast potential for carbon innovation in the region: seaweed and seashells, woodland management and timber houses, green hydrogen and biochar. Both environmental and commercial stakeholders have emphasised the importance of decarbonisation as well as offsetting. There is a significant danger that, by trying to do everything, nothing is achieved.

The Woodland and Peatland Codes are well established and have potential in the region. They are relatively straightforward to use and professional advisors are familiar with them. The significant demand for high-integrity, UK-based carbon offsets means that there is a high likelihood of a financial return on investment. This makes them an excellent starting point for an Argyll & Bute Carbon Scheme.

Use of these codes is expanding already. Since this project began earlier in 2022, the number of peatland schemes in the region has increased fourfold. Any public sector intervention must be clear on the value being added over growth which would have happened anyway.

Peatland

Peatland schemes have significant advantages. Because they are a restoration of existing land use, instead of a land-use change, on land with few existing options (blanket bogs do not have high agricultural value and are out of bounds for afforestation) so do not have so many potential carbon or economic trade-offs.

Peatland Carbon Units (PCUs) are lower risk for the seller than Woodland Carbon Units. Because their offsets are for avoiding emissions rather than for sequestration, PCUs are retrospective: even if the peatland degrades in future, the emission was still avoided in the year the unit was issued. The land manager still has a strong incentive to maintain the scheme, as otherwise they drop out of the Carbon Code and cannot benefit from any more PCU sales in future. However, unlike a woodland where a corporate carbon buyer has a long-term contractual hold over the site, peatland units do not tie the seller into a contract with the buyer. There is only a risk to the land manager if they sell Promissory Issuance Units (PIUs) in advance. PIUs are a measure of the carbon which is expected to be saved by the scheme, subject to its success. If these are sold, the seller is liable should the scheme fail. A seller and buyer can still agree to a long-term supply of carbon units through a guarantee of 'first refusal' of PCUs in return for a guarantee to buy on agreed terms.

The most significant land-use conflict with peatland restoration is with deer stalking. Deer numbers may need to be reduced to levels too low for a viable stalking business to prevent peatland erosion. There may also be erosion impacts from sheep, or problems for sheep caused by re-wetting of bogs. Awareness and consultation with stalking or grazing interests should take place early on in proposed peatland restoration schemes.

Peatland restoration has the added complexity that it often works best over a catchment or watershed, requiring collaboration between several landowners. Neither the hydrology of a peatland, nor the movement of deer, are respecters of estate boundaries.

Peatland restoration is still a new carbon opportunity, and it has taken several years for government agencies, auditors, professional advisors, contractors, landowners, and carbon buyers to build capacity and develop schemes on the ground. These are now coming through in more significant numbers. There will still be opportunity, however, for assisting in the development of schemes where there are additional complexities such as several land managers or smaller holdings.

Recommendation: Investigate the ownership and management of peatland areas identified as having high potential for restoration, to target advice and support to sites which may have difficulty developing projects independently.

Woodland

The Woodland Carbon Code is longer-established than the Peatland Code, so relevant parties are well-versed in developing schemes, registering and selling Promissory Issuance Units and Woodland Carbon Units (WCUs). The idea of woodland sequestering carbon is more intuitive to buyers, and woodlands are more familiar and 'charismatic' than peatlands, making them potentially a more attractive option. However, it is not clear that there will be significant difference in carbon unit value or demand going forward. The risks of woodland, which has potential to re-release carbon for example due to disease or fire, are becoming more widely known to buyers. However, demand for WCUs is strong and likely to continue for the foreseeable future.

There are various risks to be considered and mitigated in the development of woodland carbon schemes.

Woodland creation is a land-use change. It is not recommended for high-grade arable land; but given that there is almost no arable land in the region, the target area for woodland on a Scottish metric would be the best grazing land. Afforesting these areas would have a disastrous impact on farming, which relies on these better areas to remain viable. On poorer land, caution must be taken to avoid sites with too much peat, important habitats such as ancient grassland, or so exposed that trees will grow poorly and sequester little carbon. These local considerations make it difficult to undertake meaningful desk-based scoping exercises to estimate tree planting potential in the region. They will, however, be assessed carefully during the existing woodland design and carbon registration process.

