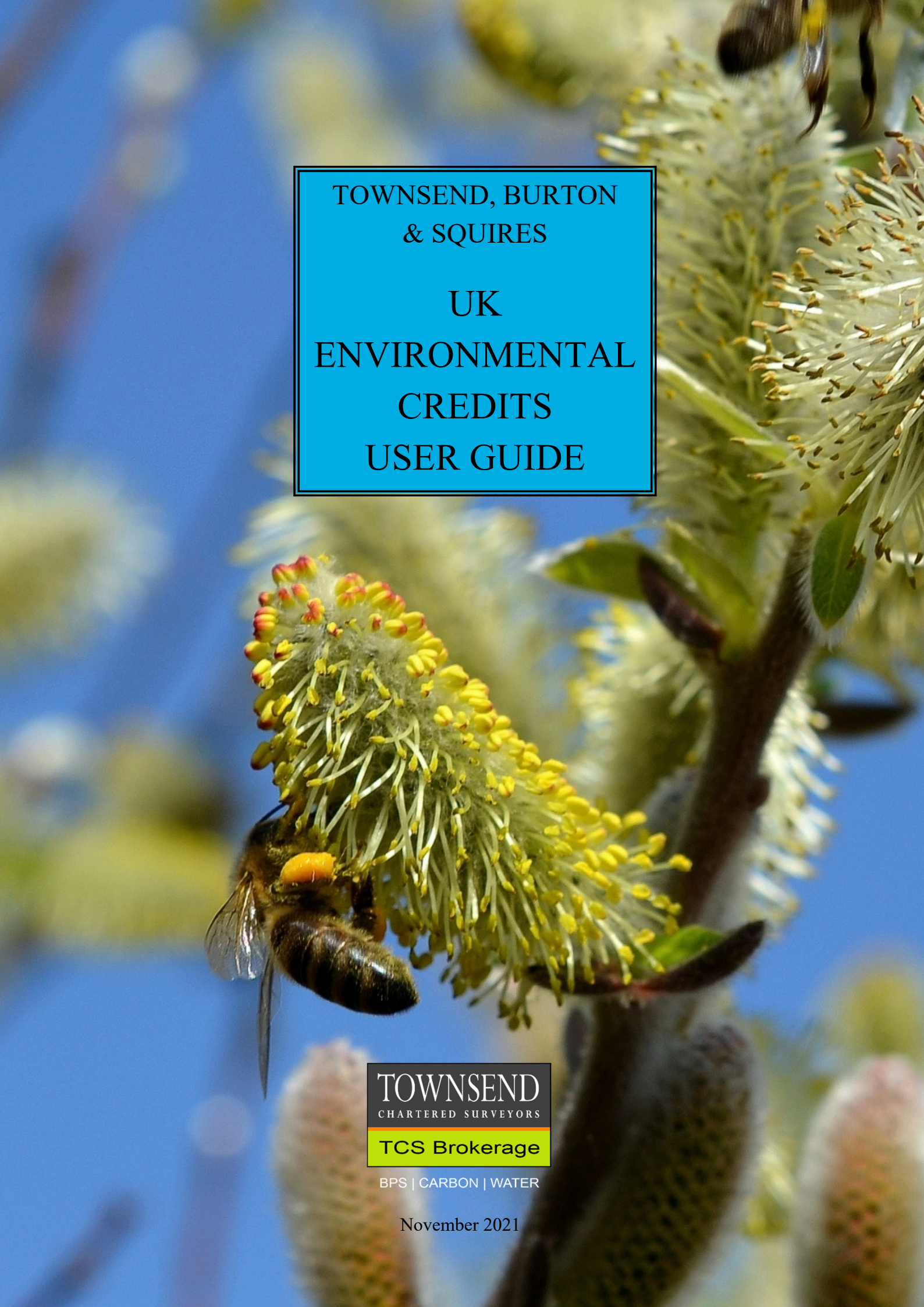


TOWNSEND, BURTON
& SQUIRES

UK ENVIRONMENTAL CREDITS USER GUIDE

TOWNSEND
CHARTERED SURVEYORS
TCS Brokerage
BPS | CARBON | WATER

November 2021

BIOGRAPHICAL NOTES



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PREFACE

This is an independently published guide for those involved or expecting to be involved with UK environmental credits in respect to buying and selling, and also the creation and maintenance requirements involved with the said credits as part of a farm or estate's Natural Capital Management. Information is based on official Government guidance. However as a developing market certain areas are subject to consultation or are still at a pilot stage, with the private sector also expected to play an important part in how these markets emerge.

The Guide uses the term 'environmental credit' to cover carbon credits, biodiversity units and nitrate offsets. Carbon credits are further divided into Woodland, Peatland and Soil. At the time of writing carbon offsetting is assumed to be on a voluntary basis, with the anticipation of future regulations and requirements set to influence supply, demand and the price of the units. We discuss the background to each credit, followed by an overview of the steps involved from the perspective of the supplier (the farmer/landowner) and then the purchaser.

The authors have made use of their experience running nationwide quota agencies for over thirty-five years and being involved in the practical implications for farmers and landowners, resolving disputes with the RPA, court and arbitration test cases and the effect on all aspects of rural farm and estate management of government run subsidy schemes. The Guide provides a synopsis of the current or proposed environmental credit trading system in the UK, and what should be considered when buying, selling and managing credits.

This has been designed as an interactive e-book allowing readers to more easily find relevant subjects/sections by following the links from the contents page. We are expecting users of the guide to "dip in and out" in order to find sections of interest to them.

Hugh Townsend
Mark Burton
Alasdair Squires
November 2021

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1 UK BACKGROUND

1.1 In recent years the Government has put increasing effort into environmental measures, with agricultural policy focused not just on food production but on delivering environmental benefit with 'public money for public goods'. The Environment Bill became an Act on the 9th November 2021. This created a range of powers aiming to assist the Government in meeting its long-term, legally-binding environmental targets to improve air and water quality, protect wildlife, increase waste recycling and reduce plastics.

1.2 In a rapidly changing, environmentally focused period, this book doesn't attempt to be the ultimate guide but intends to give indicators as to some of the detail involved with different opportunities and requirements. When we discuss environmental credits, we use the term to include: credits produced via carbon sequestration (whether from woodland, peatland or soil), which both organisations and individuals may use to voluntarily offset their carbon footprint; biodiversity units that are required when calculating a 10% biodiversity net gain for developments; nitrate offsets for development sites in nitrate vulnerable areas; and phosphate offsets for land in particularly susceptible water catchment areas.

1.3 The Government envisage a situation where public and private sector work together to establish a market for these 'environmental goods'/services and push each other to improve the environment whilst still allowing the completion of projects necessary to society.

1.4 The markets for carbon, biodiversity units, nitrate and phosphate offsetting are set to expand considerably over the next few years and might be considered as an option to mitigate losses as BPS direct payments are phased out. We discuss the opportunities for the land manager to create and trade credits in section 9 and the payments which might be expected in section 10.

1.5 Whilst not an environmental credit as such, there has also been recent speculation around the introduction of Emissions Caps for the agriculture sector. This would function in a similar manner to the Emissions Trading Scheme already in place for certain industries. The implications of this are discussed in section 11 both for farmers and as a potential market for quota type trading.

1.6 Again, while not an environmental credit the trading of Water Abstraction Licences that link intrinsically also into the water quality of our rivers and waterways. This market is well developed and is increasingly being encouraged by the Environmental Agency. See here for more details.

1.7 For our annual market comments see here.

1.8 The Government's pledge of being 'net zero' by 2050 may require the agricultural industry to have their emissions measured and to offset their carbon footprint to reach net zero status. Many supermarkets may also require produce to be net zero going forward, for example Morrisons have stated "by 2030 we aim to be supplied by 'net zero' carbon British farms as a whole" with others expected to follow. As such, it is important to consider the need to offset the farm's own carbon footprint before deciding to sell carbon and other environmental credits on the open market.

1.9 The ownership of environmental credits, including where land is tenanted and when relevant rights (such as mineral rights) have been reserved, is not covered in this book. With all sales of rights over land, including environmental credits, these matters need to be carefully considered before credits are sold.

2 INTERNATIONAL BACKGROUND TO CLIMATE CHANGE POLICY

We set out below a brief timeline of international policy agreements which have helped create the current climate of tradeable environmental credits:

2.1 UN Framework Convention on Climate Change

Signed from 1992-1993, this is the treaty that established the annual COP conventions we see today. It also saw developed countries commit to not further increase their greenhouse gas emissions after the new millennium. This was the first UN agreement recognising global warming as a serious international threat and laid the diplomatic groundwork for a variety of further agreements.

2.2 The Kyoto Protocol

2.2.1 Signed on the 11th December 1997, and becoming effective in 2005, this was the first international agreement for the reduction of greenhouse gas emissions. 192 nations are parties to the Protocol, of whom 52 made legally binding commitments to reduce their emissions levels relative to what they were in 1990 in the period leading to 2012, when the Protocol was set to expire. Of these 38 committed to further reductions up to 2020 under the Durban Action Plan. The extent of the reduction was set by each nation individually. The UK's commitments were to reduce emissions by 12% (based on 1990 emission levels) up to 2012, rising to 20% by 2020. Both of these targets were met.

2.2.2 The Kyoto Protocol implemented two key concepts relevant to landowners:

- *Emissions trading:* This allows nations which have not met their commitments to purchase emissions permits from those that had. The aim was to incentivise those nations which had met their commitments to benefit from going further. This system operates strictly between nations. It is not to be confused with the UK and EU Emissions Trading Systems (see below), which use trading of emissions permits between businesses as a means of reducing total emissions within a bloc.

  The Kyoto protocol has now expired. However, a common criticism both at the time and beyond was that it was not ambitious enough in the emissions reductions it mandated. True to this criticism, many countries were able to quickly meet their targets under the Protocol, and now retain large stocks of offsets and emissions permits even though there are now no longer any Kyoto targets to which these relate. If and how these should be used for emissions trading under agreements following the Kyoto Protocol remains a point of diplomatic contention.

- *Carbon offsets:* The Protocol allowed signatories to offset their emissions by two systems:

    a. Investment into other nations to help their economies grow in a way that is environmentally sustainable (the "Clean Development Mechanism") or otherwise reduce their emissions ("Joint Implementation")

    b. Changes to land use causing carbon to be removed from the atmosphere, such as woodland planting

2.2.3 Carbon offset under these means is unusual, relative to modern carbon offsets, in that it could be deducted by the nation who owns the offset's total emissions to contribute to it meeting a legally binding target. All of these offsets were also tradeable between nations, as with emissions themselves and may continue to be depending on the future implementation of Article 6 of the Paris Agreement.

2.2.4 While it laid out much of the thinking behind current agreements and is crucial to understanding the history of where we are now, the Kyoto Protocol formally expired on the 31st December 2020. Its binding commitments were replaced by more stringent but less legally compelling pledges under the Paris Agreement – see below. In particular, Kyoto Protocol emissions trading rules have been replaced by Article 6 of the Paris Agreement, which has yet to be widely implemented.

2.3 The Copenhagen Accord

Signed in 2009, this was the first international agreement accepting no rise in global temperature further than 2°C. It also saw a commitment to extend the Kyoto Protocol beyond 2012, which was implemented via the Durban Action Plan mentioned above, and to replace it by 2020, which did not happen. A small handful of countries pledged further emissions reductions. However, none of the commitments under the Accord were binding, leading many to question its ultimate effectiveness.

2.4 The EU Emissions Trading System (EU-ETS)

2.4.1 Formally adopted in 2005, this EU directive aims to reduce greenhouse gas emissions from aviation, electricity and heat generation, and certain key sectors of heavy industry such as steel and chemical production. It does this by regularly producing a maximum figure for the total of emissions from these industries. Individual companies are then allocated permits for emissions based on the best performing firms in the sector and face financial penalty if, after the end of a set period, they do not have enough permits to cover their emissions. If they turn out to have more permits than required they can sell these to firms which do not have enough. Permits are then reissued based on the next target figure for a new period.

2.4.2 The EU-ETS was closely associated with the Kyoto Protocol from 2008 until that agreement expired. Trading of permits under the EU-ETS by businesses also factored into trading between nations under the Protocol, and companies could use Clean Development Mechanism and Joint Implementation offsets to meet their EU-ETS commitments. Offsets for land use changes were deliberately excluded, however –

they could still be used by governments under the Protocol, but not by companies under the EU-ETS. As the Kyoto Protocol has now expired, this is no longer the case, and the EU has yet to include further offsetting under the EU-ETS. However, the Paris Agreement (see below) lays out some basic ideas about how a carbon offsetting system should work, bearing in mind criticism faced by offsets under Kyoto Protocol rules of corruption and lack of permanence. The EU has stated that it will consider how such units can be implemented in the future.

2.4.3 In July 2021, a number of amendments were proposed from Brussels to broaden the EU-ETS. These include bringing maritime transport under the System and setting up a separate, parallel system for construction and roadbuilding.

2.4.4 The UK was a key architect of the EU-ETS. Prior to the full scheme going live, a pilot UK Emissions Trading Scheme for the Union was in place from 2002, which informed the eventual EU System. Following leaving the EU, the UK has returned to having its own, internal emissions trading scheme. (See 2.13)

2.5 The Paris Agreement

2.5.1 Signed in 2016, this requires each of its 193 parties to set a five-year target for emission reduction and climate change mitigation, with a collective objective of keeping the increase in global temperature significantly below 2°C relative to pre-industrial times (as in the Copenhagen Accord), and preferably below 1.5°C.

