

FOREST AND WOOD PRODUCTS INDUSTRY SECTOR

IRC Skills Forecast and Proposed Schedule of Work

2018–2021

Prepared on behalf of Forest Management and Harvesting IRC, Timber and Wood Processing IRC and Timber Building Solutions IRC for the Australian Industry and Skills Committee

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IRC SKILLS FORECAST AND PROPOSED SCHEDULE OF WORK 2018–2021

Purpose

This Skills Forecast represents the latest industry intelligence and resulting schedule of work of the Forest Management and Harvesting Industry Reference Committee (IRC), Timber and Wood Processing IRC and Timber Building Solutions IRC. It has been developed through research of national, industry data sources, and ongoing input from IRC members and key stakeholders. The report is designed to provide industry intelligence to support the Australian Industry and Skills Committee's (AISC) four-year rolling National Schedule of training product development and review work.

The report is structured according to the AISC template, in four main sections:

- **Sector Overview** – examining the depth and breadth of the industry and identifying the macro environment that currently challenges and provide opportunities for the industry.
- **Employment** – reviewing the employment projections by the Department of Employment and outlining the current workforce profile and supply for the industry.
- **Skills Outlook** – identifying the key priority skills for the industry, key drivers and how they can benefit from improvement or development of national skills standards.
- **Proposed Schedule of Work** – establishing the scope and timeframe of proposed training package development in line with industry priority skills.

Administrative information

Name of Applicable Industry Reference Committee (IRC)	Forest Management and Harvesting IRC
	Timber and Wood Processing IRC
	Timber Building Solutions IRC
Name of Applicable Skills Service Organisation (SSO)	Skills Impact Ltd

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A. EXECUTIVE SUMMARY

The forest and wood products industry is a significant employer and contributor to the regional economy. Most business is located and conducted throughout all states and territories, in geographical locations with high concentration of industrial plantations and/or production forests. The industry supplies timber and timber products, mostly to meet demand from increasing rate of urbanisation and housing construction. In addition to the provision of efficient and sustainable architectural solutions, the industry also contributes – like no other industry – to Australia’s bioenergy and biofuel economy.

As a result of buoyant construction activity in recent years, the industry operates at full capacity, generating further employment in some sectors and positive economic growth. However, no progress has been made on the development of new productive forest estates in regions with high dependence on forest industries to meet this growing demand for logs.

Industry’s workforce development and employment levels have followed a consistent trend over the past ten years (2006–2016). Notably, the industry has developed a preference for short, nationally accredited courses over full qualifications to support efficiency and productivity. Traditionally, most formal training for specialist skills has been undertaken in areas related to forest management, harvesting and haulage and sawmilling and processing due to safety concerns and high-risk activities in these sectors. Businesses also undertake and invest in a significant amount of informal or non-accredited training to upskill the workforce.

The report identifies that skills that support a range of new forest-harvesting operations and technologies, timber value and volume recovery in sawmills and the high demand and current requirements of estimating and design capabilities in timber truss and frame manufacturing are top priority skills for the industry.

Summary of Key Points in Each Section

Sector overview

- The forest and wood products industry is characterised by six sub-sectors: forest growing and management, harvesting and haulage, sawmilling and processing, timber manufactured products, wood panel and board production, and timber merchandising.
- In 2016, the industry included 12,852 businesses and directly employed more than 42,600 people (this does not include log haulage drivers and timber retailers).
- Australian state and territory governments, through large state forestry business enterprises or agencies, along with privately owned plantation companies, undertake many forest conservation and forest-growing and harvesting activities. The sawmilling and timber manufactured sectors are characterised by a large number of small and medium-sized producers and a lower number of large producers, which are often vertically integrated companies. Most of the wood panel businesses are large-scale operations.
- Total sales turnover of the forestry and manufacturing sectors increased two consecutive years by 15% (or \$2.2 billion) to reach \$17.9 billion in 2016.
- The industry is represented by approximately 42 peak organisations at a national and state or regional level, including industry and industry sub-sector associations, associations of other industry-related sectors, industry networks, professional and employee associations and key industry services bodies.
- Key regulations for the industry include, or are related to, three significant pieces of legislation at the national level and over 30 at the state and territory level that support the conservation and sustainable management of forests. These three significant national policies are:

- 1992 National Forest Policy Statement (NFPS)
- Plantations for Australia: The 2020 Vision
- National Indigenous Forestry Strategy.
- Industry operations are also guided by a wide range of codes of practice for sustainable and safe forest management of forests for wood production; and two voluntary forest certification schemes – the Responsible Wood Certification Scheme, and the Forest Stewardship Council Scheme (FSC).
- The industry has the following regulated occupations¹: operators working in Copper Chromium Arsenate (CCA) timber treatment plants are required by law to hold a specific operator licence or user permit. The industry requires suitable training from all operators involved in high-risk activities, mainly harvesting machine operators, to perform these work functions safely.
- opportunities to the industry are driven by increased global population, urbanisation and lifestyle change, emerging economies in the Asia-Pacific, intense activity in building construction, and engineered wood products with emerging markets through growing demand for forests and wood products. Key challenges for the industry include:
 - New investments will be needed to expand the productive forest estate in strategic regions, such as those with high dependence on forest industries, to meet the incremental requirement for log supply. Possible approaches include collaborative investment structures for farm forest growers.
 - Recruitment, training and management of employees is rapidly increasing in complexity, which, for an industry dominated by small and medium enterprises, seems beyond the reach.
 - China's attractive log market for export may change the business dynamics in the industry and escalate the rate of sawnwood imports as the local supply for softwood log tightens.

Employment and training

- The forest and wood products (FWP) industry workforce is aging. The proportion of workforce aged 50 to 60 years and over 60 years increased by 4% and 5% respectively in 2016 when compared to 2006.
- Men constituted more than 80% of all employees in the industry in 2016.
- The proportion of people (as per cent of total employees per industry sector) working as forestry and harvesting machine operators, timber and wood process workers, wood machinists and sawdoctors decreased considerably in 2016 when compared to 2006. The proportion of production managers and sales assistants increased.
- The employment numbers in the industry is expected to remain relatively stable over the next five years.
- In 2016, there were 3,634 student enrolments in *FWP Forest and Wood Products Training Package* qualifications and 46,459 student enrolments in FWP units of competency. Over two-thirds of students lived in inner- and outer-regional Australia.

Skills outlook

- Priority skills in the forest and wood products industry over the next four years, 2018–2021, are summarised in Table 1.

¹ Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

Table 1: Forest and wood products industry priority skills 2018–2021.

Priority Skill	Description	Drivers
Forest Management and Harvesting		
New harvesting technologies	<p>This priority covers skills requirements to support a range of key forest harvesting operations and technologies that are essential to the sector and its productivity in the future, including:</p> <ul style="list-style-type: none"> the use of geospatial technologies in forest operations programming skills for forest technicians and supervisors to create and manage harvesting optimisation files for single grip harvester management of electrical risks related to electrical and hydraulic maintenance of harvesting machines application of best practices to minimise environmental footprint of forest harvesting machine operation for steep slope terrain harvesting (tethered harvesting and cable logging harvesting) machine operation for in-field wood chipping debarking of logs in the forest. 	<p>Forest harvesting activity is forecast to grow over the next five years due to a growing demand for timber and wood chip production for paper manufacturing worldwide. Forest and harvesting organisations operate in a context where they must secure long-term supply contracts, comply with regulatory requirements while remaining economically viable, and produce higher volumes more efficiently to meet the growing demand for logs.</p> <p>Harnessing new technologies is a continuous process, and a process the industry is using to deal with increasingly stringent regulatory conditions; to maintain a safe workplace; and maintain environmental credentials.</p>
Forest management innovation	<p>This priority covers skills requirements to support a range of industry initiatives to improve productivity, expansion and operations of forest estates for timber production, including:</p> <ul style="list-style-type: none"> mechanical forest biomass removal for minimising bushfire risks management and safety in farm forests specialty timber harvesting and extraction (single tree falling and extraction in isolated areas and use of chainsaw above ground) tree breeding knowledge to enable effective communication with genetic engineers. 	<p>Higher-level skills are needed to support the industry innovation driven by the objective of managing forests to best practice in safety and environmental practices while achieving business returns.</p> <p>Drivers include: fire management and community protection are a constant concern in rural Australia, where forests adjoin townships; farmers diversifying their farming activities to include small woodlots, which require management skills and safe practices; speciality timbers is a developing niche industry and challenging operational area in forestry; and efficient tree breeding entails communication and</p>

Priority Skill	Description	Drivers
		application of the outputs in forest management.
Roundwood and wood chip export at the portside	This priority covers skills requirements to support the growing commercial export operations for roundwood and wood chips at the port side. Specific skills requirements will be determined through industry consultation.	Drivers include: a positive forecast for the wood chip and log export market has resulted in the development of new and existing export facilities and management of more complex operations.
Timber and Wood Processing		
Advances in woodmachining and sawdoctoring	This priority covers skills requirements to assist with the current expectations of wood machinists and sawdoctors as a result of technology changes and businesses operating in the competitive manufacturing environment. Specific skills requirements will be determined through industry consultation.	Drivers include: changes in sawmill technology increased the cutting and volumes of timber products that are being processed; the timber product is also being reduced in size and thickness, placing many new demands on sawdoctors; and the Certificate III in Woodmachining and Sawdoctoring needing to be aligned with current workplace requirements.
Sawmill timber and process optimisation	<p>This priority covers skills requirements to support productivity and technological developments in the timber sawmilling sector, including:</p> <ul style="list-style-type: none"> • ability to apply timber sawmilling principles, practices and processes that demonstrate improvement in resource efficiency and productivity • ability to efficiently operate timber optimisation scanners (including X-ray, CT and 3D laser scanning) and software for log grading and sawing pattern optimisation • knowledge about the fundamentals of mechanical and computing systems related to timber optimisation equipment and ability to undertake maintenance for this equipment. 	In order to remain competitive in the marketplace, substantial investment in sawmill operations is required to keep up with technical developments, market demands, resource availability and production processes for maximum timber value and volume recovery. Skills development alignment will ensure the greatest gain for the sector.
Timber product development and supply chain innovation	<p>This priority is subject to industry consultation achieved during the AISC cross-sector project, 'Supply Chain', and the outcomes of the project.</p> <p>In principle, this priority covers skills requirements to support capabilities for product development in timber processing and improve performance</p>	Drivers include: higher business targets for efficiency, productivity and competitiveness; increased complexity of the Australian timber businesses in the marketplace; and introduced radio-frequency identification (RFID) technology and other tracking technologies.

Priority Skill	Description	Drivers
	in the product supply chain operations. Specific skills requirements will be determined through industry consultation.	
Bioenergy, co-generation and biochar	This priority is subject to further industry development. In principle, it covers skills requirements to support emerging bioenergy and biofuel developments based on forest biomass and other agricultural plant residues. Specific skills requirements will be determined through industry consultation.	Drivers include: co-generation is increasingly used in the industry to produce steam for the mill (heat boilers) to operate kilns; and an increasing number of industry developments for the utilisation of forest harvesting and timber processing residues, together with agricultural plant residues, to create value-added products.
Timber Building Solutions		
Timber truss and frame estimating and design	Skills requirements to assist with the high demand of estimating and design capabilities in the timber truss and frame industry. Skill needs include improved understanding of house construction to enable estimators/detailers to design and calculate quantities of timber for fabrication orders.	Drivers include: most frame and truss design and estimation jobs are currently undertaken overseas by trained professionals; businesses need people on site able to do these tasks; the structure of the existing qualification represents a barrier to training uptake due to a high number of pre-requisite units; the outcomes within existing units of competency are no longer sufficient to support the quality outcomes required by industry; and skill sets seen to facilitate a better career path for frame and truss designers.
Advanced sales, marketing and customer service skills	This priority is subject to industry consultation achieved during the AISC cross-sector project, 'Consumer Engagement through Social Media', and the outcomes of the project. In principle, this priority covers skills requirements to support implementation and ongoing management of online portals and systems for improved sales, marketing and customer service in the timber manufacturing industry. Specific skills requirements will be determined through industry consultation.	Drivers include: increased demand for Australia's quality timber products from the Asian and domestic markets, involving a greater digital interaction of timber businesses with global supply chains and online presence.

B. SECTOR OVERVIEW

Sector description

The forest and wood products industry integrates the value chain of forests and wood resource utilisation through six industry sub-sectors:

- Forest growing and management
- Harvesting and haulage
- Sawmilling and processing
- Timber manufactured products
- Wood panel and board production
- Timber merchandising.

In 2016, the industry was comprised of 12,852 businesses across forestry, timber processing, timber manufacturing and timber wholesaling² and directly employed 42, 600 people (this excludes log haulage drivers and timber retailers)³. Based on industry estimates⁴, the direct and flow-on employment generated through the industry value chain is close to 120,000 people.

The forest and wood products industry is closely related with other economic sectors. Cross-industry synergies occur concerning management of forest reserves and parks through conservation and land management; arboriculture through the provision of environmental and recreational services; indoor and outdoor timber furniture manufacturing; pulp and paper manufacturing; and emerging bioindustries through the manufacturing of biofuels, bioenergy and biomaterials.

This industry is a significant contributor to rural and regional economies as most business is located and conducted in all states and territories, in geographical locations with high concentration of industrial plantations. In 2016, the industry, through its forestry and manufacturing component, contributed to the regional and Australian economy with a total sales turnover of \$17.9 billion. This economic value represented a 15% (or \$2.2 billion) increase from 2015. The industry value added (IVA) increased by 16% (or \$823 million) to \$ 6.0 billion over 2015–2016 and operating profit before tax (OPBT) rose by 19% (\$360 million) to \$2.2 billion.⁵

Relevant Training Package Qualifications

The training package for the forest and wood products sector is *FWP Forest and Wood Products*. The *FWP Training Package* comprises 25 qualifications, 31 skill sets and 328 units of competency (see Table 2).

Table 2: *FWP Training Package* qualifications.

FWP Training Package Qualifications
Qualification Level: Certificate I
Certificate I in Forest and Forest Products
Qualification Level: Certificate II
Certificate II in Forest Growing and Management
Certificate II in Harvesting and Haulage
Certificate II in Sawmilling and Processing

² ABS, 2017, *Counts of Australian businesses, including entries and exits, Jun 2012 to Jun 2016*, Cat. No. 8165.0.

³ ABS, 2016, *Census*.

⁴ Australian Forest Products Association, 2015, 'A national institute for forest products innovation', <<http://ausfpa.com.au/wp-content/uploads/2015/11/AFPA-RD-Policy-Proposal.pdf>>.

⁵ ABS, 2017, *Australian industry, 2015-16*, Cat No 8155.0

FWP Training Package Qualifications	
Certificate II in Wood Panel Products Certificate II in Timber Manufactured Products Certificate II in Timber Merchandising Certificate II in Timber Truss and Frame Design and Manufacture	
Qualification Level: Certificate III	
Certificate III in Forest Growing and Management Certificate III in Harvesting and Haulage Certificate III in Sawmilling and Processing Certificate III in Wood Panel Products Certificate III in Timber Manufactured Products Certificate III in Timber Merchandising Certificate III in Sawdoctoring Certificate III in Woodmachining Certificate III in Timber Truss and Frame Design and Manufacture	
Qualification Level: Certificate IV	
Certificate IV in Forest Operations Certificate IV in Timber Processing Certificate IV in Timber Truss and Frame Manufacture Certificate IV in Timber Truss and Frame Design	
Qualification Level: Diploma	
Diploma of Forest and Forest Products Diploma of Timber Truss and Frame Manufacture Diploma of Timber Truss and Frame Design	
Qualification Level: Advanced Diploma	
Advanced Diploma of Forest Industry Sustainability	

Sector Analysis

Sub-sector description and analysis of businesses involved

Sub-sector Name	Forest Growing and Management
Scope of Work	The sector consists of businesses engaged in the management of industrial plantation estates, native forests and farm forests, primarily for the production of wood and wood fibre. Other activities include the establishment of estates and access roads, management of firebreaks and other forestry support services.
Forest Business Enterprises	Many forest conservation, forest management and harvesting activities in state forests are undertaken by state and territory governments through large state forestry business enterprises or agencies. State forests in Victoria, New South Wales, Queensland, Tasmania and Western Australia provide native

Sub-sector Name	Forest Growing and Management
	<p>resources for processing and further manufacturing, subject to availability through Regional Forest Agreements (RFAs).</p> <p>There are over 20 private plantation management companies that manage Australia's industrial plantations for commercial wood production on behalf of state governments and private forest owners, such as institutional investors, managed investment schemes, farm forest owners, timber industry companies, and other private owners.⁶</p> <p>Based on ABS data, the sector also comprises 993 forestry support services businesses.⁷</p> <p>State forestry business enterprises⁸</p> <ul style="list-style-type: none"> • Forestry Corporation of New South Wales • VicForests • Sustainable Timber Tasmania • ForestrySA • Forest Products Commission of Western Australia • Department of Agriculture and Fisheries Queensland. <p>Major plantation management companies</p> <ul style="list-style-type: none"> • Hancock Queensland Plantations (Hancock Timber Resource Group) • Hancock Victorian Plantations (Hancock Timber Resource Group) • Australian Bluegum Plantations • Forico Pty Ltd (New Forests) • One Forty One • Timberlands Pacific • PF Olsen. <p>The majority of these are foreign-owned proprietary companies, involving Australian and international superannuation and investment funds.</p>
Geographical Location	<p>Businesses and forest management activities for commercial timber harvesting are located and conducted in all states and territories.</p> <p>Geographic zones with high concentration of industrial plantations include the south-west and the great southern region of Western Australia; the south-east of South Australia and south-west Victoria (known as the Green Triangle); Tasmania; the central and east coast of Victoria; coastal, southern highlands and northern New South Wales and southern Queensland; and the north of the Northern Territory.</p>
Automation and Digitisation	<p>Advanced technologies were introduced in this sector to assist efficient forest planning and forest operations, fire and pathogen management, and cultivation of trees. IT technologies are used to develop growth models, logistics models, harvest-planning models, reporting, and communication services for integrated harvest planning.</p>

⁶ ForestWorks research.

⁷ ABS, 2017, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0

⁸ Enterprises are listed according to their market share or significance in the sector.

Sub-sector Name	Harvesting and Haulage
Scope of Work	<p>This sector consists of enterprises that harvest forests for timber products, wood chips, pulpwood, rough-hewn products (mine timbers, posts and railway sleepers) and firewood. Forest management companies (public and private) normally commission forest harvest enterprises to conduct harvesting operations.</p> <p>The sector also includes businesses that haul or transport logs and other forest products, produce wood chips in the field, or gather forest biomass.</p>
Forest Harvest Enterprises	<p>Based on ABS data, the sector comprised 1,316 forest harvest enterprises in 2016.⁹ Many are non-employing, family-owned businesses (703) and small operations (549). There are several medium-size harvesting businesses (41), which are often vertically integrated and perform a wide range of complex forest operations.</p> <p>Some examples of major vertically integrated harvesting enterprises</p> <ul style="list-style-type: none"> • Softwood Logging Services (WA) • L.V. Dohnt & Co Pty Ltd (VIC, SA and WA) • Tabeel Logging (VIC and SA).
Geographical Location	<p>Harvesting businesses operate in industrial plantations in all states and territories and regions of native forests with allowable areas for harvest.</p>
Automation and Digitisation	<p>Enterprises in this sector use tree falling equipment, chainsaws and automated heavy machinery (including mechanical harvesters, debarking and de-limbing machines, excavators and log grab machines, forwarders and skidders). These machines are equipped with on-board computers and GPS-based technology to maximise value recovery, monitor the harvester's location over time, communicate, or control equipment in remote areas. There is a growing reliance upon computer monitoring of harvest rates, values, quality and quantities compiled on an hourly and daily basis, increasing the complexity of digital management by field operators.</p>

Sub-sector Name	Sawmilling and Processing
Scope of Work	<p>The main activity of this sector is the primary processing of logs from trees. The sector produces a range of products, such as sawn timber and wood chips, for different applications. Types of processing facilities include sawmills, wood chip mills and timber resawing and dressing enterprises.</p> <p>Sawmills process hardwood or softwood logs for the production of rough-sawn timber and resawn timber.</p> <p>Rough-sawn timber products include green and dry-sawn timber for structural applications and green-sawn timber for other uses. These products are further processed at the same sawmill or downstream sectors (e.g. timber manufactured products or furnishing) with timber components in a</p>

⁹ ABS, 2017, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0

Sub-sector Name	Sawmilling and Processing
	<p>wide variety of sizes. These products are used by building and construction industries, timber frame and roof trusses, furniture, internal joinery, lining, finger-jointed lengths and laminated beams, fencing and poles and packaging and pallets.</p> <p>Sawmills also undertake chemical preservation of rough timber or logs produced.</p> <p>Wood chip mills convert logs or waste from sawmilling into chips. The wood chips are used in downstream sectors for paper and paperboard manufacturing and wood panel production.</p> <p>Timber resawing and dressing enterprises produce dressed timber (floorboards and weatherboards), mouldings and resawn timber from timber sawn at other mills. Dressing involves seasoning (kiln- or air-dried timber) or chemical preservation for different end-users in the building construction industry.</p>
Processors	<p>The sector comprised 687 sawmills in 2016.¹⁰ This number includes over 186 hardwood mills, most of which are small-scale operations, 60 major softwood mills and rough-sawn timber mills.¹¹ Softwood operations are larger in scale, with some being part of integrated forest products companies. There were also 81 wood chip mills, including 15 major wood chip production plants and export facilities.¹² Most wood chip mills are family owned and small-scale enterprises. The sector also comprised 242 timber resawing and dressing enterprises, from small to large-scale operations.¹³</p> <p>Major timber processors¹⁴</p> <p>Softwood:</p> <ul style="list-style-type: none"> • Carter Holt Harvey Woodproducts Australia (NSW, VIC) • One Forty One (SA – formerly Carter Holt Harvey) • Hyne Timber (NSW, QLD) • Timberlink Australia (SA, TAS) • Highland Pine Products (NSW) • Wespine Industries Pty Ltd (WA) • Associated Kiln Driers Pty Ltd (VIC) • Dongwha Timbers (NSW) • Superior Wood Pty Ltd (QLD) • Allied Timber Products Pty Ltd (NSW and QLD) • N F McDonnell & Sons (SA).

¹⁰ ABS, 2017, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0

¹¹ ABARES, 2015, 'Australia's Forestry Industries 2015', <http://data.daff.gov.au/data/warehouse/9aaf/9aaf/2015/AustForIndstryMap/AustForIndstryMap201504_hires_v1.0.0.pdf>.

¹² ABARES, 2015, 'Australia's Forestry Industries 2015', <http://data.daff.gov.au/data/warehouse/9aaf/9aaf/2015/AustForIndstryMap/AustForIndstryMap201504_hires_v1.0.0.pdf>.

¹³ ABS, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0.

¹⁴ Enterprises are listed according to their market share or significance in the sector.

Sub-sector Name	Sawmilling and Processing
	<p>Hardwood:</p> <ul style="list-style-type: none"> • Boral Hardwood Timber (NSW) • Neville Smith Forest Products (VIC, NSW and TAS) • Hurford Hardwood (NSW) • Australian Sustainable Hardwoods (ASH) (VIC) • Auswest Timber (WA). <p>Major wood chip producers¹⁵</p> <ul style="list-style-type: none"> • Mitsui Bussan Woodchip Oceania Pty Ltd (Mitsui & Co Limited) operates Bunbury Fibre Exports in WA and South West Fibre Pty Ltd (49.0%) (VIC) • Midway Limited operates Midway wood chip mill and South West Fibre Pty Ltd (51.0%) (VIC) • WA Plantation Resources Pty Ltd, WAPRES (Marubeni Corporation & Nippon Paper Industries) (WA) • Allied Natural Wood Exports (NSW).
Geographical Location	Sawmilling activities are undertaken in most states. Sawmills are established near logging/harvestable areas of both native forests and plantations, and provide important regional employment opportunities for rural towns across Australia.
Automation and Digitisation	The sector is highly mechanised and operations rely heavily upon computer-controlled equipment for log and timber transfer, drying and packaging. Specialised sawmilling X-ray (or infrared, ultrasound) scanning technologies are used for optimising cutting pattern of logs. Other technologies include Computer Numerical Control (CNC) manufacturing tools and inventory management software systems. Types of machinery include saws, finger-jointing equipment, moulders, chippers, kilns and boilers, cranes, log loaders, forklifts and timber stacking machine.
Sub-sector Name	Timber Manufactured Products
Scope of Work	<p>Producers who operate in this sector source timber from sawmills and other upstream timber processing enterprises to manufacture wooden structural components, joinery and pre-fabricated timber building systems for the construction market. The sector also includes other wood product manufacturers.</p> <p>Pre-fabricated timber building systems include wall and roof systems, floor cassettes, Cross Laminated Timber (CLT) systems and post and beams (Glulam or I-Beams).</p>
Producers	In 2016, the sector comprised 4,000 small and medium size-manufacturing plants that combine joinery and cabinetmakers and structural components

¹⁵ Ibid.

