



# ROOTS FOR FURTHER GROWTH

AN ECONOMIC  
STRATEGY FOR  
SCOTLAND'S  
FOREST & TIMBER  
TECHNOLOGIES  
SECTOR TO  
2030.

GROWING SCOTLAND'S  
WOOD-BASED BIOECONOMY  
THROUGH INVESTMENT  
& INNOVATION



Scottish  
Forest &  
Timber  
Technologies



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GROWING SCOTLAND'S  
WOOD-BASED BIOECONOMY  
THROUGH INVESTMENT & INNOVATION

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<b>03</b>	<b>Foreword</b>
<b>05</b>	<b>Executive Summary</b>
<b>07</b>	<b>1. Introduction</b>
<b>11</b>	<b>2. What We Have Achieved So Far.</b>
<b>14</b>	<b>3. Our Vision</b>
<b>21</b>	<b>4. Strategic Priorities</b>
<b>23</b>	○ Maximising the Economic Outputs of Scotland's Forest & Fibre Resource
<b>26</b>	○ Improving the Safety & Efficiency of the Wood Fibre Supply Chain
<b>27</b>	○ Expanding Our Markets & Adding Value
<b>31</b>	○ Developing a Workforce with Skills for the Future
<b>32</b>	○ Understanding and Communicating the Forest & Wood-based Industries Contribution to Scotland's Economy
<b>33</b>	<b>5. Action Plan for 2019-2021</b>

# FOREWORD

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I am delighted to endorse “Roots for Further Growth”, an ambitious and forward thinking strategy for inclusive economic growth in Scotland’s Forest and Timber Technologies sector.

This is a sector that spans from tree nurseries, growing productive sustainably managed forests, forest tourism, timber harvesting, transport, downstream wood processing, primary manufacturing and woody biomass energy. Plus the businesses involved in importing wood and wood products and the recycling of wood fibre.

The outputs of these industries are important for Scotland’s rural economy, and beyond; contributing significantly to Scotland’s economic inclusive growth and delivery of our climate change plan by sequestering carbon in our forests and then storing it in wood products derived from those forests.

This sector has invested heavily over the last 10 years to achieve world class wood processing facilities and has created additional jobs in response to forecasts of increased wood fibre availability until 2030. The Scottish Government has a current annual target of 10,000 ha of new woodland which is set to increase in stages to 15,000 ha a year by 2024-2025. This will not only increase sequestered carbon but provide the sector with additional wood fibre feedstock for further growth beyond 2030.

I welcome the ambition of this sector to double its economic contribution to Scotland’s economy by 2030 through innovation and investment, and the publication of this strategy.



Mr Fergus Ewing

Cabinet Secretary for the Rural Economy



**Over the last decade** our sector has grown significantly, and we are **determined to double our contribution to the Scottish economy by 2030.**

We recognise this is an ambitious target, but we believe it is attainable through investment in our people, our resources, and innovation throughout the supply chain leading to added value resulting in **increased productivity and manufacturing throughout the sector.**

We foresee challenges ahead, but by clearly defining how we will achieve our ambitions and working in collaboration across the supply chain and in partnership with the public sector, we will succeed.

A forecast significant increase in wood fibre availability in Scotland over the next 12 years will provide a great opportunity for the sector to grow, but we are very aware that after 2030, that same forecast is reporting a decrease in potential coniferous roundwood availability in Scotland over the following 15 years. We will continue to work tirelessly to make our forests more productive and our operations more safe and efficient, we will seek new ways of adding value, and explore opportunities for increasing processing and downstream manufacturing of all wood-based products in Scotland. However, due to the length of rotation of our forest crops our sector has always planned long term compared with other sectors of the Scottish economy, and the economic contribution from the sector could be significantly reduced if the productive capacity of the current forest inventory is not maintained through timeous restocking and new woodland creation of productive tree species. That's why we welcome the Scottish Government's woodland creation targets, their continued support through the Strategic Timber Transport Scheme and the Timber Development Programme, all of which will help our sector achieve its objective of economic growth.

The potential of a sustainable natural material like wood fibre is an exciting one in a low carbon future world, offering opportunities to sequester and store carbon, substitute high embodied energy products and even provide a feedstock to replace fossil fuel derived products. All these outputs, and more, can provide significant economic and environmental benefits for the people of Scotland to 2030 and beyond.

We are all set for further growth!



Martin Gale, Chair.

Forest & Timber Technologies Industry Leadership Group



# EXECUTIVE SUMMARY

The strategy covers the economic and business activities associated with:

- **Growing and managing forests in Scotland, and for other related business opportunities such as forest tourism, food and carbon markets, as well as the importing and exporting of wood fibre to provide a sustainable supply of fibre for wood-based industries.**
- **The primary processing of trees grown in Scotland, for example at sawmills and panel board mills, and the manufacture of wood products for the construction sector.**
- **The importing and further manufacturing of wood products from overseas.**
- **Woodfuel supply chains.**
- **Reuse and recycling of wood fibre.**

The sector's contributions to Scotland's urban and rural economies are described and also the factors influencing the balance between further local processing and imports. The important contributions that wood and wood products can make to sustainability and the circular economy are also recognised.

The main reasons that have underpinned the sector's growth over the last 10 years are identified and the sector's present contributions to the Scottish economy are quantified.

The ILG's vision is that in 2030 the Scottish forest and timber technologies sector's present contributions to the sustainable low carbon growth of the Scottish economy from using virgin, reused and recycled wood fibre will have doubled.

This will be because there is far greater recognition that as trees grow in Scotland, they capture and store carbon, and forest and woodlands provide health and recreation opportunities, while at the same time sustainably producing a natural, highly versatile feedstock for industry. In addition, wood and wood products will have become the products of choice in many end-uses because of a much greater appreciation of their low carbon footprint compared with other building and packaging materials.

This document, which has been prepared by the **Forest and Timber Technologies Industry Leadership Group (ILG)**, sets out a strategy and action plan for the forest and timber technologies sector in Scotland up to 2030.

By 2030 research and innovation will have demonstrated commercial opportunities of some potential new end uses from both virgin, reused and recycled wood fibre that are presently being investigated.

Potential coniferous roundwood availability in Scotland is forecast to increase before decreasing quite markedly after 2030. Without planting more productive coniferous trees in Scotland now, the contributions of companies that use trees grown domestically will fall after 2030. This may impact on achieving our 2030 vision, as the parts of our industry that use wood fibre grown in Scotland need to have confidence about the future availability of coniferous roundwood in Scotland when making decisions about allocating capital to investments and funding innovation. The importance of planting more trees now, and protecting Scotland's forests and woods from disease, is recognised as being of critical importance if we are to contribute to Scotland's economy in 2030 and beyond.

The strategy identifies and describes five immediate strategic priorities for the forest and timber technologies sector and which are to:

- **Maximise the economic outputs of Scotland's forest and fibre resource.**
- **Improve the safety and productivity of the wood fibre supply chain.**
- **Expand markets and add value.**
- **Develop a work force with skills for the future which support inclusive growth.**
- **Understand and communicate the forest and wood-based industries' contributions to Scotland's economy.**

The importance of delivering the strategy is recognised and a detailed action plan is provided in Section 5 that identifies individual potential projects for each of the five immediate strategic priorities, and who the most appropriate lead partner or partners will be for each.





# 1. INTRODUCTION



# Scottish Forest and Timber Technologies is **a dynamic and innovative sector** with a huge opportunity for further economic growth while continuing to deliver **essential environmental and social benefits to Scotland** and its people.

Our sector is currently contributing to the sustainable growth of the Scottish economy through providing jobs, by growing our businesses, expanding existing markets, and developing new opportunities through research and innovation resulting in a contribution of over £1 billion per annum to Scotland's Gross Value Added.

In its Programme for Government, the Scottish Government states that it wants to work with the Forest and Timber Technologies Industry Leadership Group to develop a long-term action plan to identify and exploit strategic opportunities for economic growth in the sector.

Scottish Government's Scottish Forestry Strategy focuses on creating and maintaining multi-benefit forests for the people of Scotland based on the three pillars of sustainability; environmental, social and economic. We fully endorse this approach and this document sets out our industry-led strategy and action plan for economic growth in the Scottish Forest & Timber Technologies sector in Scotland until 2030, although unlike other sectors we continue to have a long-term focus to 2050 and beyond because of our need for a wood fibre resource that is growing sustainably.