WCUs are sold with a guarantee that the carbon sequestered will be maintained for the full contract length. This means trees must be carefully managed to protect them from impacts such as fire, disease or grazing by deer, and any losses replaced quickly with replanting. It also puts restrictions on thinning and harvesting, which may be (or become) valuable for economic, amenity, or biodiversity reasons. Woodland carbon project developers must consider carefully what ecosystem services might become valuable in future, and ensure carbon offsets do not become a barrier to future options.

Recommendation: Work with groups of land managers to identify potential sites for tree planting and appropriate management plans, to enhance habitat networks delivering carbon and other ecosystem benefits across a landscape without impacting on business activity.

5.2.2 Farm level: a carbon premium

A major barrier for carbon projects is direct sale of carbon units from the land manager to the buyer. The challenge, however, is to develop a system of payments which guarantees carbon while maintaining freedom for the land manager to make management decisions and respond to changing markets and conditions.

If land managers are paid to *maintain* a landscape, as is effectively the case with the present Woodland and Peatland Codes, there is a risk that commodity prices may rise and outcompete carbon. In this case, if the landowner is not contractually tied in, they may drop out of the scheme to intensify production instead. If they are contractually tied in, they may lose out on the future commodity opportunity, so very high prices will have to be paid for carbon to attract landowners. There is also a wider danger that, in the case of

commodity shortages in future, society is strategically constrained from increasing production of food, materials or energy, by carbon offset contracts.

If land managers are paid for *actions* (such as tree planting), they have no incentive to maintain the carbon projects for the long term. This worked for the American Forest Carbon programme because there was a clear upgrading of an economic timber resource associated with the investment in carbon, but this does not translate easily into a UK context.

A third approach can reconcile this apparent conflict between carbon and production. This is the model used by the Nestlé LENS programme, in which a premium is added to the commodity price. This means that the greatest rewards for the land manager comes from combining increased production with delivering other outcomes. This approach could potentially work for payments for carbon offset projects. This section explores how this would work at the land manager end; in the next section, the mechanism to translate this into carbon trading is explained.

A carbon premium could be paid, for example, on the price of beef cattle from farms integrating trees on an appropriate plan; on lamb from farms with peatland restoration programmes; on timber from forests being managed to increase standing carbon and yield; on shellfish or seaweed participating in marine carbon research projects; on firewood or venison harvested from native woodland being protected from deer or other impacts. Carbon prices might be a fixed amount or a percentage, and would need to reflect the relationship between production and desired outcomes. For example, on a cattle farm with considerable potential for both intensification and carbon, the premium per animal could be quite small; whereas in Atlantic Rainforest restoration, where the management intervention required deer management to very low levels with no wood extraction, the premium per animal might be very high.

In some cases, the main 'product' might not be a commodity, but another benefit, such as increased visitor revenue, public or private biodiversity funding for restoration of a threatened species, or payments by a water company or downstream community for improved water quality or flood reduction. Providing carbon supplements for these income streams again ensures that carbon is maximised alongside the desired ecological, social and economic outcomes.

This model could initially be launched as a scheme for livestock farms using existing carbon codes. Farms could join on a voluntary basis, and plans be agreed for woodland creation and peatland restoration. A minimum viable payment would be agreed, setting the minimum price for carbon. KPIs would include delivery of carbon actions and farm output. Adherence to incoming public sector monitoring standards such as farm carbon auditing and a farm business plan, would be required to insure against perverse outcomes.

The scheme should not just incentivise farms to restore peatland and increase woodland. By increasing profitability from production, it should also enable interventions such as better pasture management, to increase the value of the farm business. Farms could also increase their premiums by creating more woodland, or participating in further carbon opportunities developing in future.

Adding a payment for carbon offsetting to the price of animals should help protect the farm business from fluctuations in commodity market prices. Consideration is required to ensure that the carbon premium did not result in commodity prices being undercut.

In future, as methodology becomes available and capacity is built, new codes and interventions could be added. It would also be possible in future to combine ecosystem

service payments in other ways, for example adding payments for benefits to biodiversity, water, or visitors, as commodity premiums.

