

Scoping a Roadmap for Delivering Sustainability and Growth of Welsh Woodlands

For: Wales Forest Business Partnership

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The best time to plant trees was 25 years ago.

The next best time is now

(Chinese proverb)

Scoping a Roadmap for Delivering Sustainability and Growth of Welsh Woodlands

Executive Summary

This report provides the scope, objectives and outline methodology for the preparation of a roadmap for forestry, wood industries and wood use in Wales. The 20th Century saw UK forest management evolve from wartime supply through employment provision to amenity and biodiversity. As it stands at the crossroads of new challenges for the 21st century, Welsh forestry requires a fresh assessment of the opportunities and options available.

This roadmap has been proposed by the Wales Forest Business Partnership, as an independent piece of work which, if fully commissioned, will:-

- Bring together new and existing work on the forestry and wood sectors in Wales to present the options for the optimum development of the sector to deliver benefits for economic development and employment, biodiversity and amenity, carbon management and climate change mitigation
- Deliver the evidence base and detailed deployment plans for a range of development options
- Bring additional focus and clarity to the Woodlands for Wales vision and action plan

This scoping report, suggests where information and data may be sourced, and highlights the assumptions and presumptions that may previously have been unchallenged or require review, together with context and examples from other jurisdictions and industries. In doing so, it is the authors' intention, that the nature of subsequent work should focus on consistency of policy and subsequent delivery, with due reference to a range of outcomes, their affordability, and the practical engagement of existing and new players within the wider forestry and wood system.

It is evident, from early research for this study and previous engagement with forestry networks in Wales and beyond, that:

- There is a massive body of work on Welsh forestry
- A significant step forward via National Forest Industry Surveys is due in 2015
- That the challenges through climate change and disease are evolving quickly
- That many of the avowed outcomes and objectives stated within published work are at odds with evidence contained elsewhere within it, or represent broad aspirations without practical delivery measures

A comprehensive roadmap will deliver both detailed examples of the mechanisms and methodology for change, where appropriate, together with detailed evidence of the overall aggregated benefits accruing from their deployment. As a scoping study, this report can only give examples of this approach, but aims to demonstrate the comprehensive approach and evidence that will arise from a full roadmap exercise.

The scoping study has been prepared by Resource Efficiency Services; an independent Welsh based company with experience of delivering similar work in the UK, Europe and North America.

There are strong grounds to believe that the Welsh forestry and wood processing sectors, together with a wider deployment of wood within construction and other markets, can deliver a significant improvement in economic productivity, job creation and carbon management. It is likely that the timber required for this development of Welsh forestry can be met through adjustments to the nature of new woodland and woodland management, and in doing so underpin the likelihood of sustained increases in afforestation and productivity. The required adjustments will not mean detrimental change to existing aspirations for amenity and biodiversity and produce a range of benefits at reduced net cost to the Government and people of Wales.

In summary the roadmap will

- provide a context to understand the potential for forestry to contribute to sustainable economic growth in Wales
- provide a decision making tool for public policy
- highlight tensions and trade-offs between the various demands made on forestry
- help to foster a new innovative spirit in the forest sector
- help to clarify the understanding of the role and responsibilities of the governing institutions
- provide the WFBP with a high level guidance document to inform strategic development and specific work programme actions

The central aim of the Wales Forest Business Partnership in commissioning this initial scoping study is that it will provide a compelling case for the development and use of a roadmap for Welsh forestry.

1 INTRODUCTION

1.1 Background

This scoping study has been commissioned by the Wales Forest Business Partnership as an independent contribution to the debate on the future scale and nature of Welsh woodlands and their associated industries.

The future of Welsh forestry is often characterised as a choice between conifer plantation forestry and the management of native species for biodiversity, amenity and climate benefits.

The reality, as the recently established Natural Resources Wales team will attest, is much more complex, with issues of disease, land use change and sustainable “green growth” to consider against a background of challenging economic circumstances.

A recent study commissioned by Defra for England revealed that the value of the forestry/wood sectors was not well understood and that both the current and potential values of forestry, and its related processing industries, significantly exceeded previous estimates and planning assumptions. These prior misconceptions were largely due to reporting boundaries which often cease at the point of low value roadside commodities.

There is also a widespread presumption, particularly amongst the public, that woods are best left alone, and that management is a negative activity, where felling is always a bad thing. This takes many forms, from the confusion between ancient trees and ancient woodlands, to the view that commercial forestry is mutually exclusive to leisure activities, including fishing, and has negative impacts on water quality and biodiversity. While the assumed connection between “monoculture” commercial forestry and recent disease episodes is often quoted, it is much rarer to hear discussion of the countervailing and widely proven benefits to silvicultural health, land management and sustainable forest cover generated by financially viable woodland management.

So, why undertake the compilation of a roadmap for Welsh wood now?

Initial research shows that the complex network of policy and historic research surrounding forestry has been based upon a series of prevailing circumstances and embedded assumptions. The conflicting demands and changing landscape facing the Welsh Woodland and Countryside estate, both public and private, suggest that a review of existing policy, management structures and institutions is appropriate to address the current challenges.

Having served the historic demands of boosting wood supply, employment and amenity, forestry stands on the verge of new policy environment driven by austerity, declining public budgets and the emerging focus on Green Growth.

As we review the forestry and wood supply chain, below, we will highlight some of the tensions between current status, including its historic basis, and future demands. This will highlight areas for further investigation and resolution of existing inconsistencies. It is however worth stating some “universal truths” which appear to run throughout the policy, practice and public perception of the forestry sector.

1. Growing a commercial wood sector is good for the economy (in terms of GDP, balance of trade, employment) and is a desirable outcome
2. The commercial wood sector can be grown in a way that benefits the Welsh economy as well as increasing amenity, social benefit, natural capital (carbon and biodiversity) and other non-economic benefits
3. State intervention in forestry will be increasingly constrained and framed in terms of the non-market benefits

1.2 Historic context

The development of settled communities across the UK traditionally incorporated the partial clearance and ongoing management of local woodland for fuel, tools and shelter using techniques such as coppicing and pollarding. The use of a local timber resource remained steady and sustainable until the onset of the industrial revolution. Demand then grew rapidly until the UK became significantly dependent on imported timber. The difficulty of importing timber during WW1 threatened UK industries (particularly mining with its dependence on pit props to mine and supply coal to Churchill's Navy) and led to the establishment of the Forestry Commission (FC) in 1919. The FC purchased mainly poor agricultural land and remaining broadleaved woodland and planted concentrations of largely single species conifers for the subsequent development of a 'strategic national resource'.

After WW2, timber was again in short supply and afforestation was seen as a major priority by governments all over Europe. With declining upland agriculture and accompanying population loss, afforestation was seen as an opportunity to create short term jobs in site preparation and tree planting and long term jobs in forest management, timber extraction and log processing. After WW2 Sitka Spruce became the most commonly planted species. The state incentivised planting by provided grants and tax incentives to private owners. This period also saw a gradual swing away from economic justification for forestry towards a recognition of the wider forestry benefits of recreation and wildlife conservation and there was a growing backlash against aspects of British forestry, and in particular the reliance on conifer plantations and afforestation of the uplands. However, the post war afforestation policy remained largely intact until the 1980s when there was a removal of tax concessions and a policy shift towards broadleaves.

The release of cheap timber from the newly independent ex-Soviet Baltic States in the early 1990s caused a collapse in softwood prices across Europe and further encouraged the debate in the UK about the role of the state in forestry and the role of conifer plantations in particular.

By the 1990s partly as a consequence of the perceived lack of commercial value, and due to intensifying societal pressures, policy shifted away from afforestation towards amenity and environmental considerations resulting in a shift away from single species conifer plantations towards native broadleaves and mixed plantations.

In 1992 the Rio Summit (The United Nations conference on Environment and Development) was the first of the important global conferences focusing on the environment. The role of forestry in environmental protection was recognised and reflected in all subsequent conferences

- Kyoto 1997 recognised the role of forests in providing carbon stores, and
- Durban 2011 recognised the role of carbon stored in forest products, suggesting a preference for long life products such as sawnwood in construction

Forests are becoming increasingly valued for their role in fighting climate change and for their ability to generate renewable and sustainable resources, for building and fuel, if properly managed. This has resulted in afforestation and reforestation once again being on the political agenda.

In the aftermath of the global financial crises of the mid 2000s a light is being shed once again on the economic role that forestry can play in supporting sustainable economic development - or Green Growth as it is being described in Wales.

So alongside the need for amenity, biodiversity and carbon storage in both trees and products, there is a widespread desire, to see forestry increasing its contribution to the economy. This can be seen in some emerging policy areas, but is not always well reconciled, with the conflicting visions of:

- Economic viability and benefits
- Reversion to smaller scale “native” woodlands and
- Lower impact silvicultural systems

often leading to ill-defined or unsuccessful delivery programmes.

Certainly opportunities are emerging, not least in renewable energy policy, which are likely to drive a substantial rise in demand for woody biomass which could be provided by co-products from Welsh forests, offsetting the fall in demand for pulpwood and underpinning the economics of existing processing operations. In addition, sustainable construction legislation could also lead to an increase in high performance off-site housing solutions based principally on timber. This could also result in an increased demand for secure indigenous supplies.