## Breadth of Sector

The strategy covers the economic and business activities associated with:

- **Growing and managing forests to provide a sustainable supply of wood fibre for forest-based industries, and for other business opportunities such as forest tourism, food and carbon markets.**
- **The primary processing of trees grown in Scotland, for example at sawmills and panel board mills, and the manufacture of wood products for the construction sector.**
- **Importing and further manufacturing of wood products from overseas, often to meet specific technical and market end use requirements.**
- **Woodfuel supply chains.**
- **Reuse and recycling of wood fibre.**

The strategy does not extend beyond the supply of materials into construction and house building, where wood and wood products are extensively used, as these very important economic activities have their own sector development strategies.



Photography: Marcus Ginns

# Timber Processing Sites, Shipping Points & Major Biomass Consumers

- Key Timber Ports
  - Other Timber Ports
  - ▲ Key Piers
  - 🌿 Woodland (NFI)
- Timber Processing Sites**
- Major Sawmill
  - Panel Mill
  - Paper Mill
  - Major Biomass Consumer





## Rural & Urban Economic Contributions

Scotland now has approximately 1.4 million hectares of established forest and woodland. The economic activities associated with the establishment, management, harvesting, transport, and much of the processing of the roundwood and other woodland products takes place in the rural areas of Scotland (Map 1) and so make a major contribution to Scotland's rural economy. Small scale processing and the use of other non-timber forest products often strengthens the local economy through what can often be even more local circulation of value in rural areas.

Scotland also has a history of importing forest products, as the woodland area has not been as large as it is today since about 1750, as a result, another very important part of the sector comprises companies that import and further process wood and wood products from countries such as Sweden, Russia, the Baltic states, and other parts of the UK. The further processing and manufacturing of imported products, such as timber frames and roof trusses is often based around ports, or in other urban areas where these activities contribute to Scotland's urban economy. The profitability of our companies at any one time is particularly dependent on the relative level of Sterling compared with the currencies of other timber exporting countries.

### Map 1

Where the Sector Contributes to Scotland's Rural Economy

At times it favours importers and those using imported timber in Scotland, and at others it favours companies that use and process roundwood and fibre produced in Scotland. Whatever the balance is at any one time, we are all ambitious and determined to see more wood fibre used because wood fibre is a renewable, natural resource that contributes so much economically, environmentally, and socially to the people of Scotland.

## Circular Economy & Sustainability

Sustainable economic and environmental growth requires us also to use the wood fibre we have as efficiently and appropriately as possible by cascading our use of it down the value chain, and to recycle as much as we can. Wood is a natural product and is therefore highly suitable for reuse and recycling, and the resulting fibre is an important additional source of feedstock for the sector. Reuse and recycling activities are already an important component of the sector's contributions to Scotland's economy.





A wide-angle photograph of a large industrial wood processing facility. In the center, a worker wearing a high-visibility yellow and orange vest and dark pants is walking away from the camera, carrying a long wooden beam. The floor is covered with numerous stacks of long, yellow-painted wooden planks. To the left, there are more stacks of wood and some machinery. In the background, the facility's structure is visible, including high ceilings, metal beams, and various pieces of equipment. The lighting is bright, coming from overhead industrial lights.

# 2. WHAT WE HAVE ACHIEVED SO FAR



## **The sector's present contributions to Scotland's rural and urban economies is based on:**

- Creating additional value from the increased harvesting of 2 million tonnes per annum of softwoods from Scotland's sustainably managed forests since 2005.
- Continual incremental investment in new machinery and processes and market development by individual companies in the sector, as well as major investments in new plant and equipment by some companies based on a collective industry ambition to grow the sector. These investments are estimated to have totalled well in excess of £500 million.
- Making the public, professionals, and the construction industry more aware of the environmental benefits of using wood and wood products from sustainably managed forests.
- Companies increasing their focus on product quality, presentation and customer service, such as 'just in time' delivery.
- Expanding existing markets and investigating and developing new ones.
- Being innovative and investing in new technology along the supply chain to maintain cost competitiveness.
- Investing in new value adding opportunities.
- Improving our technical knowledge of the properties of trees grown in Scotland by working in partnership with universities and research organisations, including Forest Research and Edinburgh Napier University, as well as public bodies and overseas organisations.
- Supporting the development of the Forestry School at Inverness College (University of the Highlands & Islands) to attract young people to work in the sector with the necessary qualifications, skills and training.
- Improving our communication with the public through the efforts of individual companies, Forestry Commission Scotland or its successor, and by working with a range of other organisations including Wood for Good.

The Scottish Parliament Information Centre (SPICe) briefing to the Scottish Parliament in 2016 examined past estimates of the sector's contributions to GVA, and concluded that the sector's contributions may have increased by 43% between 2004 and 2014 and this percentage is likely to have increased further in the years since 2014.

Using wood more efficiently, widening its use, substituting for less energy efficient building materials or replacing fossil fuels as an energy source over the last 10 years has significantly increased the sector's contribution to mitigating

climate change. The wood raw material equivalent of all wood and wood products used in the UK between 2008 and 2017 is estimated to be about 500 million cubic metres (Forestry Commission Statistics). With 1 cubic metre of wood storing the equivalent of 2 tonnes of carbon dioxide, at point of production this amounts to approximately 1 billion tonnes of carbon dioxide stored over the period.

The ILG and companies have also been building partnerships with Scotland's construction and industrial biotech innovation centres (Construction Scotland Innovation Centre and Industrial Biotechnology Innovation Centre).

## Our Present contributions to Scotland's economy

Our present contributions to Scotland's economy from Scotland's forests are summarised in Infographic 1 below.

In addition to these combined contributions from companies that establish, manage, transport and process wood grown in Scotland, there are also very

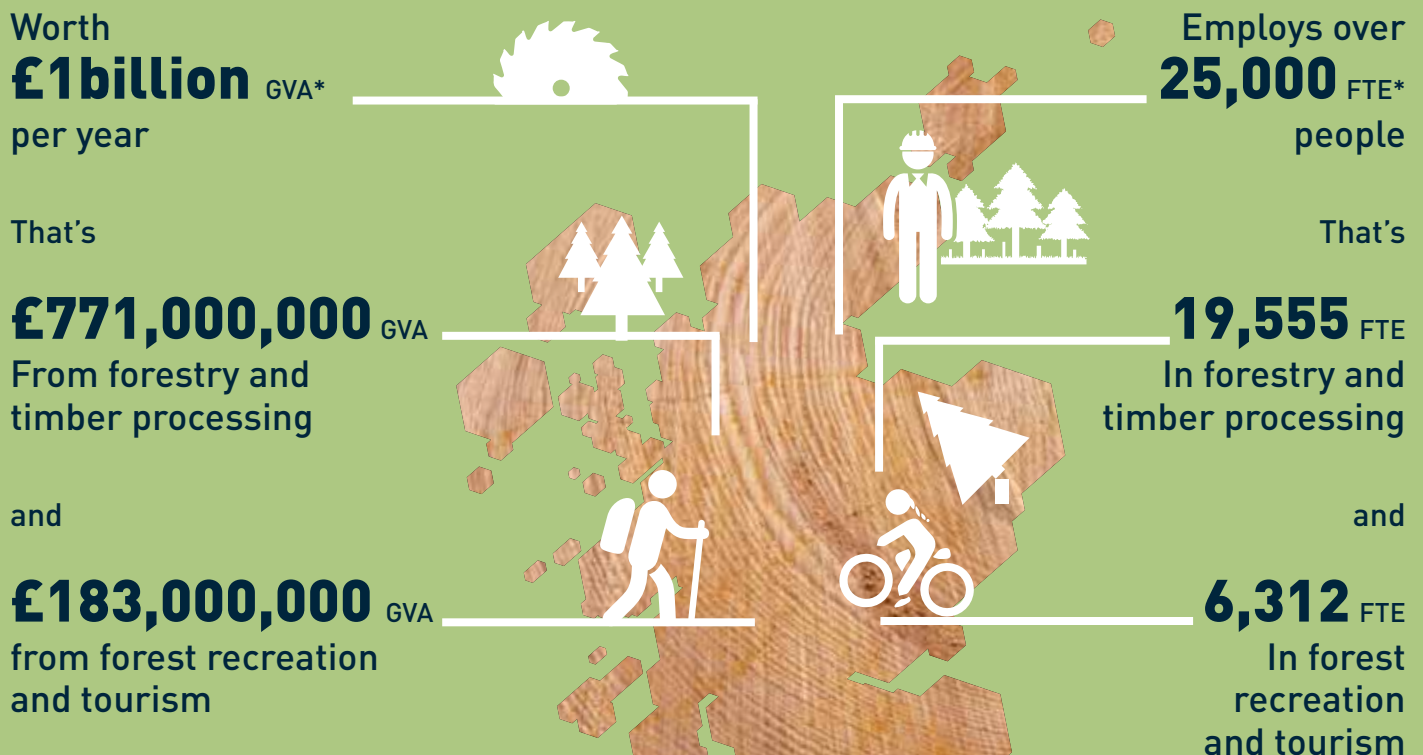
significant contributions made to Scotland's economy by companies that import, further process and market wood, and manufacture wood products.