2.5.2 These five-year targets, or NDCs as they are known, are not legally binding, although the mechanism for reporting emissions is binding. This means that offsets with legal force, under the Kyoto protocol, were not explicitly included. Some scope for offsetting appears in Article 6 of the Agreement, which also allows emissions trading. However, this Article is particularly limited and obscure in its wording, and does not lay out a framework of how a compliant trading or offsetting system might work. Therefore, few such schemes are in operation.

2.5.3 The Paris Agreement also included commitments for providing $100bn of annual funding for climate change mitigation to developing countries and further funding to compensate the harm these countries would suffer as a result of climate change.

2.5.4 The Paris Agreement remains in force, so any commitments made at COP-26 would need to build on it and should be seen in the context of the non-binding NDCs.

2.6 The Glasgow Pact

2.6.1 Agreed but not yet signed or ratified at the time of writing, this is to include agreements to reduce methane emissions and deforestation, and to “phase down” the use of coal. It is also to include financial commitments to the assistance of developing countries affected by climate change.

2.6.2 In addition, the COP26 Glasgow summit saw the creation of a document instructing the UN Subsidiary Body for Scientific and Technological Advice to formally investigate how Article 6 of the Paris Agreement, mentioned above, can be put into

practice. This includes specifically "carbon mitigations", an explicit euphemism for offsets, following what many see as their poor implementation under the Kyoto Protocol. In time, this should lead to a new framework for multinational carbon trading perhaps on an even larger scale than the EU-ETS, with carbon credits of some form looking set to play a defined, legally forceful role.

2.7 Domestic Background: Environmental Policy and Legislation in the UK

The point we have now reached is the result of a gradual build-up of legislation and policy within the UK with stated objectives of protecting both the national and global environment. An understanding of those pieces of legislation which remain relevant, and recent policy on environmental matters, is key to understanding the direction of travel and the constraints in which the credits sit.

2.8 National Parks and Access to the Countryside Act 1949

This Act first provided for the creation of National Parks, Nature Reserves and Public Rights of Way, all of which remain in place today. This Act can be seen as an early acknowledgement of the value of "natural capital", albeit not in those exact terms, by protecting valuable sites and landscapes for the benefits they provide, and promoting general access to the countryside to improve public health in the wake of the Second World War.

2.9 Forestry Act 1977

This is the key piece of legislation protecting woodland in the UK. Under the Act it is illegal to fell trees unless either an exemption applies or a licence has been granted by the Forestry Commission. Although the parliament of the time was focused just as much on timber production as biodiversity, this Act is a cornerstone to the permanence of carbon sequestered under the Woodland Carbon Code.

2.10 Wildlife and Countryside Act 1981

This far-reaching Act combined a number of historic laws while also adding a variety of new provisions. Today it provides basic protections for wildlife in the UK as an end in itself including making all unlicenced shooting of birds illegal. It also created a key new form of protected designation, the Site of Special Scientific Interest (SSSI). The protection of "biodiversity" is mentioned explicitly, and the Act also specifies a number of particularly important threatened species. Any improvements to biodiversity from farming activity must be supplementary to these basic protections.

2.11 Town and Country Planning Act 1990

This is the key piece of legislation for the UK planning system. It requires the Government to produce a National Planning Policy Framework, upon which all local plans must be based, and provides requirements as to what this framework must contain. There are key environmental elements to this, including for the protection of locally significant sites and landscapes even when not nationally designated, and in particular for the protection of nationally designated sites such as SSSIs. It was recently amended under the Environment Act 2021 to also require almost all development to provide a "net gain" in biodiversity.

2.12 Countryside and Rights of Way Act 2000

This is another wide-ranging piece of legislation, building on the 1949 Act to further promote public countryside access, while also introducing the further landscape designation "Area of Outstanding Natural Beauty" and strengthening some wildlife protections under the 1981 Act.

2.13 Climate Change Act 2008

2.13.1 This historic Act enshrines the UK's oft-cited legally binding emissions reduction target, initially to 20% of 1990 levels by 2050 but now net zero by 2050 following an amendment by order in 2019. It also contains Government obligations to measure and report national emissions, and laid the groundwork for what would become the EU Emissions Trading System.

2.13.2 Today it also sets the legislative framework for the UK-ETS (see below). This was effectively anchored to the EU scheme until March 2021 and continues to operate under similar principles. The 2021 Net Zero Strategy appears more concrete. The word "offset" is used little, presumably due to the negative connotations it has picked up from the aforementioned issues with offsets under the Kyoto Protocol. However, mentions of "land based GGRs [greenhouse gas reductions]" and discussion of how GGRs could be implemented into the UK-ETS appear promising.

2.14 Habitats and Species Regulations 2017

This is originally a piece of EU regulation, now brought into UK law following Brexit. It provides further protection to key sites and species considered to be of European importance.

2.15 UK Emissions Trading Scheme (UK-ETS) introduced in 2020

2.15.1 This was introduced immediately following Brexit as the UK could no longer be part of the EU-ETS. As the EU system (see 2.4), this aims to reduce emissions in key issues such as aviation and the production of steel and chemicals by phased issuing of a decreasing number of tradeable emission "permits". For now it remains closely aligned to the EU-ETS, although as domestic legislation, there is scope for the two to diverge.

2.15.2 There was some speculation that highways could be incorporated into the UK-ETS mirroring EU proposals, but this was not mentioned in the Net Zero Strategy. However, the Strategy does briefly mention trading of emissions from agriculture. The ramifications of this would be wide-ranging, and are discussed in section 11.

2.15.3 One might speculate that, given their similarity in both objectives and function, it may be sensible to re-incorporate the UK-ETS back into the EU-ETS, perhaps allowing landowners a truly international market for carbon sequestration. However, we expect this to remain diplomatically impractical in at least the medium term.

2.16 Agriculture Act 2020

This is the Act which enabled DEFRA to move English farming subsidies from the EU's area based "Basic Payment Scheme" to the more environmentally focused ELMS. DEFRA hopes this will transform farmland management in the UK. Schemes under this Act will remain a

key income stream for farmers and should be considered as the baseline which the environmental credits mentioned herein will supplement.

2.17 Environment Act 2021

This is an exceptionally wide piece of legislation covering everything from urban tree protection to governmental oversight. Critically, it also provides a requirement of developments to provide "biodiversity net gain" and provides "conservation covenants" as a legal tool for this. It also requires the Government to declare a "climate emergency," as an insight into the state of mind which has brought us to this point.

2.18 Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network (2010)

This damning independent investigation conducted on the Government's behalf is also known as the "Lawton Report". It concluded that England's habitats, many of them irreplaceable, had declined and were continuing to decline at an alarming rate and were already insufficient to provide the network of good-quality spaces needed by England's wildlife. It then set out a plan for reversing this change that requires new sites as well as expansion and greater connectivity between and better management of existing sites. This has frequently been summarised as "more, bigger, better and more joined up". As well as being a key influence on the ongoing development of agri-environment schemes, it is also crucial to understanding the context of biodiversity offsetting as a policy and its ultimate objectives in reversing the decline seen in this report.

2.19 Clean Growth Strategy 2017

This policy paper laid out the Government's plans for environmentally friendly economic growth. It laid out a strategy for the countryside to encourage carbon sequestration, biodiversity and soil health, while keeping land "highly productive". The UK-ETS is first raised as a post-Brexit measure, including tentative mention of the inclusion of carbon offsetting. Several of today's clichés such as "leave the environment in a better state than how we found it" and "natural capital" became prevalent in this document.

2.20 A Green Future: Our 25 Year Plan to Improve the Environment (2018)

Building from the Clean Growth Strategy and to some extent the Lawton Report, this document laid down a set of actions to be undertaken to achieve long-term improvement in the UK's environment. This was striking in that it crystalised the ongoing shift from managed environmental decline to government activity aimed at long-term improvement. It outlined, without detail, a variety of measures including those now familiar as biodiversity offsetting, ELMs and the Peatland Carbon Code.

2.21 Health and Harmony: the Future for Food, Farming and the Environment in a Green Brexit (2018)

This paper laid out then-Environment Secretary Michael Gove's intentions for agricultural subsidy policy, which would later become enshrined in the Agriculture Act. More widely, it

laid out the principle of "public money for public goods" supplemented by private sector funding which is precisely what we are now discussing in this publication.

2.22 Net Zero Strategy: Build Back Greener (2021)

Written to coincide with the Glasgow COP-26 summit, this sets out exactly how the government intends to reach the net zero target laid out in the Climate Change Act. This predictably affects all areas of society, with a number of implications for farming. These include hinting at farm carbon "quotas" (our word) and suggesting the need to protect domestic agriculture from climate changes' effects. Perhaps the most interesting development from this is an explicit intention by the Government to investigate how "greenhouse gas removals" (a phrase coined because "offset" has become somewhat politically charged) could be incorporated in the UK Emissions Trading Scheme – a clear step forward from the Clean Growth strategy.

3 CARBON CAPTURE AND TRADING

3.1 Background

3.1.1 So far efforts to reduce the nation's net carbon emissions, have led to measures such as a ban on new internal combustion vehicles by 2030 and the legal requirement for tenanted property to meet a minimum set of energy efficiency standards. The COP26 climate summit has pushed for the end to the use of coal and other fossil fuels, and led to promises by leaders from more than 100 countries worldwide to stop deforestation by 2030.

3.1.2 Reducing net emissions does not, however, just mean emitting less carbon. Certain measures can also remove carbon from the atmosphere.

3.1.3 The Government has already put into place a system in which carbon removed from the atmosphere by woodland planting or peatland restoration can be 'bought' by businesses wanting to self-regulate their offsetting, currently on a voluntary basis, to prepare for future legislative offsetting requirements, or to be seen as 'green' as possible in their marketing/corporate status.

3.1.4 The three main areas of land-based carbon sequestration are through woodland, peatland and soil. The first two are regulated by Government-recognised codes known as the Woodland Carbon Code (WCC) and Peatland Carbon Code (PCC). These provide assurance through set standards of regulation and ensure permanence of the credits sequestered. Woodland creation is the most common way of establishing to establish carbon credits and is the most widely found type of unit. At the time of writing a Soil Carbon Code (SCC) is anticipated but not yet available. Soil Carbon Units (SCU) may still be purchased, but they are considered a less secure option due to the lack of standardisation in recording quantity, additionality, and permanence.

3.2 Future of the Carbon Offsetting Market

3.2.1 Mark Carney, finance advisor to Boris Johnson and UN Special Envoy for Climate Action and Finance, has established a taskforce to promote the expansion of the carbon offsetting market. There are two key objectives: firstly, to look at how best to expand the market, and secondly to 'legitimise' the market by establishing a framework to regulate and standardise the price and quality of carbon units across projects. This may prove to be a key development for international carbon credit markets.

3.2.2 The UK Government has so far been slow to embrace offsetting as a tool to reach carbon neutrality, understandably focusing on reducing emissions in the first instance. For certain industries, however, there will always be a level of emissions produced out of necessity. Once a company has made all possible reductions then offsetting is an important option to enable them to reach a net zero carbon footprint. It is heartening therefore to see proposals in the 2021 Net Zero Strategy to investigate giving voluntary offsets some legislative force through the UK-ETS (see 2.21).

3.2.3 As companies large and small increasingly pledge carbon neutrality, farmers and landowners (having first accounted for their own emissions) should consider a range of carbon capture schemes from woodland creation to peatland and soil management to meet this demand and alleviate the upcoming loss of BPS direct payments.

4. WOODLAND CARBON CODE

4.1 Woodland Carbon Code (WCC) Background

4.1.1 The WCC is the Government approved voluntary standard for UK woodland creation projects where the landowner wishes to verify and trade the carbon captured by new woodland. It is administered by the Forestry Commission. The WCC is used to verify carbon sequestering projects throughout the UK. There are currently ongoing projects in all regions. Each nation of the UK does, however, provide differing support and grants for establishment of woodland. Sites in England also have access to the Woodland Carbon Guarantee (WCG) which allows the future option for selling of units to the Government.

4.1.2 Carbon sequestered or 'captured' by woodland is measured in the form of a Woodland Carbon Unit (WCU). One WCU represents a tonne of carbon dioxide captured in verified woodland which can then be purchased to offset emissions or to claim carbon neutrality for a business or individual. The latest Woodland Carbon Guarantee auctions resulted in an average of £20.32 WCU/tCO_2 in August 2021. A new native woodland can capture 300-400 tonnes of CO_2 equivalent per ha by 2050. This could represent circa £113 per acre per annum and may rise if competing demand from the corporate sector is sufficiently strong, especially following a tightening of legislative requirements.

4.1.3 A business wanting to offset its future emissions may also purchase a Pending Issuance Unit (PIU) which is in effect the future deliverance of a predicted WCU over a period

of time. The Forestry Commission report that landowners with new woodlands, which meet the standards set out in the WCC, initially sold carbon upfront to companies for between £5 and £15 / tCO_2. Whilst this cannot be used to offset UK-based emissions until a WCU is verified (after 5 years from planting and every 10 years thereafter), it does allow a business to plan for offsetting future emissions. The WCC provides the standard for verification of WCUs, and this allows a purchaser assurance that any units purchased are actually providing the carbon capture they are paying for.