Sub-sector Name	Timber Manufactured Products
	<p>manufacturers.¹⁶ There are approximately 350 truss and frame fabricators in Australia¹⁷ and a small number of other pre-fabricated timber-building solution manufacturers. Also, there are 755 producers that manufacture other wood products (excluding furniture).¹⁸</p> <p>Major producers of timber manufactured products¹⁹</p> <p>Frame and truss:</p> <ul style="list-style-type: none"> • Timbertruss • AAA Advanced Trusses and Windows • Dahlsens • BB Truss & Timber • Able Truss • Trusses Plus Pty Ltd • Trusspro Pty Ltd • South Coast Prefab Pty Ltd • M.B. Pre-Fab Framing • Owen Truss • OStruss Pty Ltd • Truss Right • Prefab Technology Pty Ltd • Drouin West timber and Truss • Country Truss Pty Ltd • Engtruss Australia Pty Ltd • Able Truss and Timber • Cleveland Trade Centre • Parkside Timber & Hardware • Dynamic Timbers Pty Ltd • Rankine Timber & Truss. <p>Other timber pre-fabricated solution operations include:</p> <ul style="list-style-type: none"> • Tilling Timber Pty Ltd • Structural Insulated Panels (SIPs) Industries (WA).
Geographical Location	Production facilities are located in all states close to capital cities with larger populations and growing housing construction and economic activity.
Automation and Digitisation	The sector predominantly utilises state-of-the-art machinery and involves digital design and fabrication processes.

Sub-sector Name	Wood Panel and Board Production
Scope of Work	<p>This sector includes all enterprises that manufacture reconstituted wood panels, plywood, Laminated Veneer Lumber (LVL) and laminations of timber (CLT, Glulam and I-Beam) from veneer and sawn timber.</p> <p>Reconstituted wood panel products are made from wood chips, sawdust, wood shavings, slabwood or off-cuts and can be of different types – particleboards (PBs), medium-density fibreboards (MDFs), hardboard, softboard and other fibreboards.</p>

¹⁶ ABS, 2017, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0.

¹⁷ Pryda, 2016, 'About us', <<http://www.pryda.com.au/about-us>>.

¹⁸ ABS, 2017, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0

¹⁹ Enterprises are listed according to their market share or significance in the sector

Sub-sector Name	Wood Panel and Board Production																
Producers	<p>In 2016, the sector comprised 97 reconstituted wood panel manufacturers, including a few large-scale operations; 29 small to medium-size veneer and plywood manufacturers; and a small number of LVL and Glulam plants.²⁰</p> <p>Major producers</p> <p>Wood panel manufacturers:</p> <table> <tr> <td>• Carter Holt Harvey (QLD and NSW)</td><td>Particleboard</td></tr> <tr> <td>• Laminex (QLD and WA)</td><td>MDF and Particleboard</td></tr> <tr> <td>• Borg Manufacturing (NSW and SA)</td><td>MDF and Particleboard</td></tr> <tr> <td>• Alpine MDF Industries (VIC)</td><td>MDF</td></tr> <tr> <td>• D&R Henderson (VIC)</td><td>Particleboard</td></tr> <tr> <td>• DG Brims & Sons (QLD and WA)</td><td>Particleboard</td></tr> <tr> <td>• Tasmanian Wood Panels (TAS)</td><td>Particleboard</td></tr> <tr> <td>• Weathertex (NSW).</td><td>Hardboard</td></tr> </table> <p>Decorative veneer manufacturers:</p> <ul style="list-style-type: none"> ▪ Speciality Veneers (TAS). <p>Plywood manufacturers:</p> <ul style="list-style-type: none"> • Carter Holt Harvey (VIC) • Big River Timbers (NSW) • Austral Plywoods (QLD) • Ta Ann Timbers (TAS) • North Coast Plywood (NSW). <p>Laminated Veneer Lumber (LVL) manufacturers:</p> <ul style="list-style-type: none"> • Wesbeam (WA) <p>Cross Laminated Timber (CLT) manufacturers:</p> <ul style="list-style-type: none"> • XLam Australia (VIC and NSW). <p>Glulam manufacturers:</p> <ul style="list-style-type: none"> • Hyne & Son (QLD) • VICBEAM Australia (VIC) • ASH (Australian Sustainable Hardwoods) (VIC). 	• Carter Holt Harvey (QLD and NSW)	Particleboard	• Laminex (QLD and WA)	MDF and Particleboard	• Borg Manufacturing (NSW and SA)	MDF and Particleboard	• Alpine MDF Industries (VIC)	MDF	• D&R Henderson (VIC)	Particleboard	• DG Brims & Sons (QLD and WA)	Particleboard	• Tasmanian Wood Panels (TAS)	Particleboard	• Weathertex (NSW).	Hardboard
• Carter Holt Harvey (QLD and NSW)	Particleboard																
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• D&R Henderson (VIC)	Particleboard																
• DG Brims & Sons (QLD and WA)	Particleboard																
• Tasmanian Wood Panels (TAS)	Particleboard																
• Weathertex (NSW).	Hardboard																
Geographical Location	<p>Production facilities are located in most Australian states (New South Wales, Victoria, Queensland and South Australia) in the proximity of capital cities. They are dependent upon growing populations, housing/industrial construction and economic activity.</p>																
Automation and Digitisation	<p>In this sector, manufacturing is carried out in capital-intensive continuous production lines, involving highly automated machinery, computerised equipment and new systems for efficient drying processes.</p>																

Sub-sector Name	Timber Merchandising
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²⁰ ABS, 2017, Counts of Australian Businesses June 2012 to June 2016, Cat. No. 8165.0

Scope of Work	<p>The sector operates via two major channels:</p> <ul style="list-style-type: none"> • retail and trade merchants who sell and provide advice and customer solution to the public, DIY market and builders • wholesalers, manufacturers, importers and exporters. <p>Retail and trade merchants stock a broad range of local and imported timber products, panel products, wooden structural components and builder's hardware.</p> <p>Wholesalers, manufacturers, importers and exporters sell, import and/or export large volumes of hardwood and softwood products, sawn and moulded products, softwood framing, panel products and engineered wood products, and distribute them through the merchant sector, or directly to the building industry.</p>
Wholesalers	<p>The sector is highly fragmented, consisting of many small-scale timber yards and wholesalers who service narrow geographic or product markets and several large-scale manufacturers and retailers. In 2016, there were 1,071 timber wholesalers in Australia.²¹</p> <p>Major wholesalers²²</p> <ul style="list-style-type: none"> • Gunnersens • Meyer Timber • Dindas Australia • Wesbeam Pty Ltd • Tilling timber Pty Ltd • ITI Australia • Bowens • Heyden Frame & Truss Pty Ltd • Timber Truss Solutions • Big River Timbers • Le Messurier Timber Co Pty Ltd/Carter Holt Harvey Woodproducts • Bunnings Warehouse • Home Timber and Hardware • Austim.
Geographical Location	<p>Timber wholesalers and retailers have operations throughout Australia.</p>
Automation and Digitisation	<p>Wholesalers and retailers are increasingly reviewing the best ways of providing products, information and services to customers. They are adapting to new ways of collaborative logistics (computerised inventory control systems, tracking and reporting technologies) and digital communication. Ongoing development of units to support these skills is required.</p>

²¹ ABS, 2017, Counts of Australian Businesses June 2012 to June 2016, Cat. No. 8165.0

²² Enterprises are listed according to their market share or significance in the sector.

Relevant Stakeholders

Approximately 42 peak organisations represent the forest and wood product industry sector at a national and state or regional level (see Table 3 and Table 4). These organisations include industry and industry sub-sector associations (18), associations of other industry-related sectors (11) and other industry networks, professional and employee associations and industry services bodies (13).

Table 3: Relative number of industry peak bodies.

Category	Number
Industry associations	7
Industry sub-sector associations	11
Associations of other industry-related sectors	11
Industry networks	1
Professional associations	2
Employee associations	3
Industry standards bodies	2
Industry R&D services bodies	1
Industry services bodies	2
Council associations	2
Total	42

Table 4: Peak industry sector organisations.

Categories – Peak Industry Sector Organisations	Geographical Representation
Industry Sector Associations	
Australian Forest Products Association (AFPA)	National
Timber Communities Australia (TCA)	National
Timber NSW	NSW
Timber Queensland Ltd	QLD
Forest Industries Association of Tasmania (FIAT)	TAS
Victorian Association of Forest Industries (VAFI)	VIC
Forest Industries Federation WA (FIFWA)	WA
Industry Sub-sector Associations	
Forest Growing and Management	
Australian Forest Growers (AFG)	National
Harvesting and Haulage	
Australian Forest Contractors Association (AFCA)	National
Tasmanian Forest Contractors Association (TFCA)	TAS
Sawmilling and Processing	
Timber Preservers Association of Australia (TPAA)	National
Tasmanian Sawmillers Association (TSA)	TAS
Timber Manufactured Products	
Frame & Truss Manufacturers Association of Australia (FTMA)	National
Glued Laminated Timber Association of Australia (GLTAA)	National
Wood Panel and Board Production	

Categories – Peak Industry Sector Organisations	Geographical Representation
Engineered Wood Products Association of Australasia (EWPA)	National & Pacific
Timber Veneer Association of Australia	National
Timber Merchandising	
Timber & Building Materials Association (TABMA)	National
Timber Merchants Association (TMA)	VIC
Associations of other Industry-Related Sectors	
Australian Pulp and Paper Industry Technical Association (APPITA)	National & New Zealand
Australian Furniture Association (AFA)	National
Australian Shop & Office Fitting Industry Association (ASOFIA)	National
Australian Window Association (AWA)	National
Australian Woodworking Industry Suppliers Association (AWISA)	National
Cabinet Makers & Designers Association (CMDA)	National
Furnishing Industry Association of Australia (FIAA)	National
Furniture Cabinets Joinery Alliance (FCJA)	National
NSW Glass & Glazing Association	National
Picture Framers Guild Australia (PFGA)	National
Cabinet Makers Association Inc. (CMA) of WA	WA
Industry Networks	
Forest Industry Council (Southern NSW) Inc.	NSW
Professional Associations	
Institute of Foresters Australia (IFA)	National
Arboriculture Australia	National
Industry Standards Bodies	
Responsible Wood Certification Scheme (formerly known as Australian Forestry Standard Ltd)	National
Forest Stewardship Council (FSC) Australia	National
Employee Representative Organisations	
CFMEU Forestry and Furnishing Products Division	National
Australian Workers' Union (AWU)	National
Australian Council of Trade Unions (ACTU)	National
Industry R&D Services Bodies	
Forest and Wood Products Australia Ltd (FWPA)	National
Industry Services Bodies	
ForestWorks Ltd	National
Timber Trade Industrial Association (TTIA)	National
Timber Development Association NSW	NSW
Council Associations	
National Timber Councils Association (NTCA)	National
Timber Towns Victoria (TTV)	VIC

Industry and Occupational Regulations and Standards

Industry regulations

Australian forest and wood products industry operates under a high level of regulation.

Environmental protection

Australia's public native forests, including those held in nature conservation reserves and those available for wood production, are governed and managed under national and state/territory regulatory frameworks and management plans (many of which are prescribed in legislation) relating to the conservation and sustainable management of forests.

There are three significant pieces of legislation at the federal level that support the conservation and sustainable management of public native forests, and over 30 pieces of legislation at the state and territory level. Federal legislation includes:

- *Environmental Protection and Biodiversity Conservation Act 1999*
- *Regional Forest Agreement Act 2002*
- *Illegal Logging Prohibition Act 2012*.

Management of forests on private land is also regulated under various native vegetation Acts. State and territory government forestry legislation includes:

- *Forestry Act 2012* (NSW)
- *Forestry Act 1959* (QLD)
- *Forest Act 1950* (SA)
- *South Australian Forestry Corporation Act 2000* (SA)
- *Forest Management Act 2013* (TAS)
- *Forestry (Rebuilding the Forest Industry) Act 2014* (TAS)
- *Forest Act 1958* (VIC)
- *Victorian Plantations Corporation (Amendment) Act 1998* (VIC)
- *Sustainable Forests (Timber) Act 2004*
- *Forests Act 1918* (WA).

Federal and state and territory government environmental and heritage protection legislation includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
- *The Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cwth)
- *Environmental Protection Act 1994* (QLD)
- *Nature Conservation Act 1992* (QLD)
- *Aboriginal Cultural Heritage Act 2003* (QLD)
- *Conservation and Land Management Act 1984* (QLD)
- *Protection of the Environment Operations Act 1997* (NSW)
- *Biodiversity Conservation Act 2016* (NSW)
- *Environment Protection Act 1993* (SA)
- *Natural Resources Management Act 2004* (SA)
- *Aboriginal Heritage Act 1988* (SA)
- *Environmental Management and Pollution Control Act 1994* (TAS)
- *Aboriginal Heritage Act 1975* (TAS)
- *Environmental Protection Act 1970* (VIC)
- *Catchment and Land Protection Act 1994* (VIC)
- *Flora and Fauna Guarantee Act 1988* (VIC)
- *Wildlife Act 1975* (VIC)
- *Aboriginal Heritage Act 2006* (VIC)

- *Environmental Protection Act 1986* (WA)
- *Biodiversity Conservation Act 2016* (WA)
- *Conservation and Land Management Act 1984* (WA)
- *Aboriginal Heritage Act 1972* (WA).

Major non-legislative policies and strategies that guide the sustainable forest management of Australia's forest also include:

- *National Forestry Policy Statement 1992* (Cwth)
- *Plantations for Australia: the 2020 Vision* (Cwth)
- *National Indigenous Forestry Strategy 2005* (Cwth)
- *Australia's Biodiversity Conservation Strategy 2010-2030* (Cwth)
- *Australia's strategy for the National Reserve System 2009-2030* (Cwth)
- *Farm Forestry National Action Statement 2005* (Cwth)
- *The Australian Forestry Standard for Forest Management (AS 4708:2013)* (Cwth)
- *FSC Australia – Forest Stewardship Standard (AFSS) (Draft)* (Cwth)
- *ACT Nature Conservation Strategy 2013-23* (ACT)
- *ACT Lowland Woodland Conservation Strategy (Action Plan No.27)* (ACT)
- *Forest NSW Forest Management Policy* (NSW)
- *Farm Forestry Strategy for NSW 2003* (NSW)
- *Industry Development Plan 2013-2017* (NT)
- *Territory 2030 Strategic Plan 2009* (NT)
- *Forest Management Policy Statement* (QLD)
- *Queensland Timber Plantation Strategy 2020* (QLD)
- *Building Nature's Resilience: A Biodiversity Strategy for Queensland* (QLD)
- *The Queensland Forest and Timber Industry Plan* (QLD)
- *Forest Industry Strategy: Vision 2050 Strategic Directions 2011-2016* (SA)
- *ForestrySA Policy for Sustainable Forest Management* (SA)
- *No Species Loss: A Nature Conservation Strategy for South Australia 2007-2017* (SA)
- *Permanent Native Forest Estate Policy* (TAS)
- *Forestry Tasmania's Sustainable Forest Management Policy* (TAS)
- *Sustainability Charter for Victoria's State Forests* (VIC)
- *Ecologically Sustainable Forest Management Policy* (VIC)
- *Forest Products Commission Forest Management Policy* (WA).

In addition, the industry operates under the guidance and implementation of codes of practice, guidance materials and standards for sustainable forest management of wood production forests. As shown below, the codes and other types of guidance documents cover a range of industry matters and vary in their legal status and jurisdiction coverage:

- Forest planning
- Forest access and roading
- Operating heavy vehicles
- Managing work health and safety (WHS) risks in forest harvesting
- Sawmilling and timber operations
- Timber preservation
- Conservation of non-wood values
- Pest, weed and fire management
- Harvesting of non-wood forest products.

Work health and safety

Safety is a major driver for industry training. The activities of most significant concern regarding safety are within the forest growing and management and harvesting and haulage sectors, due to the high use of mobile machinery and the nature of the working environment.

Within all six-industry sectors, the areas of high risk and high compliance requirements include:

- manual tree falling
- operation of mobile machinery and equipment in the forest terrain
- loading and unloading log trucks
- load restraints
- stacking timber
- cable logging
- fatigue management
- manual handling
- forklift in motion/ transporting goods
- chemical hazards
- other chainsaw or pole saw activities
- slips, trips, falls.

Industry producers and wholesalers are required to meet work health and safety requirements of applicable Commonwealth, state or territory legislation and regulations, Safe Work Australia guidelines, and organisational safety policies and procedures.

National work and safety guidelines, developed by Safe Work Australia and the industry, for managing risks in forestry operations include:

- *Guide to growing and managing Forests (2013)*
- *Guide to managing risks of loading, transporting and unloading logs (2014)*
- *Guide to managing risks of in-field processing forest products (2014)*
- *Guide to managing risks of timber harvesting operations (2014)*
- *Guide to managing risk of plant and equipment for forestry operations (2014)*
- *Guide to managing risks of general hazards in forestry operations (2017)*
- *Guide to managing risks of log landing (2014)*
- *Guide to managing risks of log extraction (2014)*
- *Guide to managing risks of coupe and harvesting site access and preparation (2014)*
- *Guide to managing risks of tree trimming and removal work (2016)*
- *Forestry operations guidance material (2014)*
- *General guide for managing risks in forestry operations (2014).*

Wholesalers must comply with the *Competition and Consumer Act 2010*, which covers relationships between all parties within the supply chain (including wholesalers, manufacturers, retailers and consumers) and promotes fair-trading among these parties.

Industry standards

The industry implements two voluntary forest certification schemes, the Responsible Wood Certification Scheme and the Forest Stewardship Council Scheme (FSC), which typically require more stringent forest management practices than the legislation alone. Forest management standards and chain-of-custody standards frame both schemes.

Regulated occupations in the industry

Regulated occupations have legal (or industry) requirements or restrictions to perform the work. They require a licence to practice from, or registration by, a professional association or occupational licensing authority.

A range of industry-specific operations, particularly in forest harvesting, are recognised by work health and safety authorities as high-risk activities. However, there are no regulated occupational licencing requirements for these operations. The industry requires suitable training from all harvesting machine operators to undertake their work functions safely and satisfy obligations and liabilities under national work health and safety regulations. Industry establishes essential skills requirements, which are verified by a third party via FOLS Skills Verification Program and managed by ForestWorks (for details, refer to the section below).

The forest and wood products industry employs a wide range of regulated occupations that are not industry specific. These include electricians, plumbers and mobile equipment, crane and forklift operators.

Operators working in Copper Chromium Arsenate (CCA) timber treatment plants are required to hold either a CCA Commercial Operator Licence or a CCA Agricultural Chemical User Permit, consistent with the type of business in which they operate.

Skills verification programs for managers, contractors and operators

Forest managers in several states require a FOLS to verify the skills of a worker in specified job roles. FOLS provides consistent operating standards for individuals in high-risk activities, such as tree felling and tree harvesting and haulage, through uniform sets of measures for safety and the environment. It ensures workers are trained and their skills are current.

Also, employers and managers are legally required to ensure the personal safety of all workers. The evidence for demonstrating that workers can perform safely and efficiently in harvesting operations is 'holding' adequate FOLS endorsements to operate tree felling and harvesting equipment such as chainsaws, bulldozers and excavators, skid steer loaders, mobile chippers and splitters, and a range of trucks and vehicles.

FOLS Skills Verification Program is the only industry-led system that supports the professionalism and safety of industry through a national electronic system of recording and verifying the training and currency of workers' skills. FOLS offers businesses a method of demonstrating that appropriate training has been provided to satisfy obligations and liabilities under national WHS legislation and Regulations. FOLS verifies a worker has undertaken the required nationally recognised training and kept their skills current through regular practice of the work activities listed on their FOLS.

A Forestry Better Business Program has also been developed. It recognises professional businesses operating to high standards in the forest industry. The program assists forest managers and contracting businesses by clearly describing and documenting the standards they are required to meet in four key areas: safety, environmental, economic, and people. The program provides a web-based platform to support business development. Businesses can use the web portal to store and share information to demonstrate they meet current standards.

Challenges and Opportunities in the Sector

Australian forest and wood products sector operates in a dynamic environment shaped by a range of socioeconomic factors, technological developments, environmental challenges and policy frameworks. The industry's challenges and opportunities for growth relating to these factors are discussed below.

Society and culture

Increased global population, urbanisation and lifestyle change

Global population is expected to grow from 7.3 billion to 9.7 billion in 2050, driving an increasing demand for forests and wood products. The highest rate of population growth will be in Africa and Asia. China

and India are currently the two largest countries in the world, each with more than 1 billion people.²³ Australia's population is also projected to double to 46 million by 2075.²⁴

Rising personal incomes, rapid urbanisation and government efforts across Asia, South America and Africa to improve living conditions of low-income earners will drive wood product demand. Sixty per cent of China's population is projected to live in cities by 2020 and more than a billion by 2050. Current national development targets in China consider the increase of green buildings' share from 2% to 50% of all new construction by 2020, which will require upgrades to construction building materials and construction codes.²⁵

People of all social classes tend to prefer efficient and sustainable architectural solutions, inspired by the customised lifestyle and home designs with integrated interior and exterior wood features.

Challenges

- Existing wood supply chains will require structural changes to enable better use of all parts of the tree or forest resource and generate a maximum value recovery.
- New investments will be needed to expand the productive forest estate in strategic regions such as those with high dependence on forest industries. Possible approaches include cooperative structures for farm forest growers. New plantations will mean an ongoing availability of forest resources to meet the incremental requirement for log supply.
- New plantations will continue to face increased competition for agricultural land and water use that are also essential for food production.

Aging population and career values

Attracting and recruiting young skilled people in the industry will increase in complexity as the senior workforce retires and younger generations tend to seek businesses who take an active role in the personal and professional development of employees and offer digital workplaces and flexible working conditions.

Currently, the Australian workforce is dominated by pre-1980 generations, but within ten years' time, 60% of the workforce will be Generations Y and Z (people born after the 1980s).²⁶ Younger generations value learning opportunities, collaboration, work-life balance and flexibility. They share a work ethic, which is based on diversity, challenge, responsibility and creative input, as opposed to a more rigid, work-centric approach. These people require constant motivation and opportunity to develop their skills. Digital technology and web-based delivery or operating systems are preferred to traditional work processes, communication, lectures or training.

Many workplaces will face the situation where four or five generations may be working side by side as the retirement age also increases, due to personal choices to accommodate a particular lifestyle or national policies to assist fiscal pressures.

Challenges

- Recruitment, training and management of employees are rapidly increasing in complexity, which, for an industry dominated by small and medium-sized enterprises, it seems beyond the reach.

Business and economics

Domestic market

²³ <<http://www.un.org/en/development/desa/news/population/2015-report.html>>.

²⁴ 3222.0 - Population Projections, Australia, 2012 (base) to 2101.

²⁵ <<https://www.edgebuildings.com/wp-content/uploads/2017/09/China-Green-Building-Market-Intelligence-EXPORT.pdf>>.

²⁶ Future skills and training.

Building construction is the most influential driver for the demand of most timber and wood products in Australia. In 2017, construction work has reached an all-time high after a few years of sustained growth. Analysts suggest that the recent construction boom has removed the past under-supply of dwellings from the market in the short term, which means that the housing market (approvals) will decline over the next three years.²⁷

The housing construction cycle, supported by the population growth, will continue to provide a growing but cyclical demand for timber products. Opportunities may exist to build a greater production capacity for certain products locally to replace the import volumes.

Currently, the industry meets over 80% of the Australian demand for softwood roundwood and over 90% for sawn hardwood. Sawn softwood has remained the material of choice for light timber framing, recording a relatively flat demand. The trend in construction for multiple-storey buildings drives a growing demand for new-engineered wood products such as LVL and I-Joist.²⁸ Hardwood sawnwood demand is affected by reduced log availability. Logs from commercial plantations and relatively small volumes of sawn product are also exported to China.