It is estimated that the total present turnover of companies operating in the forest and timber sector in Scotland is approximately £3 billion.

### Infographic 1:

The Contribution to Scotland's Economy Resulting from the Growing & Processing of Trees Grown in Scotland's Woods & Forests

## Forestry's Economic contribution to Scotland



\*Gross Value Added and \*Full-Time Equivalent taken from "The economic contribution of the forestry sector in Scotland 2015"



The background of the entire page is a close-up, high-resolution image of a wood cross-section. It shows concentric growth rings in shades of light brown, tan, and beige. The texture is organic and detailed, with some darker, more irregular lines interspersed among the rings.

# 3. OUR VISION

**We see enormous economic potential for the sector up to 2050 and beyond, but we also acknowledge there are more and better ways that we can do what we have done, and what we are doing now.**



# **Our vision is that by 2030** we will have doubled the Scottish forest and timber technologies sector's present contributions to the **sustainable low carbon growth of the Scottish economy** from using virgin, reused and recycled wood fibre.

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This will be because there is far greater recognition that as trees grow in Scotland, they capture and store carbon dioxide, and forests and woodlands provide health and recreation opportunities, while at the same time sustainably producing a natural, highly versatile material. In addition, wood and wood products will have become the products of choice in many end-uses due to their excellent environmental credentials, and because research and innovation will have demonstrated commercial opportunities of new end uses from both virgin, reused and recycled wood fibre that are presently being investigated. As a result, we will have increased the quantity of wood fibre based products sourced or produced in Scotland by 20% and we will have then grown our use of Scottish grown wood fibre to the limit of its potential availability. We will also have increased the turnover of companies operating in the Scottish forest and timber technologies sector from £3 billion to £6 billion per annum.

Many companies operating or based in Scotland already have an international focus for some of their activities. These include exporting logs and importing wood fibre, exporting processed wood products, and investing in and operating wood processing plants in other countries. They are also importing products processed in these plants to supply their customers in Scotland and the rest of the UK. These activities are relatively limited at present, but we expect these international activities to gradually increase in the future, particularly as wood fibre availability in Scotland becomes more limiting. Looking towards 2050, which is the time a tree would take to reach maturity if it was planted now, we are very aware that after 2030, potential coniferous roundwood availability in Scotland

is forecast to decrease quite markedly. Without planting more productive coniferous trees in Scotland now, the contributions of our companies that use trees grown domestically will fall after 2030. This may impact on achieving our 2030 vision, as the parts of our industry that use wood fibre grown in Scotland need to have confidence about the future availability of coniferous roundwood in Scotland when making what are often long-term decisions about allocating capital to investments and funding innovation. Therefore, it is extremely important that all our wood supply chains are efficient and maximise utilisation of the wood fibre that is available.

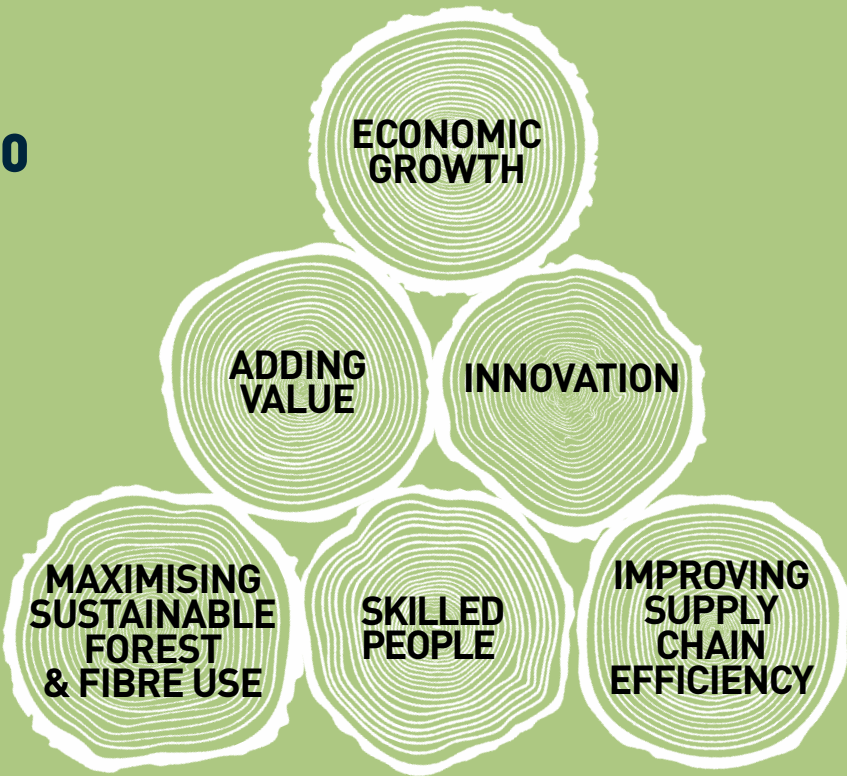
We are also aware that there are other external influences that can impact on our vision and strategy. For example, as more wood is used in constructing buildings globally because of its environmental benefits, this may increase the global demand for wood with cost and supply implications, and it may influence how we use wood products in buildings.



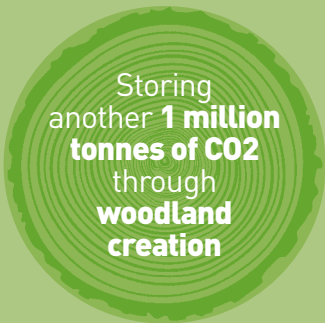
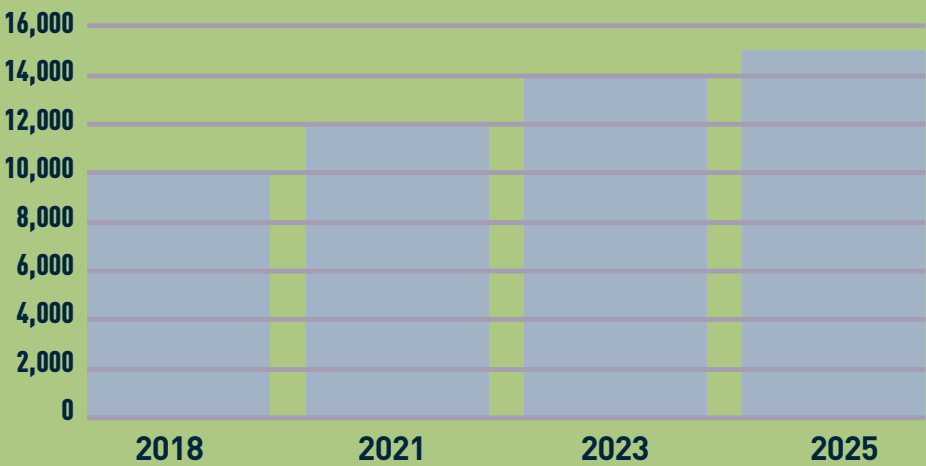