1.3 Current context

Today approximately 40% of UK wood consumption comes from home grown sources. There is therefore a substantial opportunity to further improve the UK balance of trade in timber and job creation, particularly in rural areas. However, this opportunity must be set within the current trends of diminishing public finance and the current political trend of limiting the role of the state to regulation, as opposed to direct market intervention. Added to this there is the continued international integration of markets in the process known as globalisation, which makes it increasingly difficult to implement national policies that might be perceived as protectionist. Despite these trends there is increasing interest in measures to protect or support local enterprise through, for example

- marketing campaigns for local timber (e.g. ‘Grown in Britain’)
- procurement initiatives such as ‘Wood First’, and
- mechanisms which recognise the importance of local provision in public procurement as allowed within the Social Value Act of 2013

These market focused endeavours tend to engender the support of the public, private and third sectors alike, but will need to be based upon a viable and holistic vision for forestry, which the roadmap will aim to create.

Of course the desire to balance timber production with other sustainability considerations is not new and can be readily traced back throughout the history of forestry. Most recently the *Woodlands for Wales 2009*, the *Welsh Assembly Government’s Strategy for Woodlands and Trees*, restated its original 2001, 50 year

vision that *“Wales will be known for its high quality woodlands that enhance the landscape, are appropriate to local conditions and have a diverse mixture of species and habitats. These will:*

- *Provide real social and community benefits, both locally and nationally;*
- *Support thriving woodland-based industries; and*
- *Contribute to a better quality environment throughout Wales”*

However analysis of current trends suggests that limited progress has been made in recent years in terms of increased cover or productivity. There has been restricted new planting, without focus on the planting of species that will enable utilisation in higher value applications. There has been limited success in tackling the barriers to bringing unmanaged woodland back into management, despite appropriate forest management now being widely understood to be environmentally beneficial.

A combination of this perceived lack of progress, the increasing opportunity for forestry to play a role in combating and adapting to climate change and the need for sustainable economic development or ‘Green Growth’ suggests that we need to reconsider the role of the governing institutions (public, private and third sector) that influence forest policy and the delivery of desired outcomes.

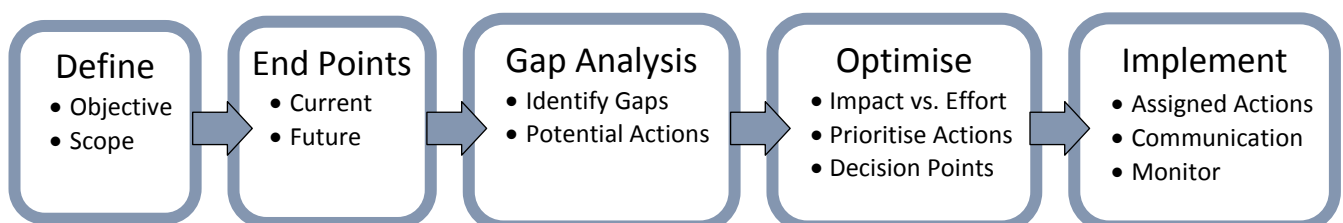
The timing is particularly significant in Wales given the establishment of Natural Resources Wales and its role in managing the Welsh Government Woodland Estate (WGWE). This presents a unique opportunity to review the challenges opportunities and resources available to Wales, its woodlands and the resulting outcomes.

1.4 Scoping study methodology

In undertaking this brief scoping study the authors have reviewed recent industry reports and data from Wales, the UK and to a lesser extent Europe (see bibliography section for a list). We have sought to provide sufficient detail and analysis to highlight issues facing Welsh forestry and provide some examples of potential solutions and opportunities that the roadmap (if fully commissioned) would help to realise. This detail is largely provided in Appendix A and summarised within the next section of this report.

We have provided a methodology for delivering the full roadmap which includes both a review of best practice from other industries and geographical areas and a sequential series of work packages to deliver it.

The established best practice suggests the following 5 stage process:



Work packages have been outlined against each of these stages with indications and examples of the inter-reliance between sequential actions, and the iterative nature of some opportunities.

2 OPPORTUNITIES, ISSUES & CONSTRAINTS

This section seeks to summarise the issues that the roadmap will need to address if we are to grow the contribution of forestry to the future economic, environmental and social sustainability of Wales. Our aim is to provide key facts where appropriate, as well as to provide examples of potential opportunities or solutions. More detailed background data and analysis of each subject area is contained in Appendix A.

2.1 Woodland area

Wales has a current recorded woodland cover of 306,000 hectares, or 14.8% of its available land. This is broadly in line with other parts of the UK (England 10% Scotland 18.2% NI 8.2%) but well below the EU average of 37%. and a World average of 31%.

Numerous aspirations for increasing woodland cover have been expressed alongside evolving schemes to support both woodland evolution (including farm woodland and plantations on ancient woodland sites) and increases in overall cover.

Under the Better Woodland for Wales Grant Scheme which ran 2006 to 2010 – only 380 hectares per year of new cover was established. This was mainly in small blocks and at low density. At this rate, it would take 55 years to add 1% cover, or over 800 years to double cover.

The Glastir programme, which started in 2010, references the creation of 100,000 ha of additional woodland cover, and there is evidence from the *Woodlands for Wales Indicators 2013-14* report that net annual planting may now be as high as 900 hectares. This additional 100,000 ha is also referenced in the Welsh Government's *Land Use Climate Change* report with an aspiration to achieve it by 2030. If the Welsh Government target of 100,000 ha new woodland by 2030 is achieved, an additional 5,800 ha of woodland would need to be planted annually.

Given that woodland creation is both an existing target and is almost universally recognised as an effective way of fighting climate change (as well as provide other valuable environmental, social and economic functions), the rate of afforestation is extremely low and suggests that more radical and innovative approaches are required. The roadmap can provide the clarity to ensure that afforestation is more than just aspiration, and provides the framework to deal with how it can be financed and delivered in reality.

2.2 Woodland ownership

Throughout the UK, a significant proportion of the productive woodland estate is in public hands. The Welsh Government Woodland Estate (WGWE) extends to 117,000 hectares, or 38% of wooded land, but represents 58% of the woodland area under active management. This ownership structure, in Wales, in common with the rest of the UK differs from the European norm, not just in the relatively high proportion of managed woodland in state ownership, but also in the absence of integrated forestry and processing ownership. With the exception of small areas of woodland, supplying “craft” processes, sawmills and large scale wood processors in Wales do not own, or completely manage significant areas of forestry. In contrast, the large scale wood processing industries of Germany, Austria and Scandinavia show a high degree of integration, managing forestry for supply into their sawmills, biomass plants and into a growing number of value added processing operations for chemicals or engineered wood products.

Of the privately owned woodland, about 1/5 is on farms (equivalent to 60,800 ha), this sector is a key focus for strategies to increase future value. 'Better Woodlands for Wales' and 'Glastir' have had some impact in terms of bringing more woodland into management, but change is pitifully slow considering the size of the opportunity. The level of farmers currently generating income from timber is very low with only 3% harvesting woodland products for sale.

If Welsh forestry is to grow in scale and value, emulating the productivity, innovation and diversity of continental best practice, it will require a significant overhaul of approaches to both public and private woodland. This review will need to demonstrate sufficient value to encourage increased management of private woods and a greater integration of interests in production and innovation around the WGWE. While much has been made of recent investments in processing capacity for large scale softwoods, the scope and aspiration of this has been limited by European standards, and both productivity and value, from the forest estate, continue to lag behind benchmark levels.

2.3 Woodland management

While public attitude surveys often display a presumption that “natural” or “native” woodlands represent the best forms of landscape or biodiversity protection, it is now widely accepted that managed woodland is better for all potential outcomes than unmanaged woodland. While this may cover a range of scale and nature of intervention, the improvement in outcomes supports the ongoing drive to bring existing woodland into management.

It is also clear that for many private sector forest owners there is considerable inertia, in engaging with comprehensive management, as their primary management objective for their woodland has not been income generation (due to low timber prices) and they are not dependent on forests for their livelihood. Basic business plan data for economically viable woodland establishment and management is not widely disseminated. While circumstances vary considerably a common basis for initial engagement is likely to require at least initial breakeven/payback analysis.

A key outcome expressed in recent policy is, in parallel with the increase in woodland under management, to decrease the amount of this woodland that is managed under a clear-fell regime. While the WGWE has historically been managed on a mainly (66%) clear-fell basis originally instituted to create “structural diversity” – presumably of age classes across the estate. Recent policy direction has promoted a reduction in the prevalence of this system to improve “structural diversity” – presumably of age classes within individual stands. This is clearly a paradigm which needs to be further understood and given further consideration over what scales the methods apply. The result is over 37,000 hectares of productive forest on the WGWE have been designated as non-clearfell through the FDP process. This has been done without publication of any significant effects on costs, yields and future productivity.

Although woodland management is now widely regarded as an opportunity to ensure a range of beneficial outcomes, different management systems can have a profound impact, not just on environmental outcomes, but also on quality and cost of timber and as a consequence on the viability of processing industries and woodland management. A roadmap would highlight the opportunities to ensure that management method and cost is balanced with the need for biodiversity, disease risk management, amenity and productivity. It will also highlight the need to ensure there is a vision for how ongoing management is paid for.

2.4 Species

The species composition of the current Welsh forest is well understood from the National Forest Inventory. The forest as a whole is dominated by Sitka Spruce (78k ha) with other coniferous plantations made up of larches, Douglas fir and pines. Broadleaf composition is far more diverse. Oak (24k ha) is the largest contributor to broadleaf with ash (16.5k ha) being the next largest single species. Notably the category of “other Broadleaves” (18k ha) ranks 2nd in the top 10 indicating that there are a large number of species with small areas of coverage with the 9th ranking individual species, hawthorn, having a coverage of just under 5k ha.