Recommendation: Explore a farm carbon scheme based on commodity premium payments for livestock, to incentivise integration of carbon projects in farm businesses alongside investment in sustainable production.

5.2.3 Regional level: owning the carbon

Our global case studies demonstrate how a regional scale intermediary body can absorb the risk of carbon projects and deal with corporate carbon buyers.

Small farm-scale projects would be aggregated into single, region-wide applications for the Woodland and Peatland Carbon Codes. A project team of forestry and peatland restoration professionals would work with farmers to deliver schemes on the ground.

A cost-effective auditing plan would be agreed, which might include a paper trail (such as farm carbon audits), drone or satellite monitoring, and site inspections. This would be similar to the group schemes operated by forestry companies which enable many small woodland owners to be certified to FSC standard as part of one auditing process. Auditors such as Soil Association who deliver both FSC and Carbon auditing are familiar with this model.

Consideration would need to be given to the possibility that land might change hands, and/or use.

Economic modelling and piloting would be required to develop the scheme, and find out whether it would yield enough carbon to provide payments at a level which would attract land managers. Various features should help to make the scheme more cost-effective than simply selling carbon offsets, making the value of each carbon unit go further and facilitating even small schemes:

- The scheme is designed also to encourage higher productivity, incentivising investment in the profitability of the business as a whole.
- The farmer is not tied in to a contract with a distant carbon buyer: they simply face losing the premium should they drop out of the scheme.
- Forestry grant application, woodland management and auditing overheads should be lower through efficiencies of a group scheme, and would not be paid upfront by the farmer.
- Farmers can start small, for example with a small extension to a farm woodland, and potentially develop more ambitious integrated farm woodland schemes in future, without having to develop separate carbon projects each time.
- Carbon delivered through partnerships with farmers can be marketed as high-integrity and low-risk, as it does not involve wholesale land-use change and associated social impacts.

Carbon would be 'owned' by the intermediary body, who would be responsible for selling carbon units and managing the risk of project failure. This body would receive a small percentage of the sale price, giving them an interest in ensuring the carbon was marketed effectively and sold for the best price.

It is envisaged that the scheme would be operated by a private sector body, but be underwritten by the public sector through a guarantee of purchase of carbon units at a base price, akin to the Woodland Carbon Guarantee scheme in England. Facilitating carbon trading should be a cost-effective way for Scottish Government to deliver nature based carbon solutions, and in return they have the capacity to absorb the risk of failure. If, conversely, carbon is sold at a higher rate than the base price, additional profits can be

shared between the farmer (in higher premiums), the intermediary body (in additional profits), and the Scottish Government (in agreed revenue) to balance their risk.

Recommendation: Work with the private sector to set up an Argyll & Bute carbon scheme to increase peatland restoration and woodland cover in integrated productive landscapes.

5.2.4 Out in the market: Selling Argyll & Bute Carbon

There has been some discussion amongst stakeholders that it would be beneficial to find local buyers for Argyll & Bute carbon. This stems from a consideration of increasing internal investment in the region, from an expectation that local buyers might pay more, and from a fear of 'losing' carbon to external buyers.

These considerations are understandable, but largely unfounded. None of the industry stakeholders we spoke to had considered buying carbon offsets, let alone paying a premium for local offsets. They were interested in increasing carbon-related internal investment in the region, but through projects such as renewable energy, hydrogen transport, or low-carbon housing. It would be more beneficial for the region to tap in to this existing interest, as a separate initiative, than to persuade them to spend money on offsets instead.

Buyers of offsets in the voluntary carbon market do not take carbon from the region itself. Rather, they purchase simply the right to make a claim: that they have funded a piece of action to tackle climate change, which would not otherwise have taken place. Voluntary offsets sit alongside formal carbon reporting, and claims like 'carbon neutral' are essentially PR claims, albeit increasingly regulated through robust standards. Carbon projects funded by offsets in a region can still be counted in the region's overall carbon account without 'double counting', because the offset funder has only made a voluntary payment to make a claim, and not affected their own formal carbon account which feeds into the sectoral carbon figures for the country in which they operate. Land based enterprises, which will calculate the carbon balance of their own produce or operation based on both emissions and sequestration, should ensure that they do not sell offsets to an extent that prevents them achieving net zero internally; but in low-intensity systems such as those in Argyll & Bute this should not pose a significant problem.