# Scottish Forest & Timber Technologies Growth Strategy to 2030

## KEY THEMES

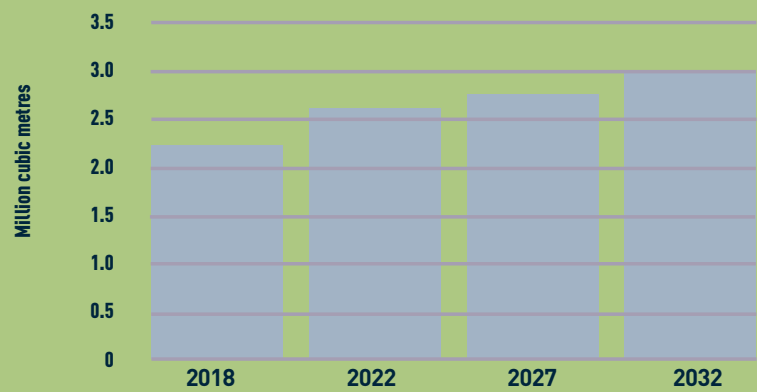


## Woodland Creation Targets



**Source:** Scottish Government Climate Change Plan: Third report on proposals and policies 2018-2032 (RPP3)

# Scottish Wood Used in Construction



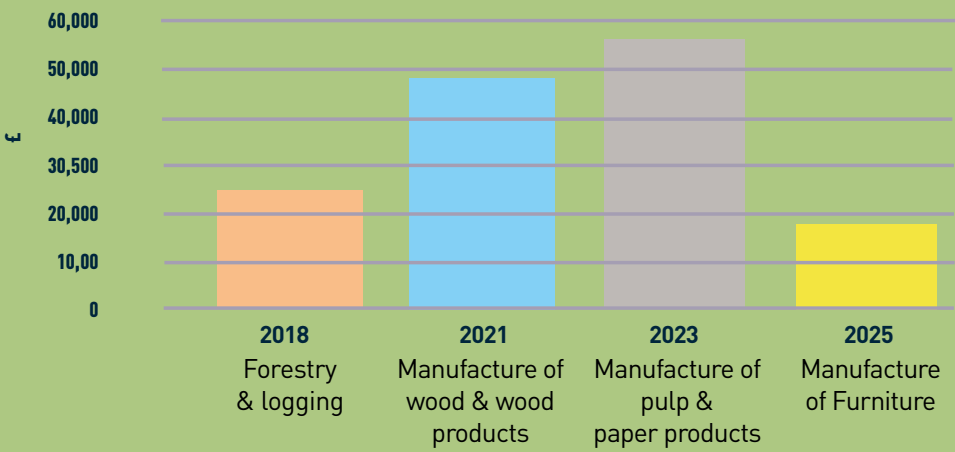
**A 50% Increase in Scottish wood used in construction**