Australia's wood chip production is supplied to local reconstituted wood panel manufacturers and global markets, mainly China and Japan. Domestic reconstituted wood panel production meets over 90% of local demand for particleboard (PB) and over 80% of medium-density fibreboard (MDF).

Domestic plywood production meets only 25% of local demand. Some volumes of softwood and hardwood peeler logs and veneers are exported.

Challenges

- Investment in the softwood processing sector may be limited by uncertainties about the future supply of forest resources. If the log supply to emerging economies (China) continues, there will be less sawlog supply for domestic wood processors.
- The hardwood sawmilling sector and upstream hardwood manufacturing is increasingly challenged by an ongoing reduction of log supply as more native forests available for wood production are transitioned to forest reserves, and the supply from hardwood plantations is limited and not suitable for all ranges of products.

Emerging economies

Positive macroeconomic forecast for Asia-Pacific countries holds great potential for some Australian forest growers with access to export ports and risks for wood processors and domestic markets.

China has been the leading destination of globally traded softwood logs over the last five years, due to its economic growth and developments in the housing, wood products and furniture sectors. Although a recent slowdown in residential construction has been recorded as a result of an over-saturated market, China's demand for timber is expected to last because the country has banned all logging of national natural forests.²⁹

Australia's exports and market share in Asia have surged since 2013, mainly due to softwood log exports. Almost 15% of the total log harvest in 2016 was exported to China, making Australia the world's fifth-largest softwood log exporter³⁰. A small percentage of logs was also shipped to South Korea and India. Wood chip exports to China and Japan have been the most significant component (nearly one-third) of Australia's total wood products exports.³¹

²⁷ <<http://www.fwpa.com.au/statistics-count-newsletter/1374-31-housing-collapse-over-next-three-years.html>>.

²⁸ Margules Groome Consulting, Q2 2017, Newsletter, Game Changer China.

²⁹ Margules Groome Consulting, Q2 2017, Newsletter, Game Changer China.

³⁰ <<https://www.unece.org/fileadmin/DAM/timber/publications/FPAMR2017AdvanceDraft.pdf>>.

³¹ <http://data.daff.gov.au/data/warehouse/9aaf/afwpsd9abfe/afwpsd9abfe20171107/AFWPSOverview_20171107_v1.0.0.pdf>.

Australia mainly imports wood-based panels from China and Europe, and sawnwood from New Zealand.

Challenges

- China's attractive log market for export may change the business dynamics in the industry and escalate the rate of sawnwood imports as the local supply for softwood log tightens.³² Growing log exports could lead to contractual changes between resource owners and sawmills (long-term versus short-term) and growing competition between processors in some regions due to higher and more volatile log prices.

Products with emerging markets

Solid engineered wood products, including Cross Laminated Timber (CLT) and Glulam and bioenergy products such as biogas and wood pellets, are products with a growing demand in Australia and globally. Industry participation in these emerging markets offers opportunities for investment, innovation and entrepreneurship and facilitates higher returns from lower-quality logs, sawnwood, wood residues and biomass.

CLT has gained considerable interest globally as it enables architects and engineers to use completely different methods to design and construct tall and large buildings. CLT production plants are well established in Europe and currently emerging in North America, Asia and Oceania. The potential CLT market in the US is estimated at 2–6 million cubic metres, which is far more than the current global supply.³³ Japan plans to use CLT in 6% of future buildings up to four storeys high, subsidise investment costs to increase domestic CLT production capacity, and reduce production costs by more than 50%.³⁴ New Zealand has been producing CLT commercially since 2013 for the local markets and export.

Most CLT volumes used for tall buildings in Australia have been imported from Austria and Germany. Our domestic market is expected to grow as all Australian states and territories adopted the *National Construction Code 2016 (NCC)*, which permits the use of timber structural elements in mid-rise buildings up to eight storeys high. XLAM Australia is first CLT plant to operate and become an active player in Australia's timber building components market.

Nearly 33% of the total global bioenergy sector is in Europe, 29% in the Asia-Pacific region, and almost 20% in North America.³⁵ Bioenergy accounts for 61% of all renewable energy consumed in Europe, with 40–45% being based on feedstock that originates in the forest sector (forest biomass-based fuels).³⁶ Regional bioenergy markets include South Korea and Japan. China is also showing signs of potential growth. These countries are supported by government policies and incentives with a focus on fostering expansion in biomass use for energy production (wood pellets).

Australia generates considerable volumes of wood processing and forest harvest residues that could be used to develop bioenergy. The domestic bioenergy market currently consists of small bioenergy plants for heating and electricity generation. The Australian Government has recently emphasised and recognised, through the National Energy Guarantee (NEG) policy, the role of energy derived from biomass in the national economy, broadening the prospects for future market development in Australia.³⁷

Challenges

- Availability of future log supply in the context of no new plantation developments raises concerns to potential investors who look to develop new production capacities for products with emerging markets.

³² Margules Groome Consulting, Q2 2017, Newsletter, Game Changer China.

³³ <<https://www.unece.org/fileadmin/DAM/timber/publications/FPAMR2017AdvanceDraft.pdf>>.

³⁴ Ibid.

³⁵ FWPA Megatrends.

³⁶ Ibid.

³⁷ <<http://www.joshfrydenberg.com.au/guest/mediaReleasesDetails.aspx?id=446>>.

- An increase in the domestic CLT production and consumption may evolve into a potential shift in the local markets, displacing some volumes of traditional products.
- Further development of national and state-based policies is required to enable wood residues from existing wood processing operations to become available for the energy sector and biochemical production.

Empowered customers

Due to the advantages of digital technology, individual customers are now better educated and informed to look for products customised to their needs and with low social, environmental and economic footprints.

The influence of the individual consumer on the forest and wood products industry has been limited until recently. Architects, builders/developers, large retail chains and green building-rating schemes have driven the demand for certified products through their specifications. According to research by FWPA, individual customers' awareness of both AFS (now known as Responsible Wood) and FSC certification is low, but consumers claim that they are more likely to buy certified products.

Individual consumers are developing a preference for online product information and direct purchase.

Challenges

- Customer behaviour in the digital age drives digital strategies. The need to increase the speed of service delivery and improve agility to respond to customers and market changes places pressure across timber retailing and the supply chain to gain digital marketing skills and digital customer service capabilities.

Technology

Transformative technologies

A range of advanced technologies related to biotechnology, geospatial technology, robotics and automation is being integrated into operations of leading forestry, transport, logistics and wood products companies. Growing adoption will benefit the industry as a result of improved tree characteristics and forest growth rates, increased log utilisation, process improvement, better pest management, more climate adaptable species and greater value-add and productivity.

Advanced technologies with a significant impact on commercial forest management and harvesting now and in the future include:

- biotechnology: clonal propagation, marker-aided selection and breeding, genetic engineering and genomics
- geospatial technologies: remote sensors, drone technology (UAVs), wearable and mobile technologies/apps, and new generation satellite imagery technologies
- robotics and automation: automatic (X-Ray) log measuring systems, on-board computers with wireless data transfer, and remote-controlled felling (HiVision by Hiab).

Self-driving vehicles may also have the potential to change commercial forest practices in the future. Applications can already be seen in mining operations and the military sector, with driverless convoys of off-road trucks utilised to travel through an uninhabited and difficult terrain. Agriculture is another industry in which self-driving tractors are used for some applications.³⁸

³⁸ <https://delivering-tomorrow.com/wp-content/uploads/2015/08/dhl_self_driving_vehicles.pdf>.

There are some advanced technologies in the timber and wood processing sector for which potential has not been fully realised. These include specialised sawmilling X-ray (or infrared, ultrasound) scanning technologies that are used for optimising cutting pattern of logs, computer-controlled systems with applications in log and timber transfer, drying or packaging among other processes, Computer Numerical Control (CNC) manufacturing tools, and inventory management software systems.

Computer-aided design and manufacturing (CAD/CAM) technologies and CNC robotics are also applied in the design and manufacture of engineered solid wood products and standard and modular pre-fabricated walls, floors and roof trusses.

Challenges

- Capital investment in the industry is fragmented and directed to upgrades of existing technology.³⁹ Challenges impeding technology adoption in the industry include knowledge of potential value of advanced technologies, favourable economic and business environment, leadership, capital investment, and skills and capabilities in the organisation.

Digitisation

Digital adoption can enable new processes and practices, greater collaboration, especially with external partners, better customer engagement, and increased speed and agility in responding to customers and markets. It can also empower and enable the workforce.

Based on a report by Accenture, forest and wood products companies worldwide lag behind many other industries in taking advantage of digital technologies. Most have a growing interest in digital transformation but take a cautious wait-and-see approach to digital technology. Digital efforts in the industry involve fragmented trials, as opposed to a broader view of the technologies' potential. Reportedly, many companies lack leadership and concrete strategies.⁴⁰

Challenges

- Implementation of digital approaches requires strategies to evolve existing operations into new business models through leadership support and development of digital skills and capabilities in the organisation.

Environment

Sustainability actions

The Australian and state governments have renewed their commitment to maintaining support for long-term Regional Forest Agreements (RFAs). Renewed Agreements provide an ongoing framework for the industry to implement effective forest conservation, forest management and forest industry practices and support the long-term stability of local forest and processing industry. In 2017, the Tasmanian RFA was extended for the next two decades.

The Australian Government this year finalised the method and practical policies to cover forest plantations under the Emissions Reduction Fund, the Carbon Farming Initiative (CFI) and Direct Action policies. The forest plantation methodology will allow forest growers and farmers to factor the possibility of a small carbon payment into the high cost of establishing areas of new trees.

The industry, with support from federal and state governments, responds in a variety of other ways to environmental and sustainability requirements. Two sustainability schemes are currently operational in Australia: the international and draft Australian Forest Stewardship Council (FSC) and the Responsible Wood Certification Scheme. Eleven local government associations and councils around Australia and New Zealand (NZ) implement wood encouragement policies (WEP) to drive the construction sector towards the use of sustainable timber products. In early 2017, the Victorian Government formalised the

³⁹ <<http://www.fwpa.com.au/statistics-count-newsletter/1403-fwpa-australian-timber-industry-investmentreview.html>>.

⁴⁰ <https://www.accenture.com/us-en/blogs/blogs-forest-products-tracking-digital-transformation?c=glb_forestproductstexacttarget_10031236:emc_1017&emc=21917766:emc-102717>.

existing Koala Management Strategy to improve the management practices of blue gum plantations in the Green Triangle region and better protect koalas during logs harvesting.

Climatic weather shifts

Global warming, through climate variability and extreme weather conditions, has various implications for the industry and its value chain. Opportunities for the industry to reduce associated impacts in relation to effects on the future forest productivity and resource supply include greater and coordinated application of biotechnology and best practices for tree breeding, site selection and forest management.

Extensive studies⁴¹ show that growing occurrences of higher temperatures, drought, flood, and bushfire conditions may affect future forest growth and resource suitability for intended production purposes, as Australia lacks a tree stock capable of responding to changing climate conditions.

Increased fire risk and bushfires change the estimates for forest resource availability. As a result of the large-scale wildfires in the eastern Victorian public forests between 2002 and 2009, VicForests incorporated the effects of fire on the resource supply into its outlook projections. A shortage of sawlog supply is also expected in Western Australia over the next 10–15 years due to the significant bushfires from 2015 and 2016.

The industry has set out a new bushfire policy through the Australian Forest Products Association (AFPA) to reduce the bushfire risk to forests, country towns and essential rural assets. The policy outlines a new approach for the proactive and targeted reduction of understory and dense forest re-growth.⁴² Trials were conducted in NSW to establish whether mechanical thinning of forests can reduce bushfire risk in an economical, socially acceptable and environmentally sound manner around conservation areas or towns where prescribed burning is undesirable for a range of reasons.⁴³

⁴¹

<http://www.agriculture.gov.au/abares/publications/display?url=http://143.188.17.20/anrdl/DAFFService/display.php?fid=pe_abares20110824.01_21a.xml>; and <http://www.fwpa.com.au/images/resources/PNC068-0708_Research_Report_Climate_Change_0.pdf>.

⁴² <<http://ausfpa.com.au/publications/policies/can-we-better-fire-proof-our-country-towns/>>.

⁴³ <<http://www.agriculture.gov.au/forestry/national/nbmp>>.

C. EMPLOYMENT AND TRAINING

Employment Update

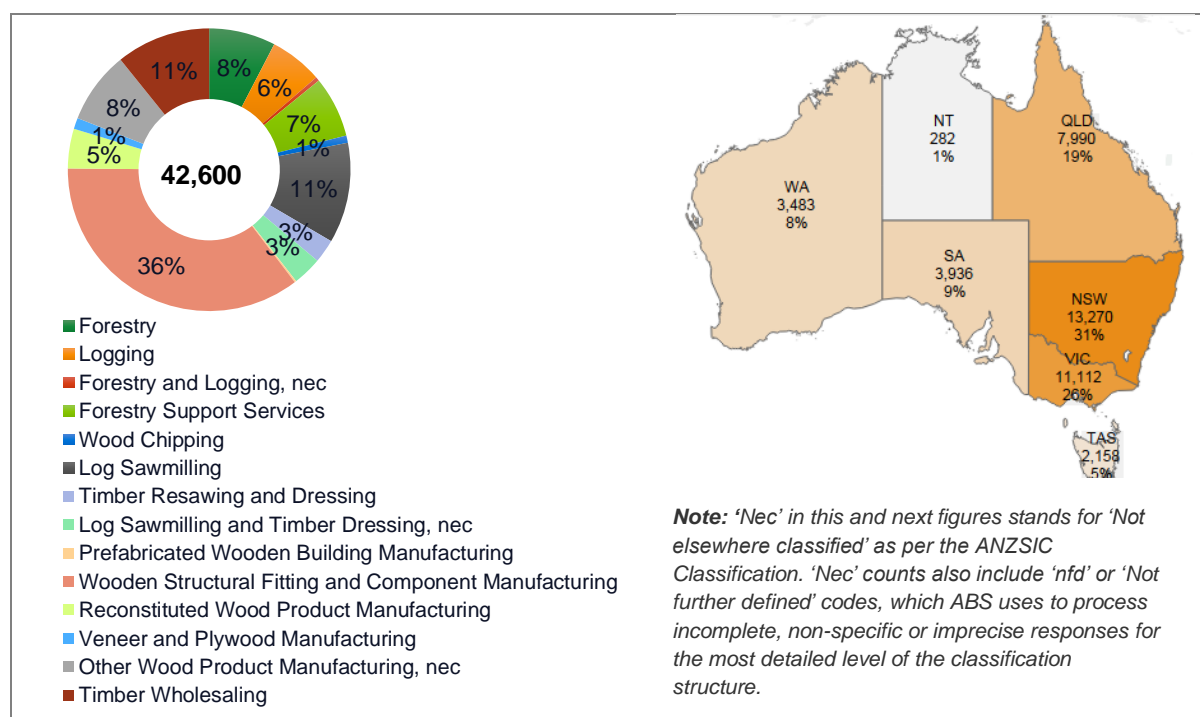
Total employment in the forest and wood products industry and historical trends reflect industry rationalisation after the global financial crisis (GFC) and ongoing reduction of timber production from native forests. Since 2006, the number of businesses in the industry has declined by about 40%.⁴⁴ However, the industry has recovered during the last few years as a result of improved activity and timber product demand from the construction sector. Businesses have produced at full capacities, generating further employment in some sectors and positive economic indicators.

Total employment

Based on the 2016 Census, the Australian forest and wood products industry employed 42,600 people across all industry sub-sectors in 2016 (see Figure 1), excluding log haulage drivers and timber retailing occupations.⁴⁵ About 82% of these were employed full-time.

Wood structural fitting and component manufacturing⁴⁶ was the largest industry sub-sector by employment, representing just above a third of the industry. Log sawmilling, timber wholesaling, forestry, forestry support services and other wood product manufacturing were the following largest sub-sectors. New South Wales, Victoria, and Queensland concentrate over 75% of the industry employment.⁴⁷

Figure 1: Industry employment by subsectors and states and territories, 2016.



⁴⁴ ABS, 2017, *Counts of Australian Businesses June 2012 to June 2016*, Cat. No. 8165.0.

⁴⁵ A limitation of the ABS Census is that it classifies workers into specific industries of employment based on the Australia-New Zealand Standard Industrial Classification (ANZSIC). Under this classification log haulage drivers belong to the transport industry and timber retailing occupations belong to the hardware and building retailing industry.

⁴⁶ According to ANZSIC, wood structural fitting and component manufacturing include finger-jointing, timber roof trusses, timber doors and windows, wooden kitchen cabinets, timber structural components/fittings.

⁴⁷ All employment data in this report is sourced from ABS, Census Datasets.

Changes in employment

Total employment in the forest and wood products industry declined by 31% from 61,782 employees in 2006 to 42,601 employees in 2016.

At the industry sub-sector level, employment decreased by 24% for forestry but increased for support services. This decline suggests a shift towards sub-contracting work and deregulation in this sector. Employment for harvesting operations saw a slight decrease in 2011 but recovered to 2,570 employees in 2016 (see Figure 2).

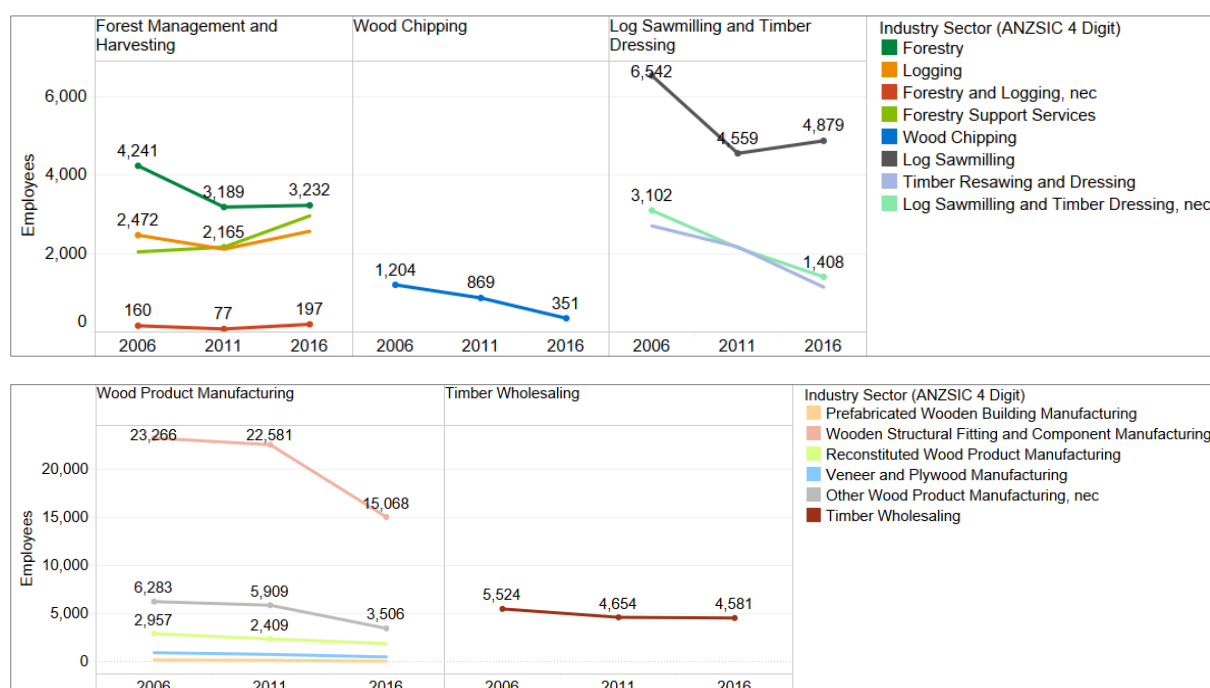
The wood chipping sector experienced a 71% drop in employment between 2006 and 2016.

Employment counts for log sawmilling and timber dressing show an over 50% decline in timber resawing and dressing, and a 25% decline in log sawmilling.

Employment in wood products manufacturing has also dropped across all its sub-sectors. There was a 35% decline in wooden structural fitting from 23,266 employees in 2006 to 15,068 employees in 2016 and reconstituted wood product manufacturing from 2,957 employees in 2006 to 1,926 employees in 2016. Employment in veneer and plywood manufacturing dropped by 45% from 980 employees in 2006 to 538 employees in 2016.

A reduction in employment also occurred in the timber wholesaling sector but at a lower rate (17%).

Figure 2: Changes in employment, 2006–2016.

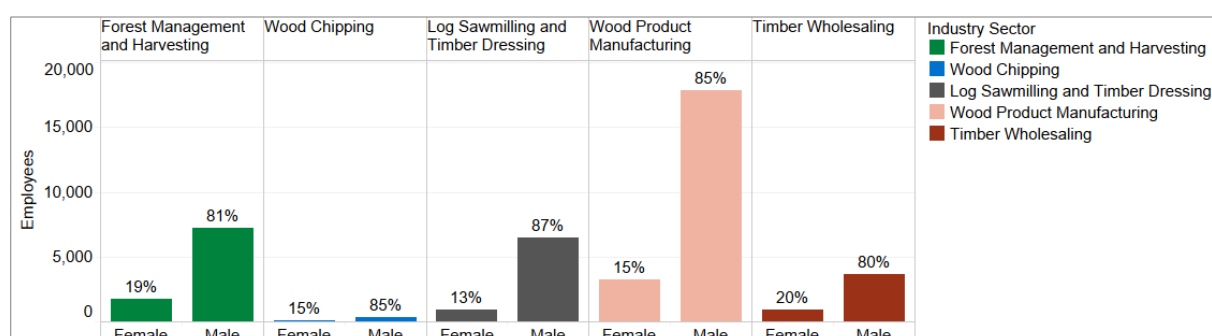


Gender composition of the workforce

Men constituted more than 80% of all employees in the forest and wood products industry in 2016. Across the sectors, a slightly higher proportion of men (87%) was identified in the sawmilling and timber dressing sub-sectors (see Figure 3).

From 2006 to 2016, the proportion of women in the industry declined. There was a 23% decrease for women's participation in pre-fabricated wood building manufacturing, and 4% in veneer and plywood manufacturing. Small increases were recorded for wood chipping (3%) and forestry support services (1%).

Figure 3: Industry employment by gender, 2016.