In terms of carbon premiums, buyers across the UK are eager to source UK-based offsets, with a strong story of nature and community benefit. A well-designed project enhancing charismatic natural habitats in Argyll & Bute, with strong engagement from local stakeholders, should yield good carbon prices from and bring new investment into the region.

There are two parts to ensuring a high integrity carbon transaction. One is that the carbon units themselves are high-integrity, guaranteed through robust accreditation and stakeholder engagement. The other is that the carbon buyer is using offsets as part of a genuine process to tackle climate change by reducing their carbon footprint, and not simply to 'greenwash' activities. This is also increasingly regulated through verification schemes such as the BSI carbon neutrality standard PAS 2060, or the SBTi Net Zero Standard. To ensure the integrity of the scheme, it may be considered desirable to require carbon buyers of Argyll & Bute carbon to meet certain standards. This could increase integrity and success of the scheme, or alternatively could impact profitability if it excludes too many potential buyers, so further research should be undertaken before making such provisions.

Recommendation: Market Argyll & Bute carbon to buyers around the UK, to bring investment into the region.

It is possible the tourism industry could provide opportunities to market offsets, for example by giving visitors the chance to offset the carbon footprint of their stay. This could be an interesting pathway for knowledge development, by giving tourism businesses a route in to understanding carbon accounting, and enabling tourists to consider their environmental impact, and perhaps be encouraged to reduce it before offsetting, for example by using alternatives to car travel, reusing towels, turning down radiators, or choosing accredited low-carbon restaurants or hotels. This could be developed in conjunction with existing initiatives like the Green Tourism Award. Developing a scheme like this would be complex and significantly more costly than selling offsets to a single corporate buyer; however, it could enable carbon to be a lever for awareness-raising and wider decarbonisation of the tourism sector.

Recommendation: Build connections with stakeholders involved in low-carbon tourism, with a view to potentially providing market mechanisms to deliver shared aims in future.

5.2.5 Governance

It was proposed above that the carbon scheme would be best operated by a private sector company, with experience in designing woodland and peatland schemes, accessing grant funding for project development, engaging with farmers and land managers, registering and verifying carbon projects, and selling carbon credits.

Some upfront investment by HIENT may be necessary to fund design of the scheme and ensure it meets all requirements. More important, however, will be a Carbon Guarantee, to de-risk the project through a guaranteed market at a base price for carbon units. This could be backed by Scottish Government (similar to the English Woodland Carbon Guarantee), achieved through engagement with a major carbon investor at the outset in return for a guarantee of future offsets (the model used by NGP), or through an investor such as the Scottish National Investment Bank (in return for a proportion of the revenue if an outside buyer pays more).

The stakeholder network developed in the course of this project, including representatives of government agencies, farmers, community groups and ENGOs, will be extremely valuable in facilitating the development of multi-benefit landscape scale schemes.

Recommendation: Develop structures to provide a Carbon Guarantee for the scheme and facilitate stakeholder engagement.

5.2.6 Carbon credits must not compete with conservation

Maximising carbon, biodiversity and economy may often involve difficult choices and trade-offs, which need to consider both the local site and the global impact. This reality is, however, often simplified in discussions: either into a naïve assumption that 'nature-based carbon' must naturally be good for biodiversity and future economic prosperity; or in a suspicion amongst stakeholders that the other two interests are cynically allied against their own. Biodiversity advocates criticise carbon schemes for profit which damage ecosystems, while farmers and foresters see an environmental alliance of nature and carbon taking land out of production.

An advantage of peatland restoration is that it usually does deliver ecological benefits alongside carbon. On the peatland itself, wetland habitat is created which is quickly colonised by species such as dragonflies and amphibians. In the freshwater and marine habitats downstream, water quality improves as pollution and sediment from eroding peat is reduced. Woodland creation is more complex, and, while regulations guard against significant ecological damage, carbon does little to incentivise positive management for

biodiversity in a native woodland creation scheme, and nothing to improve condition of existing woodlands.