The choice of species suitable for growing in Wales varies across the country and, with climate change and disease threat concerns growing, it is vital that decisions made now about planting result in a robust forest in the future. Species planted now must thrive in the current environmental conditions but also be suited to the expected future climate with potentially higher temperatures, more extreme weather incidents and new diseases. An Ecological Site Classification (ESC) of conditions across Wales has allowed a series of maps to be produced showing which areas of land are suitable for growing a number of species of both conifers and broadleaves. This is based on inputs covering

- soil type and quality
- water availability
- wind risk
- mean temperature and seasonal temperature difference

and show the change in suitability of areas of land across Wales for different species based on today’s environmental conditions and the expected environmental conditions prevalent in 2050 and 2080 under a number of climate change scenarios.

Whilst ESC considers the suitability of species to different areas of Wales, it does not take into account any silvicultural management, market, land use competition or social inputs which must also be considered when making a planting choice.

The desired trends in species mix aspired to by WG are to:

- Increase diversity of woodland types at a catchment and woodland scale
- Increase the area of non-native woodlands with intimate mixtures
- Planting becoming less dominated by single species
- Planting of a wider genetic base

“There are likely to be significant changes to the composition, structure and character of the ground flora and other species of priority for biodiversity and conservation, particularly under High emissions scenarios and over longer time frames. Current species descriptions of native woodland communities are unlikely to remain valid, so the changing climate raises difficult questions for conservation of woodland biodiversity. In replanting the preference for use of native tree species and local provenances under all circumstances will need to be reconsidered” (The Read Report, 2009)

2.5 Timber production

Timber production is naturally related to woodland cover, but more specifically to standing volumes of timber, how fast the trees in the forest grow or their annual increment and the age class distribution of the trees. NRW contribute to maintaining a production availability forecast for both softwood and hardwood, projecting known information (cover, planting, yield class, age class, standing volume, increment) forward over the next 50 years. This information comes from:

- NRW : internal record known as the sub compartment database (SCDB)
- Private Sector: information and surveys used to compile the National Forestry Inventory

Softwood production

Within Wales, the 131,000 ha net of conifer forest contains around 36.6 million m³ overbark standing (obs) of timber. This area excludes enclosed open areas, roads, firebreaks and other non-productive areas included the headline figures. This “standing stock” currently increases by around 1.4 million m³ pa with around 2 million m³ available for harvest. The available harvest is approximately 50/50 NRW and private forest with the NRW share hovering between 40% and 60% over the next 50 years.

In Wales, typically between 85% and 97% of the available softwood timber is harvested year on year. The Age Class distribution of coniferous forest is such that we are currently benefitting from an abundance of harvestable timber. The lack of coniferous planting however will produce an estimated 25% reduction in the available timber for harvest to 1.5 million m³ in the late 2020s and early 2030s and a further drop to around 1 million m³ in early 2040s. This first decline cannot be reversed by trees from any additional planting now and even the subsequent drop occurs before what is considered a normal growing cycle for Sitka spruce, for example, requiring them to be harvested before reaching optimal size, if required to fill any shortfall.

This shortfall in capacity (for the UK not just Wales) in softwood availability is a huge concern to the industry. To put this in context, a 500,000 m³ drop in harvest equates to around 250,000 m³ of sawlogs. This is the entire capacity of BSW Newbridge on Wye, Wales’ largest sawmill. As a result a number of options currently being evaluated. These include:

- Delaying harvest of some timber during the period up to 2027. This will undoubtedly put pressure on prices in the short term but potentially avoid bigger disturbances post 2027. This involves clearing any backlog of overdue timber which is in itself problematic, as modern sawmills struggle to cope with oversized logs resulting from overdue harvest, and much of this is in difficult to access sites. Delaying harvesting will also damage the harvesting sector.
- Harvesting some timber earlier coupled with a planting program to cover the generated shortfall. Current planting regimes support broadleaf and mixed forestry as opposed to conifer plantations.
- Substituting demand where possible with hardwood, but given that the hardwood processing capacity and harvest is much lower, and that hardwood is not suitable for most industrial markets there may be little scope for substitution.

Hardwood production

The net forest area of broadleaves is estimated to be 137,000 ha which in turn contains 27.3 million m³ of timber. The big contrast to softwood is in the amount of harvest availability. The availability is quoted against areas of managed forest only, which gives figures only representing a fraction of the full biological potential. Currently only around 32,000 m³ of hardwood is harvested against a full biological potential of over 1 million m³ which contains a large amount of over-mature timber (timber which should have already been harvested). The forecast availability of hardwood even from that just in management is expected to rise sharply in the period to 2040s with a tenfold increase to around 400,000 m³. Even this however is a theoretical availability and does not guarantee that it will be harvested. This will depend predominantly on achieving access to new markets and supplying an increasing demand for firewood.

The availability of timber going into the future is well understood and modelled extensively by NRW (and FC for UK) through the 50 year forecasts. A gaping hole in availability of softwoods is anticipated in the near future with a 25% reduction expected late 2020s and a further reduction in the early 2040s of a similar level. This is a genuine threat to the processing industries in Wales, to forest management and to innovation. The hardwood forecast reflects the high level of unmanaged broadleaf forests and is a fraction of the softwood output. The availability is set to rise for hardwoods but this will require significant market development to convert the availability into physical harvest. Currently there is over 1 million m³ of over- mature hardwood (past the time it should have been harvested). Without a clear market this will require public support for intervention to remove and keep the forest in management. The roadmap will signpost options currently emerging to manage this transition.

2.6 Employment

There are between 8,500 and 11,300 people employed (either full-time or part time) in the forest sector in Wales (Welsh Government, 2014). Approximately 10% are directly employed in forestry and logging. Employment in the forest sector and processing sectors is particularly important to rural communities.

Expanding employment opportunities in rural Wales is a high priority for policy makers. Additionally, expanding employment in forestry and associated industries is creating 'green jobs'. Increasing forest productivity through increasing forest cover and increasing productive forest management would provide much needed rural employment in management, harvesting and primary processing. Additionally, the multiplier impacts of increased productivity to the Welsh economy are significant.

The employment opportunity from developing the Welsh forest sector has been considered in a report commissioned by the Wales Forest Business Partnership and Confor, 2013 – 'Growing a thousand new forestry jobs in Wales'. The report concluded that expanding management to all woodland in Wales would create 627 new jobs, and a plan to meet the target of 100,000 ha by 2030 would create 145 new jobs. A further 443 could be created in wood fuel and a further 400 in primary processing. The roadmap would also review opportunities for employment in innovative wood products and construction, based upon best practice elsewhere.

2.7 Timber price and the value of Welsh forestry

Gross Value Added

Based on Standard Industry Classification (SIC) codes, the total GVA of the Welsh forest sector has grown to £455.7 million, approximately 1% of Wales' GDP, of which £20 million is in forestry and logging (SIC02), with

manufacture of wood products another £147.7 million (SIC16) and manufacture of paper and paper products £288.1 million (SIC17).

However, these figures relate to the forestry sector as a whole and are not a true reflection of the value added from the processing of Welsh grown timber. Specifically the figures for wood products include all activity based on imported timber as well as Welsh grown timber and as the paper and paper products industries no longer use Welsh timber these estimates do not relate to Welsh forests. By contrast no estimates are made for the added value of energy (heat and electricity) produced from Welsh timber.

This indicates that basing the analysis of the health or otherwise of the Welsh forest sector on GVA derived from SIC code information is misleading. A more accurate estimate of the value Welsh timber adds to Wales' GDP is required if we are to use GVA as a meaningful measuring of performance.

The timber industries' contribution to GDP has always been understated through consideration of forestry and primary processing only, whereas the majority of GVA is from secondary processing. Additionally, many of the goods and services provided by forests are not marketed or assigned monetary value leading to an underestimate of the contribution of forestry, and creating economic challenges for forest owners.

Tourism and recreation make a considerable contribution to the economy of Wales (£3.2bn in 2007, 6% of total Full Time Equivalent workforce in 2003), yet little is known about actual GVA or employment figures for those businesses engaged specifically in woodland related tourism and recreation provision, although a 2003 study estimated that day visits to forests contributed £51 million to the Welsh economy.

Timber price

Between the 1990s and 2000 there was a continuous decline of timber prices. However, since 2010 there are signs that the price is beginning to rise but in real terms prices are still well below those of the 1980s. The key influences on timber price are exchange rates, UK demand and overseas supply. Global economic trends would indicate that the cost of timber, in line with other commodities, is likely to continue to rise over the coming decades. However, how this rise will affect the value of forestry relative to farming (important for afforestation) or the competitiveness of timber relative to other materials is unclear.

Surprisingly, for such a seemingly important issue to the future of forestry, there is only limited analyses of timber price available in the published literature. What, for example, is the reason for the timber sales price in Scotland exceeding equivalents in Wales by circa £10/tonne at time of writing? This price differential may be due to the larger Scottish market and greater competition or perhaps due to supply decisions made by the dominant supplier (NRW).

Perhaps as a consequence of forestry being considered to contribute little to the GDP of Wales, the sector has not been seen as a priority for transformational policy intervention. Now, with the ever-growing threat from climate change and emphasis on Green Growth, the forest sector is beginning to be viewed as one that offers significant potential for development. The development of the roadmap will provide a format to capture the true economic value of forestry, its innovation opportunities (including wood products, construction and fuel) and to review all options to ensure that this potential will be realised.