**Source:** Scottish Government Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3)



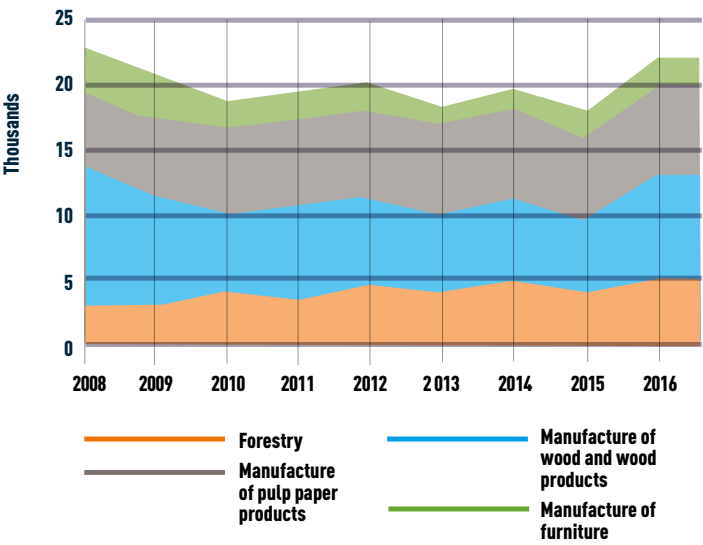
# Scottish Forest & Timber Technologies

## Gross Value Added per Head 2016

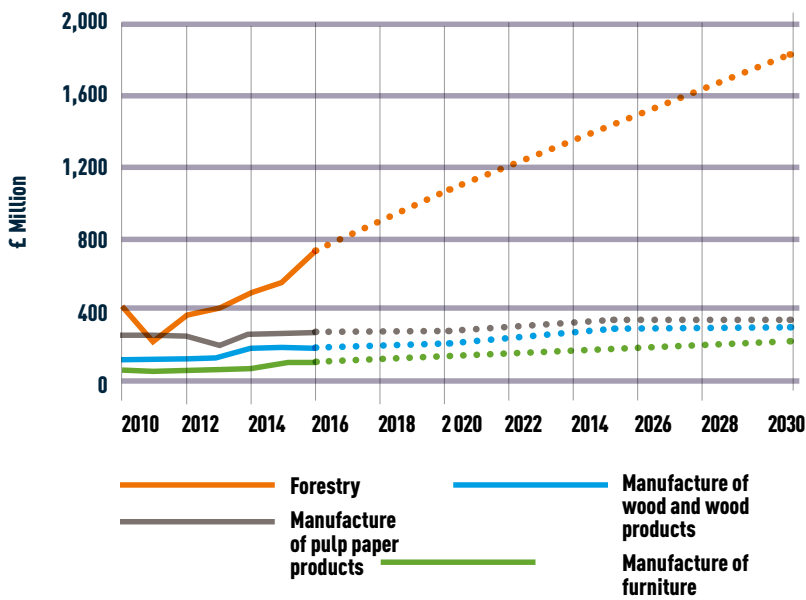




# Employment

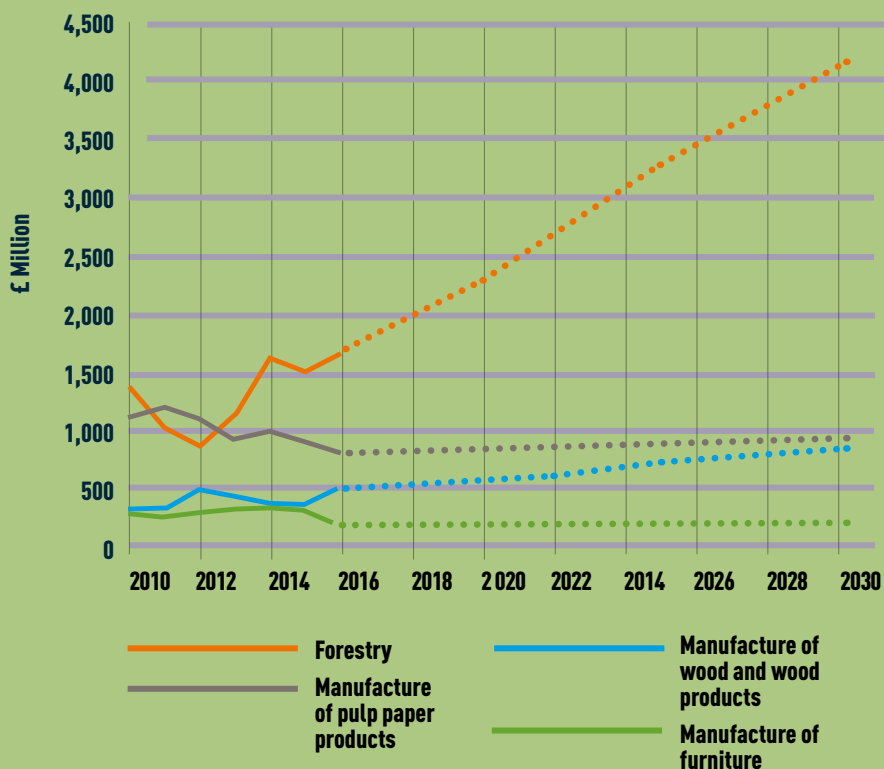


## Actual & Growth GVA Targets 2010 - 2030



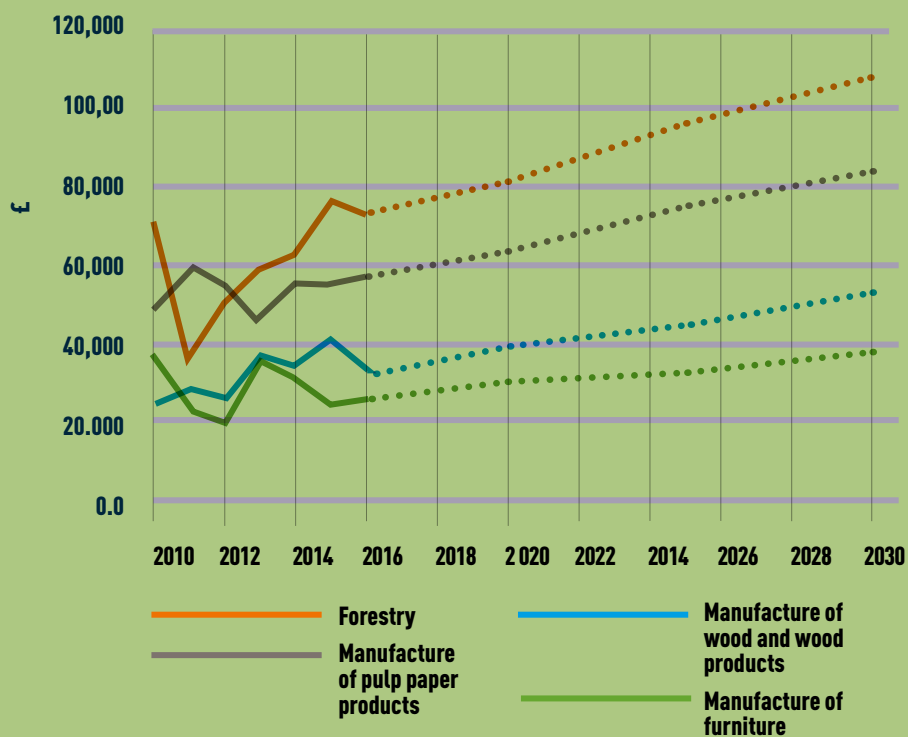
Sector  
GVA  
to Double by  
2030

## Actual & Growth Turnover Targets 2010 - 2030



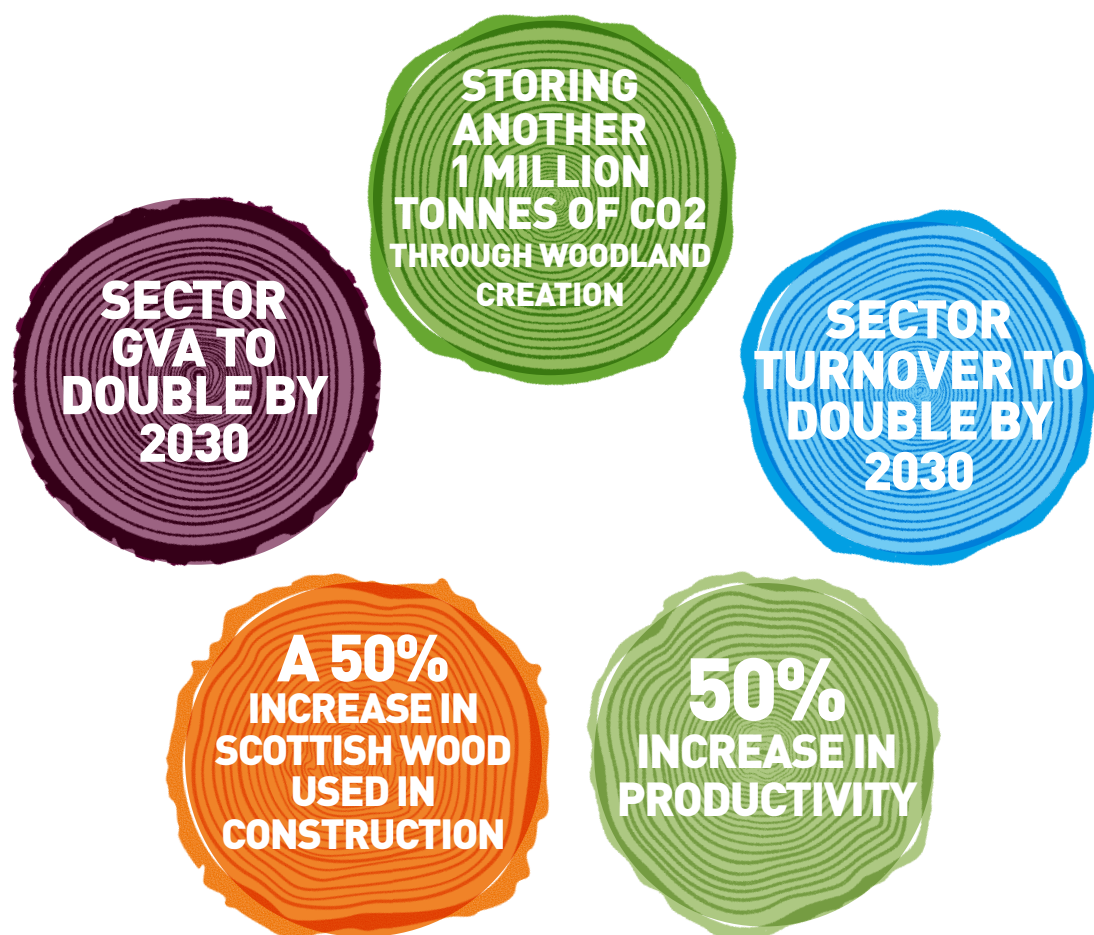
**Sector  
Turnover to  
Double by  
2030**

## Gross Value Added per Head - Actual & Growth Targets 2010 - 2030



**50%  
Increase in  
Productivity**





## Scottish Forest & Timber Technologies Target 2030

ECONOMIC GROWTH	
MAXIMISING SUSTAINABLE FOREST AND FIBRE USE IMPROVING SUPPLY CHAIN EFFICIENCY	
ADDING VALUE	
INNOVATION	
SKILLED PEOPLE	

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# 4. OUR STRATEGY FOR ACHIEVING THAT VISION

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Our view of the prospects for our sector is that there are many **exciting opportunities ahead of us in the future** – some opportunities exist already, and some will come further into the future. These and other opportunities will help in moving Scotland to a **low carbon sustainable economy**.

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The rate at which we can grow and take up the opportunities will be influenced to some degree by the overall rate of economic growth in other sectors of the economy in Scotland, and in other countries, as the demand for most of our products is a derived one. Exchange rate movements will also be an ever present risk creating threats or opportunities for companies depending on where they are in their supply chain.

We recognise that to achieve our vision will require increased collaboration between companies in the sector and between government and research organisations, and with other sectors such as agriculture and tourism.

**It will also require:**

- Increasing the availability of our wood fibre feedstocks in Scotland.
- A continuing focus on the safety of the people who work in the sector.
- Maximising the efficiency of the supply chain.
- Adding greater value to the wood fibre we grow or import into Scotland where we can.

- Using the wood fibre resources in Scotland from our existing forests and woodlands as efficiently as possible by cascading their uses down the value chain reusing and recycling as much wood fibre as possible.

**Of the many ways that would help us to achieve our vision we have decided to focus on the following five immediate strategic priorities.**



# 1

## Maximising the Economic Outputs of Scotland's Forest & Fibre Resource to 2030

### Scotland's Woods & Forests

Scotland's 1.4 million hectares of trees, woods and forests provide the raw materials or feedstock for many companies that contribute to the growth of Scotland's economy<sup>1</sup>. Their continued activities and their future growth depend on the availability of that feedstock.

The present production from our forests and woodlands is based on new woodlands created in the past and, by 2030, the forecast<sup>2</sup> potential annual availability of coniferous roundwood from our woods and forests in Scotland will be 2 million tonnes greater than now.