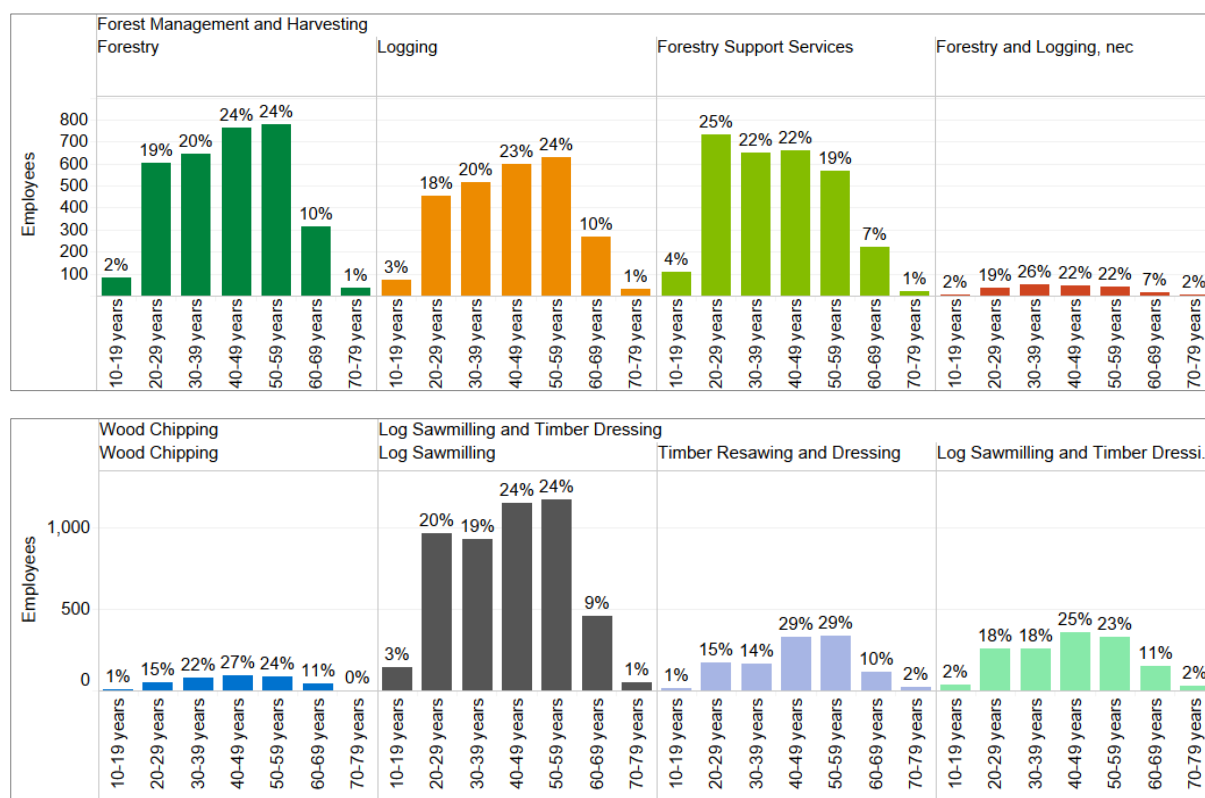


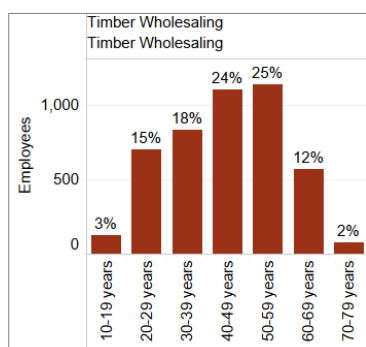
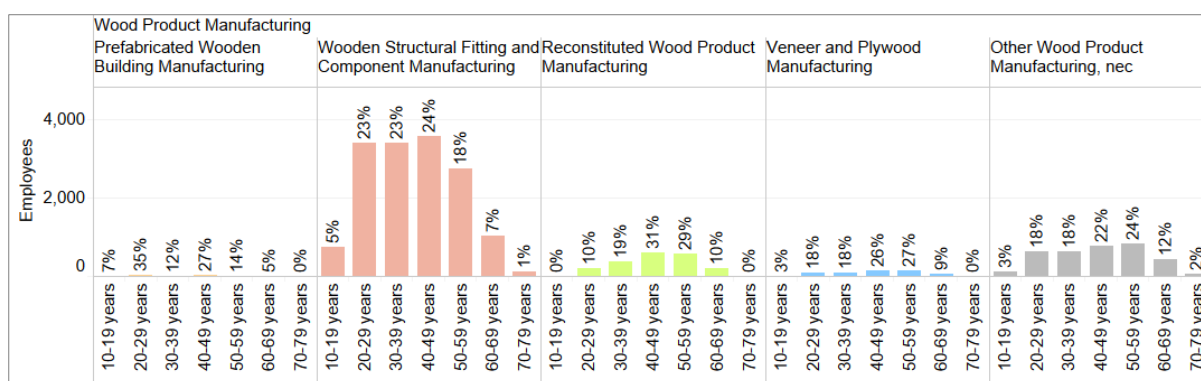
Age levels of the workforce

The industry workforce is aging. The proportion of the workforce in the age groups 50 to 60 years and over 60 years increased by 4% and 5% respectively in 2016 when compared with 2006.

Age distribution of the workforce differs slightly among the industry sub-sectors. The workforce in the pre-fabricated wood building manufacturing, forestry support services, wood structural components and log sawmilling sectors is younger when compared to other industry sub-sectors. In 2016, these sub-sectors employed a higher proportion of people (23% to 42% of the sector workforce) in the 10–19 years and 20–29 years age groups, and a slightly lower proportion (19% to 34%) in the age groups over 50 years (Figure 4).

Figure 4: Industry employment by age level, 2016.





Changes in occupation of employment⁴⁸

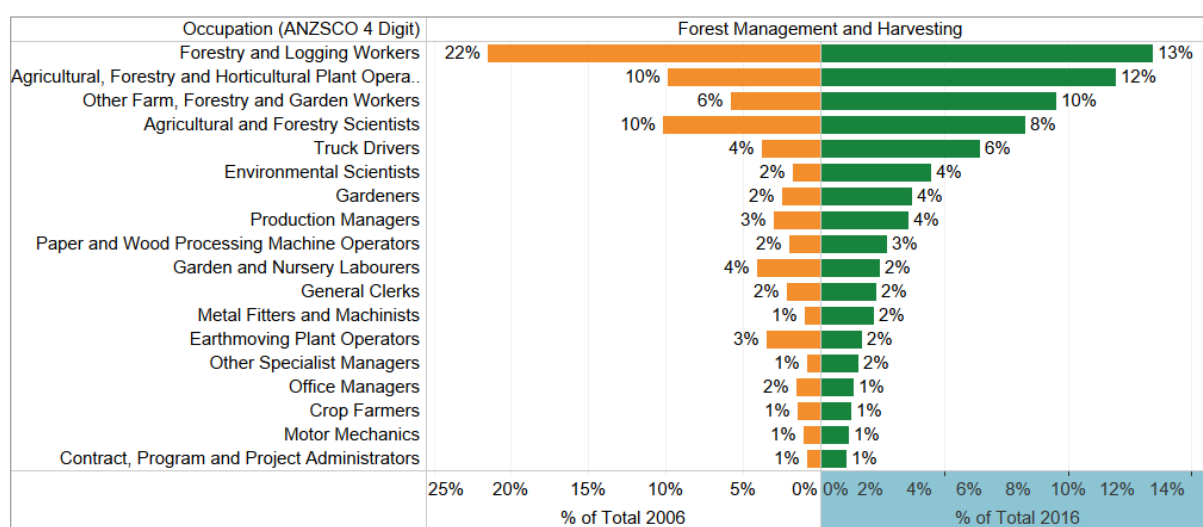
Forest management and harvesting

Main occupations of employment in the forest management and harvesting sector are forestry and harvesting machine operators, other forestry plant and machinery operators, other forestry workers, forestry and environmental scientists and truck drivers. Other occupations include gardeners, production managers and wood processing machine operators amongst other occupations.

The proportion of people working as forestry and harvesting machine operators decreased by 9% from 2006 to 2016 while the proportion of other forestry plant and machinery operators and other forestry workers increased by 2% and 4% respectively (Figure 5).

⁴⁸ Note that ABS Census classifies workers into occupational groups based on the Australia-New Zealand Standard Classification of Occupations (ANZSCO). As a result, the Census employment by occupational groups do not always or accurately describe specific occupations as seen in this section's charts. For example, sawdoctors are classified as precision metal trades workers; and frame and truss designers, estimators and detailers are classified as 'Architectural, Building and Surveying Technicians'. Sawmilling Machine operators, veneer machine operators or debarker operators are all classified into the same occupational group as paper products machine operators as ANZSCO does not provide distinct 4-digit occupational groups for these workers.

Figure 5: Relative employment by occupations in forestry and harvesting, 2006 and 2016.

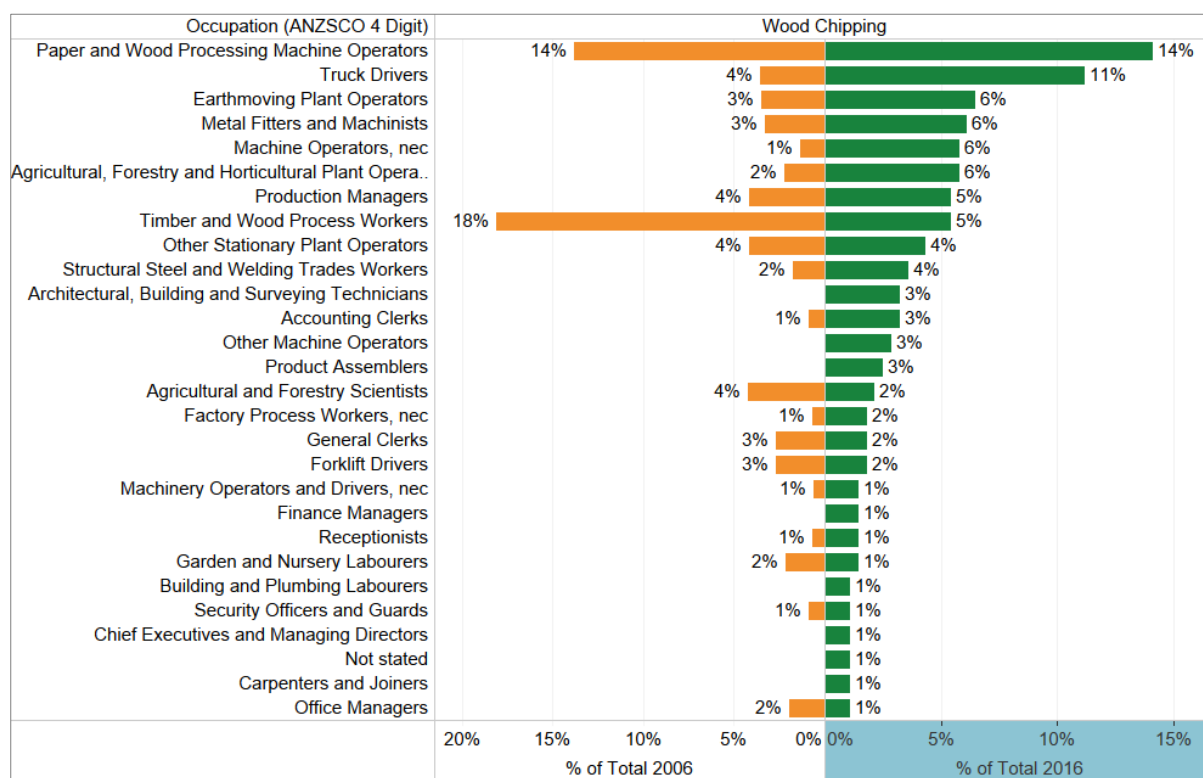


Wood chipping

The chart below suggests that the wood chipping workforce occupies a broader range of occupations, despite the low numbers of employees in this sub-sector. In 2006 and in 2016, main occupations included paper and wood processing machine operators, truck drivers, earthmoving plant operators, metal fitters and machinists and other machine and plant operators.

The proportion of people working in these and other occupations including structural steel workers, building technicians and accounting personnel increased from 2006 to 2016, but decreased for timber and wood process workers, forestry scientists and forklift drivers (Figure 6).

Figure 6 Relative employment by occupations in wood chipping, 2006 and 2016.

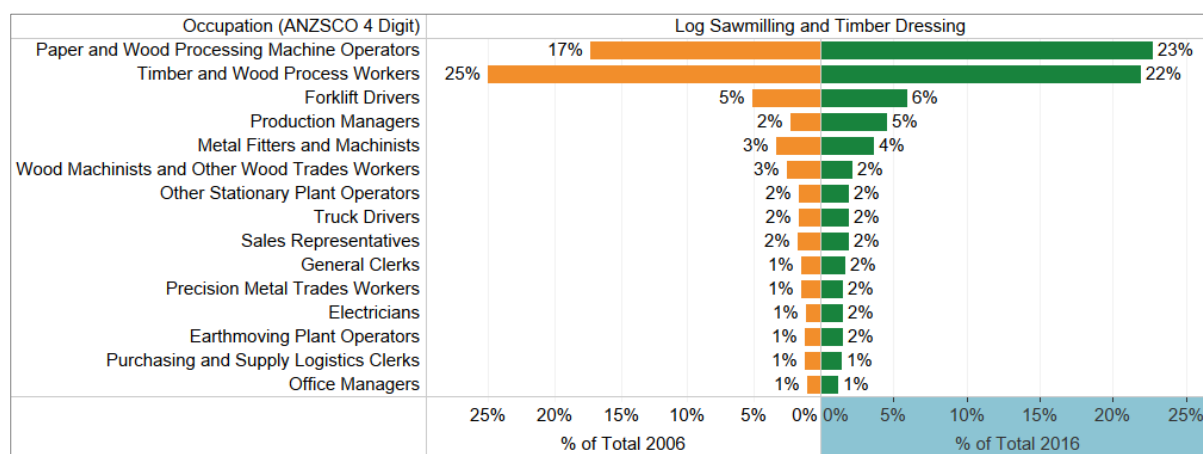


Log sawmilling and timber dressing

The main occupations of employment in the log sawmilling and timber dressing sub-sector are timber and wood process workers, wood processing machine operators, forklift drivers and production managers. Other occupations include metal fitters and machinists, wood machinists, other stationary plant operators and truck drivers.

From 2006 to 2016, the proportion of people working as wood processing machine operators increased by 6%, although the number of employees for this occupation decreased slightly. The proportion and number of production managers also increased by 3% (Figure 7).

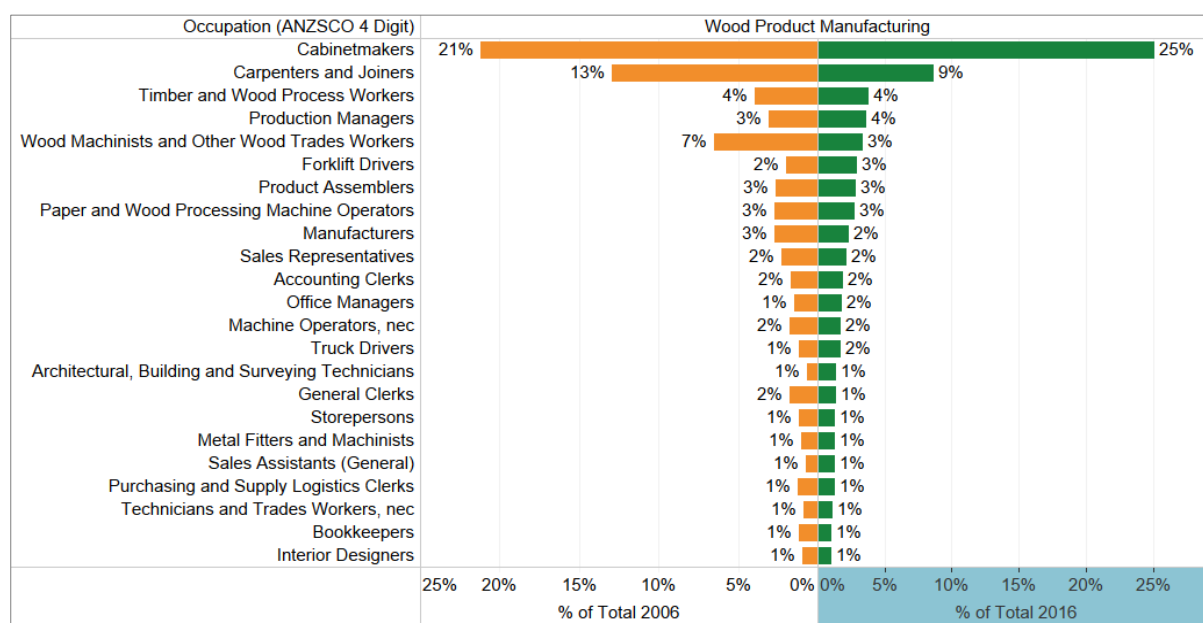
Figure 7: Relative employment by occupations in sawmilling and timber dressing, 2006 and 2016.



Wood product manufacturing

The main occupations of employment in wood product manufacturing are cabinetmakers, carpenters and joiners, representing wooden structural fitting and component manufacturing. Other occupations include timber process workers, production managers, wood machinists, forklift drivers, and product assemblers. From 2006 to 2016, the proportion of cabinetmakers from the total industry sector workforce increased by 6%, although the number decreased considerably. The proportion and number of wood machinists also decreased (Figure 8).

Figure 8: Relative employment by occupations in wood product manufacturing, 2006 and 2016.

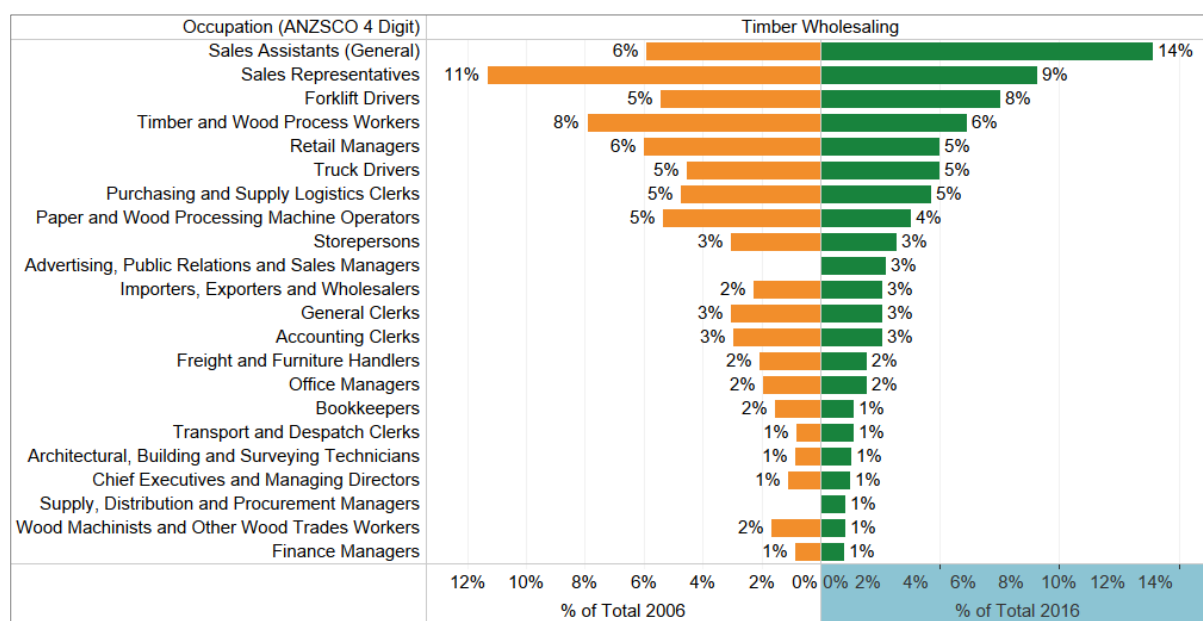


Timber wholesaling

The main occupations of employment in the timber wholesaling sector are sales assistants, sales representatives, forklift drivers, timber and wood process workers, retail managers, truck drivers and purchasing and supply logistics operators. Other occupations include store persons, sales managers, importers, and exporters.

The proportion of people working as sales assistants increased by 8% from 2006 to 2016 and forklift drivers by 3%. Sales representatives and timber process workers decreased both by 2% (Figure 9).

Figure 9: Relative employment by occupations in timber wholesaling, 2006 and 2016.



Employment Outlook

The Department of Employment⁴⁹ estimates that employment in the forest and wood products industry remains relatively stable over the next five years to 2022 (Table 5).

Table 5: Department of Employment Industry Projections, five years to May 2022.⁵⁰

Industry Sub-sector	Employment Level	Employment Projections		
	May 2017 ('000)	May 2022 ('000)	Growth ('000)	(%)
Forestry and logging	7.5	7.2	0.0	-0.5
Forestry support services	3.8	3.8	0.0	0.0
Log sawmilling and timber dressing	8.1	7.6	-0.5	-6.1
Wood product manufacturing	26.9	25.3	1.6	-5.9
Timber and hardware goods wholesaling*	49.1	50.0	0.9	1.9
Total	95.4	93.9	-1.5	2.0

Note: (*) This industry sector includes timber wholesaling, plumbing goods wholesaling, and other hardware goods wholesaling.

⁴⁹ Department's projections are based on the forecasts and projections set out in the Mid-Year Economic and Fiscal Outlook

⁵⁰ Department of Employment, 2016, 'Industry Employment Projections – Five Years to May 2022', <<http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections>>.

Training Update

The level of industry employment and that of nationally accredited training – specific to the industry – have trended together over the last ten years.

The data shows that the industry has developed a strong preference for short, accredited courses over full qualifications in its specialist areas. In 2016, the average enrolments per employee in subjects related to the *FWP Training Package* was 1.09. Note that related industries, such as arboriculture, also import some FWP units of competency.

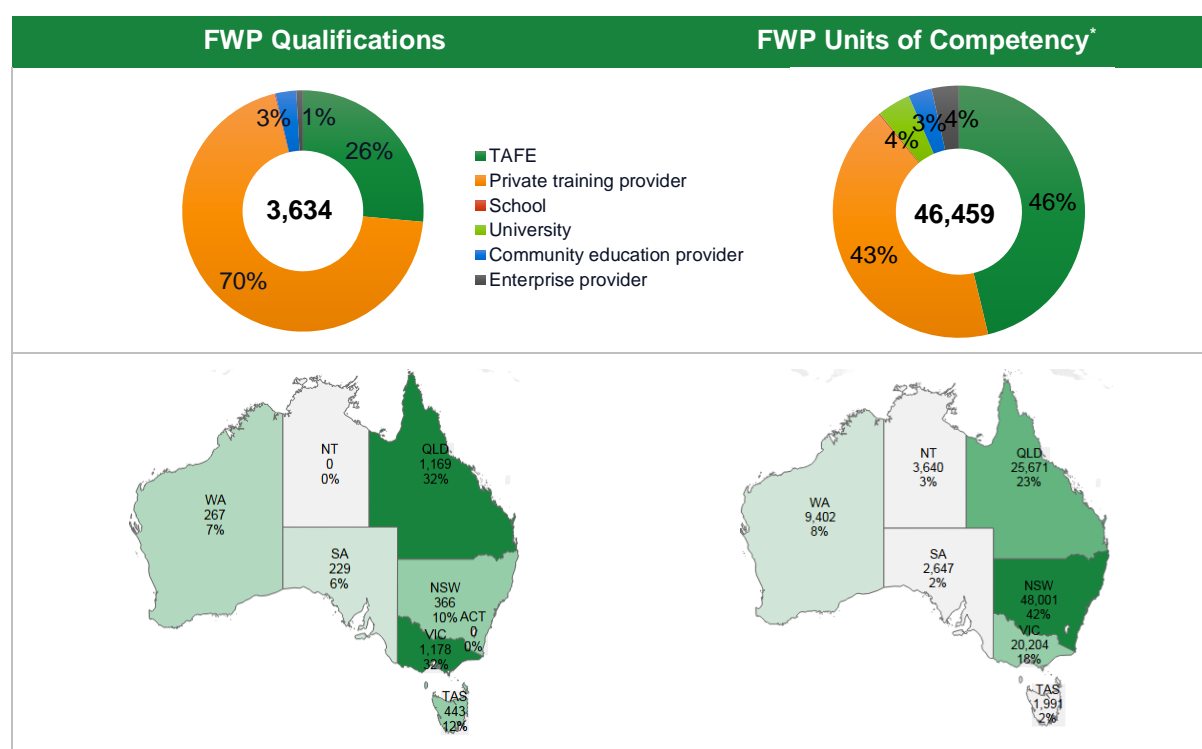
Traditionally, the most formal training has been undertaken in areas related to forest management, harvesting and haulage, and sawmilling and processing because of the high-risk activities performed by workers in these sectors and safety being a primary concern. Accredited skills ensure that businesses have an adequately skilled workforce, which complies with industry codes of practice.

To skill their workforce, businesses also undertake a significant amount of informal or non-accredited training. This training method is often chosen due to a range of factors: a perceived level of difficulty to deal with the VET system, costs of accredited training, the reduction of government-based funding programs for training, views that national competencies do not cover regional needs, and unaffordability to take employees off-the-job for training.

Number of student enrolments

In 2016, there were 3,634 student enrolments in *FWP Training Package* qualifications and 46,459 student enrolments in FWP units of competency. Most students were attracted by private training providers and TAFE organisations in Queensland, Victoria, and New South Wales (Figure 10).⁵¹

Figure 10: Student enrolments in *FWP Training Package* components, 2016.



Note: (*) Including units of competency prefixed 'FPI' (acronym for former versions of the *FWP Training Package*).

⁵¹ Training data in this report is sourced from NCVER VOCSTATS.

Currently, there are 377 registered training organisations (RTOs) with FWP training components on their scope of registration, servicing the Australian forest and wood products industry sector.⁵²

Figure 11, Figure 12 and Figure 13 shows the most and least preferred *FWP Training Package* qualifications during 2015 and 2016, as well as qualifications with no enrolments in 2016.

Figure 11: Top five most-popular *FWP Training Package* qualifications by number of enrolments, 2015–2016.