4.2 UK Woodland Creation Grants

4.2.1 *England Woodland Creation Offer (EWCO)*

This is a grant to support the creation of new woodland, run by the Forestry Commission. It offers payments for capital items, including each tree planted, at a payment rate the Forestry Commission believes will cover 100% of costs. The Offer also provides "bolt-on" payments for a range of perceived benefits new woodlands may produce, such as expanding existing native woodlands, reducing flooding, or allowing public access. It also contributes a £200/ha pa payment for woodland maintenance in the ten years following establishment.

4.2.2 *Scottish Government Forestry Grant Scheme*

The Forestry Grant Scheme offers support for the creation of new woodland and the sustainable management of existing woodland in Scotland. There are eight categories of support options which include among others: planting, woodland protection and harvesting. There is grant support of up to £3,600/ha for initial planting and £624/ha annual maintenance for 5 years depending on woodland type and location. Agroforestry systems with 200 trees/ha can receive capital grants of up to £1,860/ha with £48/ha annual maintenance for 5 years.

4.2.3 *Wales - The Woodland Investment Grant (TWIG) Scheme/Glastir Woodland Creation*

For 2021/2022, the TWIG grant provides 100% funding with the maximum grant award per application up to £250,000 and a minimum of £10,000. Glastir Woodland Grants also provide for the creation, management, and restoration of woodland in Wales. Glastir works on a per hectare basis, providing £4,500 under its highest-paying "woodlands for carbon" subcategory. It also offers a £60/ha pa maintenance payment for 12 years following creation, and a further £350/ha pa payment, also over 12 years, for income foregone from agriculture.

4.2.4 *Northern Ireland - Small Woodland Grant Scheme / Forest Expansion Scheme / Woodland Investment Grant*

The Small Woodland Grant Scheme is specifically for new native woodland planting of 0.20 hectares and larger. The Forest Expansion Scheme is for new woodland planting of 3 hectares and larger. All woodlands that comply with the UK Forestry Standard are eligible for support. Successful applicants will receive up to 100% of eligible establishment costs and, where eligible, annual premia for a 10-year period. Payments include:

- Establishment grant of £2,925/ha covering initial preparation, trees (from a defined list), labour, weeding, maintenance, monitoring and protection. 80% of this grant (£2,340/ha) will be claimed in Year 1 and the remaining 20% (£585/ha) will be claimed in Year 5.

- Annual premia: This is an area-based payment of £3,500/ha (10 annual payments x £350/ha) for woodland creation on agricultural land. The grant is eligible in Years 1-10. These are payments for income foregone to cover loss of income compared to agricultural production. The grant rate may be subject to a periodic review.

- Stock fence grant: A payment rate of £6/m for new stock fencing. This is based on a standard specification. 100% of this grant will be claimed in Year 1.

4.2.5 We set out in Appendix 8 the comparison of regional Woodland Creation Grants.

4.3 English Woodland Carbon Guarantee

In England, the Government's Woodland Carbon Guarantee (WCG) aims to support and encourage the planting of new woodland for carbon capture. There is no similar option for the other UK regions at present. This scheme guarantees that a landowner will be able to sell their WCUs to the Government for a pre-agreed price every 5 or 10 years up to 2055/56. One would still have the option to sell via the open market should prices rise above the pre-agreed price but would retain the security of a guaranteed minimum price from the Government going forward. Being accredited under the WCC is a requirement to be eligible for the Government's WCG. The value of the WCU is determined via reverse auction before a contract with the Government is agreed for the option. The results have ranged from £17.31 to £24.11 per WCU.

4.4 Under Grazed Low Density New Woodland

It is possible to use an agroforestry system to generate WCUs without taking land out of agricultural production. In this instance grazing would be combined with low density woodland to gain three sources of income including the current BPS payments. Care is needed however with agricultural use in respect to the Forestry Commission as this could be a breach of their funding rules.

4.5 Example Budgets

A series of budgets estimating costs and returns for various sized woodland projects ranging from 10 ha to 100ha for all regions are set out in Appendices 2-7.

4.6 Trading Woodland Carbon Credits

4.6.1 *Woodland Creation*:

- We can advise on establishing woodland (including site selection, design, carbon sequestering calculations, applying for grants based on the relevant regional location e.g. English Woodland Creation Offer, The Forestry Grant Scheme, Glastir Woodland Creation, Forest Expansion Scheme, HS2 Woodland Fund etc.) that is approved by the WCC, and the validation and verification process.

- For those looking to purchase land for woodland creation we act as a purchaser's agent, finding on- and off-market sites depending on where and what type of woodland project you want to establish. This includes initial desktop and site surveys. We have a register of sites available and clients looking to buy.

- We have a register for trading woodland carbon units including Pending Issuance Units if you are considering taking advantage of the new carbon market.

4.6.2 *Purchasing Carbon Units*

- We are registered with IHS Markit as an official trader of woodland carbon.

5. PEATLAND CARBON CODE

5.1 Introduction

Peatland restored under the Peatland Carbon Code (PCC) works similarly to woodland under the Woodland Carbon Code. Projects have a set of standards and procedures which assure carbon buyers that their units are present and properly monitored, providing confidence in the market. Whilst still at an early stage (the first Peatland Code validation was awarded in 2018), the market value, supply and demand are expected to increase as the Government legislates for carbon neutrality.

5.2 What is the Peatland Carbon Code?

5.2.1 Peatland is a long-term store of historically laid down carbon, and it does not grow, or at least not very quickly. Therefore, the Peatland Code relates to peatland considered to be in poor condition. Such peatland, says the Code, will constantly release carbon stored back into the atmosphere until it is improved. It is this improvement that generates credits. The Code measures peatland carbon based on how much would have been released over a period of time had the peatland not been improved, compared with how much, if any, will be released after the improvements are complete. This determines the number of credits received.

5.2.2 "Improvement" in this context usually means rewetting dry areas and re-establishing permanent green cover over bare patches. The Code is flexible about how this is done, provided that basic requirements are met such as not breaching planning regulations and not already being a legal requirement. This means a great variety of different activities can and have been conducted under the Code, ranging from simply blocking drains and changing grazing regimes to full scale "rewilding" projects.

5.3 Differences from woodland carbon

5.3.1 The key difference between the peatland and woodland carbon systems is flexibility. Sequestering carbon by woodland creation specifically requires trees to be planted and managed in a WCC compliant fashion, which will usually remove the land from agricultural production. However, there are many different kinds of works which can

sequester carbon from peatlands, which may avoid taking the land entirely out of production.

5.3.2 The counterpoint to this is it means a more involved application process. It is broadly accepted that planting trees removes carbon, but a case may need to be made under the Peatland Code about why the specific proposed works will have the desired effects. This may mean a longer application process.

5.3.3 This also means that the "self-assessment" verifications available under the woodland carbon code are not available in relation to peatland.

5.4 Trading Peatland Credits

5.4.1 *Restoring Peatland*

- Should you wish to acquire a peatland to restore we can help with the sourcing and acquisition process. We act as a purchaser's agent, finding on- and off-market sites This includes initial desktop and site surveys carried out by our team including our ecologists. We have a register of sites available and clients looking to buy.
- We can manage the verifying and validation of carbon units sequestered by the peatland.

5.4.2 *Selling Carbon Units*

- We have a peatland carbon register and can market peatland carbon units on your behalf.

5.4.3 *Purchasing Carbon Credits*

- We are registered with IHS Markit as an official trader of peatland carbon.

6. SOIL CARBON TRADING

6.1 Emerging market

At present the soil carbon market is not fully developed. Measurement of volumes and permanence of carbon sequestered lacks standardisation. It can be confusing for the land manager who is interested in trading soil carbon due to the number of similar trading platforms. Standards can vary by country and even by trading platform/organisation within a country. Some methods suggest 2-3 tonnes CO_2 can be sequestered by soil per hectare per annum, others more than 5 tonnes.

6.2 ELMS and trading

The introduction of the Environmental Land Management Scheme (ELMs) and its 'public money for public goods' mantra, will reward land managers for taking environmentally beneficial actions including sequestering carbon through soil management. It is hoped one

may trade this sequestered carbon, which some sources suggest may create a greater amount of sequestered carbon than any amount of tree planting in the UK.

6.3 Soil Carbon Code

6.3.1 The UK Government hopes the open market will be a means of driving investment in environmentally beneficial practices. However, they must address the issues surrounding measurement and the avoidance of double-counting units. While there is no current soil equivalent to the Woodland and Peatland Carbon Codes, the Government has indicated that such a code is in production. This code should aid the market by providing a robust, recognised standard in which buyers can have confidence.

6.3.2 DEFRA and the AHDB are working together to develop a carbon foot printing tool for soil carbon to be applied at a UK-wide level by 2023. This would address the issue of the multitude of carbon tools currently available, all measuring in slightly different ways.

6.3.3 DEFRA also intends to bring together public and private sectors to help finance projects under ELMs. Private sector funding may refer to some open market trading of the scheme's benefits, including in the form of carbon credits. However, in line with the Woodland and Peatland Codes, the Soil Carbon Code may include an "additionality requirement" which prevents the registration of carbon sequestered from works directly funded by other means, perhaps leading to a separate, additional set of activities either parallel to or "over and above" ELMs' requirements to qualify for the Soil Carbon Code. We believe this will not be a limiting factor in the amount of soil carbon that will be available to market.

6.4 Trading Soil Carbon

We have a register of clients interested in purchasing and selling carbon sequestered through soil management.

7. BIODIVERSITY NET GAIN

7.1 25-year plan

One of the aims of the Government's 25-year Environment Plan, is to "leave the environment in a better state than we found it". One way the Government hopes to achieve this is found in the Environment Act 2021 which, in part by amending the Town and Country Planning Act (1990), requires developers to contribute to at least 10% net gain in biodiversity. This requirement is expected to be mandatory for all Town & Country Planning Act (TCPA) developments by 2023 following further consultation.

7.2 Habitat creation and habitat enhancement/restoration

There are two main options for achieving this, habitat creation and habitat enhancement/restoration. These will each involve actions such as planting woodland, sowing

wildflower meadows, creation of wetlands and ponds, hedgerows, tree lines, scrub belts and grassland verges. All habitats must be secured for at least 30 years.

7.3 Conservation covenants

Developers must set out how their net gain will be achieved as part of their planning application. Whilst they are encouraged to provide net gain on site if possible, many will have to either purchase land to create habitat elsewhere or pay someone to establish it for them. For farmers and landowners this represents an opportunity to create more income from unprofitable areas of land (as well as productive areas) and can complement the holding's areas of productive farming. There is also the potential for synergy with other areas of diversification such as sporting or tourism. The downside is land will be locked up for at least 30 years. These conservation covenants will run with the land, creating binding targets and obligations on whoever buys or inherits the land.

7.4 Biodiversity units

The biodiversity net gain (BNG) that developers require, and landowners will create, is represented by 'biodiversity units' calculated via the Biodiversity Metric 3.0. This will provide the common standard required for quality assurance for purchasers and regulates exactly what the provider is required to do. Whilst this metric has been in use in various iterations in the past it is likely that this version will be the one used for calculations for BNG, subject to a final consultation now the Environment Act has received Royal Assent. It is possible that values could soar depending on the supply and demand. It will be interesting to see how BNG will interact with other environmental schemes such as ELMS. It is generally understood that benefits may not be 'stacked' and that there must be additionality. The British Standards Institution's guidance, BS 8683, defines this as not paying for something that would happen anyway, whereas DEFRA simply say they will not pay for the same thing twice. The latter statement suggests more leeway and that the by-product of one scheme may be sold separately to the initial action e.g. creating woodland for biodiversity then selling the carbon sequestered as credits. In this instance you are not selling the carbon itself twice as you are being paid to create/improve habitat rather than sequestering carbon, making use of all revenue streams available from taking land out of production. This would encourage the overall uptake of landowners willing to take part.

7.5 Calculating a site's baseline

7.5.1 There are several factors and multipliers involved in calculating the units a site will lose or gain. These include: area, distinctiveness, condition, strategic significance, impact of development, time to reach desired level, difficulty of establishment, risk and proximity of development site to offset site. The higher the development site's biodiversity, the more habitat will be lost from the development and in turn required from off-site projects to make up a 10% net gain. This process will discourage new development on sites of high biodiversity.

7.5.2 First the original baseline of the area to be developed is established. Then the impact of the developmental actions and any existing habitat lost are calculated and subtracted from the baseline. After the developer has established the on-site losses, they must try

to deliver on-site gains. Where this does not reach 10% net gain, they must look for off-site schemes.

7.6 Unit calculations for off-site creation/enhancement

7.6.1 *Establish off-site baseline*

The area in ha or km for rivers is worked out. There is no specific minimum or maximum size but under a certain threshold it would simply not be worth it. Local authorities are in the process of creating areas of strategic significance. If the location of a site is within such an area it receives a 15% boost to the number of units generated. If it is considered to be in a desirable location but not within an official strategic site it may receive a 10% boost subject to the Local Authority's agreement.

Every habitat is given a distinctiveness score between 0 and 8 based on its rarity, proportion in SSSIs and its UK Priority status. This is multiplied by the area.