Conservation projects are often on a fragile economic footing, dependent on short-term grant funding which tends to favour capital projects rather than ongoing maintenance. Developing more sustainable economic models for conservation is beyond the scope of this project, but carbon funding could potentially be structured to play a better role. There could be merit in exploring a similar scheme for conservation to the farmer scheme proposed above, in which schemes designed by conservation groups are paid for carbon benefit, not in tonnes of carbon, but on the basis of payment for conservation outcomes. While carbon is unlikely to cover the full costs of conservation management, it could be an important element.

Recommendation: Consider a model of carbon payments for conservation outcomes, similar to the payments for commodity production explored above.

5.2.7 Farming is a fragile industry: carbon could support or demolish it

The role of agriculture in the Argyll & Bute economy is complex. On the one hand, GVA of agriculture is low, most farms in the region would not be profitable without subsidy, food production value is low, and the industry has suffered from decades of under-investment. On the other hand, a high proportion of income from farming is reinvested in the region: the sector employs significant numbers of people, and supports a wider service sector; and over half of the farming workforce are business-owner occupiers. Except for costs of inputs such as diesel or feed, almost all the economic benefit of farming stays within the region, in contrast to other industries which are often owned elsewhere. The climate and character of the region means farming is never likely to deliver high-volume food production. However, with investment in innovative low-carbon techniques, such as better grassland management, or regenerative systems sharing livestock with arable areas, Argyll & Bute's farms could be put on a stronger financial footing and provide a more important role in food production.

This means that the economic costs of simply allowing farming to be displaced by nature-based carbon projects are more complex, and higher, than is first apparent. Any carbon strategy must fully understand the economic role farming plays in the region, and understand how interventions may undermine, or underpin, farming and food production. On the one hand, it could simply displace farming; on the other, it could potentially provide the investment needed to transform and modernise the sector, and expand its economic and carbon benefit to the region as a whole.

Recommendation: Undertake research into the farming economy in Argyll & Bute, and opportunities to use carbon to increase its resilience and productivity.

5.3 An Argyll & Bute Challenge Fund

5.3.1 Taking carbon to the next stage

The woodland and peatland farm carbon scheme proposed above is as a first step. From the outset, it is important also to design in further development and innovation, since the opportunities presented by this scheme will be necessarily limited.

The CivTech and NGP case studies are examples of how funding can be channelled smartly to achieve multiple aims: to build capacity, de-risk a project, and ultimately deliver a significant and self-sustaining project.

This model involves giving a small amount of funding to a large number of projects to work up their plans, and then selecting a few to take forward to a further stage. This means that a large number of stakeholders in the region gain knowledge of the carbon

economy, skills such as business planning and PR, and networking contacts, which they can use in future. It also means that all money goes into the regional economy, whereas one poorly-planned large grant on the basis of a slick application might be spent by organisations further afield.

Projects in the intermediate stage benefit from further capacity-building such as working up a business plan, so that even those which fail to be awarded further funding have a strong plan with which to apply elsewhere.

A project awarded significant funding should meet strong criteria for Monitoring, Reporting and Verification (MRV) of outcomes, and should demonstrate a long-term economic outcome, either in the creation of a sustainable business model, or in the delivery of low-carbon infrastructure or natural capital enhancement which will have a long-term benefit.

Care must be taken to ensure that a challenge fund does not become an 'idea-stealing machine': the intellectual property of applicants is not misused. If unsuccessful applicants put forward good ideas which could enhance the final project, the terms of the competition should allow those applicants to become collaborators and be fairly rewarded for their contributions. This is not merely on moral grounds but because it makes economic sense to maintain good relationships with all those involved in building a low-carbon economy, particularly in a small sector such as the land use of a rural region.

The scheme must also be attractive to businesses. These will weigh up, in making a competitive application, the cost of the application versus the chance of success. Businesses are unlikely to apply for tenders where they consider they may have a one-in-ten success rate unless they are confident the process will have genuine benefit to them, for example through opportunities to access valuable consultancy, coaching, or networks.