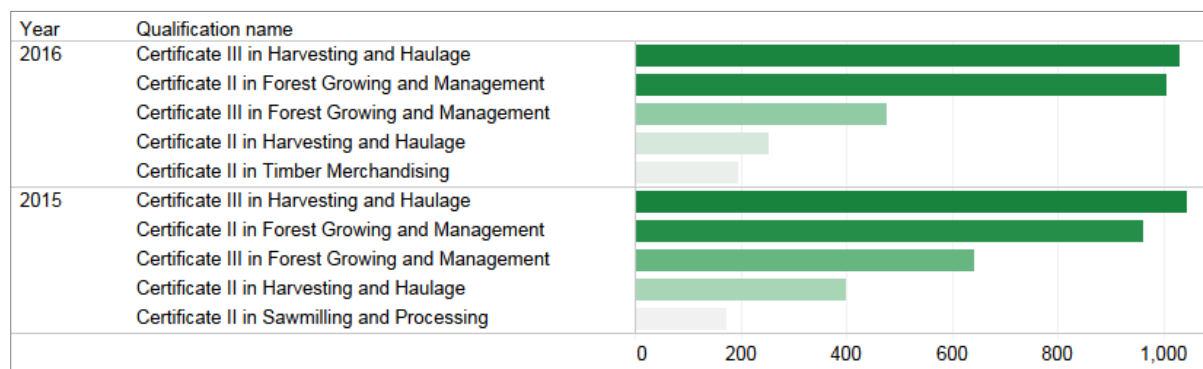


Figure 12: Least-popular *FWP Training Package* qualifications by number of enrolments, 2015–2016.

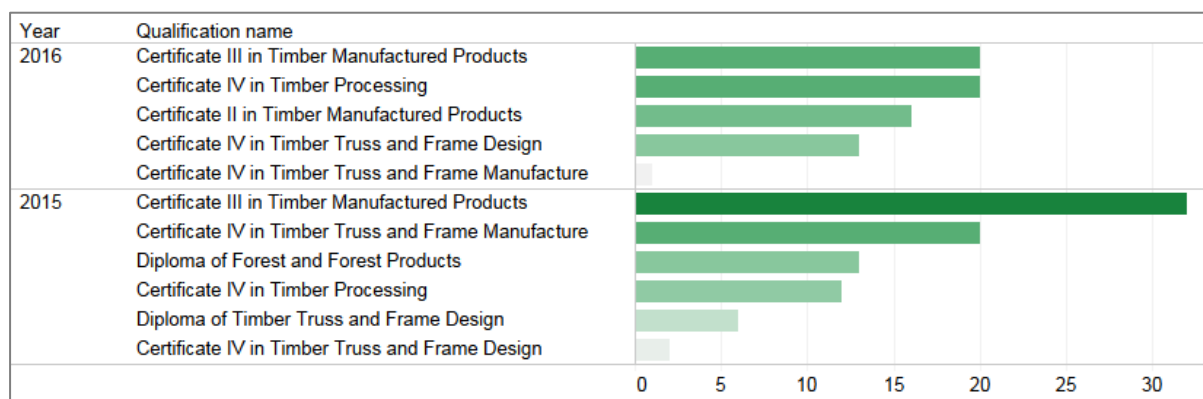


Figure 13: *FWP Training Package* qualifications with no enrolments, 2016.

Year	Qualification Name
2016	Certificate I in Forest and Forest Products
	Certificate II in Wood Panel Products
	Certificate II in Timber Truss and Frame Design and Manufacture
	Certificate III in Wood Panel Products
	Diploma of Timber Truss and Frame Manufacture
	Diploma of Timber Truss and Frame Design
	Advanced Diploma of Forest Industry Sustainability

Qualification enrolments

Total VET enrolments in *FWP Training Package* qualifications grew by 8% (or 271 enrolments) from 2014 to 2015 due to an increase in training activity delivered by private training providers in Queensland. In 2016, total enrolments dropped back to the enrolment level recorded in 2014 (Figure 14 and Figure 15). Total VET activity includes enrolments from all types of providers and combines government-funded, apprentices, VET in Schools, and fee-for-service training from private and other training providers.

⁵² training.gov.au

Apprenticeships and traineeships for trade and non-trade occupations in the forest and wood products industry have declined by 71% (or 645 commencements) from 2010 to 2013 and levelled out at 270 commencements from 2013 to 2016.

Government-funded enrolments for *FWP Training Package* qualifications fell sharply (or by 68%) from 4,016 in 2010 to 1,295 in 2014, and hit a low of 1,122 enrolments in 2015. Enrolments in subsidised training recovered slightly to reach 1,257 in 2016.

VET in Schools activity for *FWP Training Package* qualifications delivered to school students has been traditionally low, levelling out at 37 enrolments (on average) between 2010 and 2016. The VET in Schools figures includes only enrolments through TAFE and state schools operating as RTOs.

Figure 14: Enrolments for *FWP Training Package* qualifications, 2010–2016.

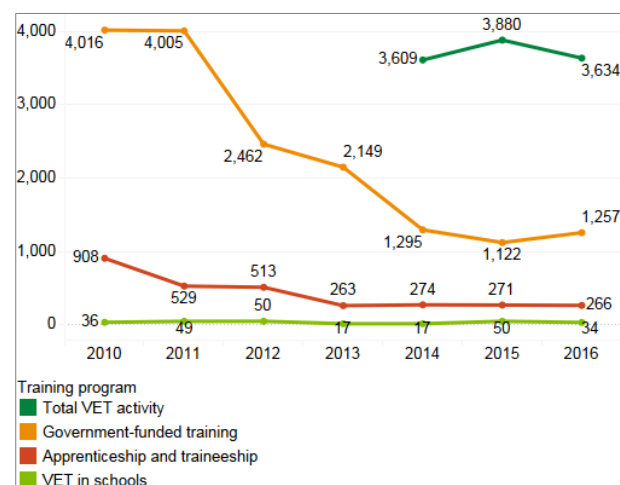
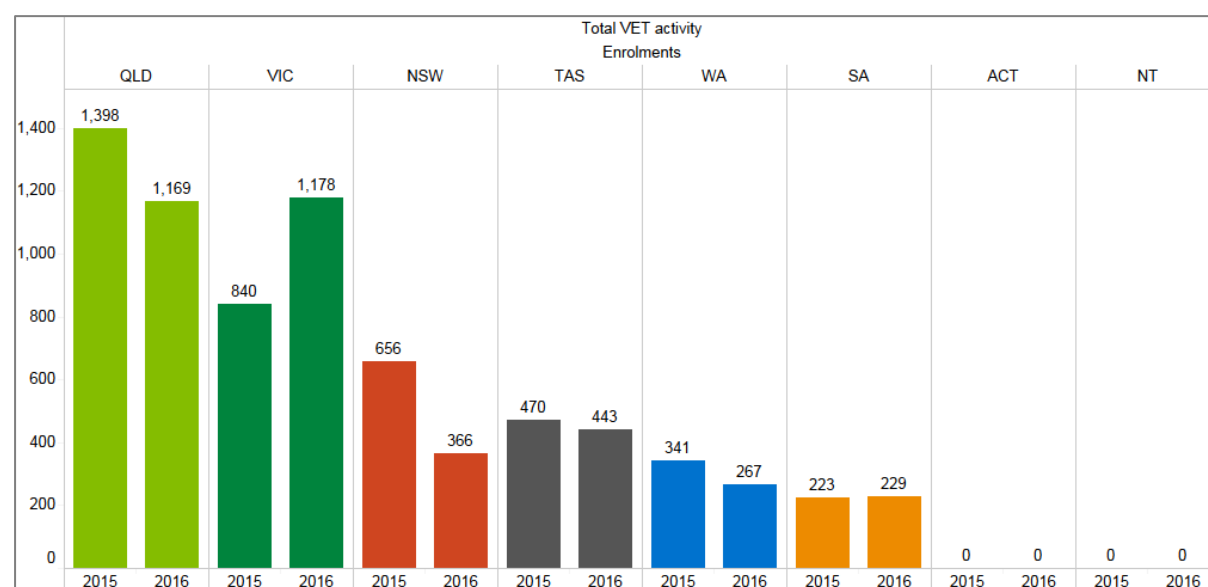


Figure 15: State/territory-level comparison for total VET enrolments in *FWP Training Package* qualifications, 2015–2016.*



Note: (*) State/territory of training organisation. Uncategorised data (reported as 'Not known') for state/territories is not included.

Subject enrolments

Total VET enrolments for FWP subjects increased by 51% (or 15,753 enrolments) from 30,706 in 2014 to 46,459 in 2016 due to an increase in training activity in New South Wales (Figure 16 and Figure 17).

Government-funded enrolments dropped from a relatively stable level of about 21,000 enrolments during 2010–2012 to a low of 13,764 enrolments in 2013. A slight recovery followed this decline of 35% in enrolments during 2013–2015 and grew by 46% to 22,327 enrolments in 2016.

VET in Schools activity for FWP subjects delivered to school students peaked at 659 enrolments in 2015 and dropped back to pre-2015 levels in 2016.

Figure 16: Trends in enrolments for FWP units of competency, 2010–2016.

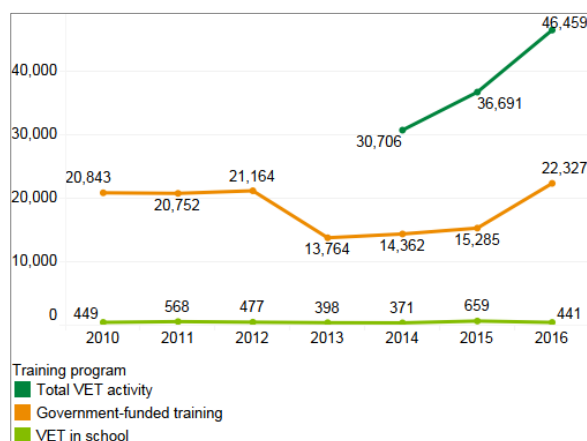
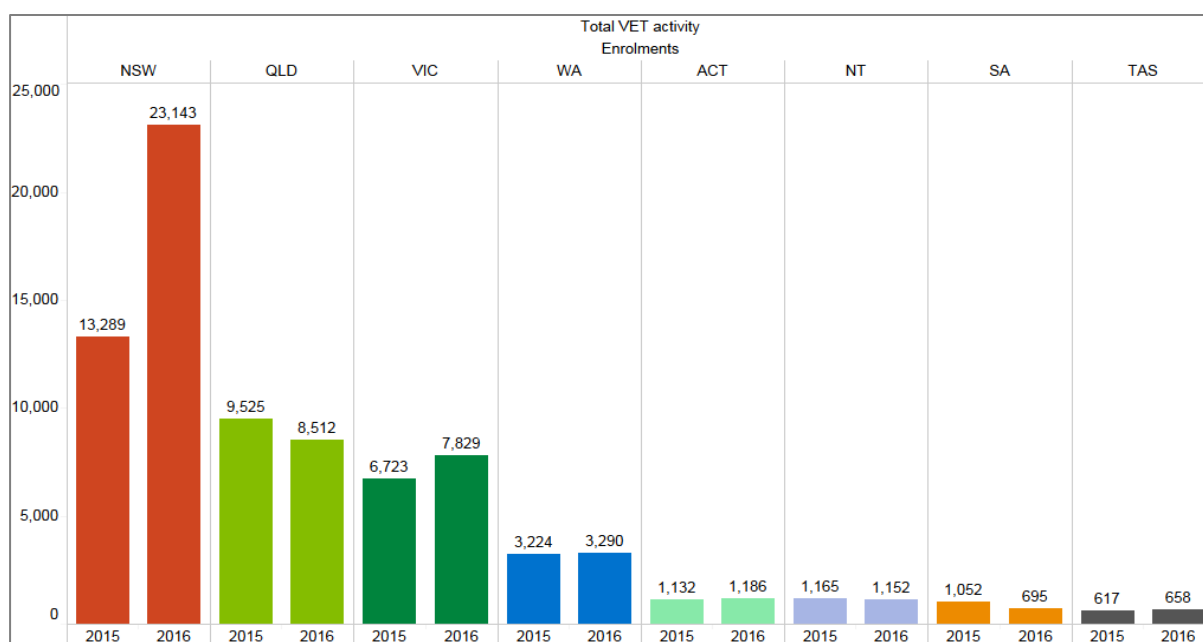


Figure 17: State-level comparison for total VET enrolments in *FWP Training Package* units of competency, 2015–2016.*



Note: (*) State/territory of training organisation. Uncategorised data (reported as 'Not known') for state/territories is not included.

Student profile

Total student cohort enrolled in *FWP Training Package* qualifications was represented by 95% male and 5% female in 2016. The highest proportion of students were in the age groups 30–39 and 40–49 years. There was a small representation of Indigenous students (200). Over two-thirds of students lived in inner- and outer-regional Australia. A small proportion of students (0.17%) resided overseas.

D. SKILLS OUTLOOK

This section identifies the priority skills needs in the forest and wood products industry over the next four years (2018–2021), as established by the IRCs through an analysis of new and estimated future demands placed upon the industry.

The section focuses on the skills needs that can benefit from improvement or development of the national skills standards as opposed to skill shortages (i.e. positions difficult to fill). The latter are normally addressed through other mechanisms, such as industries' workforce strategic plans and governments' market adjustment mechanisms designed to balance the supply and demand for a skilled workforce.

The priority skills proposed for training package development work in this section, and detailed further in Section E (Proposed Schedule of Work) and Attachment A (2018–2019 Project Details), also incorporate a review of training package components that, currently, present major content or training delivering issues for industry stakeholders. Refer to Attachment D for the list of issues related to the current *FWP Training Package* components, as identified by industry stakeholders during 2017 and the beginning of 2018.

Skills shortages identified through industry's regional socioeconomic studies⁵³ include growing demand for workers with specialised skills, such as specialist engineers, scientists and mechanics, and mobile and fixed-plant operators. The industry has also indicated the need for workers with high-level financial, middle management and information and communication technology (ICT) skills. Recruiting skilled managers and professional staff, transport workers, finance managers and heavy machinery operators is also a problematic area for many businesses in the regions.

Industry Priority for Specialist Skills

The 2018–2021 outlook for skills needs and priorities in the forestry and wood products sector is shaped by a range of development trends and factors as outlined below.

Forest Management and Harvesting

Priority Skill 1

New harvesting technologies

Skill Description

This priority covers skills requirements to support a range of key forest harvesting operations and technologies that are essential to the sector and its productivity in the future, including:

- the use of geospatial technologies in forest operations
- programming skills for forest technicians and supervisors to create and manage harvesting optimisation files for single grip harvester
- management of electrical risks related to electrical and hydraulic maintenance of harvesting machines
- application of best practices to minimise environmental footprint of forest harvesting
- machine operation for steep slope terrain harvesting (tethered harvesting and cable logging harvesting)

⁵³ Schirmer, J., Gibbs, D., Mylek, M., Magnusson, A. and Morison, J., 2017, *Socio-economic impacts of the softwood plantation industry in the South West Slopes and Bombala region, NSW*. http://www.crownland.nsw.gov.au/__data/assets/pdf_file/0005/721724/socio-economic-impacts-of-the-softwood-plantation-industry.pdf.

- machine operation for in-field wood chipping
- debarking of logs in the forest.

Relevant Occupations

Harvesting operation managers, forest managers, forest supervisors, forest technicians, harvesting supervisor/team leader, harvesting machine operators, wood chipping operators.

Drivers

Forest harvesting activity is forecast to grow over the next five years due to a growing demand for timber and wood chip production for paper manufacturing worldwide. Forest and harvesting organisations operate in a context where they must secure long-term supply contracts, comply with regulatory requirements while remaining economically viable and producing higher volumes more efficiently to meet the growing demand for logs.

Harnessing new technologies is a continuous process, and a process the industry is using to deal with increasingly stringent regulatory conditions; to maintain a safe workplace; and maintain environmental credentials.

Forest management companies in Australia are investing heavily in drones and in training their staff to become pilots and use the technology operationally for a range of industry-specific applications.

Stakeholder feedback indicates that many errors occur in harvesting due to incorrect programming of the log-cutting instruction files for on-board computers. To address the problem, forestry technicians who write these files need to be upskilled to complete this task correctly.

The ongoing adherence to sustainable forest-management practices and regulations has influenced and changed the skills requirements in the industry.

The demand for harvesting on steep ground is growing as pressure increases to maximise harvest volumes from forests to meet demand. Skills are required to use a newly introduced harvesting system, known as tethered harvesting, to harvest safely, economically and with minimal environmental damage on steep terrain.

Efficient machine operation and management of chip quality have become critical for the wood chipping companies to optimise outcomes from in-field chipping operations. This efficiency is particularly required because Australia competes in an international marketplace to provide chips for paper products.

Effective debarking enhances the value and utilisation of forest products. The industry has indicated the need to develop a new unit for in-field debarking of logs, specific to harvesting task in native forests.

Training Package Solutions

The following training package development work is required to address identified skill needs and gaps in qualifications for the forest and harvesting operations:

- development of a minimum 3 new skill sets for harvesting on steep slope terrain and in-field chipping operations

- development of a minimum of 13 new units of competency at AQF Levels 3 and 4 in harvesting technologies operations
- review of 45 existing units of competency from the *FWP Training Package* related to environmental practices and geospatial data management for forest assessment and tree inventory.

See Attachment A for further details.

Priority Skill 2

Forest management innovation

Skill Description

This priority covers skills requirements to support a range of industry initiatives to improve productivity, expansion and operations of forest estates for timber production, including:

- mechanical forest biomass removal for minimising bushfire risks
- management and safety in farm forests
- specialty timber harvesting and extraction (single tree falling and extraction in isolated areas and use of chainsaw above ground)
- tree breeding knowledge to enable effective communication with genetic engineers.

Relevant Occupations

Forest managers, planners and workers, farm forest managers, nursery technicians and tree orchards managers.

Drivers

Higher-level skills are needed to support the industry innovation driven by the objective of managing forests to best practice in safety and environmental practices while achieving business returns.

Fire management and community protection are a constant concern in rural Australia. Trials have been undertaken to reduce fuel loads through biomass removal rather than the traditional fuel reduction burning around population centres. This practice has been driven by the need to minimise the impact of these activities on the surrounding communities from smoke, dust and fire. The Victorian Black Saturday fires (2009) and earlier Canberra fires (2003) have shown the need for improved community protection through biomass removal as a new practice in rural Australia where forests adjoin townships.

Farmers have diversified their farming activities progressively to include small woodlots. Management of small woodlands or farm forestry has some similarities to larger-scale forests. However, the scale creates a series of issues regarding economics and management practices. Hence, there is an identified gap in skills associated with managing small woodlots and safe practices, which are not addressed in the current training package.

Speciality timbers is a developing niche industry in forestry. Identifying, harvesting and extracting a single tree is an intricate and challenging area. The industry has identified associated skills as a skills need.

Tree breeding is a technical and highly specialised area. The benefits of tree breeding are well acknowledged. However, the skills for understanding, communicating with genetic engineers, and utilising the outputs in forest management is a skills area not currently included in the training package.

Training Package Solutions

Further industry consultation and analysis is required to determine training package components for review and development to address this skill priority.

Priority Skill 3

Roundwood and wood chip export skills at the portside

Skill Description

This priority covers skills requirements to support the growing commercial export operations for roundwood and wood chips at the port side. Specific skills requirements will be determined through industry consultation.

Relevant Occupations

Wood chip sampling operations, operators at the receiver/export facilities, export managers.

Drivers

On a value basis, wood chip and log exports reached record levels in 2015-16, with key exporting markets being China, Japan and Korea.⁵⁴ Tasmanian woodchip exports alone have increased by 76% during the same period⁵⁵. In 2017, Southwood Fibre has launched a proposal for the development of an export facility for wood chips in southern Tasmania.⁵⁶ Also, Port of Portland in Victoria has grown as the single most significant port for hardwood chips being exported in the world⁵⁷, and current exports are sustained and appear set to continue at high levels.

The value of roundwood export reached all-time highs in 2016–2017, representing a 37% increase from the previous year.⁵⁸

Training Package Solutions

Further industry consultation and analysis is required to determine training package components for review and development to address this skill priority.

Timber and Wood Processing

Priority Skill 1

Advances in woodmachining and sawdoctoring

Skill Description

This priority covers skills requirements to assist with the current expectations of wood machinists and sawdoctors as a result of technology changes and

⁵⁴ ABARES, 2016, 'Australian forest and wood products statistics: March and June quarters 2016', <<http://www.agriculture.gov.au/abares/forestsaustralia/australian-forest-and-wood-products-statistics>>.

⁵⁵ Ryan, J., January 2016, 'Forestry industry behind 76pc woodchip export jump, 'not Tasmanian Government, Greens say', ABC News, <<http://www.abc.net.au/news/2016-01-12/tasmanian-woodchip-exports-jump-76pc-in-12-months/7082644>>.

⁵⁶ McIntyre, D., Nov 2017, 'Southwood Fibre's woodchip export proposal 'missing link' for Tasmania's southern forests', ABC News, <<http://www.abc.net.au/news/2017-11-15/proposal-to-export-woodchip-from-southern-tasmania/9152282>>.

⁵⁷ Grindlay, D., August 2015, 'Port of Portland now biggest exporter of blue gum hardwood chips in the world', ABC News, <<http://www.abc.net.au/news/2015-08-18/blue-gum-portland-woodchips-exports-china-japan-forestry/6704158>>.

⁵⁸ ABARES, 2017, Australian forest and wood products statistics, March and June quarters 2017.

businesses operating in the competitive manufacturing environment. Specific skills requirements will be determined through industry consultation.

Relevant Occupations

Wood machinists and sawdoctors.

Drivers

Stakeholder feedback indicated the need for reviewing Certificate III in Woodmachining and Certificate III in Sawdoctoring to adapt these qualifications to the current workplace requirements.

The traditional sawdoctor was based around sharpening saws for use in the industry. Now, with much higher timber product volumes being processed and changes in technology, many saws are cutting faster. The timber product is also being reduced in size and thickness, placing many new demands on sawdoctors.

The sawdoctor's role needs to be reviewed as the technology has changed and with that, the expectations on the role. The trade is now as much focused and involved with machine performance as providing sharp saws to a sawmill, manufacturing plant or building site.

Consideration should also be given to changing the trade name to better match the role and requirements of the trade. It is challenging to attract new people into the trade, and the trade name may be a contributing factor.

A new unit of competency for beam saw operations was also indicated as a priority and for inclusion in this qualification.

Training Package Solution

The following training package development work is required to address identified skill needs and gaps in qualifications for woodmachining and sawdoctoring operations: The project will:

- review and update 2 qualifications: Certificate III in Woodmachining and Certificate III in Sawdoctoring
- review and update 46 units of competency listed on these qualifications.

See Attachment A for further details.

Priority Skill 2

Sawmill timber and process optimisation

Skill Description

This priority covers skills requirements to support productivity and technological developments in the timber sawmilling sector. Skill needs include:

- ability to apply timber sawmilling principles, practices and processes that demonstrate improvement in resource efficiency and productivity
- ability to efficiently operate timber optimisation scanners (including X-ray, CT and 3D laser scanning) and software for log grading and sawing pattern optimisation

- knowledge of the fundamentals of mechanical and computing systems related to timber optimisation equipment and ability to undertake maintenance of this equipment.

Relevant Occupations

Sawmill process controllers, sawdoctors and supervisors.

Drivers

Most sawmill companies have invested heavily in operations to keep up with technical developments, market demands, resource availability and production processes for maximum timber value and volume recovery.

3D, X-Ray and acoustic scanning devices are some of the optimisation technologies employed to assess log rotation, grading of timber, board density and fibre stiffness – which are essential to determining a product's end use. Other examples of optimisation technologies available in the sector include automated transfer systems between different process sequences and computer-assisted machine centres for sawing and re-sawing. The application of these technologies and processes is unique to timber processing.

The industry identified that new and improved units of competency are required to support skills in timber and process optimisation throughout a sawmill production process.

Training Package Solutions

The following training package development work is required to address identified skill needs and gaps in qualifications for the sawmill operations:

- development of a minimum 6 new units of competency at AQF Levels 3 and 4
- review of 11 existing units of competency from the *FWP Training Package* related to log sorting, sawing, dry mill processing and timber treatment.

See Attachment A for further details.

Priority Skill 3

Timber product development and supply chain innovation

Skill Description

This priority is subject to industry consultation achieved during the AISC cross-sector project, 'Supply Chain', and the outcomes of the project. In principle, this priority covers skills requirements to support capabilities for product development in timber processing and to improve performance in product supply chain operations. Specific skills requirements will be determined through industry consultation.