This is combined with the condition of the existing habitat (or proposed habitat) ranging from x1 (Poor) to x3 (good). Certain habitats such as cereal crops are automatically classed as poor.

This creates the starting point for the number of units available.

As an example, 2 ha of arable would generate:

2 (Area) x 2 ('Low' Distinctiveness) x 1 ('poor Condition) x 1 ('Low' Strategic Significance) = 4 Units

7.6.2 *Account for Loss of existing habitat*

Once calculated, the baseline unit value on the offset site must be subtracted from the final offsite figure (after habitat creation), as it is classed as lost habitat. This is where enhancement is useful as an alternative to creation as less overall habitat is lost, with more net units produced.

7.6.3 *Account for Gain of created/enhanced habitat*

The created/enhanced habitat value must be calculated, as when establishing the baseline, but using the new type of habitat or new condition scores with the following multipliers:

- *Spatial risk* - The distance of the new site to the developer's site will negatively impact the amount of usable units by 25% if in a neighbouring Local Authority area and 50% if further afield.
- *Difficulty of creation and time* - The time it takes for enhancement or creation of a habitat to reach its desired potential will impact units with up to a 70% reduction if it takes 30 years or longer. The higher the difficulty will reduce the value by up to 10%.
- *Example* - If the above arable site was used to create Gorse Scrub:

2 (Area) x 4 (‘Medium’ Distinctiveness) x 3 (‘Good’ Condition) = 24

x 1 (‘Low’ Strategic Significance) = 24

x 0.7 (Remoteness: 10+ years to establishment) x 1 (‘Low’ Difficulty of creation)

x 1 (Spatial Risk: Within same LPA)

= 16.8 Units minus: 4 (Baseline Units Lost)

Units created = 12.8

7.6.4 It is worth noting the benefits of enhancing existing land rather than creating new habitat. More units may be produced via enhancement even if the habitat is a more ‘common’ one than a newly created ‘rare’ habitat.

7.6.5 The type of habitat, whether created or enhanced, must be carefully considered as factors such as time taken to establish will drastically affect the number of units produced. The land manager must also consider how BNG complements the rest of the business. Whilst it may seem simpler to sell land to developers and let them create habitat for themselves, retaining the land allows one to sell BNG units and continue farming to an extent (depending on the type of habitat created/enhanced) thus allowing the landowner to make the most of their ‘natural capital’.

7.6.6 The Environment Act has introduced provisions to implement a Local Nature Recovery Strategy. This will support the delivery of biodiversity net gain by putting a duty on Local Authorities to map and record areas with potential for creating or improving habitat and other environmental goals. This will involve mapping valuable existing areas, making specific proposals for improvement and agreeing priority areas and outcomes for evidence based, locally led plans. As mentioned, if a site is within one of these strategic areas it will receive a bonus multiplier to the units produced.

7.7 Trading Biodiversity Net Gain

7.7.1 Biodiversity Net Gain is expected to become mandatory by 2023 now the Environment Act 2021 has received royal assent. Certain planning authorities already informally require net gain. Please register your interest with us now to take advantage of Biodiversity Net Gain schemes as they progress.

7.7.2 We can advise on suitability of areas for Biodiversity Net Gain.

7.7.3 Our surveying team will calculate the potential Biodiversity Units using the DEFRA Biodiversity Metric 3.0, created by the actions you will undertake on your land.

7.7.4 For those looking to acquire Biodiversity units we can add you to our register and match you to a site that suits your requirements and location.

7.7.5 This can include the sourcing and purchase of areas with potential for net gain or simply the purchase of the credits.

8. NITRATE OFFSETS

8.1 Introduction

In September 2020 DEFRA announced the intention to set up a 'Nitrate trading' platform, at the time of writing this is yet to be established.

8.1.1 The idea is that housing developers would be able to buy 'nitrate credits' to offset the footprint of new homes in areas particularly vulnerable to nitrate pollution. A nitrate credit would represent 1kg/N offset per year.

8.1.2 Developers will need an 'Appropriate Assessment' of the development proposal if there is a likelihood of increasing nitrogen loading into protected sites. A nitrogen budget must would be calculated and if the site is not nitrate neutral then nitrate mitigation would be required. If this did not result in neutrality, then planning would will be refused.

8.1.3 The Government announced a pilot scheme on the 11th September 2020 to enable development on the Solent in Hampshire where development had been prevented because of nitrate pollution to the Solent strait. The participation of landowners and farmers in nitrate offsetting involves two main options: indirectly through taking land out of high nitrogen uses, e.g. crops or intensive livestock systems, or directly through actions such as creation of 'interceptor' wetlands. Either type of scheme must be in place for a sufficient length of time. Natural England guidance suggests this will generally be 80-125 years. The area must also be of sufficient size to meet the legal tests in the Conservation of Habitats and Species Regulations. The location for mitigation land must be within the water catchment area of the development. The local planning authority will decide on the suitability of the proposed mitigation scheme based on the legal tests within the Habitats Regulations.

8.1.4 The requirement for the offsetting site to be within the water catchment of the development site means that putting land forward for offsetting is dependent on local development within your area. This differs from Biodiversity Net Gain, for which the two sites may be further afield.

8.1.5 We set out in Appendix 9 a table produced by Natural England of farm types and average nitrogen-nitrate loss in the Solent catchment area.

8.2 Potential land use change to produce nitrate offsets

8.2.1 *Conversion of agricultural land for community and wildlife benefits*

Land use may be permanently changed, converting agricultural land with higher nitrogen loading to alternative uses with lower nitrogen loading.

8.2.2 *Woodland planting*

This requires 20% canopy cover at maturity or roughly 100 trees per hectare depending on the type of trees planted. Woodland planting is estimated to equate to 5 kg/ha of nitrate reduction per year.

8.2.3 *Wetlands*

Wetlands can remove a proportion of nitrogen through denitrification and sedimentation. Urban runoff can be routed through wetlands as can part of the flow of existing streams or rivers. Wetlands must be maintained to provide ongoing nutrient removal.

8.2.4 *Future developments*

For future developments the Government has proposed an online auction service that will allow landowners to list potential environmental improvements to nitrate buffer sites in an area. Developers will bid to use these improvements to offset nitrate contamination from their developments. Landowners listing improvements will receive a payment from the highest bidding developer to put them into place. The developer can then use them to help attain planning permission.

8.3 Nitrate Vulnerable Zones (NVZ)

There is speculation that nitrate offsetting may be a requirement for developments within all NVZs in the future. As this includes 55% of all land in England there may be huge demand for land with offsetting potential. Although currently the pilot scheme is limited to a few areas such as the Solent, it may be expanded around the country to other areas facing similar issues.

8.4 Trading Nitrate Offset

8.4.1 Although nitrate offsetting is still in development, register your interest with us now to take advantage of these schemes as they progress.

8.4.2 We can advise on suitability of areas for nitrate buffer sites

8.4.3 For those looking to purchase offsets we can add you to our register and match you to a site that suits your requirements and location.

9. PHOSPHATE OFFSETS

9.1 In certain areas of the country, such as the Somerset levels and Moors, Natural England has is a need for protection from further phosphate pollution. This restricts the building of new housing and other developments in the area as, before determining a planning application that may increase phosphates within the catchment, local authorities must undertake a Habitats Regulations Assessment (HRA).

9.2 Some County Councils with affected catchment areas provide a Phosphate Budget Calculator 3.1 for developers. As part of the planning application process, developers will work out their

site's pollution levels, then consider a range of measures such as removal at source, mitigation, and if necessary, offsetting of phosphate.

9.3 Offsite offsets will include agricultural management in catchment-based areas, accredited offset projects, nature-based efforts such as habitat creation and improvements to water recycling. Change of land use for mitigation includes constructing wetland, woodland, heathland and meadow amongst others.

9.4 Interestingly Somerset County Council suggest any phosphate schemes may include dual-use mitigation schemes taken from the Environment Act (2021) such as projects used for the 10% biodiversity net gain requirement.

9.5 In Somerset at least, using offsets to allow development is very much a work in progress and is not yet available at the time of writing.

10. HOW DO YOU CREATE AND MANAGE ENVIRONMENTAL CREDITS?

10.1 Woodland Creation

10.1.1 *Decide on site*

The choice of site will affect carbon sequestration potential not just through the choice of tree species, but also through soil type and previous land use.

10.1.2 *Design*

Tree species, stocking density, frequency of thinning, access routes and additional methods of income must all be taken into account before the woodland is planted. We use decision support tools such as the Ecological Site Classification to carefully match tree species to site conditions including soil type, drainage, elevation, exposure, and aspect. Other matters such as access for future management and the level of protection required during establishment will be considered and factored in.

10.1.3 *Receive planting consent under relevant Environmental Impact Assessment Regulations*

Planting in Northern Ireland is governed under the Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2006; planting in Scotland is governed by The Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017; planting in England and Wales is covered by the The Environmental Impact Assessment (Forestry) (England and Wales) (Amendment) Regulations 2017

In England these consents can be partially funded under the Woodland Creation Planning Grant which will pay £1,000 towards Stage 1 of the scoping study and £150/ha (minus £1,000) for Stage 2.

10.1.4 *Funding for establishment*

This can be provided through grants such as the English Woodland Creation Offer, Forestry Grant Scheme, Glastir Woodland Creation and the Forest Expansion Scheme. Schemes in England can also consider applying for the Woodland Carbon Guarantee via reverse auction. This scheme creates a safety net, should you be accepted, as the Government will pay the amount bid for your credits, should you not be able to sell for a higher price in the open market.

10.1.5 *Registration with the Woodland Carbon Code*

The project must be registered before planting. This may be as a single or group project.

10.1.6 *Planting*

The woodland can then be planted.

10.1.7 *Validation by accredited body*

This must occur within 3 years from the date of registration. All trees must be planted by this point. Organic Farmers and Growers and the Soil Association are accredited by the UK Accreditation Service to validate woodlands under the Woodland Carbon Code. This is a relatively complex process requiring a large volume of documents and a case to be properly made as to why the woodland passes several key tests.

10.1.8 *Initial Verification*

This happens 5 years after planting was completed, but the validator should be contacted 12 months before this date.

10.1.9 *Further Verifications*

Every ten years after the initial verification, there must be a further verification resulting in further conversion of PIUs (Pending Issuance Units) into WCUs (Woodland Carbon Units). A site visit will not necessarily be needed. If the woodland has performed well and rules have been followed, every second verification can be a "self-assessment," which is a simpler process that does not involve a validator.

10.2 Peatland Restoration

10.2.1 *Decide on site*

You will either already own peatland or will need to acquire some.

10.2.2 *Registration*

The peatland will be registered on the Peatland Code Registry.

10.2.3 *Site survey and creation of Restoration Plan*

This will establish the suitability of the project and how it will be restored, and calculate the carbon that is retained.

10.2.4 *Validation*

Validation will take place before the implementation of the restoration plan by an approved validation/verification body (currently only Organic Farmer and Growers have the necessary accreditation for this) who will provide a validation statement.

10.2.5 *Implementation of Restoration Plan*

The Restoration Plan must be implemented before the expiry of the validation statement. PIUs will then be issued.

10.2.6 *Verification*

Verification will take place after one year of the start of the project. It will evaluate the restoration and condition of the peatland in accordance with the validated restoration plan. The project will be listed on the Peatland Code Registry as verified. A proportion of PIUs will be converted to Peatland Carbon Units.

10.2.7 *Ongoing verification*

This occurs at year 5, and every 10 years afterwards for the length of the agreement.

10.3 Soil Carbon Management

10.3.1 This is currently unregulated with a lack of standardisation in measuring volumes and permanence of carbon sequestered. We anticipate the Government supporting a Soil Carbon Code (see 6.4)

10.3.2 While, there is currently limited certification of these credits, which in turn limits their tradeable value, it remains possible to measure these credits and market them for sale, albeit to what is presently a highly limited market.

10.3.3 As there are a number of different tools available, there is no single process that applies to all of them. However, in broad terms the mechanism is:

- *Baseline Measurement*

  Use a measurement tool to estimate how much carbon will be stored in in the soil if no further action is taken.

- *Consideration of Own Contribution*

  Use the tool to estimate how much this is improved by current or planned activities.

- *Verification*

  Use whatever means the chosen tool allows to document and verify this carbon.

- *Marketing*

  Attempt to use the evidence form this process to find a buyer for this carbon.

10.3.4 As discussed, there are a number of different tools, each with their own variations on this broad process. When the Soil Carbon Code is in place, we expect this to be a more involved process than any existing soil carbon tool, more closely resembling the woodland and peatland codes.

Beware that any improvements now may well not provide carbon credits to trade if the same principle of additionality is applied as with the WCC.

10.4 Biodiversity net gain

10.4.1 *Evaluate the site/calculate baseline*

The location and area of the land and whether it is in a Local Authority's area of strategic significance must be established and the site baseline calculated.

10.4.2 *Calculate the creation/enhancement*

Decide on what works are to be carried out on the land and calculate the habitat enhancement that will be achieved by them;

10.4.3 *Record information on register/seek purchaser*

This information will be added to our register and the Local Authority's registers and we can advise on the introduction of a developer who will buy the units.