This increased forecast production of virgin fibre will help companies to expand their activities and to increase our economic contributions to Scotland's economy, but we also need to focus on maximising the efficiency and productivity of the ways we use this virgin fibre resource. We will do this by:

- Endeavouring to ensure that the management of Scotland's existing coniferous and broadleaved forests and woodlands is of the highest quality, and in accordance with the UK Forestry Standard.
- Exploring and using new technologies and processes to gain a more accurate and cost-effective inventory of Scotland's existing forest resources and wood fibre availability, such as the use of satellites both conventional ones and nano-satellites, LIDAR, remote sensing, and drones. This will allow us to plan our use of Scotland's virgin wood fibre better.
- Ensure the timeous restocking of areas that have been felled.
- Improve the quality and quantity of wood fibre grown in Scotland through tree breeding research, given the limited area of Scotland's forests and woods, while recognising that our forests and woods are used for a multiplicity of purposes.
- Do all we can to protect our forests and woodlands from pests and diseases, and from the impacts of climate change, as it is vitally important to us as our activities depend on the wood fibre they produce. We support the ongoing research into these vital areas so that we can put in place whatever protection or resilience measures may be necessary.
- Promote, encourage, and deliver an increased area of productive new woods and forests in Scotland by planting coniferous trees as a matter of urgency to mitigate as far as possible the reduction in forecast availability of coniferous roundwood in Scotland after 2030.





**There are other ways that the trees, woods, and forests are indirectly contributing to Scotland's economy and we expect them to grow as well in the future.**

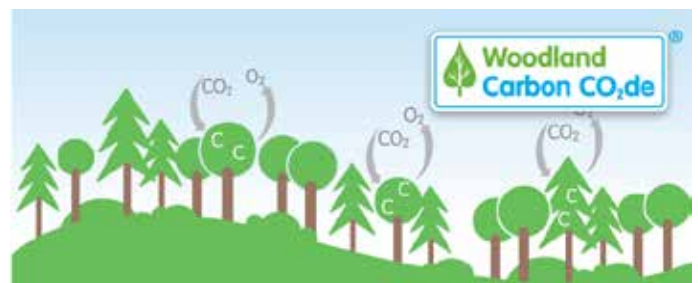
### **Forest Tourism**

In addition to providing the raw materials and products for many companies to use, Scotland's woods and forests contribute indirectly to Scotland's rural economy as they provide both local people and visitors opportunities to undertake activities such as mountain biking, walking and observing nature. When there are other local tourist attractions as well, they can help to attract visitors to rural areas and encourage them to use local shops and restaurants, and stay locally, which will result in further contributions to the local economy. We will do all we can to grow those activities where it is compatible with our production activities<sup>3</sup>.



### **Carbon Market**

Funding from the development of a carbon market has the potential to support the planting and management of an increased area of productive conifers and broadleaves in Scotland and this will bring about a greater contribution to Scotland's economy through these increased activities.



- 1 We recognise that Scotland's trees, woods and forests also deliver very significant environmental and social benefits as well as a range of ecosystem services. For us, the forests are also green 'factories' that capture carbon from the atmosphere and convert it into wood fibres in the form of trees.
- 2 Forestry Commission National Forest Inventory Report. 25-year forecast on softwood availability, 2015
- 3 Our forests are also Scotland's 'natural health service' as they can improve their health and mental well-being from these activities

## Imported Wood & Wood Products

Scotland has imported wood and wood products for the construction sector for many years and this is an important source of feedstock, and of manufactured wood products for many companies in our sector. Some of this material is of a quality that cannot be produced by trees grown in Scotland, or elsewhere in the UK, or in the quantities required and so it must continue to be imported. Some wood and wood products that are imported could be produced in Scotland, but the balance very much depends on exchange rates and our future trade arrangements. Greater wood fibre self-sufficiency will potentially bring increased economic benefits to Scotland's economy.

## Reusing & Recycling

As wood is a natural material, products made from it can potentially be reused or recycled. Reused and recycled wood fibres are therefore increasingly important sources of wood fibre for the sector. Reused and recycled fibres can be used on their own or mixed with virgin fibres.

There are costs to the collection and sorting of discarded wood for reusing and recycling, and therefore there are limits to the amounts that can be reused and recycled. The quality of the material, and the degree to which it can be separated and cleaned also determines the amounts. For some uses, such as animal bedding, the reused or recycled material must be of the highest quality because of its contact with animals. Particle board manufacturers would prefer the highest quality material as well, but they can and do use a slightly lower grade where necessary. Where contamination of wood has occurred through, for example, being in contact with chemicals and some paints, it may not be suitable for reusing or recycling for any use and can only go the landfill. Reused or recycled wood and wood products are an important source of wood fibre for a number of companies in this sector in Scotland, and cascading wood collected for reusing or recycling down the value chain is very important for companies in this sector. Investment in equipment that will improve the efficiency of sorting reuseable or recyclable wood and wood products according to its quality, and innovative new methods for removing paints, varnishes, wood preservatives and glues, for example, could potentially increase the amount of wood fibre that is reused and recycled for further use in Scotland.





# 2

## Improving the Safety & Efficiency of the Wood Fibre Supply Chain

The harvesting, collection and transport of wood fibre sourced in Scotland can account for 30% to 45% of our wood fibre input costs. If the wood fibre is imported from outside the UK, the supply chain can be longer, and the costs may account for a higher percentage of input costs depending on exchange rates.

It is therefore vitally important that we continue to focus along the wood chain to find ways to reduce all supply chain costs without compromising operator safety, whether the wood and wood products are made from Scottish sourced fibre or are imported.

We anticipate that we will do this by:

- Continuing our focus on improving the health and safety standards of our work practices.
- Exploring new technologies and systems for maximising wood fibre recovery from our forests in a sustainable manner.
- Adopting new innovative ways of log and wood product handling, trucking, rail and shipping. This might include, for example, research into further developments that can reduce the impact of trucks on roads and whether it may be feasible to introduce alternative powered trucks to reduce their environmental impact.

- Using remote sensing and real-time tracking of logs and wood products.
- Using innovative systems that integrate planning, operations, harvesting, transport & sales.
- Using advances in automated measurement, materials handling, packaging and distribution.
- Introducing new mobile communications and data transfer technologies for local operations and the use of 'big data' from these operations to improve operational efficiencies.
- Identifying opportunities to use robotics, automation, augmented and virtual reality, machine learning, and telematics.

Some of the ways we can do this will be unique to the sector, but many of the material handling, tracking and logistics costs using sensors, and the massive quantities of structured and unstructured data now potentially being generated are ones that are of considerable importance to companies in other industries in Scotland and in other parts of the world and so there are potentially significant areas for cross-industry collaboration.



# 3

## Expanding our Markets and Adding Value

Some of the more important present uses of wood and wood products in Scotland are shown below. Some of the wood fibre comes from trees grown in Scotland, some from reused and recycled material and some from imports.

### Products Made from Trees and Used in Scotland



Expanding these markets and developing new ones will require:

- Further research about our customers so we better understand them, the technical standards they require of our products and their service requirements.
- Encouragement and support for continuing research to obtain the best possible technical information about wood and wood-based products that will allow professionals and consumers

to compare them with alternative potentially competing products and to promote those findings, so the users have the information to make appropriate choices.

- Identifying ways to overcome any barriers to the uptake of products made from trees grown in Scotland and, in particular, overcoming any lack of technical information about their performance which might prevent or limit their use.
- Exploring and creating new and innovative wood-based value-added products, processes and markets for them, such as solid laminated products and processes, through working with organisations such as the Edinburgh Napier University, the Innovation Centres for Construction Scotland (CISC), Industrial Biotechnology (IBiolC), Building Research Establishment (BRE), and Timber Research & Development Association (TRADA).

We expect the markets for all wood-based products to grow in the future because they are made from a renewable, natural material that can also be recycled. Some markets, such as the printed media markets, have been declining more recently because of the rapid increase in digital advertising, but other uses, such as wood energy, have developed for the wood fibre these companies used. With the increase in internet shopping, the market for paper-based packaging, such as cardboard boxes, is expected to grow significantly, and the public pressure against using single-use plastics is also expected to increase demand for paper-based packaging.

Many of these products contain a high proportion of recycled wood fibre. Other new market opportunities are being explored globally.

There are four markets which we think have the greatest potential to grow with the help of further research, innovation and investment, and therefore increase the economic contributions the sector makes to the Scottish economy up to 2030. Our strategy is therefore to focus most of our attention on them.





## House Building & the Construction Industry

Our largest market for wood products at present is in house building and the construction industry where significant quantities of sawn timber, panel products and engineered wood products are used.