Challenges suggested by the evidence-gathering undertaken for this report could be wide ranging. Manufacturing 'tree-to-home' timber houses to tackle skills shortages; developing effective models of close-to-nature agriculture, silviculture and aquaculture at commercial scale; measuring and accrediting carbon credits from native or commercial woodland management, marine projects, or even retrofitting housing in the area to Passivhaus standard; maximising carbon and economic benefit from organic waste; or developing hydrogen infrastructure, are just some of the possibilities raised by stakeholders.

Recommendation: Explore the challenge fund model as a way to direct funding efficiently into well-designed, low-risk, multi-benefit carbon projects.

5.3.2 Investment for a challenge fund

The money in a challenge fund may ultimately come from carbon funding traded for offsets (as in the NGP example). It could be internal investment by a consortium of public sector and industry partners to solve a shared challenge like housing, or undertake research and development. It could also be venture capital, developing new and innovative opportunities for the low-carbon economy ultimately for an economic return.

Carbon venture capital forms a significant proportion of global carbon finance, and understanding how to access it could be a bigger turn-key activity to unlock a low carbon economy, than accessing offset money. The Scottish National Investment Bank, for example, aims to provide 'patient (long term) capital to businesses and projects throughout Scotland to support the development of a fairer, more sustainable economy.'

Just as an intermediary body can aggregate small carbon schemes for one carbon buyer, so this could develop into alternative forms of region-wide investment – unlocking the vision of the contributor who believed that, having missed out on the oil age, Argyll & Bute should be in the forefront of the regenerative, net zero economy.

Developing this kind of investment will be more complex than carbon trading, where structures for generating and selling carbon are already in place. However, it should be considered as a longer-term aim from the outset, so that connections are built, knowledge is developed, and opportunities are not missed through a focus on carbon trading.

Recommendation: set a long-term aim to unlock investment for the nature-based carbon economy, beyond carbon trading.

5.3.3 Regional industries are key to low-carbon growth, but not as offset buyers

The industries of the region, such as distilling, fish farming, and tourism, are the engines which drive economic growth and bring wealth into the region. They create jobs, and support a wide range of support sectors: infrastructure such as haulage and construction, public sector services like schools and healthcare, and professional advisors such as surveyors, lawyers and accountants.

Carbon is now firmly on the agenda of the region's industries, although for many it is still a new development and a steep learning curve. Many businesses are now familiar with carbon accounting, have targets for carbon reduction, and plans for decarbonisation. The industries we spoke to had not, however, engaged in any cross-sector thinking or collaboration on carbon – indeed, there had been little collaboration or networking even within sectors, for example through trade associations.

It was striking that none of the manufacturing industry stakeholders we interviewed were interested in carbon offsetting, or had significantly considered it. Voluntary offsets were regarded as a PR measure not relevant to their needs. While this was only of a small sample of representatives, these were significant industries with strong carbon knowledge, so it suggests that there is not significant interest in offsetting in this group.

Industries are arguably the biggest source of capacity for the carbon economy in the region. There are significant opportunities to tap in to their knowledge, engagement, and investment potential. There is also the opportunity to benefit them, by facilitating joined-up, cross-sector thinking on shared carbon challenges such as transport, renewable energy, hydrogen, organic wastes, and housing. Enabling industries to share thinking on these and engage with relevant representatives of public sector agencies could unlock significant carbon innovation.

Recommendation: Bring together industry and public sector stakeholders at a Carbon Economy event, to discuss joined-up solutions to cross-sector challenges and engage them in development of a challenge fund.

5.3.4 Forestry is a valuable industry, but not adding enough value

Carbon offsets can provide a valuable income stream where growing timber is not appropriate but native woodland can deliver benefits. This would include on riparian margins, adjacent to ancient woodlands, on high upland sites, on very small areas such as field corners, or to provide diversification and enhancement to a mixed productive woodland.