2.8 Supply and demand

The demand side of the wood products market is influenced by a wide range of factors, most notably the health of the construction market (extremely volatile in recent years) and exchange rates which alter the

balance of competition from imports. Longer term, the carbon sequestration and renewable resource implicit in wood as a building material, are expected to drive growing demand for wood. With considerable scope to expand the percentage of timber frame (and in many cases offsite manufactured) housing within Wales, as has already happened in Scotland, there are obvious opportunities for increasing the use of wood, including a percentage of home grown material. This opportunity is further bolstered by the European trend to engineered wood products such as I-joists and more recently cross laminated timber (CLT) which may also allow the use of a wider range of locally grown species. These developments do face the challenge of a conservative industry and slow changing regulation in expanding to wider market acceptance.

Sawn softwood production has seen recent growth and remains the main market for UK grown timber. There has also been a growth in the wood fuel market. In contrast the market for wood in pulp and paper, fence posts and wood based panels has seen no growth... in 2013 sawn softwood output was approximately 3.5 million m³ and hardwood output was 50,000m³.

Approximately 1/3 of UK sawnwood demand is derived from UK production. However, there is no data available to indicate into which markets UK and Welsh sawnwood is able to penetrate. There is a need for more information. By way of contrast Ireland is a net exporter of sawnwood and in 2012 supplied 6.5% of the UK sawnwood market.

The sawn softwood market is dominated by the demand in construction which accounted for 62% of sawn softwood consumption in the UK in 2011. In 2011 the sawn softwood market was valued at £1.5 billion. Surprisingly, the use of sawn softwood in construction appears to have been in decline throughout the early 2000s even before the 28% drop in 2008. One explanation for the reduction in use of sawnwood could be the use of alternative products. These alternatives could include wood based products such as MDF joinery (skirting boards etc.) and engineered wood (I-joists). The use of UK grown sawn softwood in construction was 889,000m³ in 2010. Whilst the volume of UK grown sawn softwood has remained fairly consistent, the decline in the total market has resulted in a growth of market share from 12% in 2002 up to 17% in 2010. The consumption of domestic sawn softwood appears to have been resistant to the construction downturn in 2008/09 which is widely believed to be due to a change in exchange rates. This growth in the relative importance of UK produced sawn softwood in construction is matched in the other major markets of fencing and pallets.

Only 6-10% of the total sawn softwood entering construction appears to go into new build housing. This suggests that a strategy to increase the volume of Welsh produced sawn softwood in construction should be one focused on general construction (repair, maintenance and improvement) rather than new build housing. However, the market data – largely derived from a single Timber Trends report provides insufficient detail to enable firm conclusions to be drawn. Surprisingly there is little available data on the market applications for sawn softwood in construction. This information gap needs addressing.

There are substantial opportunities for UK timber – in particular expansion of the market share of UK sawnwood, the growing wood fuel market and the need for innovative wood products in construction (both new build and particularly in retrofit). The development of a roadmap would require a rigorous analysis of the supply and demand for timber to ensure that market interventions are appropriate and targeted in a way that ensures maximum benefit.

2.9 Commercial structure

The sawmilling sector in Wales is dominated by two key players that can be said to have modern large scale high productivity lines able to supply construction grade timber - BSW in Newbridge (with a stated capacity of 140,000 m³ timber output) and Pontrilas in Herefordshire on the Welsh border. These companies are differentiated from the other mills not just through scale, but also through the added value processes of kilning and stress grading¹ giving them the ability to supply construction grade timber. BSW have recently signed a contract with Natural Resources Wales to process 600,000 m³ of larch which is being felled to slow down the spread of *Phytophthora ramorum*.

Kronospan based in Chirk employs 600 people with an output of 600,000 m³ of woodbased panels. Output also includes 500,000 worktops, 18 million m² of laminate flooring and turns over around £200 million. Also on the site is a sawmill that consumes 240,000 tonnes/year. The post-consumer waste consumption is 300,000 tonnes for the chipboard line.

The Welsh forestry sector is currently dominated by three major softwood customers (BSW, Pontrilas and Kronospan) and one softwood supplier (Welsh Government). The roadmap should consider how best to nurture a competitive and dynamic sector given the relatively small current forest resource, the limited number of market participants and the limited degree of innovation.

2.10 Biomass

The EU target is for 20% of its energy to come from renewable sources by 2020, with the UK required to achieve 15% average, across electricity, heat and transport. In the EU, woody biomass accounts for about 50% of the total renewable energy supply (UN, 2011). Uncertainties include the lack of information about the resource, the informal nature of some of the transactions and policy concerns surround the impact of biomass policy on other aspects of the sector.

A 2013 estimate for the amount of wood and tree derived products used in Wales to produce energy was around 190,000 TPA (green tonnes) providing the fuel across a range of energy plant from large scale power generation through co-firing and dedicated biomass plants to commercial scale heat only systems which are relatively easily quantified through grant support schemes such as WEBS and WEBS2 and ongoing revenue support initiatives like the Renewable Obligation (RO – for electricity) and the Renewable Heat Incentive (RHI – at the time of the report only the non-domestic RHI was open). This effectively ignores any domestic scale installations which, whilst much smaller in size, will be far more numerous.

This figure represents the minimum scale of biomass use and is likely to significantly under estimate the true total today due to:

- The introduction of the Domestic RHI in 2014 – and its capital support precursor
- The existing wood chip and pellet based systems outside of any grant scheme
- The non-domestic RHI being heavily oversubscribed which was not the case at the time of the Woodfuel Wales report
- Log based systems which form part of a much less organised and less formal industry structure

¹ Most Welsh softwood timber is graded to C16 under the European classification system defined in BS EN 388 where C denotes conifer based, (D – deciduous is used for hardwoods) and the number from 12 – 40 increasing strength. C16 is suitable for a wide variety of timber framing, carcassing and general construction uses, but UK timber can achieve higher grades when required through selection and engineering operations such as finger jointing and lamination.

Future growth in the short to medium term will be driven by the RHI and RO regimes, and while long term growth in use of biomass is predicted to ease, this will require significant investment and technological advances.

Biomass from tree derived sources now plays a vital role in underpinning the value of forestry by adding value to lower quality timber, forest residues and arboricultural arisings. The previous markets for these now rely heavily on recycled materials with the pulp market no longer present in Wales. It offers opportunities for both broadleaf and coniferous species in different markets and makes a vital contribution to offering cost effective low carbon heat and electricity. Demand is expanding at least in the short to medium term being driven by the RO (and subsequently CRCs and FIT support when the RO ceases) for electricity and the RHI for heat. Whilst in the longer term, demand is expected to reduce, any long term drop off is reliant on significant technological advances for decarbonising the electricity grid and development of more advanced energy conversion techniques such as gasification and pyrolysis.

2.11 Demand Stimulation (e.g. Grown in Britain)

The Grown in Britain campaign was developed in 2013 and is in the early stages of implementation. A central feature is a certification scheme which is designed to increase visibility of homegrown timber by licensing woodlands, timber and timber products that are grown in the UK. The licensing process provides assurance that the timber has been grown in the UK in accordance with the Government Timber Procurement Policies. It covers all types of wood grown within England, Northern Ireland, Scotland and Wales. The Grown in Britain label can be used on products to promote supply chain integrity and the British origin of the product. The Grown in Britain licensing scheme complements and integrates with other well proven forest certification schemes such as the Forest Stewardship Council (FSC) and the Programme for Endorsement of Forest Certification (PEFC). This type of regional branding has worked well in the food and drink (particularly beer) sector. On the flip side, sawnwood is a commodity product and the market is determined by international pricing and exchange rates. Branding homegrown timber may add some value to the resource in niche markets but is perhaps unlikely to have a significant effect on volume markets without significant intervention from the Welsh Government.

It should also be noted that BSW, the major supplier in the sawnwood sector, has a highly sophisticated centralised sales system for all 7 of its UK mills. The system is designed to optimise processing and transport efficiencies and not to ensure that Welsh demand is necessarily supplied with Welsh wood. However, BSW are supportive of Grown in Britain.

Other ideas for demand stimulation include:

- Local branding
- Consolidator arrangements for both timber supply and product offer. A “clearing house” initiative has been previously trialled on a small scale basis by a South Wales local authority and there is considerable interest amongst policy makers, financiers and the forestry industry around the consolidated offer that this could unlock for woodland owners, processors and end users

Substantial market transformations are commonplace and achievable in conservative industries like construction. The steel industry developed from a 25% share of the tall structures market (75% reinforced concrete) in 1970 to a 75% share by 1990. This transformation has not been mirrored in continental Europe where reinforced concrete still dominates. This change came about through a combination of technical innovation (in this case the development of composite metal decking) and significant strategic investment

in education, training and support for designers, underpinned by a strong cooperative ethos across a group of manufacturers.

International trade agreements make the implementation of demand side policies designed to support particular national industry sectors very difficult. For example, public procurement rules prevent the specification of ‘Welsh’ timber. Interestingly, unlike agriculture, national governments are largely free to set their own forest policies and, as a consequence, public intervention rates within European forestry vary substantially. The roadmap process will contain a review of all the options for demand stimulation as well as other potential policy initiatives and draw upon examples from overseas. The roadmap will also address issues of coordination across the diverse (and often competing) elements of the wood supply chain which have, to date, resulted in significant fragmentation and dilution of wood “industry” promotion.

2.12 Global trends

The World economy is predicted to quadruple in size by 2050 (See Goldman Sachs' World Bank report). If this is the case it will create an unprecedented supply challenge for all commodities including timber. Whilst it is impossible to predict how this may play out, it can be confidently predicted that the demand for timber for both products and energy (in particular) will rise substantially. It is unclear how this increase in demand will be met, given that there are limits to production efficiencies (and there are signs that we are reaching these limits) particularly upon exhaustible commodities and to an extent on timber supply with short term predicted dips and inelasticity in supply.