We see significant potential to expand this market because there is a large demand for new homes and buildings at present, and wood-based products will be increasingly used in them as their environmental credentials are recognised and requested.

The low energy content of wood-based construction materials compared with other building materials means they can reduce the carbon footprint of buildings, and the fact that they can be reused and recycled means that they come out well in Life Cycle Analyses.

We will therefore work with the construction industry to identify opportunities where the use of wood products such as timber, wood panel products and other wood fibre based products, such as wood-based insulation, may help to deliver energy efficient buildings, faster and more efficiently, with less waste.

We also know that wood and wood products are well suited as components of Modern Methods of Construction, such as volumetric and off-site construction, speeding up on-site erection of new buildings and helping overcome skilled labour shortages in traditional trades. The integration of more wood and wood products can also bring increased energy efficiency and the improvement of air quality in buildings.

More attention may also have to be given to the development of innovative material coatings for wood, for example, for fire and moisture protection as more wood is used in construction.

**The increased use of wood-based construction materials will bring about increased business activity, such as manufacturing, along our wood-chains and this in turn will increase the size of our contribution to Scotland's economy.**

**There is no certainty about the future, but trees are a renewable natural resource that capture carbon dioxide from the atmosphere and wood fibre based products are extremely versatile, reusable, recyclable, low energy products.**

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## Exports

We will work with organisations and agencies that can help us identify the nature and scale of market opportunities across the UK and internationally.

## Energy Products

We expect wood-based biomass will be an important part of a low carbon renewable energy mix in Scotland. It is expected that the wood fuel market will grow, but much will depend on the incentives offered by Government and innovation.

Driving the increased use of wood-fuel will be the recognition that more needs to be done to mitigate climate change. There will be more companies producing and supplying firewood, wood chips, wood pellets, and heat logs because they come from a renewable natural resource. Many wood processing companies in Scotland already generate much of their heat and power for their processes using forest biomass which makes the use of wood-based products even more environmentally attractive.

## New Products for Wood Fibre

Over the next 10 years or so we expect that the end use markets for wood fibre in Scotland will remain largely as they are today, but there is a significant amount of research and development underway globally into understanding the chemistry of wood. The research will lead to innovation and the development of potential new products that will move out of the laboratory to pilot scale plants or on to full scale manufacturing.

At present we think the three most promising new research avenues for developing additional new uses and markets for wood fibre in the foreseeable future are likely to be:

- Bio-refining covering biofuels and chemicals.
- Converting reusable and recycled wood into chemicals and energy products.
- Production of composite materials and textiles.

There is no certainty about the future, but trees are a renewable, natural resource that capture carbon dioxide from the atmosphere and wood fibre based products are extremely versatile, reusable, recyclable, low energy products. We think research and innovation will continue to open-up new market opportunities for us. We are optimistic about the growth of our existing markets, and about developing new ones, but it will be up to us to make the most of the opportunities before us. We may also need support from Scottish Government for research and development to bring those opportunities to commercial production.



# 4

## Developing a Workforce with Skills for the Future

To achieve our vision in 2030 we have developed and published a sector skills strategy and action plan with the purpose of ensuring we have an able and diverse workforce that meets the demands and aspirations of an ambitious and growing sector for now and in the future. It is important for us to use effective marketing and communication strategies to promote the sector as a vibrant and progressive industry, rich with opportunities for challenging and rewarding careers.

**We need talented people who are enterprising and ambitious, willing to learn and work hard to continuously improve our sector.**

We must therefore work together with Skills Development Scotland, schools, higher and further education establishments including Edinburgh Napier University and the University of the Highlands & Islands - Scotland's Rural College, the Institute of Chartered Foresters (ICF), training bodies and other skills organisations to keep our Sector Skills Strategy current and fit for purpose. We will focus on: Talent Attraction; New Entrants; Workforce Development; Curriculum; and Inclusive Growth.

We will do this by:

- Identifying the number of people we need, what skills the sector will require in both the short and long terms, and establish what our training and qualification needs are likely to be.
- Encourage a gender balance in the workforce throughout the sector. Exploring ways of increasing the capacity of our businesses to retain and develop their existing workforce through providing training opportunities so that individuals can develop their own career opportunities.
- Support the continued focus on improving the health and safety standards of our work practices throughout the sector.
- Publicising the career opportunities in the sector through my World of Work and other recognised mechanisms to attract young people into forest sector.
- Improving the availability of our entry level training programmes, including modern apprenticeships, for a range of activities such as forest operations, management, research and training, drivers and machine operators in the forest, and in the sawmills and manufacturing plants.





# 5

## Understanding and communicating the Forest & Wood-based Industries' Contribution to Scotland's Economy

The forest industries and timber technologies sector is unique among most industry sectors in Scotland in that it contributes to the delivery of the following Government policies and strategies:

**Scotland's Economic Strategy:** We have increased our contribution to Scotland's economy and we have the potential to help grow Scotland's economy on a sustainable basis. The growing and processing of trees often takes place in rural areas where they can make an important contribution to the rural economy through the provision of jobs and the circulation of money locally.

**Climate Change Plan 2018-2032:** Trees capture and store carbon in a very cost effective, long-term way and therefore they make a significant contribution to meeting the Government's climate change targets.

**Energy Policy:** Using wood fibre or biomass as a wood fuel also helps with meeting climate change targets, as it is a renewable natural fuel.

**Construction & House Building:** Trees are being converted into a range of renewable, natural, low carbon building products that also help the health and well-being of those who live and work in buildings.

**Landfill Reduction:** Most of the products made from trees can be reused or recycled at end-of-life, including potentially Medium Density Fibreboard, rather than contributing to landfill.

**Tourism:** Forest tourism plays an important part in creating a vibrant and successful infrastructure in the rural economy that continues to attract increasing numbers of visitors, creating opportunities for further investment.

**The Biorefinery Roadmap for Scotland:** The development of the roadmap for a biorefinery in Scotland offers Scotland's wood fibre growers and processors an opportunity to develop new markets and downstream manufacturing.

### Our Ways of Communicating

We recognise that it is often easier and more effective to deliver a single message, but we feel these contributions are all important ones for delivering sustainable, environmentally sound, economic growth for Scotland in the long term. We must therefore work together to:

- Identify the most appropriate message or messages for the audience we are targeting and ensure it is clear, and delivered cost effectively.
- Explore effective ways of communicating what we are delivering, and what we can deliver, to the future growth of Scotland's economy to a wider audience than the sector itself.
- Work with other organisations to promote a wider understanding of the environmental and sustainable benefits with the aim of encouraging increased use of wood and wood based products in buildings such as housing, schools and office blocks.
- Explain how we are sustainably managing the trees we grow in Scotland and how we are using technology and innovation to process and manufacture the wood fibre in trees into a variety of end uses for markets in Scotland and beyond.

We recognise that the sector's economic, societal, and environmental contributions need to be more widely understood.



The background of the page is a close-up photograph of a tree trunk, showing the natural grain and growth rings of the wood. The wood is light brown with darker, reddish-brown bark visible along the top edge.

# **5. ACTION PLAN FOR 2019-2021**



**‘Roots for Further Growth’** charts a route for the Scottish Forest and Timber Technologies sector to achieve a vision for 2030 based upon a strategy that will impact on sector contribution, resource, products, markets, our people and other industries. **Action must be taken in each and every one of these areas**, to maximise competitiveness in wood fibre production, primary processing and manufacturing, and the industry will be capable of **fully delivering the scale of benefits that are possible** for Scotland’s Economic Strategy and for the wider society.

The following is an action plan containing a list of potential and ongoing projects that will help deliver the strategic priorities of ‘Roots for Further Growth’. It is anticipated that the actions will be taken forward through collaboration with industry, public sector, and other bodies with an interest in the forest and timber technologies sector in Scotland.

The strategy will be led by the ILG with support from the public sector and the ILG will engage with the forthcoming City Region Deals where there is industry alignment.

Key public sector partners in delivering the strategy are Forestry Commission Scotland, Scottish Enterprise, Highlands and Islands Enterprise, Skills Development Scotland, and South of Scotland Economic partnership. Others that may be involved are Zero Waste Scotland, Architecture and Design Scotland, and the Innovation Centre network.