Relevant Occupations

Timber production supervisors and managers, warehousing, distribution, or supply chain operational staff, sales and merchandising officers, supervisors and managers.

Drivers

Higher business targets for efficiency, productivity and competitiveness, require the development of valuable and innovative timber products that

address critical issues such as resource efficiency, transportability, durability and cost, as well as environmental, economic and social factors.

Increased complexity of Australian timber businesses in the marketplace requires the ability to deal with complex supply chains and logistics, including full traceability, enhanced inventory management and warehouse management.

Many timber producers have introduced radio-frequency identification (RFID) technology and other technologies, including computerised scheduling and telematics, to track entire shipments along the supply chain.⁵⁹ The complexity of tracking systems is going to further increase.

Improved skills are driven by these implementations and operation of software and hardware technologies for product transaction processing, supply chain planning and collaboration, order tracking and delivery coordination, and analytics.

Training Package Solution

Further industry consultation and analysis is required to determine training package development components for review and analysis to address this skill priority.

Priority Skill 4

Bioenergy,
co-generation and
biochar

Skill Description

This priority is subject to further industry development. In principle, it covers skills requirements to support emerging bioenergy and biofuel developments, based on forest biomass and other agricultural plant residues. Specific skills requirements will be determined through industry consultation.

Relevant Occupations

Bioenergy or biomass plant operator, technicians and managers.

Drivers

The efficient use of forest/wood residues for the generation of heat and electricity is an opportunity for Australia. Co-generation is increasingly used in the industry to produce steam for the mill (heat boilers) to operate kilns. The steam is also used to generate electricity. Co-generation increases the efficiency of a mill by reducing the consumption of electricity from the grid. Co-generation of heat offers opportunities to reduce other impacts, such as waste disposal costs.

Industry assistance provided through State government funding for bioenergy, including \$1.25 million from the Tasmanian 2016–2017 state budget towards Wood and Fibre Processing Innovation Program for the utilisation of forest harvesting, timber processing residues and agricultural plant residues to create value-added products. In 2016, the industry in

⁵⁹ Munro, T., August 2014, 'Tracking timber in the supply chain — Part 2', Matthews Intelligent Identification, <<http://blog.matthews.com.au/tracking-timber-through-the-supply-chain-part-2>>.

Tasmania announced more than ten 10 new investment projects with local government funding support in areas such as bioenergy and biofuel.⁶⁰

Biochar is a solution for both mitigation and adaptation strategies to climate change. Biochar can offer a range of environmental services, such as reclamation of degraded land, improvement of soil fertility and carbon sequestration.

Training Package Solution

Further industry consultation and analysis is required to determine training package development components for review and analysis to address this skill priority.

Timber Building Solutions

Priority Skill 1

Timber truss and frame estimating and design

Skill Description

This priority covers skills requirements to assist with the high demand of estimating and design capabilities in the timber truss and frame industry. Skill needs include improved understanding of house construction to enable estimators/detailers to design and calculate quantities of timber for fabrication orders.

There is a need for skills and improved abilities to:

- Read building plans (computer-assisted designs, sketches and drawings) to prepare detailed truss and frame drawings. This working area requires a better understanding of information in building plans, the terminology used and applications, and limitations of truss and frame components in a building in different geographical or weather conditions. It also requires knowledge of timber species, characteristics and grading systems, as well as knowledge of other hardware components used in pre-fabrication. Further, estimators and designers are required to demonstrate the ability to use and reference relevant standards and codes for different components within a building, understand the implications of truss and frame design and manufacture on other trades, and materials used in a building and understand installation requirements for roof trusses to meet the required Australian Standard (AS4440-2004).
- Calculate material quantities and prepare quotes. This job requires a greater knowledge of applied mathematics to conduct accurate and detailed measurement of materials needed to complete a frame and truss order.
- Communicate and negotiate with customers, suppliers, and colleagues.

Relevant Occupations

Timber truss and frame estimators or detailers.

⁶⁰ Tasmania Government, Department of State Growth, 2016, 'Wood and Fibre Processing Innovation Program', <http://www.stategrowth.tas.gov.au/forestry/wood_and_fibre_processing_innovation_program_2016>.

Drivers

Most of the frame and truss design and estimation jobs are currently undertaken overseas by trained professionals. As a result, the Australian frame and truss manufacturing industry are losing essential skills that are needed and can be sourced locally. Businesses need people on-site able to do these tasks.

Existing units of competency and qualifications do not accurately reflect the industry job roles for estimators/detailers and training requirements. There has been no significant review of the frame and truss qualifications over the past seven years.

The definition of outcomes within existing units is seen as insufficient to support the quality outcomes required by industry. Also, the industry identified that the structure of the existing qualifications represents a barrier to training uptake due to a high number of pre-requisite units.

The industry also proposes the development of skill sets will facilitate a better career path for the frame and truss designers.

Training Package Solutions

The following training package development work is required to address identified skill needs and gaps in qualifications for the timber truss and frame design and estimating operations:

- review of 3 qualifications and 39 units of competency to update specific skills and aspects of current timber truss and frame design practices, as determined through industry consultation, and remove of all pre-requisite requirements from the Certificate IV in Timber Truss and Frame Design.
- development of at least 2 skill sets

See Attachment A for further details.

Priority Skill 2

Advanced sales, marketing and customer service

Skill Description

This priority is subject to industry consultation achieved during the AISC cross-sector project, 'Consumer Engagement through Social Media', and the outcomes of the project. This priority covers skills requirements to support implementation and ongoing management of online portals and systems for improved sales, marketing and customer service in the timber manufacturing industry. Specific skills requirements will be determined through industry consultation.

Relevant Occupations

Managers, supervisors, sales personnel, marketing personnel, customer service personnel.

Drivers

Increased demand for Australia's quality timber products from the Asian markets, as well as domestic markets, which involves higher interaction with global supply chains and stronger online presence of businesses to sell and promote products.

In addition, growing adoption of digital technology to support sales and exposure to new and emerging markets both domestically and internationally.

Training Package Solutions

Further industry consultation and analysis is required to determine training package development components for review and analysis to address this skill priority.

Industry Priority for Generic Skills

Industry Reference Committees were consulted on ranking the generic skills priorities for the industry from a list provided by the Department of Education and Training. Table 6 outlines the advice received.

Table 6: Industry generic skills ranking by priority.

Rank	Generic Skill
1	Technology use and application skills Ability to create and/or use of technical means understand their interrelation with life, society, and the environment. Ability to understand and apply scientific or industrial processes, inventions, methods, etc. Ability to deal with increasing mechanisation and automation and computerisation. Ability to do work from mobile devices rather than from paper.
2	Environmental and Sustainability skills Ability to focus on problem-solving and the development of applied solutions to environmental issues and resource pressures at local, national and international levels.
3	Language, Literacy and Numeracy (LLN) skills Foundation skills of literacy and numeracy.
4	Design mindset/Thinking critically/Systems thinking/Problem-solving skills Ability to adapt products to rapidly shifting consumer tastes and trends. Ability to determine the deeper meaning or significance of what is being expressed via technology. Ability to understand how things that are regarded as systems influence one another within a complete entity, or larger system. Ability to think holistically.
5	Communication/Collaboration including virtual collaboration/Social intelligence skills Ability to understand and apply the principles of creating more value for customers with fewer resources (lean manufacturing) and collaborative skills. Ability to critically assess and develop content that uses new media forms and leverage these media for persuasive communications. Ability to connect with others deeply and directly, to sense and stimulate reactions and desired interactions.
6	Science, Technology, Engineering and Maths (STEM) skills Sciences, mathematics and scientific literacy.
7	Learning agility/Information literacy/Intellectual autonomy and self-management skills Ability to identify a need for information. Ability to identify, locate, evaluate, and effectively use and cite the information. Ability to discriminate and filter information for importance. Ability to do more with less. Ability to quickly develop a working knowledge of new systems to fulfil the expectations of a job. Ability to work without direct leadership and independently.
8	Managerial/Leadership skills Ability to effectively communicate with all functional areas of the organisation. Ability to represent and develop tasks and work processes for desired outcomes. Ability to oversee processes, guide initiatives and steer employees toward achievement of goals.
9	Data analysis skills Ability to translate vast amounts of data into abstract concepts and understand data-based reasoning. Ability to use data effectively to improve programs, processes and business outcomes.

Rank	Generic Skill
	Ability to work with large amounts of data: facts, figures, number crunching, analysing results.
10	Customer service/Marketing skills Ability to interact with another human being, whether helping them find, choose or buy something. Ability to supply customers' wants and needs both via face-to-face interactions or digital technology. Ability to manage online sales and marketing. Ability to understand and manage digital products.
11	Financial skills Ability to understand and apply core financial literacy concepts and metrics, streamlining processes such as budgeting, forecasting, and reporting, and stepping up compliance. Ability to manage costs and resources, and drive efficiency.
12	Entrepreneurial skills Ability to take any idea, whether it be a product and service, and turn that concept into reality and not only bring it to market but make it a viable product and/or service. Ability to focus on the very next step to get closer to the ultimate goal. Ability to weather the ups and downs of any business. Ability to sell ideas, products or services to customers, investors or employees etc.
13	Other generic skills

E. PROPOSED SCHEDULE OF WORK

Forest Management and Harvesting IRC

Year	Project Title and Description
2018–2019	<p>New harvesting technologies</p> <p>This project will review and develop new units of competency for the forest management and harvesting operators to provide the industry with a mechanism for gaining efficiency and environmental benefits from new and existing technologies. The outcomes will ensure access to occupation standards that support the industry's future economic activity and environmental and safety profile, through the necessary skills and knowledge for using forest and harvesting technologies efficiently and safely.</p> <p>The project will develop a minimum of 3 new skill sets for harvesting on steep slope terrain and in-field chipping operations and 13 new units of competency at AQF Levels 3 and 4 in harvesting technologies operations. It will also review 45 existing units of competency from the <i>FWP Training Package</i> related to environmental practices and geospatial data management for forest assessment and tree inventory.</p> <p><i>See Attachment A for further detail.</i></p>
2019–2020	<p>Forest management innovation</p> <p>This project covers skills requirements to support a range of industry initiatives to improve productivity, expansion and operations of forest estates for timber production.</p>
2020–2021	<p>Roundwood and wood chip export skills at the portside</p> <p>This priority covers skills requirements to support the growing commercial export operations for roundwood and wood chips at the portside.</p>

Timber and Wood Processing IRC

Year	Project Title and Description
2018–2019	<p>Advances in woodmachining and sawdoctoring</p> <p>This project covers skills requirements to assist with the current expectations of wood machinists and sawdoctors as a result of technology changes and businesses operating in the competitive manufacturing environment.</p> <p>The project will review 2 qualifications, Certificate III in Woodmachining and Certificate III in Sawdoctoring, and 46 units of competency listed for these qualifications.</p> <p><i>See Attachment A for further detail.</i></p>
2018–2019	<p>Sawmill timber and process optimisation</p> <p>This project will improve and develop new units of competency to address skills requirements for timber and process optimisation within sawmills. Job roles intended</p>

	<p>to benefit from this training package development work include sawmill process controllers, sawdoctors and supervisors.</p> <p>The project will develop a minimum of 6 new units of competency at AQF Levels 3 and 4 in operating timber optimisation technology; and processes and review 11 existing units of competency from the <i>FWP Training Package</i>, to improve requirements in line with the current sawmill timber and process optimisation practices.</p> <p>See Attachment A for further detail.</p>
2019–2020	<p>Timber product development and supply chain innovation</p> <p>This project is subject to industry consultation achieved during the AISC cross-sector project, 'Supply Chain', and the outcomes of the project. In principle, the proposed project aims to cover skills requirements to support capabilities for product development in timber processing and improve performance in product supply chain operations.</p>
2020–2021	<p>Bioenergy, co-generation and biochar</p> <p>This project is subject to further industry developments. In principle, it aims to cover skills requirements to support emerging bioenergy and biofuel developments based on forest biomass and other agricultural plant residues.</p>

Timber Building Solutions IRC

Year	Project Title and Description
2018–2019	<p>Timber truss and frame estimating and design</p> <p>This priority covers skills requirements to assist with the high demand for estimating and design capabilities in the timber truss and frame industry.</p> <p>The project will review 3 frame and truss qualifications at AQF Levels 2, 3 and 4, and 39 units of competency from these qualifications. The project will also develop of at least 2 skill sets and remove all the pre-requisite requirements from the Certificate IV in Timber Truss and Frame Design.</p> <p>See Attachment A for further detail.</p>
2019–2020	<p>Advanced sales, marketing and customer service skills</p> <p>This project is subject to industry consultations achieved during the AISC cross-sector project, 'Consumer Engagement through Social Media', and the outcomes of the project. In principle, the proposed project aims to cover skills requirements to support implementation and ongoing management of online portals and systems for improved sales, marketing and customer service in the timber manufacturing industry.</p>
2020–2021	No project has been identified for 2020–2021.

Time-critical projects

No time critical projects were identified for *the TWP Timber and Wood Products Manufacturing Training Package* in the Proposed Schedule of Work.

The criteria to outline time-critical projects include workplace safety issues, regulatory needs, and qualifications under VET Student Loans courses that can benefit from improvement or development of national skills standards.

Interdependencies

No training packages or IRCs interdependencies were identified for the projects listed in the Proposed Schedule of Work.

F. CURRENT AND COMPLETED PROJECTS

Current Projects

The industry is currently undertaking the following two projects that emerged from the *2017 Skills Forecast and Proposed Schedule of Work*:

- CLT and Glulam Manufacturing
- Pre-fabricated Building Systems.

These projects are expected to be completed by June 2018. Refer to Attachment B – Current IRC Projects for the list of units that are currently under development and review.

Two additional projects from the *2017 Skills Forecast and Proposed Schedule of Work* are undergoing a Case for Change study to provide further information and support the AISC's decision to fund them. These projects are:

- Safety culture and critical risk management in forestry operations
- Safe loading and unloading of timber frame and trusses.

Completed Projects

In October 2017, the industry completed the following project from the *2016 Skills Forecast and Proposed Schedule of Work*:

- Forest Harvesting Optimisation.

Refer to Attachment C – Completed IRC Projects for the list of units that were developed and reviewed.

G. IRC SIGN-OFF

This IRC Skills Forecast and Proposed Schedule of Work was agreed as the result of a properly constituted IRC decision.

Signed for and on behalf of the **Forest Management and Harvesting IRC** by its appointed Chair,

Stacey Gardener

(Name of Chair)



Signature of Chair

Date: 28 April 2018

Signed for and on behalf of the Timber and Wood Processing IRC by its appointed Chair

Dave Gover

(Name of Chair)



Signature of Chair

Date: 28 April 2018

Signed for and on behalf of the Timber Building Solutions IRC by its appointed Chair,

Dave Gover

(Name of Chair)



Signature of Chair

Date: 28 April 2018

ATTACHMENT A

2018–2019 Project Details

Relevant training package: *FWP Forest and Wood Products Training Package*

Contact details: Skills Impact Ltd, 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: 28 April 2018

FOREST MANAGEMENT AND HARVESTING IRC

Project Title

New Harvesting Technologies

Description

This project will review and develop new units of competency for the forest management and harvesting operators to provide the industry with a mechanism for gaining efficiency and environmental benefits from new and existing technologies. The outcomes will ensure access to occupation standards that support the industry's future economic activity and environmental and safety profile, through the necessary skills and knowledge for using forest and harvesting technologies efficiently and safely.

The project will develop a minimum of 3 new skill sets for harvesting on steep slope terrain and in-field chipping operations and up to 13 new units of competency at AQF Levels 3 and 4 in harvesting technologies operations. It will also review 45 existing units of competency from the *FWP Training Package* related to environmental practices, geospatial data management for forest assessment and tree inventory, and forestry operations. The full list of training package components is available in the last section, Scope of Project.

Rationale

Forest harvesting activity is forecast to grow over the next five years as harvested logs are used across a range of construction markets, due to growing demand worldwide for timber and wood chip production for paper manufacturing.

Forest and harvesting organisations are under constant pressure to improve their technical efficiency, demonstrate best forest management and environmental practices, and reduce operational costs. They must compete and perform in a context where companies must secure long-term supply contracts and comply with regulatory requirements while remaining economically viable and producing higher volumes more efficiently to meet the growing demand for logs.

Harnessing new technologies is a continuous process, and a process the industry is using to deal with increasingly stringent regulatory conditions; to maintain a safe workplace; and maintain environmental credentials.

New and improved skills are required in a series of areas that support recent industry developments and its future activity as follows.

Geospatial technologies for forest operations

Forest management companies in Australia are investing heavily in drones and in training their staff to become pilots and use the technology operationally. Forestry Corporation of NSW has currently 15

pilots based in ten offices across NSW who routinely use drones to maintain a high level of accuracy and quality control within their daily harvesting and restoration operations. Likewise, forestry enterprises in Tasmania have licensed employees to pilot drones.

The industry uses *AVI30316 Certificate III in Aviation (Remote Pilot - Visual Line of Sight)* to operate a drone within the Civil Aviation Safety Regulations.

However, in forestry, many benefits are derived from remote sensing methods (such as Lidar), drones carrying remote sensing technologies, and the acquisition and analysis of remotely sensed data for forest mapping. Observation and data collection of forestry operations and capacity to access difficult areas via drones provides opportunity to improve efficiency and quality of forest management and harvesting operations. Data collection in this way offers a window into the forest and forest activities in a quick and cost-effective manner, opening up opportunity to build knowledge and capacity and therefore improve practices and efficiencies.

The areas where drones may be used to access information include, but are not limited to, safe behavioural observations for tree fallers, koala monitoring, wind-throw assessments, survival surveys, land evaluation assessments, post-log surveys (boundary and photo interpretation), special species management, wildfire and hotspots (thermal cameras), post-thinning and post-fertiliser reviews, pest monitoring, re-generation, seed collection and waste assessments, and fire fuel load evaluation. Remote sensing methods are also used for tree metrics, digital evaluation methods, determination of surface features for safety, data transfer from harvester and forwarder or metrics on machine performance. These applications require a range of specific skills and up to 6 new units of competency in the *FWP Training Package*, including the following:

- select and apply geospatial software for forest and conservation management (Select Mission Planning Apps, image processing software and GIS system to process and analyse spatial data)
- undertake sampling of forests and collect geospatial data for forest and conservation management (includes type of drone and camera, GPS, laser scans and accuracy)
- design and perform analysis of geospatial data using spatial analysis techniques for forest and conservation management
- use geospatial data techniques to model forest resources, tree/forest health climate and soil conditions, species habitat and distribution
- prepare, present and apply geospatial data to forest and conservation planning.

Six relevant units of competency were identified in the *FWP Training Package* and are proposed for review.

Programming harvesting optimisation files

Many industry stakeholders have been actively involved in the development of two new units of competency in a previous project, which supports the efficient operation of harvesting machines equipped with on-board computers. During this project, they identified that the efficiency of these machines and operations also depends on the upstream activities conducted by forestry technicians in forest management organisations to program the log cutting instruction files correctly for the on-board computers.

Stakeholder feedback indicated that many errors occur at the development stage of the computer files and, to address the problem, forestry technicians who write on-board computer files need to be upskilled to do this task correctly.

Programming of harvesting optimisation files involves IT skills and industry-specific knowledge. The industry proposes that some units of competency from the *ICT Information and Communications Technology Training Package* are analysed and considered for adoption into the *FWP Forest and Wood*

Products Training Package and/or adaption to match industry-specific requirements and enable this skill development.

Management of electrical risks

Forest harvesting operations involve machines that carry high voltage and expose operators to electrical risks.

Best practices to minimise environmental footprint of forest harvesting

The environmental benefits of forest protection, such as protecting soil and safeguarding biodiversity, have become increasingly important to the industry. Continuous improvement in forest management practices has resulted from ongoing environmental pressures.

Forest harvesting operations are currently subject to many industry codes of practice designed to protect wildlife, water, soil, landscape quality and environmental impact assessment requirements under the federal *Environment Protection and Biodiversity Conservation Act 1999*.

Forest risk management, covering forest health and biosecurity, fire risk and salvage operations is an area of continuous improvement and high priority for the industry, which requires a review and improvement of existing training components.

Also, environmental certification against standards of the Responsible Wood Certification Scheme and the Forest Stewardship Council Scheme (FSC) is being implemented industry-wide as a result of market demand. Environmental certification requires yearly audits to ensure continued compliance with best practices for increasing sustainable forest management and logging operations.

The industry also recognises that the tyre pressure of heavy vehicles, especially logging trucks, impacts on road infrastructure and operators are responsible for using the manufacturer's recommended tyre pressure. Incorrect tyre pressure has the capacity to cause damage to logging, dirt gravel tracks and roads. It can increase the likelihood of the vehicle being bogged and/or losing control under braking or turning situations.

The ongoing adherence to sustainable forest-management practices and regulations has influenced and changed the skills requirements in the industry. Relevant units will be also reviewed and improved to include skills provisions about silvicultural systems, roads, landings and skid trails in the area of developing pre-harvesting plans and erosion control techniques to planned skid trails (i.e. log cording, matting, breach and barr tracks) to minimise environmental impact.

To meet the current level of skills requirements, the industry has identified the need to review and update 25 units of competency from the forest management and harvesting qualifications that provide for environmental planning and protection in forestry operations.

Systems for harvesting on steep slope terrain

The demand for harvesting on steep ground is growing as pressure to maximise harvest volumes from forests increases to meet demand. This harvesting technique is particularly needed in Tasmania and Gippsland (Victoria), parts of New South Wales and Queensland.

The industry is currently using yarding, cable logging techniques and a newly introduced harvesting system, known as tethered harvesting, to harvest safely, economically and with minimal environmental damage on steep terrain.

Tethered harvesting is a winch-assisted technology that extends mechanisation on steep slopes through the integration with harvesters or forwarders. This technology facilitates production of cut-to-length logs, minimises soil disturbance and improves operators' safety.

Harvesting in steep and often remote terrain is a difficult operation, which can present many risks. Thus, these operations require experienced and highly skilled workers.

Stakeholders have reported that a skills need and gap in the training package also relates to chainsaw operations for conducting pruning, seed collection and dismantling trees above ground.

The industry has indicated that a new unit of competency is required to address the training package gaps for tethered harvesting operations. Also, two new skill sets will support an emerging need for skilled operators in forest harvesting on steep terrain (yarding/cable logging and tethering techniques).

In-field wood-chipping operations

The demand for wood chips has increased over recent years and is predicted to continue to grow. As a result, efficient machine operation and management of chip quality have become critical for wood-chipping companies to optimise outcomes from in-field chipping operations. Australia competes in an international marketplace to provide chips for paper products, and quality control is critical to establishing and maintaining market share.

In-field wood chipping systems are used as an alternative to major static chipping facilities to produce pulpwood quality chips from *Eucalyptus globulus* (blue gum). In-field wood chipping is part of harvesting operations and involves a range of mobile processing machines such as chain flail debarkers and heavy production flail and chipper combination.

The *FWP Training Package* does not currently contain units of competencies for operating mobile wood chip processing machines. The industry has indicated the need for three new units of competency and one skill set to cover the operation of a flail debarker, heavy production flail and chipper combination, and excavator with log grapples for feeding logs into the mobile chipper.

In field debarking of logs

Several million tonnes of sawlog and pulp products are currently debarked in native forests in Australia annually. Effective debarking enhances the value and utilisation of forest products.

The FWP training package currently provides for mechanical debarking of logs in processing plants. The process of log debarking at the processing plant or forest area is different as it involves various techniques and technologies.

The industry has indicated the need to develop one new unit for in-field debarking of logs, specific to harvesting tasks in native forests. It is essential to focus the unit on the task rather than the specific machine, as debarking of logs at a landing or coupe may be undertaken by a variety of equipment types.

Tree felling and chainsaw operation

Through 2017-2018, industry stakeholders identified a number of issues regarding the content and 9 units of competency for tree felling and chainsaw operation. Stakeholders also indicated that a new unit of competency is needed to address gaps within the training package for chainsaw operations above ground (refer to Attachment D).

The IRC recognises synergies between the forestry sector and arboriculture, urban forestry and utility vegetation maintenance services regarding the use of tree felling and chainsaw operation units. Accordingly, the project will conduct consultations across all related industry sectors when these units are reviewed or developed.

The tree felling and chainsaw operation units are listed in a next section, namely Scope of Project, together with all other training package components within the scope of this project.