Global trends point to the substantial rise in the demand for timber. When considered alongside the substantial UK trade deficit in timber (and the UK is the world's 4th highest timber importing country) there is a clear economic opportunity for increased timber production in the UK.

An alternative vision of the future can be formulated around an increased resistance to globalisation. This can perhaps be characterised as a move from a focus upon market efficiency to a focus upon resilience and greater self-sufficiency. Such an alternative vision is credible when you consider the current disconnect between free market driven consumption growth (and consequent rising carbon emissions) and the need to avoid runaway climate change. Whilst the current trend is for greater market liberalisation there is also growing worldwide resistance. A future focused on the need for greater resilience would also point to the opportunity for substantial development of the UK timber industry. However, the focus and nature of public intervention for a future based upon a ‘resilience scenario’ would be very different to that based upon an ‘efficiency scenario’.

Whatever the future holds it is difficult to conceive of a scenario within which forestry and forest products are not of considerable and growing importance. Strategic investment focused upon the expansion of the forest sector should therefore be considered a relatively safe bet.

2.13 Innovation

Expenditure on innovation in the forestry and timber sector is low. Product, process, marketing and organisational innovations may have a profound impact on the future outlook of the forest sector. Some core opportunities to be considered are:

- Engineered wood products in construction / prefabrication of timber buildings / retrofit solutions
- Increased demand for and types of amenity

- Lower cost silvicultural systems reducing establishment and management costs
- Marketing forest ecosystem services such as biodiversity and carbon helping to encourage afforestation
- Developing locally applicable technical solutions (such as Ty Unnos) and finding mechanisms to support procurement to stimulate local supply chains within the constraints of a globalised economy
- Wood modification (e.g. acetylation, heat treatment, polymer impregnation)
- Bio-refining
- Cross Laminated Timber (CLT) panels
- Glue laminated timber beams (Glulam)
- Larch cladding
- Ash solid wood flooring
- Wood fuel pellets
- Laminated Strand Lumber (LSL)
- Technologies for grading and selection
- A state backed or facilitated supply chain consolidator may have a dramatic effect on supply chain development - particularly in the hardwood sector where fragile supply chains preclude investment. This may also create a clear link between the farmer as a potential grower and the market for timber - to help to unlock new planting
- New approaches to the ownership and management of the WGWE which would help to create more dynamic and innovative industry? The most appropriate ownership and management approach could be considered on a case by case basis depending on site specific issues and opportunities
- Cooperatives and public/private partnerships

The fact that forestry is not generally considered by policy makers as a national priority area for investment has severely hampered innovation in the sector. The focus on industries believed to lead to GDP growth, and on areas where the UK is deemed to have a competitive advantage, has led to a lack of focus on timber. Without technical and organisational innovation the forest sector in Wales will struggle to develop. A key aspect of the roadmap will be to provide the framework and context to enable effective assessment of current and future opportunities for change and innovation, and its ability to internally fund/reward this development.

2.14 Sustainability

The Welsh Government (WG) is committed to an overall target of reducing greenhouse gas (GHG) emissions in areas of devolved competence by 3% per annum with an expectation that all relevant sectors will make a contribution. Additionally it aims to cut all emissions by 40% by 2020 against a 1990 baseline.

“While real progress has been made in terms of research on emissions in Wales, perhaps the most notable finding is the extent to which many of the actions to reduce GHG emissions have not been taken forward. For those measures sponsored by Government, this relates in part to a lack of clarity (a prime example being where to place woodland creation) and a lack of sufficient incentives for farmers and landowners (e.g. for woodland creation and peatland restoration)” (ADAS, 2014)

Mitigating climate change is one of the largest and most complex challenges facing the world, with a unique complexity on the interface of biophysical processes, economic activity and considerations of geographic and intergenerational equity. The forest sector is at the origin of nearly a fifth of anthropogenic carbon emissions, mostly through deforestation, but also through wildfires, forest damage and wood harvest. At the same time, the forest sector can make a significant contribution to mitigating climate change. The main climate change mitigation strategies focused on the forest sector are:

- Sequestering carbon in forests
- Storing carbon in harvested wood products
- Substituting for non-renewable materials
- Substituting for non-renewable energy

Forestry is widely understood to make a significant contribution to climate change mitigation and adaptation, as well as addressing many other environmental issues and concerns. A key challenge that the roadmap will seek to address is how best to capture and value this contribution in a way that can help to stimulate economic growth in the sector.

2.15 Institutions

There are a large number of diverse public, private and third sector institutions that influence the timber supply chain and the forest policy environment. The sheer number of these institutions and their often conflicting interests can make decision making very slow and difficult and can stifle innovation.

There are tensions between the commercial, public and third sectors around many issues such as species, management methods, location for forestry and interventions.

There are also internal tensions within the commercial sector around many issues (particularly public policy). However, there are signs that the timber industry increasingly recognises the need to 'speak with one voice' and hence the signing of the 'Timber Accord' in 2012 which is an agreement between the signatories (the trade associations) to work together on timber representation. Also, the Timber Trades Federation and the British Woodworking Federation are currently undergoing a merger.

The departmental nature of Government also makes policy difficult and leads to inertia. The responsibilities for meeting climate change targets, managing the woodland estate and providing housing rest with different departments. There is also fragmentation in terms of delivery of publically funded research as well as a lack of a strategic national plan for promoting innovation.

It is clear that if there is to be substantial development of the sector in Wales there will undoubtedly need to be a change in the behaviour, roles and responsibilities of the guiding institutions – whether public, private or third sector. The roadmap will highlight these opportunities.

2.16 Policy incentives and interventions

Public support for private forestry has recently been focused upon state subsidies for planting and management. Grant support has been required to entice land owners into managing their forests and planting new forests. These grants schemes – the Better Woodlands for Wales and Glastir have focused predominantly on environmental outcomes (due to the objectives of the Rural Development Programme). Relative to the scale of the opportunity, it can be said that these schemes have met with limited success, and drawn criticism (from forest industries) that they reduce the productivity of the woodland, which leads

to increased costs of processing and further place the liability of future management cost onto the public purse. Increasing costs may not simply lead to a proportionate reduction in output, but possibly to a sub-economic level and the withdrawal of existing enterprises from the sector. Resistance from the farming sector to take up these grants can be put down to a range of cultural (e.g. wedded to food production) and pragmatic financial issues. Other brakes on woodland creation include environmental concerns, high land prices, and high proportion of tenanted land.

Whilst the solution is unclear, what is apparent is that current approaches are not working and a radical re-think is required. Tinkering at the edges is unlikely to lead to meeting the aspiration for sustainable development of forestry.

It is not clear how much money goes into subsidising forestry. According to the UN the average annual public expenditure on forestry in Europe is \$32/ha, but there is wide variation with 7 countries below \$10/ha and 6 countries above \$100/ha (UN Economic Commission for Europe, 2013). The non-monetary value derived from forestry is often the basis for subsidy. This subsidy can result in lower management cost and provide a de-facto subsidy to the processor, with little or no value returning to the grower in terms of higher returns. A major policy challenge is to provide framework conditions for an economically viable forest sector without being dependent on direct state subsidies for production.

This begs the questions, what is an appropriate level of subsidy? What is being paid for? And is Payment for Ecosystem Services (PES) the correct basis for introducing greater public investment into forestry? The shortcomings of PES relate to a lack of agreed metrics and do not necessarily inform key decisions such as where to plant.

It is widely understood that trees are a benefit to the environment and that increased planting is a good thing. Conventional analysis of the contribution of forestry to the economy typically considers the value of logs and primary processing. This contribution when expressed in terms of Gross Domestic Product (GDP) in Europe is on average less than 1%. Even in heavily forested countries such as Finland which has 73% forest cover the contribution of forestry to GDP is approximately 7%. It is hard to sell the idea of developing forestry as a national priority solely on the basis of its contribution to GDP.

Perhaps investment in forestry should be justified in terms of the wider benefits or externalities. These externalities most commonly include factors to support well-being such as recreation and amenity as well as biodiversity, air quality and flood prevention. However, forest policies based upon these externalities may lead to decision making which does not support or undermines the desire to develop productive forestry (in terms of species, location and management approach). For example, the reports from the Natural Capital Committee (Natural Capital Committee, 2014) suggest that the non-market value of afforestation far outweighs the market value and concludes that planting should be concentrated around urban centres to maximise 'natural capital' values (amenity). It is clear that many of these suggestions do not consider how public investment be framed to best support positive commercial outcomes, and therefore remain sustainable without continuing subsidy.

The Natural Capital Committee² propose an innovative accounting framework to enable the costs of sustaining and restoring natural capital to be evaluated and allocated to the private as well as the public sector. These include:

² The Natural Capital Committee was established in 2012 to provide expert, independent advice to Government on the state of England's natural capital. It was set up following a commitment in the landmark 2011 Natural Environment White Paper, which was titled The Natural Choice: Securing the Value of Nature.