Working groups will be tasked with identifying, initiating and/or supporting projects for each specific strategic priority. They will also be tasked to review and revise actions annually.

## Abbreviations used in ‘Roots for Further Growth’ Action Plan

Confor	The Confederation of Forest Industries (UK)	IBiolC	Industrial Biotechnology Innovation Centre
CSIC	Construction Scotland Innovation Centre	ICF	Institute of Chartered Foresters
ENU	Edinburgh Napier University	ILG	Industry Leadership Group
FCA	Forestry Contracting Association	SDI	Scottish Development International
FCS	Forestry Commission Scotland or its successor	SDS	Skills Development Scotland
FES	Forest Enterprise Scotland or its successor	SE	Scottish Enterprise
FISA	The Forest Industry Safety Accord	SLE	Scottish Land & Estates
FR	Forest Research	SFTT	Scottish Forest & Timber Technologies
HIE	Highlands & Islands Enterprise	ZWS	Zero Waste Scotland

# STRATEGIC PRIORITY 1

## Maximise the economic outputs of Scotland's Forests and Fibre Resource

Proposed Projects	Lead Responsibility
1. Commission an economic study to update the economic contribution of the Forest and Timber technologies sector to Scotland's economy.	SFTT ILG with support from SE and FCS.
2. The Identification and implementation of viable technologies and processes to gain a more accurate and cost-effective wood fibre availability forecast from Scotland's forests.	SFTT ILG working with FR and FCS.
3. Scope and deliver a 'growing wood fibre' proposition for farmers/land owners in Scotland: This initiative will take forward and enhance the work (Eskdalemuir report) done by Confor and the 'sheep and trees' project. The output will be information based on various scenarios for landowners to understand the economic opportunities offered by growing 'improved stock' commercial trees.	Confor in conjunction with the SFTT ILG and FCS.
4. Carry out a study to explore opportunities for growth and additional investment in Forest Tourism in Scotland.	SFTT ILG with support from SE, SLE, HIE, FCS, Visit Scotland and others.
5. Carry out a study to understand the economic and environmental outputs from various wood flows in the Scottish/UK wood supply chain to better inform wood cascading using an approach identified in the recent EU guidance on cascading woody biomass.	SFTT ILG, FCS and Zero Waste Scotland.
6. Continue to support innovation, research and development with an aim to increase wood fibre production and carbon capture, and to improve quality and resilience of our current forest resource.	SFTT and FCS.
7. Carry out a study to improve the understanding of the forest ownership in Scotland and their motivations for bringing fibre to the market.	SFTT ILG
8. Identify and disseminate knowledge and best practice about commercial opportunities potentially open to communities with their own woods.	SFTT ILG with support from HIE, FCS and others.
9. Identify and develop local niche and added value markets for woodland products, and identify new markets for communities that own their own woods.	SFTT ILG with support from HIE and FCS.
10. Post Brexit, maintain links with European transnational projects involved with innovation and adding value in forestry and wood-based industries.	SFTT ILG with FCS and Forest Research.



## STRATEGIC PRIORITY 2

### Improving the Efficiency and Safety of the Wood fibre Supply Chain

Proposed Projects	Lead Responsibility
11. Identify ways to increase wood fibre recovery from our harvesting operations through innovation, research and development work.	SFTT ILG with support from FCS, SE and FES.
12. Explore how we can maximise the use of data from harvester heads to significantly improve the accuracy of our forest inventory and provide accurate information on the quality of the crop harvested to growers and buyers.	SFTT ILG with support from FCS, SE and FES
13. Use data to improve production models for yield models and improve efficiency of wood mobilisation in the supply chain. This was a priority project for the operations managers sub group that we engaged with.	SFTT ILG with support from FCS, SE and FES
14. Identify opportunities to introduce automation, robotics, augmented and virtual reality to our wood supply chains, such as remote-controlled harvesters and loaders.	SFTT ILG with support from FCS, FES, FCA & SE
15. Identify new technologies and systems to increase efficiencies and to minimise environmental impacts of transportation of roundwood and wood products on road infrastructure	SFTT ILG with support from FCS, FES, FCA & SE
16. Identify and support innovation and new technologies to maximise the re-use of wood fibre along the wood supply chain and downstream industries.	SFTT ILG with support from FCS, SE and Zero Waste Scotland.
17. Identify new technologies and opportunities to reduce costs, increase productivity and increase operator safety within forest operations.	SFTT ILG with support from FCS, SE and FISA.

## STRATEGIC PRIORITY 3

### Developing Markets and Adding Value

Proposed Projects	Lead Responsibility
18. Identify existing and new markets suitable for supply by Scottish grown timber and timber products through innovation, research and development, such as: <ul style="list-style-type: none"> <li>- Manufacture and use of solid timber products and systems in Scotland.</li> <li>- Manufacture of timber rich retrofit products.</li> <li>- Designing timber deconstruction in future buildings.</li> <li>- New designs for timber rich houses/buildings for all markets.</li> </ul>	SFTT ILG with support from FCS and SE. ENU and CSIC involvement in delivery.
19. Identify and develop new and innovative wood-based value-added products, processes and services, and encourage new downstream manufacturing activity utilising home grown timber, such as: <ul style="list-style-type: none"> <li>- Wood fibre insulation.</li> <li>- Products derived from biorefining such as nanocellulose and lignin.</li> </ul>	SFTT ILG with support from FCS, SE and HIE.
20. Explore and promote the opportunities for wood fibre as a 'feedstock for bio-refining in Scotland' that are presently being investigated.	Scottish Biorefining Working Group, IBiolC, ENU and SFTT ILG with SE support,
21. Work with Construction industry professionals and others to identify opportunities to increase the use of wood products in UK buildings.	SFTT ILG
22. Explore and support opportunities for increased international trading within our wood supply chains.	SFTT ILG in conjunction with SDI/SE.

## STRATEGIC PRIORITY 4

### Developing a Workforce with Skills for the Future

Proposed Projects	Lead Responsibility
23. Work closely with others to develop, publish, and deliver a Sector Skills strategy and action plan that focuses on four key areas; talent attraction, new entrants, developing the workforce, and curriculum review.	SFTT ILG working with SDS and a large number of education and training stakeholders in Scotland
24. Proactively engage with education and training providers to ensure sector needs are clearly understood and met.	SFTT ILG working with Lantra, ICF and others.



Proposed Projects	Lead Responsibility
25. Engage with relevant Scottish Government's agencies and initiatives to raise the sector's profile and promote the sector as a vibrant and progressive industry, rich with opportunities for rewarding careers.	SFTT ILG working with SDS, Developing the Young Workforce and others.
26. Establish and publish a comprehensive careers map for the skills required for the modern forest and timber technologies sector	SFTT ILG with FCS, ICF and others.
27. Create a programme of work for SMEs in the sector in order to develop leadership skills, improve business planning and manage growth.	SFTT ILG with HIE, FCS and SE.

## STRATEGIC PRIORITY 5

### Understanding and Communicating the Forest and Wood-based Industries contribution to Scotland's Economy

Proposed Projects	Lead Responsibility
28. Support Regional industry groups to disseminate outputs and activities of the ILG, SE and FCS to a much wider range of key industry players than can be reached through general ILG meeting. To also act as a sounding board to identify strategic issues and opportunities for sector growth.	SFTT ILG supported by FCS and Confor.
29. Ensure the sector website is fully up to date with relevant information and ensure website is managed to promote the sector as a vibrant and progressive industry in which to work.	SFTT ILG supported by others.
30. Continue to work on increasing the understanding of the carbon benefits of using wood and wood products in construction and other end uses that are being sourced from sustainably managed forests.	SFTT ILG supported by FCS and others
31. Produce a publication that highlights the future aspirations for the development and adoption of innovation and technology across the Forest and Timber Technologies sector.	SFTT ILG supported by others.
32. Hold an annual sector conference/seminar reporting on progress of action plans.	SFTT ILG with support from SE and FCS.





[forestryscotland.com](http://forestryscotland.com)

The Scottish Forest and Timber Technologies Industry Leadership Group; leading business figures and key stakeholders who advise Scottish Enterprise, Highlands & Islands Enterprise and the Scottish Government on matters relating to sustainable economic development and opportunities provided by the forest and timber industries in Scotland.



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Technologies