However, where timber is suitable, it should provide a better carbon benefit and a more sustainable long-term income stream than offsetting (2.4.2.2 above). With sensitive management, forestry can provide high quality biodiversity habitat and amenity opportunities. On some sites, it may be possible to grow hardwood timber such as oak, or harvest valuable firewood from native woodland, but carbon offset agreements can inhibit the potential for future management. Woodland schemes should consider both timber growing and carbon trading, to maximise the best long-term outcomes for farmers, community groups, or other land managers.

Perspectives on the importance of forestry in the region are explored in section 3, based on interviews with forestry, sawmilling and haulage stakeholders. Case studies 4.1.4 and 4.1.5 demonstrate innovations in 'tree to home' technology to use Scottish timber for high-quality housing solutions.

Investing in modern solutions such as offsite modular construction, mobile sawmilling, and mass-timber material innovations, to process timber locally, could have significant economic and carbon benefits for the region. It could create jobs where they are required, such as in population centres and in digital and creative industries, while tackling the skills shortage in construction. It could unlock investment in industries like distilling, marine businesses, tourism and forestry by creating a new vernacular housing solution appropriate to the region. Because timber production is higher than housing demand will require, modular housing could also provide an export opportunity with significantly higher value than raw logs. It could also create a long-term added-value carbon store in timber housing, which could potentially be measured and verified as a carbon offset to lever investment to overcome the costs of implementation, and supplement investment from the public sector.

Recommendation: Engage with farmers, forest managers, woodland owners, wood processors and construction stakeholders to explore opportunities to grow timber as part of multi-purpose woodland design, and retain value within Argyll & Bute through local timber housing solutions, as opportunities for a challenge fund.

5.3.5 Sustainable businesses

The importance of financially sustainable businesses and organisations cannot be underestimated. Whatever activities are undertaken on the land, they must be supported by an income great enough to sustain them. If the income is insecure, the outcomes of the management are at risk in the medium to long term.

This is the case whether the ecosystem service being provided is provisioning of food and materials, biodiversity, carbon capture, employment, wellbeing, or a combination of several of these. It is the case whether the land manager is a corporate, private individual, tenant, public body, charity, or community trust. It is as true for a landholding of one hectare, or of ten thousand.

Income comes from many sources: through sales of commodities or service, government subsidy, tax breaks, charity donations, or income earned by the landowner in another sector and spent on the land.

In this sense, all forms of land management are alike, although culturally they may be very different. There are opportunities for different forms of land management to learn from one another and benefit from different approaches to remaining financially sustainable. This is particularly important when significant changes are taking place in income streams. Government funding for agriculture is likely to fall overall, although it may be directed better. Commodity prices are likely to rise, although costs are too. Large investments are being made into land-based projects by private buyers who have made money elsewhere, and through charity donations. Carbon offset funding is a form of this. This is, however, unpredictable and rarely sustainable in the long term, although carbon funding is intended to be for 80-100 year contracts. There is also a question over the environmental sustainability of land management which may rely on income based on the profits of an unsustainable activity elsewhere.

Recommendation: Work with stakeholders on understanding and overcoming barriers to the overall financial sustainability of land management operations.

6. Conclusion

This report aims to assess requirements for a Highlands and Islands carbon market turn-key funding platform, covering three Work Tasks:

6.1 Assess the range of barriers preventing organisations engaging in carbon trading

We interviewed land based, industry, and professional businesses, and listened to the voices of the community, environmental and public sectors at a stakeholder event. Feedback from our business interviews are summarised in section 3.

Land managers, the potential developers of carbon projects, are beginning to engage, as demonstrated by the rising number of projects being registered. Some barriers, such as lack of knowledge amongst professional advisors, and lack of capacity amongst regulators and contractors, are resolving themselves with time, as experience is gained and capacity increases. Others, like the risks involved in maintaining a woodland scheme, or the uncertainty around the tax position of carbon, are outstanding risks which a developer must price in to a scheme.

There is a fear amongst land managers and supply chain stakeholders that carbon will compete with production, causing farms to close or land which could have grown timber to be used for non-intervention carbon schemes.

We found no interest in buying carbon trading amongst industries in the region, although we are confident that the wider market for carbon will remain healthy.