- Capital maintenance payments from public, not for profit and private sector asset owners
- Rents from non-renewable resources (e.g. oil or shale gas)
- Compensation payments from developers
- Greater use of economic instruments (e.g. taxes and charges)
- Reforming and eliminating perverse subsidies
- Potential new and innovative sources (e.g. plastic bag charge, crowd funding schemes, Payment for Ecosystem Services)
- Taking advantage of match funding opportunities (e.g. the EU Life Programme)

An underlying assumption of the Natural Capital report is that agriculture pays better than forestry at the moment (due to high demand for agricultural commodities) but future projections of demand for biomass for energy and the ongoing reduction of agricultural subsidies under the CAP may improve the competitiveness of forestry. A recent report commissioned by Confor (Confor, 2014) considered the returns from the land use options in Eskdalemuir in the south of Scotland of forestry and agriculture. The report concluded that, in that particular location, forestry was a more profitable option. However, there remains considerable resistance from landowners to forest management and afforestation.

It is clear from projections of global demand increase, when considered alongside the sustainability benefits to be gained from the expansion of forestry that there is insufficient investment in the sector. Key to the substantial development of forestry and forest industries is to ensure that land owners are sufficiently incentivised to take the decision to plant trees ahead of other land use options (such as grazing), and that the necessary management to ensure health of the forest and quality of the timber can be paid for. There are approximately 60,800 ha of woodland on farms in Wales – about 1/5 of Wales total woodland cover and in spite of 50% of this land now being nominally “in management”, it is evident that very little of this land is economically engaged or actively managed for specific results or outputs.

Currently forest planting and woodland management is incentivised almost entirely through public subsidy. It would seem that public investment alone is unlikely to encourage the desired expansion of the role of forestry in Wales in meeting economic, social and environmental sustainability targets.

The case for bringing external private finance into forestry (from pension funds for example) has historically been much greater in areas with high percentages of private commercial woodlands. There has been a small degree of private commercial establishment in Wales, but not nearly as much as evidenced in Southern Scotland where private investment has established and re-planted woodland on poor upland grazing land. There has been increased evidence in recent years (in one case with direct involvement of RES) of appetite for establishment, remediation and management investment in Canada, where high levels of state retained land ownership are common.

There is considerable state involvement in Welsh forestry – through policy, regulation, ownership and investment. The roadmap will consider how this intervention can be configured to achieve maximum sector benefit as well as to highlight how private sector finance can be mobilised and how changes in grant programmes elsewhere in the UK and Europe are likely to stimulate (productive) forest creation.

3 FRAMING A ROADMAP TO A SUSTAINABLE WOOD INDUSTRY SECTOR IN WALES

3.1 Achieving a credible vision

A roadmap requires a destination. It could be argued that defining the destination, in such a rapidly changing and uncertain world is not possible. However, we can clearly define a number of desirable outcomes which inform the widely held aspiration to develop the forest sector.

- It is economically desirable to meet more of Welsh demand from home grown sources of timber
- It is environmentally desirable to bring more woodland into management and to increase the woodland cover
- It is socially desirable to create employment (particularly in rural areas) in forest management and wood processing

If the low policy priority given to forestry and forest industries is to be reversed, it is necessary to demonstrate that the above aspirations are not simply desirable, but central to Wales' sustainable development and also deliverable. Within this context, piecemeal tweaking with policy does not seem appropriate.

In defining this future, Wales should be encouraged and informed by actions taken in other countries. For example,

- Germany, in terms of strategic integration
- Ireland, in terms of use of funding to generate coniferous plantation and public owned management options
- France, in terms of support and organisation of large numbers of owners of relatively disparate and small broadleaf woodland and distribution of value through the supply chain
- Australia, in terms of its strategic approach to identifying and supporting innovation
- Japan, in terms of matching products and markets to the resource

The long timeframes, complex and multiple roles of forestry does create some challenges to framing a vision of the future. However, there are many tools, such as 'Horizons' (see image below) developed by Innovate UK, which can help to guide the development of a vision as well as the innovative strategies that will be needed for implementation.

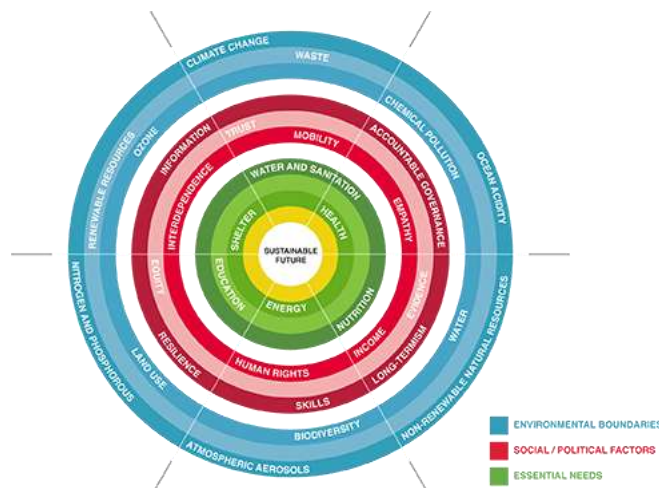


Fig. 1: Horizons Framework - Innovate UK

It is beyond the scope of this current report to precisely define the vision of the future in terms of area, species, management approach, products and markets etc. Preparing such a vision will require wide engagement with experts and interested parties. How this can be delivered is described in Section 6.

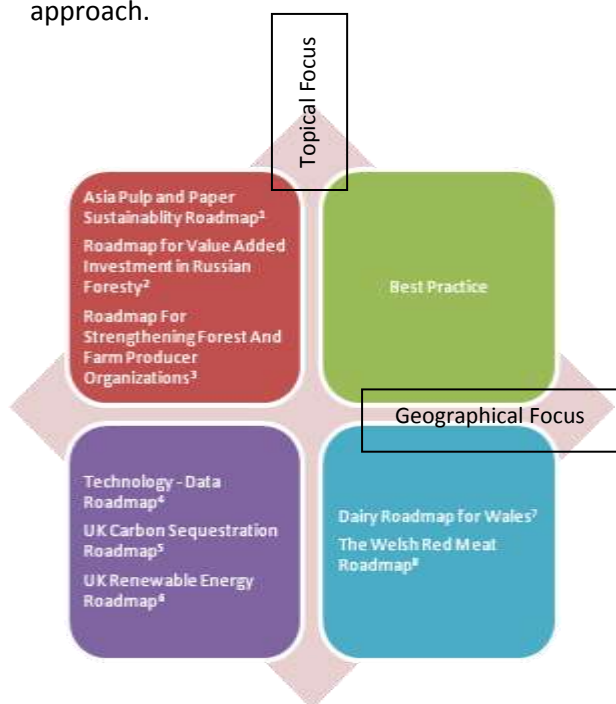
3.2 A review of roadmaps

The purpose of any roadmap should be to provide information in sufficient detail to determine the “best” way to get from one point to another. It should give enough information about each of the available route choices to enable an informed decision to be made on the best route to take to get to the required destination. This holds true both for a traditional transport based roadmap and/or a roadmap for delivering business and policy goals to achieve a desired level of performance.

The key to a policy / target driven roadmap is

- a clear understanding of current status and trajectory
- clear objectives of what needs to be achieved and
- the barriers and obstacles which will need to be overcome to reach the objective

For simple single objectives, to be achieved over a relatively short period of time, where changes can be quickly and easily assessed, a relatively simple solution is possible highlighting a direct route to the objective. However, the nature of forestry, the length of time changes taken in the short term effect the long term outcome of the industry and the complex interaction between the economic, environmental and social pressures placed on the forestry and wood processing industries requires a slightly different approach.



The roadmap needs to be able to guide the sector at significant decisions points along the route to sustainability, allowing decisions to be made with well understood implications, likely barriers to be overcome and likely effects on other activities. In order to produce a roadmap for a sustainable forest and wood industries sector and in generating this report, a number of reference roadmaps^{3,4,5,6,7,8,9,10} have been reviewed to distil best practice. Whilst none of these relate directly to a roadmap for a sustainable wood industry in Wales, their relationship to such a roadmap is indicated in Fig. 2.

Fig. 2: Roadmap references

³ <http://www.asiapulppaper.com/sustainability/vision-2020>

⁴ <http://eastagri.org/meetings/docs/meeting100/Forest%20Policy%20and%20Timber%20Industry%20Policy%20in%20Russia.pdf>

⁵ <http://www.fao.org/3/a-i3886e.pdf>

⁶ <http://pragmaticarchitect.wordpress.com/2011/03/05/how-to-build-a-roadmap/>

⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48317/4899-the-ccs-roadmap.pdf

⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48128/2167-uk-renewable-energy-roadmap.pdf

⁹ <http://www.dairyco.org.uk/resources-library/research-development/environment/milk-roadmap-wales/#.VKk4nSusVSF>

¹⁰ http://hccmpw.org.uk/publications/farming_industry_development/environmental_roadmap/

Whilst there is little consistency in format or how they are presented, they are all based on a similar methodology. This methodology shown below is proposed as best practice for generating the roadmap for a “Sustainable forestry and wood industry sector in Wales”.

This current exercise is a scoping document for the roadmap and as such maps out the detailed requirements to produce a full roadmap. As such each of the steps indicated will be progressed only to the level required to give an idea of the level of work required to carry out the full assessment.



Fig. 3: Roadmap best practice

3.3 Defining the objective and scope

Understanding the objective and scope has a significant influence on the amount of work required for full delivery and is therefore the first step.

The objective of the roadmap as proposed by the client (WFBP) is:

“a tool to guide strategy and planning for public and private organisations involved in the development and implementation of policy and actions in the forest sector to drive forward sustainable growth within the sector.”