Addressing the Minister's Priorities

Priority: Obsolete qualifications removed from the system

Preliminary analysis conducted for this project has not identified obsolete training package components that could potentially be removed from the system.

Priority: More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices

As part of the project, the Forest Management and Harvesting IRC will also seek to identify industry's expectations of training delivery and information will be presented in the *FWP Training Package Companion Volume and Implementation Guide* for training providers to improve their delivery.

Priority: The training system better supports individuals to move more easily between related occupations

The project will consider the review of units of competency that are native to other training packages for their potential adoption into forest management and harvesting qualifications. If, through consultation, these units are considered appropriate for the industry needs, the project will be able to address to some extent this priority for efficiency in the training packages and portability of skills when individuals move between related occupations.

Priority: Improved efficiency of the training system through units that can be owned and used by multiple industry sectors

Preliminary analysis indicates that other industry sectors may not use the new training package components proposed for developed. They are highly specialised for the forest management and harvesting operations.

Priority: Foster greater recognition of skill sets

The industry has a growing interest in flexible training options, including the provision of specific skill sets rather than completion of a full qualification. As described in this proposal, the industry has advised on the development and use of new skills sets.

Consultation Plan

The Forest Management and Harvesting IRC has proposed and agreed on the following project consultation plan.

- Several Technical Advisory Committees (TACs) will be established for providing technical expertise and guidance to the sub-projects during the development stage. Subject matter experts and companies proposed to be part of the TACs are provided in the list below.
- Project updates on the Skills Impact's project webpage, news alerts and industry newsletters.
- Two sessions of broad industry consultation on the draft and final draft units and skill sets via online surveys.
- Project updates and input sessions during relevant industry events.

Proposed composition of the Technical Advisory Committees

Expert Name	Organisation	State/Region
Greg Hickey	Sustainable Timbers Tasmania	TAS
Nick Roberts/Bernadette Cavanagh	FC NSW	NSW
Emma-Kate Griffiths/Adam Bowe	OFO	SA
Andy McDonald	Timberlands Pacific	SA, VIC, TAS
Robin Austen	FPC WA	WA
Malcolm Hatcher	Midway Ltd	VIC, NSW, NT
Daniel Pfunder	HQP	Qld
Aden Taylor	GMT Logging	Qld
Wayne Shaw Johnson	Harvestco	SA, VIC

Stacey Gardiner	AFCA	National
Chris Lafferty	FWPA	National
TBC	University of Tasmania	TAS
Craig Hallam	Arboriculture Australia	VIC

Scope of the Project

The project is expected to start in 2018–2019 and be completed within 12 months from its approval. Based on previous experience, the project should allow sufficient time for engaging industry stakeholders with the project. This process is often lengthy and laborious, and the project outcomes depend on industry participation.

Skill sets to be developed (3) for the *FWP Training Package*:

- **Systems for harvesting on steep slope terrain**
FWPXXXXX Skill set for cable logging (based on existing units) **(New)**
FWPXXXXX Skill set for tethered harvesting **(New)**

- **In-field wood chipping operations**
FWPXXXXX Skill set for in-field wood chipping operations **(New)**

Units of competency to be developed (13) and reviewed (45) from the *FWP Training Package*:

- **Geospatial technologies for forest operations**
FWPXXXXXXXX Select and apply geospatial software for forest and conservation management **(New)**
FWPXXXXXXXX Collect geospatial data in the field for forest and conservation management **(New)**
FWPXXXXXXXX Design and perform analysis of geospatial data using spatial analysis techniques for forest and conservation management **(New)**
FWPXXXXXXXX Use geospatial data techniques to model forest resources, climate and soil conditions, species habitat and distribution **(New)**
FWPXXXXXXXX Prepare, present and apply geospatial data to forest and conservation planning **(New)**
FWPFGM4209 Interpret and use aerial photographs for forest management
FWPFGM5219 Undertake carbon stock sampling of forests and plantations
FWPFGM4207 Conduct a forest site assessment
FWPFGM5202 Manage forestry information and interpretations programs
FWPFGM6207 Develop forest management systems and processes
FWPFGM6203 Manage sustainable tree inventory
- **Programming harvesting optimisation files**
Potentially 1 or 2 new units of competency for the *FWP Training Package*.
- **Best practice to minimise environmental footprint**
Sustainability:
FWPCOT3256 Apply biodiversity protection principles

FWPCOT3254 Implement environmentally sustainable work practices in the work area/work site

FWPCOT3258- Comply with soil and water protection

FWPCOT4208 Implement workplace sustainability practices

FWPCOT5201 Implement sustainable forestry practices

FWPCOT5206 Implement forestry chain of custody certification system

FWPCOT5207 Implement sustainability in the workplace

FWPCOR6201 Manage sustainability in the workplace

FWPCOT6202 Develop and manage a forestry chain of custody certifications process

Harvesting plans:

FWPFGM3209 Construct and maintain forest roads and tracks

FWPCOT3221 Rehabilitate tracks, quarries and landings

FWPHAR4203 Design log landings and snig tracks

FWPHAR4205 Implement harvesting plans

FWPHAR5201 Design harvesting plans

FWPFGM5208 Manage road construction and maintenance

FWPCOT5209 Manage tree harvesting to minimise environmental impact

FWPFGM5214 Develop a native forest regeneration plan

Forest risk management:

FWPFGM2210- Implement animal pest control proceduresFWPCOT5205 Develop biohazard contingency plans

FWPCOR2204 Follow fire prevention procedures

FWPCOR3203 Evaluate fire potential and prevention

FWPCOT3252 Use environmental care procedures to undertake fire salvage operations

FWPHAR4204 Plan and coordinate fire salvage operations

Tyre pressure:

FWPCOT3261 Transport forestry logs using trucks

FWPCOT3262 Transport forestry produce using trucks

- **Systems for harvesting on steep slope terrain**

FWPXXXXXXX Operate tethered harvesting system **(New)**

- **Cable logging**

FWPHAR2203- Hook up felled logs using cables (choker)

FWPHAR2204- Perform landing duties (chaser)

FWPHAR3201- Monitor log recovery (rigging slinger)

- **In-field wood chipping operations**

FWPXXXXXXX Operate excavator with log grapples for feeding logs into mobile chipper **(New)**

FWPXXXXXXX Operate a heavy production flail and chipper combination **(New)**

FWPXXXXXXX Operate a flail debarker **(New)**

FWPHAR2206- Operate a mobile chipper/mulcher

- FWP HAR3215- Operate a heavy production mobile chipper **In-field debarking of logs**

FWPXXXXXXX In-field debarking of logs for harvesting in native forests **(New)**

- **Tree felling and chainsaw operation**

FWPCOT3238 Operate pole saw

FWPHAR3220 Harvest trees manually (Intermediate)

FWPHAR3221- Harvest trees manually (Advanced) FWPCOT2236 Fall trees manually (Basic)

FWPFGM3212 Fall trees manually (Intermediate)

FWPFGM3213 Fall trees manually (Advanced)

FWPCOT2239 Trim and cut felled trees

FWPHAR2207 Trim and cut harvested trees

FWPCOT2237 - Maintain chainsaws

Supporting Information

List of units of competency from other training packages. These units appear relevant to the following project component – Programming harvesting optimisation files – and they will be reviewed for suitability or use in the development of new industry related and supported units of competency:

ICTPRG412 Configure and maintain databases

ICTPRG419 Analyse software requirements

TIMBER AND WOOD PROCESSING IRC

Project Title

Advances in Woodmachining and Sawdoctoring

Description

This project will assess the current skills requirements for wood machinists and sawdoctors as a result of technology changes over the years and a business imperative to operate in the competitive manufacturing environment. This project will result in streamlining and consolidating the national woodmachining and sawdoctoring qualifications, which underpin industry's apprenticeships and traineeships programs for these trades.

The project will review 2 qualifications, the Certificate III in Woodmachining and the Certificate III in Sawdoctoring, and 46 units of competency listed for these qualifications.

Rationale

The following feedback from stakeholders has indicated the need for reviewing the Certificate III in Woodmachining and the Certificate III in Sawdoctoring to adapt these qualifications to the current workplace requirements.

Woodmachining

Wood machinists are critical job roles in the timber and wood processing industry and represent an occupation unique to manufacturing or other industries. People in this job role use a variety of wood-processing machinery to cut, shape and mould wood for a range of practical uses. They are also required to consult plans and drawings, to select and fit blades, drillbits, cutter heads and guides to machinery, and to grind, hone and sharpen the various machinery parts.

A recent informal review conducted by the industry through limited consultation indicated that the Certificate III in Woodmachining needs to be streamlined. A number of units of competency can be removed from the qualification and other units can be imported into this qualification.

A similar feedback also indicates that skills for operating beam saws are required in wood-processing businesses and these skills are not currently covered by the woodmachining qualification, *FWP Training Package* or any other training package.

There are also reports that existing units of competency from the Certificate III in Woodmachining do not adequately cover the setting up, and operation of, overhead CNC routers for wood products processing.

In addition, the timber and wood processing industry has identified need to support the development of skills for entrants to their industry. Hence, it is proposed to scope the role of a potential new qualification for wood and machining/finishing at AQF Level 2, which may be suitable within VET in Schools program and provide a pathway into the Certificate III in Woodmachining and the Certificate III in Sawmilling and Processing.

Sawdoctoring

Likewise, sawdoctors are critical job roles in the timber and wood processing industry and the qualifications need to support businesses to attract and maintain a suitably skilled and sustainable workforce.

The traditional saw doctor role was based around repairing, maintaining and sharpening saws and cutting tools for use in the industry. Today, the sawdoctors are also expected to assist machine performance and maintain mechanical parts for a range of production machines.

Due to changes in technology and market demand, many saws in sawmills or manufacturing plants are currently cutting faster to process higher volumes of timber product. The timber product is also being reduced in size and thickness. Together, these new needs and capabilities for timber processing place many new demands on sawdoctors.

As the technology has changed, and along with it the expectations on a sawdoctor, the industry has identified the need to review the sawdoctor's role and its relevant qualification. It is proposed that, during the review, the Certificate III in Engineering - Mechanical Trade from the *MEM Metal and Engineering Training Package* is also analysed and considered for adoption into the *FWP Training Package* and/or adaption to match industry-specific requirements and enable this skill development.

Because attracting new people into this trade is also an issue, there are suggestions from the industry to consider changing the name of this trade to better match the role and current technical requirements or functions of the trade.

Addressing the Minister's Priorities

Priority: Obsolete qualifications removed from the system

Preliminary analysis conducted for this project has not identified obsolete training package components that could potentially be removed from the system. However, it is expected that industry stakeholders will identify redundant units of competencies in the Certificate III in Woodmachining and the Certificate III in Sawdoctoring during the project work.

Priority: More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices

As part of the project, the Timber and Wood Processing IRC will also seek to identify the industry's expectations of training delivery and so information will be presented in the *FWP Training Package Companion Volume and Implementation Guide* for training providers to improve their delivery.

Priority: The training system better supports individuals to move more easily between related occupations

Preliminary analysis indicates that new training package components, which may be developed during the project, may not be suitable for use in other industry sectors. Skills requirements are highly specialised for the timber sawmill operations.

Priority: Improved efficiency of the training system through units that can be owned and used by multiple industry sectors

As above.

Priority: Foster greater recognition of skill sets

The industry has a growing interest in flexible training options, including the provision of specific skill sets rather than completion of a full qualification. The industry is likely to advise on the development and use of new skill sets.

Consultation Plan

The Timber and Wood Processing IRC has agreed on the following project consultation plan.

- A project page will be set up on the Skills Impact website at the start of the project to inform about the project and provide progress updates. Skills Impact and ForestWorks will conduct further project updates via newsletters.
- The TWP IRC will form a project Technical Advisory Committee (TAC) that is representative of the industry sector and regions.
- The TAC will have up to three consultation meetings via teleconference to discuss input on draft materials and stakeholder feedback. TAC members will also contribute via telephone and email.

- Draft qualification, units and skill sets will be made available for one month on the Skills Impact website for broad stakeholder consultation.
- The final draft qualifications, units and skill sets will be made available for further stakeholder consultation and validation for two weeks.

Proposed Technical Advisory Committee

Organisation	State/Region
Softwood Sawmills	
Hyne Timber	QLD/NSW
Timberlink	SA/TAS
AKD	VIC
One Forty One	SA
Highland Pine Products	NSW
Hardwood Sawmills	
Australian Sustainable Hardwoods (ASH)	VIC
Boral Timber	NSW
Hurford Hardwood	NSW
Australian Solar Timbers	NSW

Scope of the Project

The project is expected to start in 2018–2019 and be completed within 12 months from its approval. Based on previous experience, the project should allow sufficient time for engaging industry stakeholders with the project. This process is often lengthy and laborious, and the project outcomes depend on industry participation.

Qualifications to be revised and updated (2) from the *FWP Training Package*:

FWP30816 Certificate III in Woodmachining

FWP30716 Certificate III in Sawdoctoring

Units of competency to be developed and revised (46) from the Certificate III in Woodmachining and the Certificate III in Sawdoctoring:

FWPCOT2205- Tail out materials

FWPCOT2207- Dress boards and timber

FWPCOT2208- Resaw boards and timber

FWPCOT2224- Band edges of panels

FWPCOT3201- Hand sharpen knives and blades

FWPCOT3205- Dress boards using multi-headed machines

FWPCOT3207- Set up, operate and maintain finger jointing operations

FWPCOT3209- Set up, operate and maintain end matching operations

FWPCOT3210- Sharpen cutting tools

FWPCOT3211- Maintain sawdoctoring tools

FWPCOT3212- Replace saws, blades and guides

FWPCOT3213- Manufacture cutting tools

FWPCOT3215- Swage and shape saw blades

FWPCOT3216- Assess and maintain saw performance

FWPCOT3217- Assess and maintain cutter performance

FWPCOT3233- Sharpen and align blades and knives

FWPCOT3237- Produce templates

FWPCOT3244- Cut material to profile

FWPCOT3247- Select timber for forestry operations

FWPSAW3207- Sharpen band saws

FWPSAW3208- Sharpen circular saws

FWPSAW3209- Align sawing production systems

FWPSAW3210- File and set saws

FWPSAW3211- Recondition guides

FWPSAW3212- Sharpen tipped circular saws

FWPSAW3213- Level and tension circular saws

FWPSAW3214- Join band saw blades

FWPSAW3217- Hard face saw teeth

FWPSAW3218- Replace tungsten tips

FWPSAW3219- Replace stellite tips

FWPSAW3220- Maintain wide band saw blades

FWPSAW3221- Profile saw blanks

FWPSAW3222- Recondition band mill wheels

FWPSAW3225- Maintain frame saw blades

FWPSAW3228- Apply principles of blade design to sawing procedures

FWPTMM2202- Machine material

FWPTMM3201- Convert timber

FWPTMM3202- Manufacture using joinery machines

FWPTMM3203- Estimate and cost job

FWPWPP2210- Cut panels to profile

FWPCOT2212- Grade hardwood sawn and milled products

FWPCOT2213- Grade softwood sawn and milled products

FWPCOT2214- Grade cypress sawn and milled products

FWPCOT2215- Visually stress grade hardwood

FWPCOT2216- Visually stress grade softwood

FWPCOT2217- Visually stress grade cypress

Project Title

Sawmill Timber and Process Optimisation

Description

This project will improve and develop new units of competency to address skills requirements for timber and process optimisation within sawmills. Job roles intended to benefit from this training package work include sawmill process controllers, sawdoctors and supervisors.

The project will develop a minimum of 6 new units of competency at AQF Levels 3 and 4 in operating timber optimisation technology and processes, and review 11 existing units of competency to improve requirements in line with the current sawmill timber and process optimisation practices.

Drivers

Timber sawmills are currently managed for higher efficiency and productivity targets to maintain their future competitiveness. Most companies have invested heavily in their operations to keep up with technical developments and production processes for maximum timber value and volume recovery.

Operational emphasis was first placed on maximising volume recoveries. With the way markets evolve and trees are grown, the industry has developed its processes and technology – now seeking a workforce that also understands value recovery. As a result, sawmills require capabilities to realise two operational outcomes:

- timber optimisation that is the most efficient use of logs and plant, taking into account raw material characteristics, customer demands and machine capability
- material flow optimisation that is achieved through an efficient operation of the automated and optimised material flow-based production systems.

3D, X-Ray and acoustic scanning devices are some of the optimisation technologies employed by the industry to assess log rotation, grading of timber, board density and fibre stiffness – all of which are essential to determining a product's end use. Automated transfer systems between different process sequences and computer-assisted machine centres for sawing and resawing are other examples of optimisation technologies available in the sector. The application of technologies and processes mentioned above is unique to timber processing.

The industry identified that new and improved units of competency are required to support skills in timber and process optimisation related to the following stages of sawmill production processes:

1. **Log sorting** – Major developments have been made about log sorting to improve timber value recovery due to the advances in 3D, X-Ray and acoustic scanning technologies and software. Particular skills are required to operate the scanning technologies and software and to conduct correct calibrations.
2. **Sawing in the 'green mill'** – At this stage, optimisation for value recovery occurs in two phases within the following processes:
 - sawing: log alignment and positioning – activities include the set-up of optimising system by process controllers, sawdoctors and mechanical trades and operation of scanning and optimising system
 - trimming and sorting.

Particular skills are required for each phase by both process controllers and sawdoctors.

3. **Dry mill processing and grading** – 'Dry mill' systems are equipped with computers that allow optimisation decisions for timber value recovery when resawing timber. Skills are required to

understand the cutting plan and product output mix, select the cutting programme and develop a cutting schedule to meet value recovery requirements. In addition, stress grade technology utilises acoustic, visual, X-Ray and bending to determine the structural characteristics of the full length of every single piece of timber.

4. **Timber treatment** – Major improvements in timber treatment techniques and processes have been made over recent years to ensure the durability, protection and performance of timber products. The industry requires units of competency in the current timber treatment processes. Adequate skills are also required for correct testing of treated timber.

As none of the above skills needs is covered by the Certificate III in Sawmilling and Processing or the Certificate IV in Timber Processing, 6 new units of competency are required for development. In addition, 13 units of competency from these qualifications will need to be reviewed and updated to reflect the current timber optimisation technologies and practices. The list of the proposed units is provided in a section below.

Addressing the Minister's Priorities

Priority: Obsolete qualifications removed from the system

Preliminary analysis conducted for this project has not identified obsolete training package components that could potentially be removed from the system.

Priority: More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices

As part of the project, the Timber and Wood Processing IRC will also seek to identify the industry's expectations of training delivery, and so information will be presented in the *FWP Training Package Companion Volume and Implementation Guide* for training providers to improve their delivery.

Priority: The training system better supports individuals to move more easily between related occupations

Preliminary analysis indicates that the new training package components proposed for development may not be suitable for use in other industry sectors. They are highly specialised for timber sawmill operations.

Priority: Improved efficiency of the training system through units that can be owned and used by multiple industry sectors

As above.

Priority: Foster greater recognition of skill sets

The industry has a growing interest in flexible training options, including the provision of specific skill sets rather than completion of a full qualification. The industry is likely to advise on the development and use of new skill sets.

Consultation Plan

The Timber and Wood Processing IRC has agreed on the following project consultation plan.

- A project page will be set up on the Skills Impact website at the start of the project to inform about the project and provide progress updates. Skills Impact and ForestWorks will conduct further project updates via newsletters.
- IRC will form a project Technical Advisory Committee (TAC) that is representative of the industry sector and regions.
- The TAC will have up to three consultation meetings via teleconference to discuss input on draft materials and stakeholder feedback. TAC members will also contribute via telephone and email.

- Draft qualifications, units and skill sets will be made available for one month on the Skills Impact website for broad stakeholder consultation.
- The final draft qualifications, units and skill sets will be made available for further stakeholder consultation and validation for two weeks.

Proposed Technical Advisory Committee

Organisation	State/Region
Softwood Sawmills	
Hyne Timber	QLD/NSW
Timberlink	SA/TAS
AKD	VIC
One Forty One	SA
Highland Pine Products	NSW
Hardwood Sawmills	
Australian Sustainable Hardwoods (ASH)	VIC
Boral Timber	NSW
Hurford Hardwood	NSW
Australian Solar Timbers	NSW

Scope of the Project

The project is expected to start in 2018–2019 and be completed within 12 months from its approval. Based on previous experience, the project should allow sufficient time for engaging industry stakeholders with the project. This process is often lengthy and laborious, and the project outcomes depend on industry participation.

Units of competency to be developed (6) and revised (11) for the *FWP Training Package*:

- **Sawmill machine centre optimiser**
 - FWPSAWXXXX Operate scanning and optimising system for a sawmill machine centre **(New)**
 - FWPSAWXXXX Calibrate scanning and optimising system for a sawmill machine centre **(New)**
- **Log sorting**
 - FWPSAW2207 Round softwood logs
 - FWPSAW3202 Produce sawn green boards
 - FWPSAW3203 Break down logs
 - FWPSAW3204 Saw flitches and cants
 - FWPSAW3227 Select and saw logs in multi-species operations
- **Sawing in the 'green mill'**
 - FWPSAWXXXX Optimisation (sawing) **(New)**
 - FWPSAWXXXX Optimisation (Trimming and Sorting) **(New)**
 - FWPSAW3226 Saw logs using CNC optimising systems
 - FWPCOT3206 Cut material using high speed optimiser
- **'Dry mill' processing and sorting**
 - FWPSAWXXXX Optimisation (Dry Mill) **(New)**

FWPCOT3225 Mechanically stress grade timber

FWPCOT3245 Grade, sort and mark materials

FWPCOT3230 Operate automated stacking equipment

- **Timber treatment**

FWPSAW3XXX Test treated timber **(New)**

FWPSAW3201 Treat timber

TIMBER BUILDING SOLUTIONS IRC

Project Title

Timber Truss and Frame Estimating and Design

Description

This project will review and develop new units of competencies and skill sets to address the current skills requirements in the timber truss and frame manufacturing industry and assist with the high demand for design and estimating capabilities. Improved understanding of building constructions, applied mathematics and ability to communicate and negotiate will enable designers, detailers and estimators to design and calculate quantities of timber as per fabrication orders.

The project proposes to review and update 3 qualifications and 39 units of competency. The project will also develop at least 2 skill sets and remove all the pre-requisite requirements from the Certificate IV in Timber Truss and Frame Design.

Rationale

The demand for timber roof trusses and wall frames is projected to grow over the next five years due to the housing and multi-unit development construction activity that continues to increase. These structural components are extensively used in housing construction, making this sector the primary market driver for the industry.

Historically, the house frame and truss manufacturing industry has faced a high shortage of design and estimating capabilities domestically, and this skill shortage cannot continue. Most of the jobs are currently commissioned overseas, with the Australian manufacturing industry losing quality jobs. The industry needs skilled frame and truss designers and estimators locally to improve efficiency and communication with the factory floors and construction businesses. These roles within the industry are an integral part of the day-to-day running of the business.

The industry has identified that existing frame and truss qualifications and units of competency no longer accurately reflect the industry's job titles, roles and training requirements. Also, the structure of the existing Certificate IV in Timber Truss and Frame Design represents a barrier to training uptake due to a high number of pre-requisite units for this qualification. Further, the entry-level qualification, Certificate II in Timber Truss and Frame Design and Manufacture, has assessments within a core unit that breach the Department of Education rules for school-based trainees. School-based trainees are not permitted to use some of the equipment essential for the manufacture of timber trusses and frames (for example, the only Department-permitted nailing has a lower capacity than is used in production). However, the timber truss and frame industry need to support the development of skills for entrants to their industry. These qualifications have not undergone a significant review in the past seven years.

The industry has also identified the need for skill sets to offer timber frame and truss designers and estimators a career pathway into the Certificate IV.

New and improved skills are required, particularly of frame and truss estimators, in a series of areas that support industry developments and its future activity. These skills include:

- Reading building plans (computer-assisted designs, sketches and drawings) to prepare detailed truss and frame drawings. This work area requires:
 - a better understanding of information in the building plans, the terminology used and the applications and limitations of truss and frame components in a building in different geographical or weather conditions

- knowledge of timber species, characteristics and grading systems, as well as knowledge of other hardware components used in pre-fabrication
- ability to use and reference relevant standards and codes for different components within a building
- understanding of the implications of truss and frame design and manufacture on other trades and materials used in a building
- understanding of installation requirements for roof trusses to meet the required Australian Standard (AS4440-2004).
- Calculating material quantities and prepare quotes. This activity requires a greater knowledge of applied mathematics to conduct accurate and detailed measurement of materials needed to complete a frame and truss order.
- Communicating and negotiating with customers, suppliers and colleagues.