10.5 Nitrate Offsets

10.5.1 Nitrate Offsets involve developers funding the creation of habitat such as wetlands, meadows, and woodland, or paying for land to be taken out of agricultural production.

10.5.2 Our register of buyers and sellers will enable the sale between landowners and developers. Developers will bid to use these improvements to offset nitrate contamination from their developments. Landowners listing improvements will receive a payment from the highest bidding developer to put them into place. The developer can then use them to help attain planning permission. Whilst pilots are ongoing at the moment, we expect the market to develop as a requirement to take into account catchment areas and the potential for nitrate pollution.

11. WHAT PAYMENT CAN YOU EXPECT?

11.1 Woodland Carbon Units

The most recent Woodland Carbon Guarantee auction, at the time of writing, which closed on 1st August 2021, averaged £20.32 per unit among winning bids. Auction results so far have ranged from £17.31 to £24.11 per unit since the auctions started. This is not the open market however and as a relatively young market with increasing demand, the prices

are expected to increase. PIUs have been changing hands on the open market at between £7-15 and WCUs at over £20. Based on a WCU at £20, a new native woodland of 25 acres capturing 140 tonnes of CO2 equivalent per acre by 2055 this could represent circa £51 per acre per annum in addition to planting grants and the BPS.

11.2 Peatland Carbon Units

The market for PCUs usually matches prices for WCUs.

11.3 Soil Carbon Units

11.3.1 There is less assurance surrounding SCUs at present due to there being no code at the time of writing. Therefore purchasers, and therefore transactions, are too limited to determine a clear market price. This is compounded by the number of different measurement tools, which can give widely varying figures for carbon sequestered for the same activity on the same land. Therefore, it is difficult to say how much money could be earned from a buyer for soil credits generated using existing systems.

11.3.2 Once a Code is established then a SCU should in theory be worth the same as a PCU or WCU. However it is likely that WCUs are seen as the go-to 'safer' option both in terms of visible publicity in tree planting and permanence and quality of the unit. That said, soil carbon has huge potential in that land's productive agricultural capacity can be retained to a far greater extent than when used for woodland creation, and there may potentially be more units that can be generated from soil than tree planting in the UK. They in principle should match other carbon units if an appropriate code is introduced by the government.

11.4 Biodiversity Offsets

The biodiversity value is calculated using the DEFRA biodiversity metrics. DEFRA have proposed an outline tariff of £9,000 to £15,000 per biodiversity unit hoping to make it attractive to sellers by determining not to use compensatory or income foregone models of remuneration. However, it will vary on a case-by-case basis. An example of a high paying habitat would be a hectare of arable used to create gorse scrub producing 6.4 units, subject to a variety of factors. This could potentially make up a payment of £96,000 the equivalent to £1,295/acre per annum for 30 years. Putting one hectare of modified grassland into lowland meadow would yield a net 9.03 units in optimal conditions (distance, within a formally identified area etc.) This would result in £135,450 the equivalent to £1,827/acre per annum for 30 years.

11.5 Nitrate Offsets

11.5.1 As projects in this category are still in the pilot stage there are fewer examples on what can be gained from putting land forward. Based on the test sites from the pilot in the Solent, credits are being offered by local councils for between £3,000-3,500/Nitrate credit for the cessation of certain farming practices (such as reducing stocking density) for an agreed period. Proactive interventions such as creating wetlands may be worth more. Looking at three sites containing 3,633 credits (some of which have already been sold) across 78.5 ha with each credit representing 1kg/nitrates per year if all are

sold this represents 46.28 credits/ha or £138,840/ha to the landowner over the lifetime of the agreement. If an 80-year project is assumed this would result in £1,735.50/ha pa.

11.5.2 It should be made clear that This example is based on the local council purchasing land themselves and setting a price that developers in the region must pay. As such it is not an open market value of a nitrate offset but gives an estimate of what land previously used for grazing may provide when taken out of production. In this case agricultural activity ceased, however methods of lessening the intensity (such as reducing stocking density) will also produce credits, albeit a lesser amount.

11.5.3 It is difficult to suggest that this council's approach and what they have been involved with sets a UK-wide market rate because, as we find with the Water Abstraction licence market, which involves the same number of catchment areas and therefore markets prices vary considerably. However, this is still a useful comparable to take into account when the government hopefully expands the pilot to other catchment areas.

12. CARBON EMISSIONS MARKETS: RETURN OF QUOTAS?

12.1 There is a particularly interesting sentence at the bottom of paragraph 34 of chapter 3 of the 2021 Net Zero Strategy:

> "We will continue to review potential carbon pricing strategies for land use sectors, including the potential role for voluntary or compliance carbon markets to support cost effective decarbonisation for the sector"

12.2 We have already discussed trading carbon offsets. What is being proposed in the paragraph above, is rather different.

12.3 Phrases such as "carbon pricing" and "compliance carbon markets" suggest we may see what is known as "emissions trading". This is already in place for some industries in the UK and globally. The way it works is that annually everyone in the affected industry is allocated a number of annual "Emission Permits" by the Government. Each year, they must declare how many tonnes of carbon (or equivalent) they have then emitted for that year, and they will be penalised if they then do not also surrender an equivalent number of those permits. If they do not need all of their permits, however, they can sell the excess to businesses in the same sector which do not have enough for that year.

12.4 How many permits get allocated annually is based on the average performance of the most environmentally friendly businesses in that sector, but the allocation will not be enough to cover all emissions in the sector if environmental performance across the sector does not improve. To avoid penalty, businesses must either make sure they are emitting less than is allowed by their government-issued permits, or buy extra permits from another business who does not need all of their own for that year. The total number of permits in circulation will decrease each year as government permit issues reduce, pushing up the price of permits so making it more cost-effective to reduce emissions.

12.5 This could mean that if this policy goes ahead there will be a new market for the agricultural sector with a familiar face. Whereas before farmers bought and sold permits for their total milk output, milk quota, this new market would instead be a "carbon quota". There are several points about how this would work which remain unclear at this stage, such as how the Government would decide how many permits to issue, how they would measure farm carbon outputs and exactly how permits would be traded between farms.

12.6 One example that will need to be sorted out is whether for example low-input and output organic arable production would be directly compared with conventional cropping in terms of permit allocation. If so, that would encourage all farmers away from conventional production, with clear implications for food security and increased costs for the industry. On the other hand, if the two do not share a market, low-input producers would validly feel frustrated that they cannot benefit from the techniques they deem to be lower in emissions.

12.7 We must also remind ourselves that this is just a possibility discussed in a very long-term strategic document. It may well come to nothing at all. However, if it does materialise, we have both a cost and an opportunity. For the farmers measured to have the best environmental performance, there would be real money to be made from selling these annual permits. However, for farmers who cannot, or choose not to, move in whatever direction Government measures suggest, there could be a heavy and rising cost from additional annual permit purchases.

12.8 To prepare for this, we advise careful consideration of what is on your farm that could help reduce carbon emissions and we can provide this as part of our Natural Capital farm assessment. Otherwise, the higher standards of the Sustainable Farming Initiative Pilot may give some good pointers. It may also be wise to look again at the possibility of woodland planting on less-utilised land: the credits this produces may be able to offset against these requirements for many years, so saving significant money in the long term.

13. TRADING OF ECOSYSTEM SERVICES

13.1 Whilst it is important to retain the most productive agricultural land in food production, the conversion of agricultural land for community and environmental benefits, particularly on poor quality land, allows for a wide variety of ecosystem services based on Natural Capital. Land may be used to deliver on a wide range of policy objectives and climate pledges.

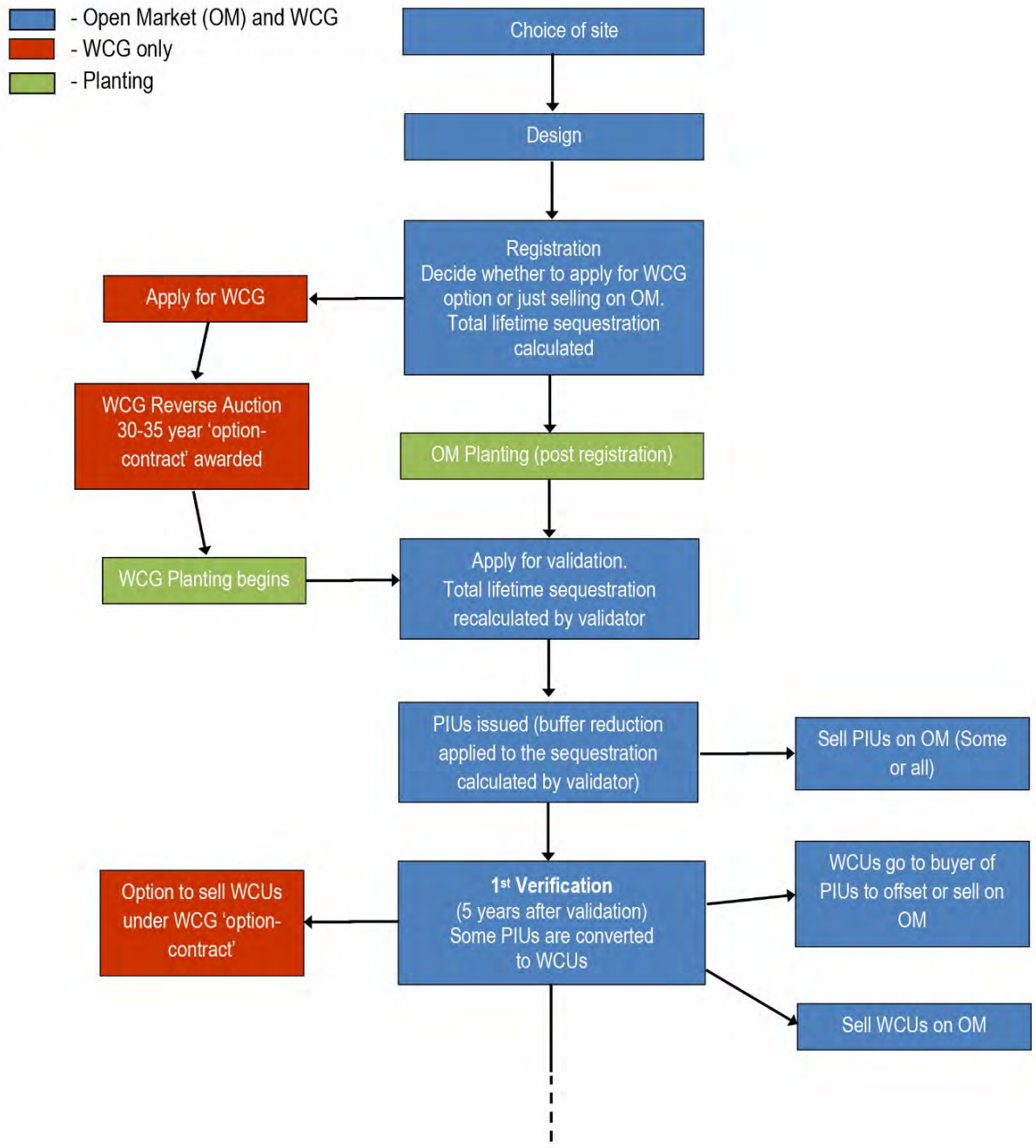
13.2 Certain projects lend their actions to a multitude of positive outcomes. Converting land out of agriculture will lower its nitrogen output for nitrate offsets, if woodland were to be planted it could also assist in flood management schemes, sequester carbon and increase biodiversity. There are an increasing number of additional services that people are willing to pay for and whilst care must be taken to comply with additionality requirements and double-counting of similar outcomes, these new "markets" will increase the potential income on most holdings.

13.3 We believe that a growing focus on identifying the carbon footprint of food (as seen with COP 26's "croissant" and "bacon butty") and the element due to how far the ingredients have travelled (plus the increased importing costs following Brexit) could well increase food prices in favour of home-grown, more sustainable food. Combine this with the emerging markets for

environmental credits, and land could receive increasing competition for an array of uses. With current Government support through ELMs and the tail end of BPS lasting until 2027, some comfort can be taken that life after BPS, given a little time perhaps, could not be the disaster that was first feared.