There is widespread concern amongst land managers, industry, and environmental stakeholders, that carbon trading is distracting from the more important task of developing a genuine low-carbon, regenerative, production economy, and is in danger of greenwashing 'business as usual'.

6.2 Provide successful global examples of Special Purpose Vehicles in the carbon or nature-based solutions context and highlight lessons for HIE.

Examples are described in section 4.

These include two carbon trading schemes, the American Family Forests and New Generation Plantations. A common feature of both of these is that the carbon is sold by the SPV itself, with land managers paid for interventions to increase carbon in the landscape while also creating a more valuable asset. This removes much of the risk for the land managers.

Closer to home, the Nestlé LENS scheme in south Scotland rewards farmers for ecosystem services through a commodity premium payment scheme. This is an attractive method as it links business productivity with environmental enhancement, and incentivises the farmer to invest in both, rather than setting them against one another. This could potentially translate to an innovative carbon scheme.

The Scottish CivTech scheme, along with New Generation Plantations, demonstrates how funding can be used smartly to deliver capacity building and de-risk projects, through an accelerator fund and challenge scheme. This could be a valuable tool to build an SPV which looks beyond carbon trading to tackle some of the wider carbon and economic challenges identified by stakeholders, and to attract more internal and external investment.

6.3 Identify the operational and governance requirements of a Special Purpose Vehicles, embedded within HIE's priorities, or relating to that remit, that could source and fund turn-key activities

Recommendations on the structure of an SPV are outlined in section 5. The brief highlighted the following aspects:

6.3.1 R&D to catalyse the carbon market in a responsible manner

Our recommendation is that the project begins by engaging farmers in woodland and peatland schemes, where structures are well established and risks are low. However, going beyond this to develop innovative opportunities will be vital. It is recommended that this be done through a challenge fund model, explored in section 5.3.6.

6.3.2 Marketing of Argyll & Bute's carbon trading potential in the context of the best use of land that balances economic, social and environmental objectives, with a view to informing the wider H&I region

Integrity of initial carbon units will be delivered through farmer-led schemes, in consultation with the stakeholder network, supported with professional advice, and verified by the woodland and peatland carbon codes. The regional scale of the project, and the unique characteristics of Argyll & Bute, will provide excellent marketing opportunities. It is proposed that delivery be undertaken by a private sector partner with the skills and interest to market the carbon effectively, outlined in section 5.2.4.

6.3.3 Providing a conduit for green investments, primarily in the carbon market where there are mechanisms to transact ecosystem services

The model proposed to channel green investments is outlined in sections 5.2.2-5.2.3. It has proved challenging for UK providers to design a carbon scheme which does not simply set up contracts between land managers and carbon buyers. The proposed model is based on lessons learned from the case studies, in which land managers are incentivised to remain in the scheme and protect carbon stores, not through a contract, but through enhanced business profitability, which makes the carbon scheme a valuable asset which can unlock wider investment in the business.

6.3.4 Providing a hub to attract, aggregate and manage investments in line with HIE's economic priorities and mission, noting due to the scale and size of businesses, social enterprises and organisations in Argyll, the supply of potential carbon will be provided by a large number of small volumes of carbon

The model outlined in sections 5.2.2-5.2.3 facilitates the aggregation of carbon. Through the SPV guaranteeing and selling the carbon rather than individual land managers, the risk of one project failing is managed.

6.3.5 Blending public and private finance to achieve those goals.

The woodland and peatland codes already effectively blend public and private finance, with public grant funding providing upfront investment and de-risking the project, and private carbon finance providing ongoing revenue.

This report proposes several new forms of blended finance:

Paying for carbon offset projects through a commodity premium is a private-private blend of finance, which tackles the problem of carbon projects being in competition with low-carbon provisioning.

The inclusion of a Carbon Guarantee, that a guaranteed price will be paid for carbon offsets if the market should fall, could be backed either by public or private finance. The funder

could be recompensed by a proportion of the profit should the offsets exceed this price and be sold on the private market.

The Challenge Fund is a powerful model which can lever public finance, internal investment, venture capital, and offset funding, to tackle a wide range of carbon challenges. This can be developed in partnership with industry stakeholders to identify key shared challenges and financial pathways.



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