Addressing the Minister's Priorities

Priority: Obsolete qualifications removed from the system

Preliminary analysis conducted for this project has not identified obsolete training package components that could potentially be removed from the system.

Priority: More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices

As part of the project, the Timber Building Solutions IRC will also seek to identify the industry's expectations of training delivery, and so information will be presented in the *FWP Training Package Companion Volume and Implementation Guide* for training providers to improve their delivery.

Priority: The training system better supports individuals to move more easily between related occupations

This project considers the review of units of competencies that are native to other training packages for their potential adoption into the forest management and harvesting qualifications. If, through consultation, these units are considered appropriate for the industry's needs, the project will be able to address to some extent this priority for efficiency in the training packages and portability of skills when individuals move between related occupations.

Priority: Improved efficiency of the training system through units that can be owned and used by multiple industry sectors

Preliminary analysis does not indicate that other industry sectors can use the new training package components proposed for development.

Priority: Foster greater recognition of skill sets

The industry has a growing interest in flexible training options, including the provision of specific skill sets rather than completion of a full qualification. As described in this proposal, the industry has advised on the development and use of new skill sets.

Consultation Plan

The Timber Building Solutions IRC has proposed and agreed on the following project consultation plan.

- A project page will be set up on the Skills Impact website at the start of the project to inform about the project and provide progress updates. Skills Impact and ForestWorks will conduct further project updates via newsletters.

- IRC will form a project Technical Advisory Committee (TAC) that is representative of the industry sector and regions.
- The TAC will have up to three consultation meetings via teleconference to discuss input on draft materials and stakeholder feedback. TAC members will also contribute via telephone and email.
- Draft qualifications, units and skill sets will be made available for one month on the Skills Impact website for broad stakeholder consultation.

The final draft qualifications, units and skill sets will be made available for further stakeholder consultation and validation for two weeks. **Proposed Technical Advisory Committee**

Organisation	State/Region
Dahlsens – Truss & Frame	NSW/VIC
Meyer Timber	NSW/VIC
Multinail Australia	NSW/QLD/VIC
Mitek Australia	NSW/QLD/SA/VIC/WA
Pryda Australia	NSW/QLD/VIC
Dindas Australia	QLD/VIC
McKay Timber	TAS
BB Truss & Timber	VIC
Drouin West Timber & Truss	VIC
Tilling Timber	VIC
Wesbeam Pty Ltd	WA

Scope of the Project

The project is expected to start in 2018–2019 and be completed within 12 months from its approval. Based on previous experience, the project should allow sufficient time for engaging industry stakeholders with the project. This process is often lengthy and laborious, and the project outcomes depend on industry participation.

Qualifications to be revised and updated (3) for the *FWP Training Package*:

FWP40416 Certificate IV in Timber Truss and Frame Design

FWP30916 Certificate III in Timber Truss and Frame Design and Manufacture

FWP20716 Certificate II in Timber Truss and Frame Design and Manufacture

Skill sets to be developed a minimum of (2) for the *FWP Training Package*:

FWPSSXXXXX Skill set for truss and frame estimating and design operations (**new**)

Units of competency to be revised and updated (39) from the Certificate II, III and IV in Timber Truss and Frame Design and Manufacture:

FWPCOR2201- Work effectively in the forest and forest products industry

FWPCOR2202- Communicate and interact effectively in the workplace

FWPCOR2203- Follow environmental care procedures

FWPCOR2207- Maintain quality and product care

FWPCOR3202- Conduct quality and product care procedures

FWPCOR3204- Visually assess materials

FWPCOR4201- Monitor safety, health and environment policies and procedures

FWPCOR4203- Monitor quality and product care procedures

FWPCOT2201- Stack and bind material

FWPCOT2210- Tally material

FWPCOT2219- Use hand-held tools

FWPCOT2227- Process orders and despatch products

FWPCOT2228- Store materials

FWPCOT2229- Dock material to length

FWPCOT2232- Cut material to shape using a saw

FWPCOT2235- Assess timber for manufacturing potential

FWPCOT3204- Prepare and interpret sketches and drawings

FWPCOT3214- Take off material quantities

FWPCOT3218- Quote and interpret from manufactured timber product plans

FWPCOT3220- Quote and interpret from computerised timber manufactured product plans

FWPCOT3236- Coordinate stock control procedures

FWPCOT3239- Create drawings using computer aided design systems

FWPCOT3241- Assemble timber wall frames

FWPCOT3242- Lay up timber roof trusses

FWPCOT3243- Operate a truss press

FWPCOT3263- Maintain and contribute to energy efficiency

FWPCOT3264- Build and maintain timber stacks

FWPCOT4202- Design timber structures

FWPSAW2205- Assemble materials using nail plates

FWPTMM2201- Cut material to length and angles

FWPTMM2203- Read and interpret timber truss, floor and/or frame fabrication plans

FWPTMM3204- Interpret designs to prepare timber roof truss drawings and documents using computers

FWPTMM3205- Interpret designs to prepare timber floor system drawings and documents using computers

FWPTMM3206- Interpret designs to prepare timber wall frame drawings and documents using computers

FWPTMM3207- Set up timber floor trusses

FWPTMM4202- Diagnose and calculate production costs

FWPTMM4205- Prepare and advise on a broad range of timber roof truss details using computers

FWPTMM4206- Prepare and advise on a broad range of timber floor system details using computers

FWPTMM4207- Prepare and advise on a broad range of timber wall frame details using computers

ATTACHMENT B

Current IRC Projects for the Forest and Wood Products Industry

Relevant training package: *FWP Forest and Wood Products Training Package*

Contact details: Skills Impact Ltd, 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: 28 April, 2017

Timber and Wood Processing IRC			
Year	Project	Qualification Code & Title	Unit and Competency Code & Title
2017–2018	CLT and Glulam manufacturing		<p>New units to be developed</p> <p>New units will also be developed for cross-laminated timber (CLT) and Glulam production, as identified through industry consultation.</p> <p>Current units to be reviewed</p> <p>FWPCOT3205 Dress boards using multi-headed machines</p> <p>FWPWPP3206 Laminate and veneer board surfaces</p> <p>FWPWPP3209 Prepare resin and additives</p> <p>FWPWPP3210 Laminate board</p> <p>FWPWPP3219 Blend and test binding mixes</p> <p>FWPWPP3221 Trim new panels to size</p> <p>FWPWPP3226 Operate a continuous press</p> <p>FWPCOT3228 Plane/sand panels</p> <p>FWPCOT3229 Mechanically stress grade panels</p> <p>FWPCOT3230 Operate automated stacking equipment</p> <p>FWPCOT3234 Cut material using CNC sizing machines</p> <p>FWPCOT3235 Machine material using CNC machining and processing centres</p> <p>FWPCOT3244 Cut material to profile</p> <p>FWPWPP4201 Plan and coordinate panel production</p> <p>FWPTMM4201 Construct prototypes and samples</p> <p>FWPSAW4204 Plan and monitor board conversion</p>

Timber and Wood Processing IRC			
Year	Project	Qualification Code & Title	Unit and Competency Code & Title
			FWPTMM5201 Assess product feasibility of designs FWPTMM5204 Manage product design FWPTMM5205 Optimise CNC operations FWPTMM5206 Plan production FWPCOT6203 Develop engineered timber products to meet energy efficient building design needs

Timber Building Solutions IRC			
Year	Project	Qualification Code & Title	Unit of Competency Code & Title
2017–2018	Pre-fabricated timber systems		New units to be developed New units will also be developed for prefabrication of panelised building systems, as identified through industry consultation. Current units to be reviewed FWPCOT2230 Assemble products FWPCOT4203 Plan and coordinate product assembly FWPTMM5203 Generate and transfer complex computer-aided drawings and specifications

ATTACHMENT C

Completed IRC Projects for the Forest and Wood Products Industry

Relevant training package: *FWP Forest and Wood Products Training Package*

Contact details: Skills Impact Ltd, 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: 28 April 2017

Forest Management and Harvesting IRC			
Year	Project	Qualification Code & Title	Unit of Competency Code & Title
2017	Forest Harvesting Optimisation	FWP30216 Certificate III in Harvesting and Haulage	New Units FWPHAR3223 Use on-board computer systems for single grip harvester FWPHAR3222 Use on-board computer systems for forwarder Improved Units FWPHAR3226 Operate feller buncher FWPHAR3229 Operate single grip harvester FWPHAR3227 Operate forwarder FWPHAR3224 Operate crawler tractor FWPHAR3230 Operate skidder FWPHAR3231 Operate yarder FWPHAR3225 Operate excavator with log grapple FWPHAR3228 Operate loader FWPCOT2224 Segregate and sort logs FWPCOT3270 Grade and mark logs FWPHAR3210 Conduct mechanical processor operations FWPCOT2226 Debark logs mechanically

ATTACHMENT D

Issues Register for the FWP Training Package (January 2017–April 2018)

Relevant training package: FWP Forest and Wood Products Training Package

Contact details: Skills Impact Ltd, 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: 28 April, 2017

Note: The next tables contain comments from stakeholders, which were received through the Issues Register. Some comments were slightly edited for readability.

Acronyms used in the following tables: PC = performance criteria; PE = performance evidence; FS = foundation skills.

Forest Management and Harvesting		
Case Title	Description	Place where the issue will be addressed
FWPCOT4208 – Major upgrade	Unit feedback concerning <i>FWPCOT4208 Implement workplace sustainability requirements</i> . Performance criteria 1.1 asks us to review the policy, whereas in the foundation skills we must be able to 'Interpret complex and unfamiliar sustainability policy.'. Step 1 should be to familiarise the learner about a sustainability policy and step 2 to review it once the learner has a working knowledge of said policy.	The comment relates to revision of PC 1.1 and the FS. Unit referred to is: <ul style="list-style-type: none"> <i>FWPCOT4208 Implement workplace sustainability practices</i>. Place where the issue will be addressed: <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
Review 'planning for log extraction' in Manual Falling units	Review how planning for log extraction can be included in the manual falling units, including <i>FPIHAR3220 Harvest trees manually (Intermediate)</i> , to ensure the performance evidence item 'apply appropriate extraction methods' is worded so that the operator considers available extraction methods in light of optimising falling activity.	The comment relates to revision of one PE (map it to PC). Unit referred to: <ul style="list-style-type: none"> <i>FWPHAR3220 Harvest trees manually (Intermediate)</i>. Place where the issue will be addressed: <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).

Forest Management and Harvesting		
Case Title	Description	Place where the issue will be addressed
Foundation Skills in 'Fall trees manually' units (basic, intermediate and advanced)	Current FS tables refer to 'calculate mass of trees and determine fall zone'. Question raised about whether or not calculating the mass of trees is required when 'falling' trees. Is calculating the mass of trees only required for harvesting trees or for both 'falling' and 'harvesting'? If it is only relevant to harvesting units, then amend FS to read 'determine fall zone' in the three falling units.	The comment relates to revision of FS. Units referred to are: <ul style="list-style-type: none"> FWPCOT2236 <i>Fall trees manually (Basic)</i> FWPFGM3212 <i>Fall trees manually (Intermediate)</i> FWPFGM3213 <i>Fall trees manually (Advanced)</i>. Place where the issue will be addressed: <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
FWPCOT2239 <i>Trim and cut felled trees</i> – performance evidence	Performance evidence requirements are unworkable while assessing this unit. 'Trim and cut trees in these environmental conditions: dry weather, condition, wet weather condition, low and moderate wind speeds'. This whole section should be removed. It doesn't need to be there. Assessing this unit in all the mentioned weather conditions will make this unit totally redundant here in WA.	The comment relates to revision of PE. Units referred to are: <ul style="list-style-type: none"> FWPCOT2239 <i>Trim and cut felled trees</i> FWPHAR2207 <i>Trim and cut harvested trees</i>. Place where the issue will be addressed: <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
Licencing statement	In both units of competency FWPCOT2236 <i>Fall trees manually (Basic)</i> and FWPCOT2239 <i>Trim and cut felled trees</i> , there is a statement that: 'Licensing, legislative, regulatory, or certification requirements apply to this unit in some states & territories at the time of publication, and may differ according to jurisdiction'. As far as determined, and in consultation with SafeWork NSW, there is no such requirement in any Australian jurisdiction.	The comment relates to revising licencing statement in the Application of the Units. Units referred to are: <ul style="list-style-type: none"> FWPCOT2236 <i>Fall trees manually (Basic)</i> FWPCOT2239 <i>Trim and cut felled trees</i>. Place where the issue will be addressed: <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
Skills to program files for harvesting on-board computers	One new unit is required to cover the skills needs for programming cutting instruction files used with on-board computers for single grip harvesters to conduct harvesting operations. Job roles affected: forest and harvesting technicians or supervisors. The issue was raised during the harvesting optimisation project.	The comment relates to development of new unit: <ul style="list-style-type: none"> Program cutting instruction files for on-board computers for single grip harvesters. Place where the issue will be addressed: <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).

Forest Management and Harvesting		
Case Title	Description	Place where the issue will be addressed
Skills for in-forest debarking of logs	A new unit is required to cover skills for in-forest debarking of logs. It should be investigated whether a generic unit can satisfy the needs as proposed by Andy Cusack or machine-related units are required (e.g. operate excavator with log grapple for debarking).	<p>The comment relates to development of new unit:</p> <ul style="list-style-type: none"> In-forest debarking of logs. <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
New units and a new skill set for wood chipping operations	<p>Three new units for wood chipping operations are required to cover the following:</p> <ul style="list-style-type: none"> Operate excavator with log grapples for feeding logs into mobile chipper Operate a heavy production flail and chipper combination Operate a flail debarker. <p>These should replace <i>FWPHAR3215 Operate a heavy production mobile chipper</i>.</p> <p>A new skill set for in-field chipping operations is also required to include the following units:</p> <ul style="list-style-type: none"> Operate a heavy production flail and chipper combination Operate skidder Operate excavator with log grapple. 	<p>The comment relates to development of new units for wood chipping operations.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
Skills for fatigue management in forestry and harvesting operations	A new unit is required to cover requirements for fatigue management (fit for work) in forestry and harvesting operations.	<p>The comment relates to development of new unit for fatigue management.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Case for Change: Safety leadership and critical risk management.
Skill set for cable logging	<p>Yarding and log cabling operations are extensively used in New Zealand and the number of log cabling crews is also expected to increase in Australia's native forests. To support this emerging need, the following skill set for cable logging is proposed:</p> <ul style="list-style-type: none"> Operate yarder Monitor log recovery (Rigging Slinger) Hook up felled logs using cables (Choker) Coordinate log recovery (Cook Tender) Perform landing duties (Chaser). 	<p>The comment relates to development of new skill set for yarding operations.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).

Forest Management and Harvesting		
Case Title	Description	Place where the issue will be addressed
Operate chainsaw above ground	A unit for operating chainsaws conducting pruning and dismantling trees above ground is required (arboriculture).	<p>The comment relates to development of a new unit for operating chainsaws.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> • Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).
Review AQF level for <i>FWPCOT3238 Operate pole saw</i>	<p>As a result of extensive validation and mapping carried out on <i>FWPCOT3238 Operate pole saw</i> and in reflection on the content and level of training to achieve competency it appears that this unit should be a Certificate II level. With the additional pressure on RTOs in relation to compliance, volume of learning, etc., we have decided to discontinue the delivery of this unit as a national competency and are offering unaccredited sessions to help employers meet WHS/OHS obligations.</p> <p>To give some perspective, we have found that the training required for proficiency relatively short compared to other units such as Basic tree falling (Level 2) unit or the Chainsaw unit that we use regularly being AHCMOM213.</p> <p>In addition to the above I would also give consideration to either making this unit more generic to allow usage in a wider range of workplaces or develop a new unit for other users. Currently because of the specific reference to tree pruning in-forest, it means that we cannot contextualise for non-forest pruning usage.</p> <p>The tool/machine is quite versatile in its application and we have ongoing demand from the sawmill and wood processing sector who use these tools in their daily activities to trim packs, individual boards, and clear equipment. Also, within the harvesting sector there is a growing demand for use of polesaws in disentanglement in the large, whole-tree chippers. These people need the training but cannot be recognised as having a national competency.</p>	<p>The comment relates to review of a unit of competency.</p> <p>Unit referred to is:</p> <ul style="list-style-type: none"> • <i>FWPCOT3238 Operate pole saw.</i> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> • Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast).

Forest Management and Harvesting		
Case Title	Description	Place where the issue will be addressed
Skills shortage and training courses	<p>The Institute of Foresters Australia is looking to improve the Registered Professional Foresters scheme and provide training courses to address skills shortages. Some suggestions priorities in terms of training courses required have included:</p> <ul style="list-style-type: none"> • forest valuation methodology • measurement techniques (inventory) and the use of new technology • introduction to resource modelling • soil science and management • fire management and control (may be several levels and offered in each region) • leadership and introduction to management roles • Lidar, remote sensing and drones and their role in managing forest landscapes • road location, construction and maintenance • forest engineering principles • valuing non-wood values in the forest • Indigenous land and fire management • use of forest machinery (chainsaws, ATVs, 4WD) • plantation forestry • managing forests for carbon • natural area management • introduction to wood science and timber processing. 	<p>This comment relates to a range of skill priorities. Many are covered by existing units of competency and some will be covered by:</p> <ul style="list-style-type: none"> • Priority Skill 1: New harvesting technologies (2018–2021 Skills Forecast). <p>An analysis and further consultations will be conducted on these skill priorities to identify gaps in the training package. New projects will be proposed in the next edition of the Skills Forecast, subject to the outcomes.</p>

Timber and Wood Processing		
Case Title	Description	Place where the issue will be addressed
<i>FWP Training Package</i> - potential gaps in woodmachining in area of woodmachining	New unit required for beam saw operations. Also, operation of overhead CNC router not adequately covered in current FWP units related to setting up and operation of CNC equipment.	<p>This comment relates to development of a new unit for beam saw operations in the Certificate III in Woodmachining.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: Advances in woodmachining and sawdoctoring (2018–2021 Skills Forecast).
Woodmachining qualification review	Limited consultation has been conducted (CFMEU, CHH and TTC). In addition, potential for Wood and Machining/Finishing pre-apprenticeship (Certificate II Level) – may be suitable within VET in Schools program. Link with Certificate III Sawmilling and processing and woodmachining qualification pathways.	<p>This comment relates to revision of a qualification and development of a new qualification.</p> <p>Qualifications referred to are:</p> <ul style="list-style-type: none"> <i>FWP30816 Certificate III in Woodmachining Woodmachining</i> (revised qualification) <i>Certificate II Wood and Machining/Finishing</i> (proposed qualification). <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: Advances in woodmachining and sawdoctoring (2018–2021 Skills Forecast).

Timber and Wood Processing		
Case Title	Description	Place where the issue will be addressed
Sawdoctor qualification	<p>There needs to be a review of the sawdoctoring trade to better match the needs of the modern sawmilling environment and changes the timber industry is facing in this competitive manufacturing environment. The traditional sawdoctor role was based around sharpening saws for use in the industry but now with much higher volumes being processed and changes in technology, many saws are cutting faster with more volumes while also being reduced in size and thickness and that is placing many new demands on sawdoctors.</p> <p>I have spoken to a number of sawdoctors, saw shop supervisors and sawmill managers and they all share this view and offer their support in principal to review the sawdoctor's role as the technology has changed and along with that the expectations of a sawdoctor. The trade is now as much focused and involved with machine performance as providing sharp saws to a sawmill, manufacturing plant or building site.</p> <p>With the training facility there in Tumut for sawdoctoring, is it possible to initiate a review of the requirements of sawdoctoring training, I think also that consideration should be also given to changing the trade name to better match the role and requirements of the trade to something like 'sawing technician'. The other problem the trade is facing is attracting new people into the trade as the trade name doesn't reflect the role in many ways.</p>	<p>This comment relates to revision of a qualification.</p> <p>Qualification referred to is:</p> <ul style="list-style-type: none"> <i>FWP30716 Certificate III in Sawdoctoring.</i> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: Advances in woodmachining and sawdoctoring (2018–2021 Skills Forecast).
FWPSAW2207 Round softwood logs	<p>The unit as written is undeliverable in approximately 95% of Australian workplaces as they do not have log scanner technology for this job function.</p> <p>Suggested fix:</p> <ol style="list-style-type: none"> 1) Alter PCs 2.3 and 4.2 to say 'If applicable' 2) Delete reference to computerised controls and back up in FS. 3) Write 'If applicable' against knowledge evidence points referring to scanners and back up. 4) Delete references to scanners and back-ups in assessment conditions. <p>Minor issue: Under knowledge evidence of typical log defects are 'warp, wane and cupping' which are sawn timber defects, not log defects. Suggest deleting these items.</p>	<p>This comment relates to review of a unit.</p> <p>Unit referred to is:</p> <ul style="list-style-type: none"> <i>FWPSAW2207 Round softwood logs.</i> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 2: Sawmill timber and process optimisation (2018–2021 Skills Forecast).

Timber Building Solutions		
Case Title	Description	Place where the issue will be addressed
Timber truss and frame industry – entry level qualification	The timber truss and frame industry have a need to support the development of skills for entrants to their industry. However, the entry-level qualification for school-based trainees has assessments within a core unit that breaches Department of Education rules. School-based trainees are not permitted to use some of the equipment essential for the manufacture of timber trusses and frames (for example, the only Department-permitted nailing has a lower capacity than is used in production).	<p>The comment relates to revision of a qualification.</p> <p>Qualification referred to is:</p> <ul style="list-style-type: none"> <i>FWP20716 Certificate II in Timber Truss and Frame Design and Manufacture.</i> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: Timber truss and frame estimating and design (2018–2021 Skills Forecast).
Training in the frame and truss sector	Training is still an issue for the frame and truss sector, with the need for training in basic skills in plan reading. There is also a skills gap in the area related to loading, as there are still accidents in this area of work. There is a further need to address the impact of steel as a competitor (as a whole industry) as it is an issue across the whole vertically integrated supply chain.	<p>The comment relates to revision of frame and truss qualifications.</p> <p>Qualifications referred to are:</p> <ul style="list-style-type: none"> <i>FWP30916 Certificate III in Timber Truss and Frame Design and Manufacture</i> <i>FWP40416 Certificate IV in Timber Truss and Frame Design.</i> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Priority Skill 1: Timber truss and frame estimating and design (2018–2021 Skills Forecast). <p>The comment also relates to developing of new units related to loading frame and trusses.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Case for Change: Loading and unloading large timber components.
Frame and truss qualifications	The current training, both in content and in delivery, is not meeting the needs of the frame and truss sector. There is a need to think outside the box and work out a way forward that includes the 'pre-apprenticeship or traineeship'. There is also a need to address the language within the industry around 'frame and truss designers'.	As above.

Timber Building Solutions		
Case Title	Description	Place where the issue will be addressed
Certificate IV in Truss and Frame design and Manufacture – entry requirements	Entry requirements for this qualification create a ‘barrier’ to entry. Work needs to be done to remove these entry requirements. The packaging rules for the Certificate IV in Truss and Frame Design and Manufacture state that achievement of six units from the Certificate III qualification (Timber Truss and Frame Design) is a requirement. Further industry consultation is needed regarding the implications of amending these packaging rules before the issue is progressed to the IRC Skills Forecast and Proposed Schedule of Work.	As above.
Loading and unloading timber	At recent SEC meeting (December 2016), it was noted that there is a need for a national standard in loading and unloading timber. Issue and possible options are currently under discussion with the regulators.	<p>The comment relates to developing of new units related to loading frame and trusses.</p> <p>Place where the issue will be addressed:</p> <ul style="list-style-type: none"> Case for Change: Loading and unloading large timber components.

Across whole FWP Training Package		
Case Title	Description	Place where the issue will be addressed
Reference to WHS/OHS in FWP units	In <i>FWP Training Package</i> units, WHS is referenced as a stand-alone requirement but in Victoria OHS must be referenced first. To ensure that this requirement is still observed, it should be OHS/WHS. The information supporting this requirement can be found at http://workplaceohs.com.au/legislation/vic-legislation	<p>The comment relates to most units in this training package.</p> <p>To be addressed on an ongoing basis as projects arise (has been addressed in the Optimisation project).</p>