Whilst the objective is relatively easy to state, understanding the implications of the objective is not as straight forward. The demands placed on the forest and forest products sector are many. To achieve sustainable growth requires a balance of the social, environmental and economic impacts of decisions made by the sector and its potential impacts on areas outside of the sector with the sector having key impacts on society as shown below:

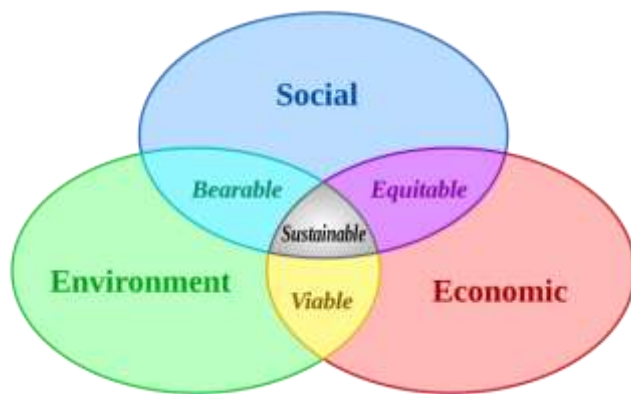


Fig. 4: Sustainability diagram

Economy

- Employment Potential
- Contribution to GDP
- Renewable Energy
- Construction

Environment

- Biodiversity
- Carbon Sequestration
- Water, Air and Soil Management

Social

- Amenity Value
- Landscape Value

In Wales specifically this has been distilled into 20 high level outcomes laid out in the Woodlands for Wales¹¹ Strategy document and reproduced below. These outcomes, whilst indicating a direction of travel, a monitoring programme and action plan in the majority of cases lack distinct targets and goals with respect to the end condition or controls addressing the compromises required and consequences of conflicting policies. Additional consideration of the relationship between the proposed roadmap and Woodlands for Wales is given in Section 4.

¹¹ <http://wales.gov.uk/docs/drah/publications/090324woodlandsforwalesstrategyen.pdf>

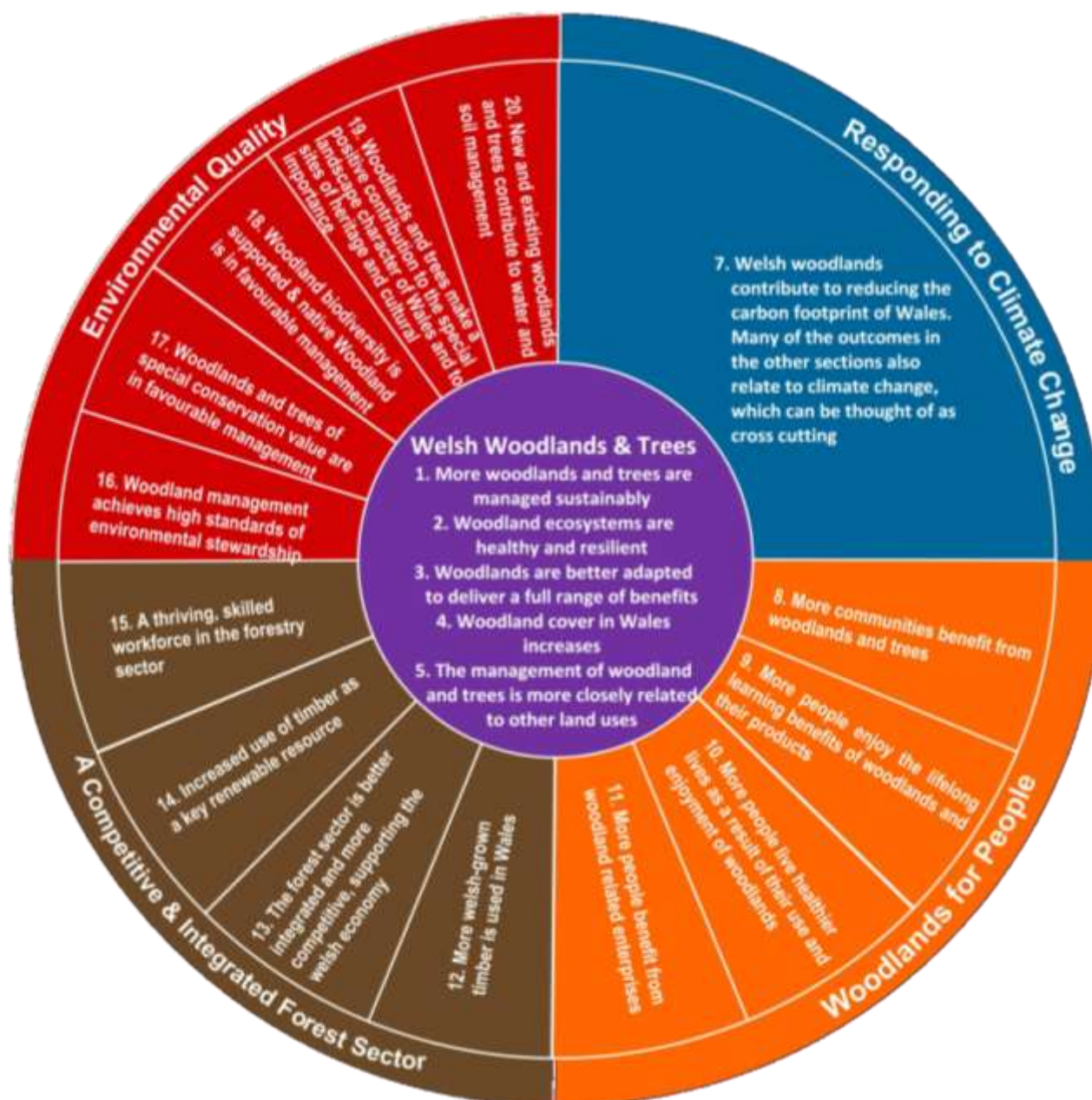


Fig. 5: Woodlands for Wales - summary actions

Whilst there is an explicit statement within the Woodlands for Wales strategy document to the contrary, the pervasive themes are that:

- large stands of similar aged, single species conifer plantations, managed by periodic thinning, ultimate clearfell and restocking with conifers and a 40-50 year rotation cycle, and
- areas of unmanaged forest – typically broadleaf

have a significant negative effect on biodiversity, ecosystem provision, woodland resilience, landscape value and amenity value. Unfortunately this represents the majority of the woodland in Wales and is driven by historic and largely current markets for softwood based timber products and a declining and lower commercial demand for native hardwoods. These effects are widely accepted by both the commercially and non-commercially orientated stakeholders in the sector.

One of the key areas the roadmap will have to address is how to manage a move away from current practice, towards an approach which delivers higher levels of the non-market services, forest cover, and productivity (i.e. without jeopardising the viability of the Welsh wood processing sector and its future opportunities). Timber in all forms is an internationally traded commodity, with both Wales and the UK as a whole already a significant importer of timber, especially construction grade timber. If Welsh grown, Welsh processed timber becomes too expensive end users will ultimately purchase it from elsewhere unless other significant value can be added to the product.

Two of the undesirable outcomes from this process are a dwindling processing sector in Wales, leading to further areas of undermanaged forest and a spiralling level of public subsidy required by the forest sector to balance income from timber against costs of management of the forest.

3.4 Target audience

The roadmap must operate on a number of levels providing both an overview of the options for the general observer plus sufficient detail to allow hard decisions to be made by industry, policy makers, and other interested stakeholders. A list of stakeholders and their role in the forest and wood products sector has been outlined in the Appendix. For the roadmap to be an effective tool in driving change, it should be led and managed by WFBP and should consider the needs of all stakeholders both in its inception, development and deployment.

4 THE ROADMAP AND WOODLANDS FOR WALES

Woodlands for Wales (WfW) provides a vision for the development of Welsh forestry to 2050. The first Woodlands for Wales report was published in 2001 and sets out the Welsh Government's aims and objectives for woodlands and trees in both public and private ownership. In 2009 the Woodlands for Wales report was updated. The drivers for such an update are described in the 2009 report as to reflect changing circumstances such as the increased pressure for climate change mitigation, to mesh with new Welsh Government policies, as well as to reflect the acknowledged need to be more ambitious.

There are a number of accompanying documents to the WfW 2009 report; these include:

The annual WfW indicators report, the latest version of which is for 2013-14 (Welsh Government, 2014) which aims to monitor the progress towards the 20 high level outcomes

A series of policy position documents in support of Woodlands for Wales which are designed to provide supporting evidence for the outcomes sought in WfW including Community Involvement, health and well-being and economic development

Woodlands for Wales Action Plan 2010-2015 (Welsh Government, 2012) which sets out activities that Welsh Government consider necessary to achieve the 20 target outcomes of the Woodlands for Wales strategy

In short, in comparison with other countries and regions the number of reports produced by the Welsh Government outline strategies and actions is truly impressive and holistic. In which case why is a roadmap required? Is it simply that productivity is not given sufficient emphasis? This question can be considered from a number of different perspectives.

- From the perspective of long term confidence required by industries within the sector the recent history is less than impressive. Many of the trends, such as bringing new woodland into management or the lack of new planting, or the increased proportion of planting being for species for which limited consideration is given to future value. There are also many market opportunities which would help to increase the value and quantity of Welsh timber which are not being addressed (e.g. low prices for roundwood, and low added-value).
- From the perspective of the imperative for climate change mitigation, the pace of change is very slow. Activities which could play a more significant role in helping Wales to meet its climate change objectives include the development of biomass, afforestation and using more Welsh timber in construction need to be accelerated.
- From the position of global demand and supply there is a clear opportunity to significantly increase the GVA from Welsh forestry, to reduce import dependency and to provide a feedstock for UK construction in particular.
- Given public sector constraints the need for creative solutions to attract new sources of long term investment (from pension funds for example) is necessary.
- Unlike other competing sectors (such as steel and concrete) the timber industry has environmental and social responsibilities (amenity, biodiversity and resource governance) which draws the policy focus away from competitiveness and productivity.
- As a guide to action to increase productivity of Welsh woodland, the Woodlands for Wales strategy is problematic. It fails to fully explore the trade-offs between the desire for economic development of the sector with other desired outcomes.