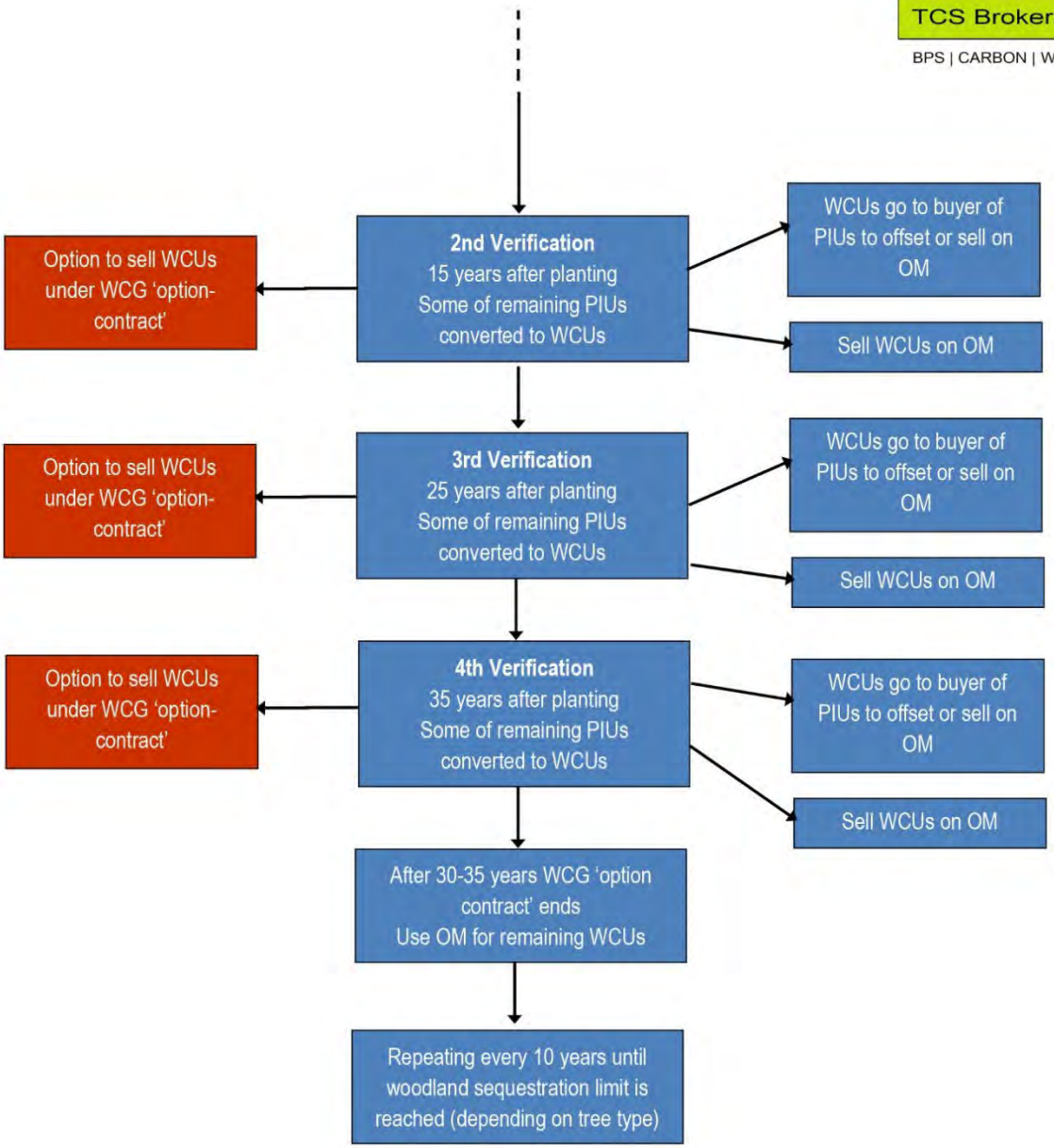
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Appendix 1: Woodland Carbon Pre-planting Options



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This flowchart is for illustration purposes only and professional advice in detail will be needed before relying on this information.
Published 28.9.20. Contact Mark Burton on 01392 823935 or email carbon@townsendcharteredsurveyors.co.uk

If you are thinking of selling Pending Issuance Units or Carbon Units, whether under the Woodland Carbon code, Peatland Code, upcoming Soil Carbon code or even through a private sector measurement system, we advise you to first consider the likely future requirement for your business to become carbon neutral. You may in future require carbon offsets for your own use, and may make a net loss if you sell the carbon sequestered on your own holding only to buy further offsets from elsewhere.

Matford Centre, Exeter EX2 8FD Tel 01392 823935
carbon@townsendcharteredsurveyors.co.uk

Appendix 2: Carbon Code - 10-Year Budget - 10ha Broadleaf – England

ITEM	NUMBER	@	£	/UNIT	TOTAL	NOTES
Grant aid (planting)	12,800	@	£1.60	/stem	£20,480.00	Assuming Woodland Carbon Fund (English Woodland Creation Offer (EWCO)
Grant aid (tree shelters)	12,800	@	£2.00	/stem	£25,600.00	Assuming EWCO
Native woodland creation supplement	10	@	£1,100.00	/ha	£11,000.00	Assuming EWCO
Sale of carbon	4,400	@	£12.00	/PIU	£49,300.00	Assuming sold as Pending Issuance Units.
BPS	10	@	£629.68	/ha	£6,296.80	Assuming EWCO and land eligible, in lowest payment reduction band, with claims/delinkage payments received until end of scheme in 2027. Also assuming claimant makes own BPS claims i.e. no professional fees
Maintenance payments	10	@	£2,000.00	/ha	£20,000.00	Assuming EWCO
Planting cost	8	@	-£5,932.80	/ha	-£47,462.40	Assuming 1,600 stems/ha (-20% open space), includes supply and plant 12,800 broadleaves with 1.2m tree shelters and stakes, mulch mats (inc 10% beat-up and 10p/stem spot spray)
Validation	1	@	-£1,200.00	-	-£1,200.00	Payment to Soil Association or Organic Farmers and Growers to issue PIUs
Verification	1	@	-£2,000.00	-	-£2,000.00	Payment to Soil Association or Organic Farmers and Growers to convert PIUs into WCUs
IHS Markit registration	4,400	@	-£0.06	/PIU	-£264.00	Mandatory payment for registration of PIUs
Management fees	-	-	-	-	-£5,000.00	Woodland design, grant applications, UK forestry standard compliance, Environmental Impact Assessment, administration of Registration, Validation and Verification including Carbon Calculation (costs vary case-by-case)
NET INCOME AFTER PLANTING					£76,750.40	Approximately £311/acre(£768/ha) income per year on average over first 10 years; woodland should then continue to produce revenue from generation of further carbon units to sell, SFI woodland maintenance payment and future woodland planning grant schemes

APPENDIX 2

- FURTHER COMMENTS

1. This example is for illustration only and should not be relied upon without further professional advice and research into the locality and requirements of the Local Planning Authority and national government.
2. PIU proceeds are gross of sale costs
3. Grant aid could include Countryside Stewardship or other sources including private investment and charitable grants
4. Carbon can be sold as WCUs or PIUs
5. Basic Payment Scheme, if relevant may be subject to further legislative change
6. Fencing/tree shelter costs and grant funding are generalised based on costs nationally, and vary by location.
7. Validation and verification costs are based on standard figures from the Soil Association, but can be subject to variation.
8. Most woodland planting requires an Environmental Impact assessment, but the work involved in producing this can vary widely with additional costs sometimes involved.
9. Management costs are illustrative only at this stage.
10. It is assumed for the purpose of this example that only low-impact ground preparation will be needed and that no additional cost is needed for infrastructure.
11. Tree species and yield class, and therefore carbon output, vary considerably by location. The figures in this table while selected to represent how a "typical" woodland might perform, they should not be relied upon to estimate the performance of any actual project(s).
12. Growing timber is exempt from Capital Gains Tax. Commercially-managed woodland is eligible for Business Property Relief for Inheritance Tax purposes, and woodlands ancillary to farm businesses are eligible for Agricultural Property Relief. Neither income nor corporation tax is charged on timber sales or woodland grants.
13. Neither income tax, corporation tax, nor VAT is payable on the sale of PIUs or WCUs.

If you are thinking of selling Pending Issuance Units or Carbon Units, whether under the Woodland Carbon code, Peatland Code, upcoming Soil Carbon code or even through a private sector measurement system, we advise you to first consider the likely future requirement for your business to become carbon neutral. You may in future require carbon offsets for your own use, and may make a net loss if you sell the carbon sequestered on your own holding only to buy further offsets from elsewhere.

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Appendix 3: Carbon Code Woodland Year 45 Budget - 100ha Commercial – England

ITEM	NUMBER	@	£	/UNIT	TOTAL	NOTES
Grant aid (planting)	191,000	@	£1.60	/stem	£305,600.00	Assuming English Woodland Creation Offer (EWCO), 70ha commercial conifers @ 2,500 stems/ha, 10ha native broadleaves @ 1,600 stems/ha, and 20% open space
Grant aid (gates)	4	@	£487.00	/gate	£1,948.00	Assuming EWCO
Grant aid (fencing)	7,900	@	£12.12	/m	£95,748.00	Assuming EWCO deer fencing with rabbit supplement
Sale of carbon (WCUs)	14,386	@	£20.00	/WCU	£287,720.00	Assuming woodland verified as performing to appropriate standards in all years so maximum number of WCUs awarded & sold. Assuming all carbon sold as WCUs & not PIUs. Assuming WCUs sold at £20/unit
BPS	100	@	£629.68	/ha	£62,968.00	Assuming EWCO and land eligible, in lowest payment reduction band with claims/delinkage payments received until end of scheme in 2027. Also assuming claimant makes own BPS claims i.e. no professional fees
Maintenance payment	100	@	£2,000.00	/ha	£200,000.00	Assuming EWCO standard maintenance payment over 10 years from establishment
Thinning income (year 18)	3,500	@	£5.00	/m^3	£17,500.00	Assuming sold standing
Clearfell income	38,500	@	£35.00	/m^3	£1,347,500.00	Assuming sold standing, 500m^3/ha of conifers. Broadleaf species not felled
Planting cost	191,000	@	-£1.54	/stem	-£294,140.00	Assuming 2,500 stems/ha sitka and 1,600 stems/ha broadleaf (-20% open space), includes supply and planting of 191,000 broadleaves and conifers (inc. 12% beat -up and 10p/stem spot spray), assuming upland pasture land with minimal ground preparation
Sprays	2	@	-£15,000.00	/spray	-£30,000.00	Assuming full spray needed years 1 and 2 at £150/ha
Deer fencing	7,900	@	-£12.00	/m	-£94,800.00	Standard specification per grant funding requirements, including rabbit netting
Validation	1	@	-£1,200.00	-	-£1,200.00	Payment to Soil Association or Organic Farmers and Growers to issue PIUs
Verification	3	@	-£2,500.00	-	-£7,500.00	Payment to Soil Association or Organic Farmers and Growers to convert PIUs into WCU. Assuming can self-assess at no cost in years 15 and 35
IHS Markit registration	13,300	@	-£0.06	/PIU	-£798.00	Mandatory payment for registration of PIUs
IHS Markit Verification	13,800	@	-£0.03	/WCU	-£414.00	Mandatory payment for conversion of PIUs into WCUs
Woodland management fees	-	-	-	-	-£60,000.00	Includes creation of management plans minus grant funding, brashing, marking for thinning, preparing tender bids and any other ongoing management matters reasonably anticipated
Management fees (carbon)	-	-	-	-	-£30,000.00	Woodland design, grant applications, UK forestry standard compliance, Environmental Impact Assessment, administration of Registration, Validation and Verification including Carbon Calculation (costs vary case-by-case)
NET INCOME AFTER PLANTING					£1,800,132.00	Approximately £164/acre(£406/ha) income per year on average over first 45 years, up until first clearfell

APPENDIX 3

- FURTHER COMMENTS

1. This example is for illustration only, and should not be relied upon without further professional advice and research into the locality and requirements of the Local Planning Authority and national government.
2. WCU proceeds are gross of sale costs
3. Grant aid could include Countryside Stewardship or other sources including private investment and charitable grants.
4. Carbon can be sold as WCUs or PIUs
5. Basic Payment Scheme, if relevant may be subject to further legislative change
6. Fencing/tree shelter costs and grant funding are generalised based on costs nationally, and vary by location.
7. Validation and verification costs are based on standard figures from the Soil Association, but can be subject to variation.
8. Most woodland planting requires an Environmental Impact assessment, but the work involved in producing this can vary widely with additional costs sometimes involved.
9. Management costs illustrative only.
10. It is assumed for the purpose of this example that only low-impact ground preparation will be needed and that no additional cost is needed for infrastructure.
11. It is assumed that commercial timber is not the most profitable use for the land as per Woodland Carbon Code additionality rules. Sites for which commercial timber is the only commercially viable use may be ineligible for carbon sequestration.
12. Tree species and yield class, and therefore carbon output, vary considerably by location. The figures in this table were selected to represent how a "typical" woodland might perform, and should not be relied upon to estimate the performance of any actual project(s).
13. Growing timber is exempt from Capital Gains Tax. Commercially-managed woodland is eligible for Business Property Relief for Inheritance Tax purposes, and woodlands ancillary to farm businesses are eligible for Agricultural Property Relief. Neither income nor corporation tax is charged on timber sales or woodland grants.
14. Neither income tax, corporation tax, nor VAT is payable on the sale of PIUs or WCUs.

If you are thinking of selling Pending Issuance Units or Carbon Units, whether under the Woodland Carbon code, Peatland Code, upcoming Soil Carbon code or even through a private sector measurement system, we advise you to first consider the likely future requirement for your business to become carbon neutral. You may in future require carbon offsets for your own use, and may make a net loss if you sell the carbon sequestered on your own holding only to buy further offsets from elsewhere.

Appendix 4: Carbon Code - 10-Year Budget - 10ha Broadleaf – Scotland

ITEM	NUMBER	@	£	/UNIT	TOTAL	NOTES
Grant aid (planting)	10	@	£3,178.00	/ha	£31,780.00	Assuming Forestry Grant Scheme - native broadleaves, £1,840/ha initial planting and £1,338/ha crop protection etc
Sale of carbon	4,400	@	£12.00	/PIU	£52,800.00	Assuming sold as Pending Issuance Units
Maintenance Payment	10	@	£1,360.00	/ha	£13,600.00	Assuming Forestry Grant Scheme - native broadleaves, £272/haPA for five years
BPS	10	@	£663.00	/ha	£6,630.00	Assuming region 1 land claimed in 2008 so full payment available. Not extended past 2024 due to lack of information.
Planting cost	8	@	-£5,932.80	/ha	-£47,462.40	Assuming 1,600 stems/ha (-20% open space), includes supply and plant 12,800 broadleaves with 1.2m tree shelters and stakes, mulch mats (inc 10% beat-up and 10p/stem spot spray)
Validation	1	@	-£1,200.00	-	-£1,200.00	Payment to Soil Association or Organic Farmers and Growers to issue PIUs
Verification	1	@	-£2,000.00	-	-£2,000.00	Payment to Soil Association or Organic Farmers and Growers to convert PIUs into WCU
IHS Markit registration	4,400	@	-£0.06	/PIU	-£264.00	Mandatory payment for registration of PIUs
Management fees	-	-	-	-	-£5,000.00	Woodland design, grant applications, UK forestry standard compliance, Environmental Impact Assessment, administration of Registration, Validation and Verification including Carbon Calculation (costs vary case-by-case)
NET INCOME AFTER PLANTING					£48,883.60	Approximately £198/acre(£488/ha) income per year on average over first 10 years; woodland should then continue to produce revenue from generation of further carbon units to sell and future woodland grant schemes

See following page for further comments

APPENDIX 4

- FURTHER COMMENTS

1. This example is for illustration only, and should not be relied upon without further professional advice and research into the locality and requirements of the Local Planning Authority and national government.
2. PIU proceeds are gross of sale costs
3. Carbon can be sold as WCUs or PIUs
4. Assuming it is currently claimed upon, the woodland is likely to remain eligible for the BPS. However, we do not currently know the BPS' future in Scotland past 2024, so this has only been factored in for three years. BPS income is therefore likely to be higher than that shown, but is unclear by how much. Fencing/tree shelter costs and grant funding are “guesstimated" without mapping data or a site inspection.
5. Fencing/tree shelter costs and grant funding are generalised based on costs nationally, and vary by location.
6. Validation and verification costs are based on standard figures from the Soil Association, but can be subject to variation.
7. Most woodland planting requires an Environmental Impact assessment, but the work involved in producing this can vary widely with additional costs sometimes involved. .
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9. It is assumed for the purpose of this example that only low-impact ground preparation will be needed and that no additional cost is needed for infrastructure.
10. Tree species and yield class, and therefore carbon output, vary considerably by location. The figures in this table were selected to represent how a "typical" woodland might perform, and should not be relied upon to estimate the performance of any actual project(s).
11. Growing timber is exempt from Capital Gains Tax. Commercially-managed woodland is eligible for Business Property Relief for Inheritance Tax purposes, and woodlands ancillary to farm businesses are eligible for Agricultural Property Relief. Neither income nor corporation tax is charged on timber sales or woodland grants.
12. Neither income tax, corporation tax, nor VAT is payable on the sale of PIUs or WCUs.

If you are thinking of selling Pending Issuance Units or Carbon Units, whether under the Woodland Carbon code, Peatland Code, upcoming Soil Carbon code or even through a private sector measurement system, we advise you to first consider the likely future requirement for your business to become carbon neutral. You may in future require carbon offsets for your own use, and may make a net loss if you sell the carbon sequestered on your own holding only to buy further offsets from elsewhere.

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Appendix 5: Carbon Code - Woodland 45-Year Budget - 100ha Commercial – Scotland

ITEM	NUMBER	@	£	/UNIT	TOTAL	NOTES
Grant aid (planting)	100	@	£2,160.00	/ha	£216,000.00	Assuming Forestry Grant Scheme Diverse Conifer
Grant aid (crop protection)	100	@	£350.00	/m	£35,000.00	Assuming Forestry Grant Scheme standard costs
Sale of carbon (WCUs)	14,386	@	£20.00	/WCU	£287,720.00	Assuming woodland verified as performing to appropriate standards in all years so maximum number of WCUs awarded and sold. Assuming all carbon sold as WCUs and not PIUs. Assuming WCUs sold at £20/unit
BPS	100	@	£663.00	/ha	£66,300.00	Assuming region 1 land claimed in 2008 so full payment available. Not extended past 2024 due to lack of information.
Maintenance payment	100	@	£1,680.00	/ha	£168,000.00	Assuming Forestry Grant Scheme diverse conifer at £336/ha pa for five years
Thinning income (year 18)	3,500	@	£5.00	/m^3	£17,500.00	Assuming sold standing
Clearfell income	38,500	@	£35.00	/m^3	£1,347,500.00	Assuming sold standing, 500m^3/ha of conifers. Broadleaf species not felled
Planting cost	191,000	@	-£1.54	/stem	-£294,140.00	Assuming 2,500 stems/ha sitka and 1,600 stems/ha broadleaf (-20% open space), includes supply and planting of 191,000 broadleaves and conifers (inc 12% beat -up and 10p/stem spot spray), assuming upland pasture land with minimal ground preparation
Sprays	2	@	-£15,000.00	/spray	-£30,000.00	Assuming full spray needed years 1 and 2 at £150/ha
Deer fencing	7,900	@	-£12.00	/m	-£94,800.00	Standard specification per grant funding requirements, including rabbit netting
Validation	1	@	-£1,200.00	-	-£1,200.00	Payment to Soil Association or Organic Farmers and Growers to issue PIUs
Verification	3	@	-£2,500.00	-	-£7,500.00	Payment to Soil Association or Organic Farmers and Growers to convert PIUs into WCU. Assuming can self-assess at no cost in years 15 and 35
IHS Markit registration	13,300	@	-£0.06	/PIU	-£798.00	Mandatory payment for registration of PIUs
IHS Markit Verification	13,800	@	-£0.03	/WCU	-£414.00	Mandatory payment for conversion of PIUs into WCUs
Woodland management fees	-	-	-	-	-£60,000.00	Includes creation of management plans minus grant funding, brashing, marking for thinning, preparing tender bids and any other ongoing management matters reasonably anticipated
Management fees (carbon)	-	-	-	-	-£30,000.00	Woodland design, grant applications, UK forestry standard compliance, Environmental Impact Assessment, administration of Registration, Validation and Verification including Carbon Calculation (costs vary case-by-case)
NET INCOME AFTER PLANTING					£1,619,168.00	Approximately £146/acre(360/ha) income per year on average over first 45 years, up until first clearfell

APPENDIX 5

- FURTHER COMMENTS

1. This example is for illustration only, and should not be relied upon without further professional advice and research into the locality and requirements of the Local Planning Authority and national government.
2. WCU proceeds are gross of sale costs
3. Carbon can be sold as WCUs or PIUs
4. Assuming it is currently claimed upon, the woodland is likely to remain eligible for the BPS. However, we do not currently know the BPS' future in Scotland past 2024, so this has only been factored in for three years. BPS income is therefore likely to be higher than that shown, but is unclear by how much. Fencing/tree shelter costs and grant funding are “guesstimated" without mapping data or a site inspection.
5. Fencing/tree shelter costs and grant funding are generalised based on costs nationally, and vary by location.
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7. Most woodland planting requires an Environmental Impact assessment, but the work involved in producing this can vary widely with additional costs sometimes involved. .
8. Management costs are illustrative only.
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10. It is assumed that commercial timber is not the most profitable use for the land as per Woodland Carbon Code additionality rules. Sites for which commercial timber is the only commercially viable use may be ineligible for carbon sequestration.
11. Tree species and yield class, and therefore carbon output, vary considerably by location. The figures in this table were selected to represent how a "typical" woodland might perform, and should not be relied upon to estimate the performance of any actual project(s).
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13. Neither income tax, corporation tax, nor VAT is payable on the sale of PIUs or WCUs.

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Appendix 6: Carbon Code - 12-Year Budget - 10ha Broadleaf – Wales

ITEM	NUMBER	@	£	/UNIT	TOTAL	NOTES
Grant aid (planting)	10	@	£3,000.00	/ha	£30,000.00	Assuming Glastir planting for biodiversity
Sale of carbon	4,400	@	£12.00	/PIU	£52,800.00	Assuming sold as Pending Issuance Units
Maintenance payments	10	@	£720.00	/ha	£7,200.00	Assuming Glastir woodland creation, £60/ha PA for 12 years
Premium Payment	10	@	£4,200.00	/ha	£42,000.00	Assuming Glastir woodland creation and BPS claimed on land, £350/ha pa for 12 years
BPS	10	@	£358.56	/ha	£3,585.60	Assuming full payment in 2022 and 2023, at 2020 rate inc redistributive payment. Further years not included as information not available.
Planting cost	8	@	-£5,932.80	/ha	-£47,462.40	Assuming 1,600 stems/ha (-20% open space), includes supply and plant 12,800 broadleaves with 1.2m tree shelters and stakes, mulch mats (inc 10% beat-up and 10p/stem spot spray)
Validation	1	@	-£1,200.00	-	-£1,200.00	Payment to Soil Association or Organic Farmers and Growers to issue PIUs
Verification	1	@	-£2,000.00	-	-£2,000.00	Payment to Soil Association or Organic Farmers and Growers to convert PIUs into WCU
IHS Markit registration	4,400	@	-£0.06	/PIU	-£264.00	Mandatory payment for registration of PIUs
Management fees	-	-	-	-	-£5,000.00	Woodland design, grant applications, UK forestry standard compliance, Environmental Impact Assessment, administration of Registration, Validation and Verification including Carbon Calculation (costs vary case-by-case)
NET INCOME AFTER PLANTING					£79,659.20	Approximately £269/acre(£664/ha) income per year on average over first 12 years; woodland should then continue to produce revenue from generation of further carbon units to sell and future woodland grant schemes

See following page for further comments

APPENDIX 6

- FURTHER COMMENTS

1. This example is for illustration only, and should not be relied upon without further professional advice and research into the locality and requirements of the Local Planning Authority and national government.
2. PIU proceeds are gross of sale costs
3. Carbon can be sold as WCUs or PIUs
4. Assuming it is currently claimed upon, the woodland is likely to remain eligible for the BPS. However, we do not currently know the BPS' future in Wales past 2023, so this has only been factored in for two years. BPS income is therefore likely to be higher than that shown, but is unclear by how much.
5. Fencing/tree shelter costs and grant funding are generalised based on costs nationally, and vary by location.
6. Validation and verification costs are based on standard figures from the Soil Association, but can be subject to variation.
7. Most woodland planting requires an Environmental Impact assessment, but the work involved in producing this can vary widely with additional costs sometimes involved. .
8. Management costs illustrative only.
9. It is assumed for the purpose of this example that only low-impact ground preparation will be needed and that no additional cost is needed for infrastructure.
10. Tree species and yield class, and therefore carbon output, vary considerably by location. The figures in this table were selected to represent how a "typical" woodland might perform, and should not be relied upon to estimate the performance of any actual project(s).
11. Growing timber is exempt from Capital Gains Tax. Commercially-managed woodland is eligible for Business Property Relief for Inheritance Tax purposes, and woodlands ancillary to farm businesses are eligible for Agricultural Property Relief. Neither income nor corporation tax is charged on timber sales or woodland grants.
12. Neither income tax, corporation tax, nor VAT is payable on the sale of PIUs or WCUs.
13. This example excludes VAT and assumes the owner/occupier is VAT registered.

If you are thinking of selling Pending Issuance Units or Carbon Units, whether under the Woodland Carbon code, Peatland Code, upcoming Soil Carbon code or even through a private sector measurement system, we advise you to first consider the likely future requirement for your business to become carbon neutral. You may in future require carbon offsets for your own use, and may make a net loss if you sell the carbon sequestered on your own holding only to buy further offsets from elsewhere.