The opportunities and challenges would suggest that fresh thinking and more radical solutions are necessary. A roadmap will provide the context for assessing the potential for innovative ideas and solutions which may otherwise be missed.

The roadmap will maintain a sharp focus on the barriers to increased productivity. From the private landowners' perspective, woodland conservation and shooting are consistently cited as reasons to manage woodland ahead of production. Other barriers include lack of awareness and confidence of options, lack of profitability and fear of bureaucracy and loss of control. From the processors' perspective there are issues of quality and price, cost of imports, poor public perception, lack of recognition of environmental benefits and high regulatory burden when compared to competing industries.

5 GENERATING THE ROADMAP

The tender document called for

“A detailed description of the required work packages and how they can be delivered - including research strategy, stakeholder engagement, section content and a list of organisations with the expertise to provide the required detail. The report would be expected to contain the following section headings:

- *Project management and coordination*
- *Forestry (up to forest gate)*
- *Primary processing and supply chain logistics*
- *Secondary processing and markets - biomass*
- *Secondary processing and markets – construction and other markets*
- *Education, training, research and development*
- *International perspectives and case studies*
- *Marketing and communication to develop communication strategy, messages and tools”*

The underlying assumption from the tender documentation is that Wales can extract substantially more benefit from its trees and forest industries. To extract these benefits the WFBP believes that a roadmap is required which would

‘not only describe a clear vision of the prize for Wales (including quantifiable targets for employment, balance of trade, sustainable construction, timber security, carbon etc.) but also describe in some detail how these targets can be met and paid for.’

The roadmap will provide a context to understand the potential for forestry to contribute to sustainable economic growth in Wales and will

- Provide a decision making tool for public policy
- Highlight tensions and trade-offs between the various demands made on forestry
- Help to foster a new innovative spirit in the forest sector
- Help to clarify the understanding of the role and responsibilities of the governing institutions
- Provide the WFBP with a high level guidance document to inform strategic development and specific work programme actions

Through the course of this scoping study, we have identified significant work that has been already carried out in this area but also significant discrepancies in the data, unclear and obtuse measurement indicators and a serious lack of coordination or integration across the supply chain. The subsector approach initially indicated may not be the best approach risking further disjointing of the sub sectors making up the forest and wood products industry in Wales. The lack of any primary paper pulp industry also opens the debate whether secondary and recycling paper industries impinge on the sector.

The areas where research appears to be lacking is that of cost benefit analysis (both fiscal and environmental) of different planting regimes and silvicultural management practice, together with a transparent view of the level of public subsidy and investment characteristics of forestry in Wales. Given one of the desired outcomes of the roadmap is a picture of how the sector is funded; this is a key data gap at the moment.

Rather than the single phase, sub-sectoral process a phased approach is proposed comprising of 3 phases recognising the requirements of a revised list of sub-sectors but with a holistic approach to the industry.

Revised sub-sectors:

- Production (public and private) – nurseries, planting, management, harvesting (incl. disease), haulage
- Primary processors – sawmilling
- Secondary processors – drying preservation, timber components, board production, laminating, fabrication, biomass producers
- Wholesale and merchanting activity
- Distribution and supply chain logistics
- Architects and specifiers
- Contractors and end-users (builders, timber framers, cabinet makers, furniture, joinery etc.)

From a delivery perspective, the original structure suggested that a separate project management co-ordination function of individual work packages. The proposed structure is for a single delivery organisation responsible for delivering the roadmap with specialist services subcontracted. This reduces the risk to WFBP by removing the risk that conflicting requirements are handled differently across sectors.

5.1 Phase 1 – Scoping and mapping

Primarily a consultative and engagement phase to provide a comprehensive map of the stakeholders that comprise the forest and wood processing sector including specifiers, users, potential funding organisations and other interested stakeholders. Once these have been identified, a scope and objective for the roadmap that is deliverable within the identified level of funding can be agreed. The wider the objective and broader the scope of the roadmap, the more funding will be required to develop and deliver it.

The objective of this phase will be to:

- Agree a roadmap is required together with an agreed objective and scope
- Agree a communication strategy and format for the roadmap
- Produce a comprehensive map of the sector

5.2 Phase 2 – Refining the end points

Work Package 2.1 – Refining the data

This scoping exercise has uncovered a huge volume of measurements, indicators and research output on the Welsh forestry and wood processing industry. With a clear objective and scope developed during phase 1, these will be distilled into a contiguous set of indicators that transparently and completely define the industry. Where possible existing measures will be used (or modified) but it is important that the dataset remains consistent across sub sectors of the industry and will form the basis of defining the current state and trajectory of the industry for the roadmap.

The objective of this phase will be to:

- Agree a consistent set of indicators that transparently and completely define the industry.
- A clear picture of the current state of the industry and its current trajectory.

Work Package 2.2 – Additional research into the current state of the industry

A number of data gaps, especially in the economics and funding of the industry in Wales, have already been uncovered through the course of this scoping study. Others will undoubtedly be uncovered during WP2.1. This work package will, through both literature review and primary research where appropriate, contribute to defining the current status of the industry. At the moment it will look at:

- Macro economics of the sector
- Micro economics of individual sub-sectors

but this list will expand through activity 1.1 and 2.1.

Work Package 2.3 – Assessing alternative destinations and routes

A number of scenarios will be developed for adjusting the current trajectory of the industry. These will look at either amending the target where necessary or changing the way in which the targets are achieved. An estimate of the efficacy of the scenarios in terms of moving towards a sustainable future, cost and funding implications will be assessed for each scenario as will the practicability of delivering the scenario.

The output from this work package will be:

- A number of scenarios for the future opportunity for Welsh forest and wood processing industries
- Implications of choosing one scenario over another and potential external and internal factors that impinge on the scenario

Work Package 2.4 – Set the destination and the route

This in itself is a 2 stage process. Extensive consultation with sector stakeholders will be required to agree the destination and possible route choices. A number of scenarios will be built into the roadmap as contingencies and alternatives to the headline scenario if industry changes unexpectedly (e.g. new diseases) to keep it on track to its desired final state. This will improve take-up by the industry and hopefully encourage a collaborative approach to delivering its objectives. There will be a good deal of iteration between the scenarios, impacts and decisions through this consultation process.

The outcome of this work package will be:

- A clear and accepted view of the sector's future with understood cost and financial implications together with contingencies and decision point guidance to keep the sector on track in a controlled manner

Work Package 2.5 – Generating the roadmap

With a clear and accepted view of the future an action plan with timed implementations of interventions, actions, interim targets and milestone achievements will be generated to deliver the future the sector wants and believes can be delivered. This will undoubtedly involve private, public and third sector stakeholders with interventions and actions covering a wide range of activities from policy through to consumption. This differs from the current Woodlands for Wales Action Plan in giving targets and timescales to the desired direction of travel.

An example of the type of impact the roadmap would have is set out below:

Objective: Increase the land used for forestry in Wales.

Principle mechanism: Glastir funding to promote planting of 50% broadleaf and 50% mixed woodland.

Supporting Intervention: Support R & D into hardwood engineered products.

Outcome: Achieve a demonstrable market value of £xx by xxxx.

Outcome Achieved

Result: a credible increase in the value of broadleaf forest with a corresponding net reduction in the reliance of broadleaf forestry from funding for non-market values and public support

Next Actions: Incentivise increase in processing capacity to fulfil potential demand and develop market presence to XXX

Outcome Not Achieved

Result: No credible increase in the market value of broadleaf forest resulting in a net increase in the reliance of broadleaf forestry from funding for non-market value and potentially spiralling public support to maintain forests in active management.

Next Action: Review policy of incentivising increasing broadleaf coverage by x% p.a

- Continuing at this level costs this £A, B Kg_{CO₂e} , C biodiversity score
- Reducing target costs £D, E Kg_{CO₂e} F biodiversity score
- Swapping increase for conifer costs £G, H Kg_{CO₂e} J biodiversity score

This is significantly better than the “let's plant lots of broadleaf which might yield hardwood output which might be valuable for high value uses such as furniture at some point in the future” approach alluded to previously in the document.

5.3 Phase 3- Delivery, monitoring and communication

Monitoring and delivery of the roadmap should be an independent or public sector function. Where possible as with the indicators, existing methods and measurements should be used but they must remain un-obtuse, contiguous and transparent. Organisations accountable for delivering and monitoring the roadmap should be remunerated where appropriate for their input and any communication should remain consistent in message across the sector even when tailored for specific audiences or formats.

6 CONCLUSION

This scoping study has described the opportunity for Welsh forestry that a roadmap would help to deliver. The authors have sought to provide sufficient background context to provide the rationale for the timing of a new approach, as well a sufficient foreground context to support the case for public investment in such a roadmap.

In summary



This report suggests where information and data may be sourced, and highlights the assumptions and presumptions that may previously have been unchallenged, together with context and examples from other jurisdictions and industries. In doing so, it is the authors' intention, that the nature of subsequent work should focus on consistency of policy and subsequent delivery, with due reference to a range of outcomes, their affordability, and the practical engagement of existing and new players within the wider forestry and wood system.

The report provides a structure for the phased delivery of a roadmap and how such a roadmap could be managed.



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