Appendix 7: Carbon Code - 10-Year Budget - 10ha Broadleaf - Northern Ireland

ITEM	NUMBER	@	£	/UNIT	TOTAL	NOTES
Grant aid (planting)	8	@	£5,932.80	/ha	£47,462.40	Assuming Forest Expansion Scheme
Sale of carbon	4,400	@	£12.00	/PIU	£52,800.00	Assuming sold as Pending Issuance Units
Premium Payment	10	@	£4,250.00	/ha	£42,500.00	Assuming Forest Expansion Scheme on lowland improved grass/arable, £425/haPA
BPS	10	@	£299.00	/ha	£2,990.00	Assuming land claimed in 2008 so full payment in 2022 including average historic element. Future years not included due to lack of information
Planting cost	8	@	-£5,932.80	/ha	-£47,462.40	Assuming 1,600 stems/ha (-20% open space), includes supply and plant 12,800 broadleaves with 1.2m tree shelters and stakes, mulch mats (inc 10% beat-up and 10p/stem spot spray)
Validation	1	@	-£1,200.00	-	-£1,200.00	Payment to Soil Association or Organic Farmers and Growers to issue PIUs
Verification	1	@	-£2,000.00	-	-£2,000.00	Payment to Soil Association or Organic Farmers and Growers to convert PIUs into WCUs.
IHS Markit registration	4,400	@	-£0.06	/PIU	-£264.00	Mandatory payment for registration of PIUs
Management fees	-	-	-	-	-£5,000.00	Woodland design, grant applications, UK forestry standard compliance, Environmental Impact Assessment, administration of Registration, Validation and Verification including Carbon Calculation (costs vary case-by-case)
NET INCOME AFTER PLANTING					£89,826.00	Approximately £364/acre(£898/ha) income per year on average over first 10 years; woodland should then continue to produce revenue from generation of further carbon units to sell and future woodland grant schemes

See following page for further comments

APPENDIX 7

- FURTHER COMMENTS

1. This example is for illustration only, and should not be relied upon without further professional advice and research into the locality and requirements of the Local Planning Authority and national government.
2. PIU proceeds are gross of sale costs
3. Carbon can be sold as WCUs or PIUs
4. Assuming it is currently claimed upon, the woodland is likely to remain eligible for the BPS. However, we do not currently know the BPS' future in Northern Ireland past 2022, so this has only been factored in for one year. BPS income is therefore likely to be higher than that shown, but is unclear by how much.
5. Fencing/tree shelter costs and grant funding are generalised based on costs nationally, and vary by location.
6. Validation and verification costs are based on standard figures from the Soil Association, but can be subject to variation.
7. Most woodland planting requires an Environmental Impact assessment, but the work involved in producing this can vary widely with additional costs sometimes involved. .
8. Management costs illustrative only.
9. It is assumed for the purpose of this example that only low-impact ground preparation will be needed and that no additional cost is needed for infrastructure.
10. Tree species and yield class, and therefore carbon output, vary considerably by location. The figures in this table were selected to represent how a "typical" woodland might perform, and should not be relied upon to estimate the performance of any actual project(s).
11. Growing timber is exempt from Capital Gains Tax. Commercially-managed woodland is eligible for Business Property Relief for Inheritance Tax purposes, and woodlands ancillary to farm businesses are eligible for Agricultural Property Relief. Neither income nor corporation tax is charged on timber sales or woodland grants.
12. Neither income tax, corporation tax, nor VAT is payable on the sale of PIUs or WCUs.

If you are thinking of selling Pending Issuance Units or Carbon Units, whether under the Woodland Carbon code, Peatland Code, upcoming Soil Carbon code or even through a private sector measurement system, we advise you to first consider the likely future requirement for your business to become carbon neutral. You may in future require carbon offsets for your own use, and may make a net loss if you sell the carbon sequestered on your own holding only to buy further offsets from elsewhere.

Appendix 8: Comparison of Regional Woodland Creation Grants for 10 ha

NATION	ENGLAND	SCOTLAND	WALES	NORTHERN IRELAND
Scheme	English Woodland Creation Offer	Forestry Grant Scheme	Glastir Woodland	Forest Expansion Scheme
Woodland Creation Planting Grant				
Initial Capital Payment	£57,080	£31,780	£30,000	£47,462
Support payments	£2,000 pa for 10 years	£2,720 pa for 5 years	£4,100 pa for 12 years	£4,250 pa for 10 years
Support payments (capitalised, 2% yield)	£17,965	£12,821	£43,359	£40,601
TOTAL VALUE OF PLANTING GRANT	£75,045	£44,601	£73,359	£88,063

1. Based on an illustrative native broadleaf woodland planted at 1,600 stems/ha stocking density, requiring tree tubes rather than fencing and no particular access works. Assuming 8ha planting with 2ha open space. Assuming woodland in some way expands existing native woodland.
2. English Woodland Creation Offer assumes 12,800 trees plus guards with biodiversity supplement.
3. Forestry Grant Scheme assumes 10ha Native Broadleaves payment plus maintenance.
4. Glastir Woodland Creation assumes 10ha Native Broadleaf - biodiversity payment and eligible for Premium Payment for income foregone from agriculture.
5. Forest Expansion Scheme assumes 10ha with premium payment on lowland grass/arable site.
6. Woodland Creation planning grant is a pre-planting grant for investigative works and obtaining permissions, available only in England.
7. Capitalisation of annual support payments at 2% yield assumes that once woodland is planted, achieving the payments is relatively low risk, but we accept that there are a number of risks in practice associated with this, from damage by pests to maladministration. This figure was fixed illustratively to allow a fair comparison between the different types of woodland but should not be considered valuation advice in relation to this kind of agreement. Different sites have different characteristics, so correspondingly will vary in the risks they face in relation to continued receipt of maintenance payments.
8. New plantings in all four nations can be eligible for the BPS. However, each nation is at a different stage regarding what will replace the BPS, how soon and whether woodlands will be eligible, so we have left the BPS out of this calculation.

Appendix 9: Average Nitrate-Nitrogen Loss per Farm Type in the Solent Catchment Area

Farm type	Kg/ha
Cereals	31.2
Dairy	25.4
General Cropping	29.2
Horticulture	29.2
Pig	70.4
Lowland Grazing	13.0
Mixed	28.3
Poultry	70.7
Average for catchment area	**26.9**

Source: Natural England

Appendix 10: Glossary of Abbreviations

AHDB	Agriculture and Horticulture Development Board
BPS	Basic Payment Scheme
BU	Biodiversity Unit
BNG	Biodiversity Net Gain
DAERA	Department of Agriculture, Environment & Rural Affairs
DEFRA	Department of Environment, Farming & Rural Affairs
ELMs	Environmental Land Management Scheme
EU-ETS	European Union Emissions Trading System
EWCO	England Woodland Creation Offer
NOC	Nitrate Offset Credit
PCC	Peatland Carbon Code
PCU	Peatland Carbon Unit
PIU	Pending Issue Unit
RPA	Rural Payments Agency
RPW	Rural Payments Wales
SCC	Soil Carbon Code
SCU	Soil Carbon Unit
SGRPID	Scottish Government Rural Payments & Inspections Division
UK-ETS	United Kingdon Emissions Trading Scheme
TWIG	The Woodland Investment Grant
WCC	Woodland Carbon Code
WCG	Woodland Carbon Guarantee
WCU	Woodland Carbon Unit

Appendix 11: Glossary of Terms

Basic Payment Scheme	Direct payment based on holding land and entitlements. Payment and rules differ between UK regions. To be phased out in England by 2027.
Biodiversity Net Gain	An approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was before.
Brexit	The withdrawal of the United Kingdom from the European Union on 31 January 2020.
Environmental Goods	Goods that can help achieve environmental and climate protection goals. Often achieved via land management.
Environmental Land Management Scheme	Scheme which will pay farmers to manage their land in an environmentally sustainable way. The scheme is made up from a set of standards. Early roll out in 2022, full version from 2024. These payments will replace BPS as the main rural grant in England.
EU Emissions Trading System	Launched in 2005 to fight global warming. Greenhouse gas emissions trading with the 'cap and trade' principle, a maximum (cap) is set on the total amount of greenhouse gases that can be emitted by all participating.
Glastir	Welsh agri-environment scheme with a stand-alone Woodland Creation element.
Natural Capital	The elements of nature that have value to society, such as forests, fisheries, rivers, biodiversity, land and minerals. Stocks of natural capital produce a wide range of benefits.
Pending Issuance Unit	Pending Issuance Unit (PIU) is a unit that represents an anticipated delivery of an emission reduction offset.
Payment Agency	In England this is the Rural Payments Agency (RPA), in Wales it is Rural Payments Wales (RPW), in Scotland it is the Scottish Government Rural Payments & Inspections Division (SGRPID), and in Northern Ireland it is the Department of Agriculture, Environment & Rural Affairs (DAERA)
Carbon Code	Code regulating carbon sequestration. Currently for woodland and peatland.
Woodland Carbon Guarantee	Scheme In which the Government agrees to buy sequestered carbon at a set price. Application involves bids via ‘reverse auction’.

Appendix 12: Useful Links

The Kyoto Protocol – Kyoto Protocol reference manual

Agriculture Act 2020 - Agriculture Act 2020 (legislation.gov.uk)

Climate Change Act 2008 - Climate Change Act 2008 (legislation.gov.uk)

Environment Bill (8/11/21) - Environment Bill - Parliamentary Bills - UK Parliament

Forestry Grants:

- ***England Woodland Creation Offer (EWCO)*** (RPA 2021)
  England Woodland Creation Offer - GOV.UK (www.gov.uk)

- ***Scottish Government Forestry Grant Scheme*** (SGRPID 2021)
  Forestry Grant Scheme (ruralpayments.org)

  108 (forestry.gov.scot)

- ***Northern Ireland - Small Woodland Grant Scheme/ Forest Expansion Scheme/Woodland Investment Grant*** (DAERA 2016)
  Forestry Grant Schemes Information Booklet 2020/21 Rural Development Programme 2014 - 2020 (daera-ni.gov.uk)

  Small Woodland Grant Scheme Information Booklet - 2021 (daera-ni.gov.uk)

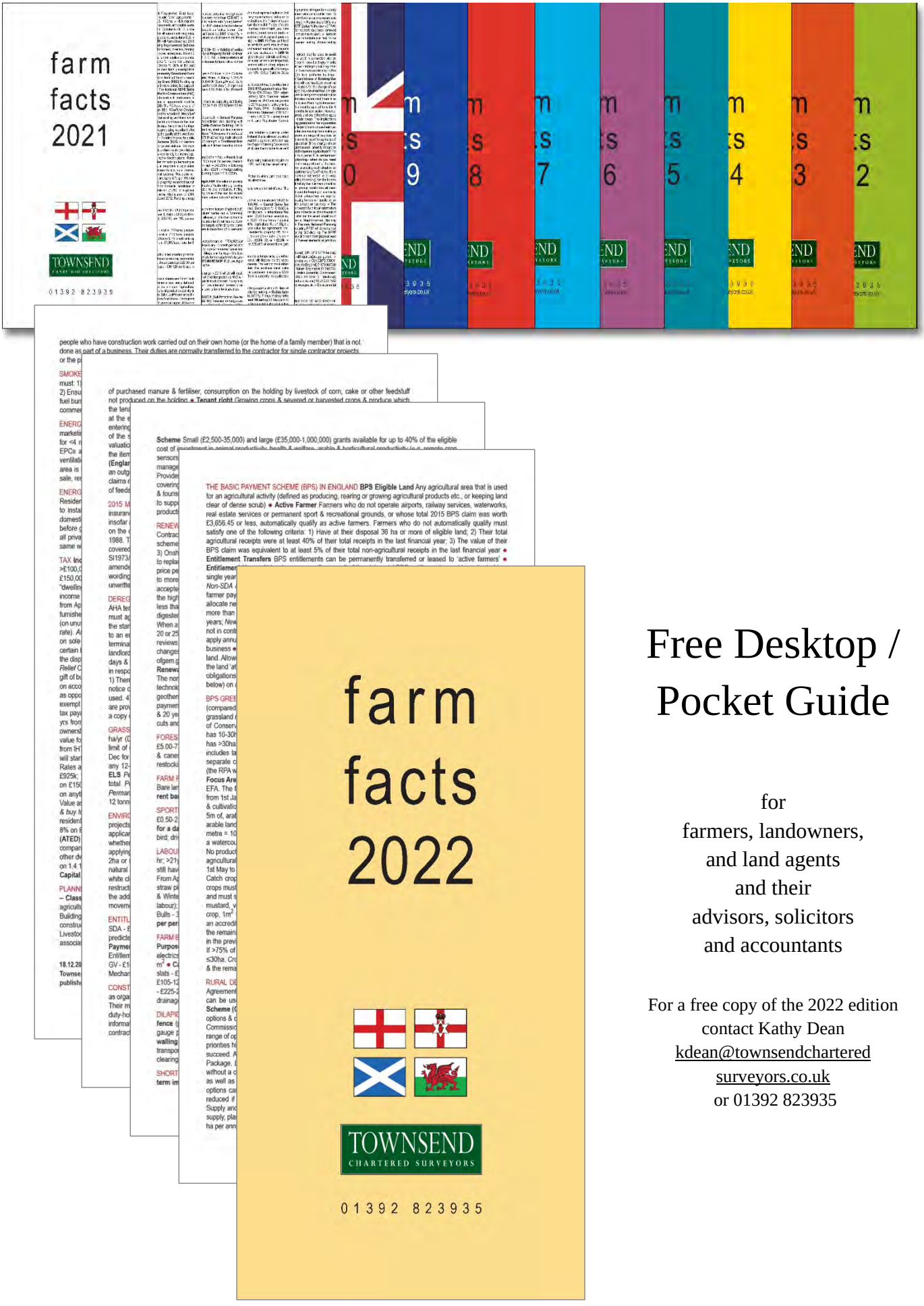
- ***The Woodland Investment Grant (TWIG) Scheme/Glastir Woodland Creation*** (RPW 2021)
  National Forest for Wales - The Woodland Investment Grant: rules booklet [HTML] | GOV.WALES

  Glastir Woodland Creation | Sub-topic | GOV.WALES

Woodland Carbon Code - Home - UK Woodland Carbon Code

25 Year Environment Plan - 25-year-environment-plan.pdf (publishing.service.gov.uk)

Home pages for UK regional Payment Agencies
RPA: https://www.gov.uk/government/organisations/rural-payments-agency
RPW: http://gov.wales/topics/environmentcountryside/farmingandcountryside/rpwonline/?lang=en
SGRPID: https://www.ruralpayments.org/publicsite/futures/topics/
DAERA: https://www.daera-ni.gov.uk/



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Jeremy Moody
CAAV Secretary & Adviser

UK Environmental Credits User Guide – Townsend, Burton & Squires
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