PULP AND PAPER MANUFACTURING INDUSTRY SECTOR

IRC Skills Forecast and Proposed Schedule of Work

2019–2022

Prepared on behalf of the Pulp and Paper Manufacturing Industry Reference Committee for the Australian Industry Skill Committee.

skillsimpact.com.au

IRC SKILLS FORECAST AND PROPOSED SCHEDULE OF WORK 2019-2022

Purpose

This Industry Reference Committee (IRC) Skills Forecast and Proposed Schedule of Work identifies proposed Vocational Education and Training (VET) training package development work necessary to meet the needs of industry and sets out the evidence of that need. The Australian Industry and Skills Committee (AISC) consider this information in prioritising and commissioning training package development work.

The IRC annual review of the Skills Forecast and Proposed Schedule of Work allows the identification of priority projects and provides the likely timing of training package development work over the next four years.

The Skills Forecast and Proposed Schedule of Work needs to provide the AISC with sufficient information on each project to consider:

- What work is to be commissioned;
- Clear evidence of employer and industry need;
- Alignment to Ministers' Priorities (see Appendix).

The Skills Forecast and Proposed Schedule of Work is to be developed in line with:

- Standards for Training Packages 2012;
- Training Package Products Policy;
- Training Package Development and Endorsement Process Policy.

This Skills Forecast presents the latest industry intelligence and resulting schedule of work for priority industry skills areas of the Pulp and Paper Manufacturing Industry Reference Committee (IRC).

This document is not intended to be identify and address every challenge faced across all industry sectors; it identifies and addresses the issues, challenges and opportunities that industry has identified as 'priority' for this stage of the schedule and acts as a resource and reference for industry and associated skills, learning and accreditation bodies seeking to act upon them.

Detailed data and information concerning industry skills needs across all sectors covered by the Pulp and Paper Manufacturing IRC, including information from previous Skills Forecasts, can be found on the Skills Impact website www.skillsimpact.com.au and is available to Industry, RTO and consumers in line with Ministerial priorities.

METHOD & STRUCTURE

This Skills Forecast and Proposed Schedule of Work was developed through research of national and industry data sources, and ongoing input from IRC members and key stakeholders.

IRC members undertake consultation with industry, and guide consultation processes undertaken on their behalf throughout each year. Consultation may include personal meetings, conference attendance, organised workshops, surveys, project feedback collection and unsolicited contributions sent to the SSO.

The Skills Forecast structure is guided by the Australian Industry Skills Commissions (AISC), which requires the following to be included:

- **Sector overview:** Brief description of the industry and industry sub-sectors, the Training Package, and current challenges and opportunities.
- **Employment & Skills Outlook:** Overview of the data, strategies and policies relevant to the industry.
- **Key Changes and Proposed Responses:** identifying the drivers for change from industry (e.g. occupations, technology, emerging markets), regulation, and nationally important policies, and proposed responses including the impact on stakeholders.
- **Consultation Undertaken:** Information on the consultation previously undertaken to support the proposed responses, including issues and sensitivities raised.
- **Proposed Schedule of Work:** The current proposed schedule of work over the next four-year period as modified from previous plans as a result of consultations and the need to meet changing priorities
- **Project Details:** details of proposed projects proposed for approval of the AISC to be undertaken in 2019-2020.

Administrative Information

Name of Industry Reference Committees (IRCs): Pulp and Paper Manufacturing

Name of Skills Service Organisation (SSO): Skills Impact

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EXECUTIVE SUMMARY

Australia's pulp and paper manufacturing industry is a world leader in sustainability and innovation, with independently-certified renewable resources, global best practices in recycling and continuously improving its energy and water efficiency and emissions. The industry continues to set a vigorous sustainability agenda, including ambitious investments in renewable energy (including energy from waste), water efficiency, and leading technologies for improving operational efficiencies. Most significantly over the last year, these investments have focussed on improving recovered paper processing.

The industry makes a significant contribution to Australia's economy and regional communities. It is highly concentrated in regional Victoria and New South Wales, dominated by a few significant businesses characterised by large-scale, vertical integration and multinational operations. It integrates many small companies that operate near capital cities in all states and territories.

Virtually every business and household in Australia uses nationally-produced pulp and paper products. Products range from paper grades from newsprint and printing to communication papers used in books, magazines and general commercial printing; corrugated containers and light-weight cartons are also prevalent. Other value-added paper products include bags, sack and paper packing goods, a range of office, educational and personal paper stationery, and personal and family products, including tissue, nappies, napkins, paper towels, and sanitary and hygiene goods.

Packaging and converted paper product manufacturing is a key growth area for the industry because of the high demand from households and business for packaged food items, e-commerce goods shipment, and retail-ready packaging. Digitisation, however, has led to declining figures associated with newsprint and general paper consumption.

In the last ten years, the industry's workforce development and employment levels have reflected general sectoral activity and changes in product demand.

Private investment by businesses is common for the training and upskilling of their employees, thus industry has overall developed a preference for non-formal over formal training.

The primary reasons for this favouring of non-formal training include:

- Large-scale businesses, with sizeable human resource and training departments, are choosing to use in-house training materials, trainers and assessors;
- Efficiency and productivity are paramount in most operations and allowing time for employees to participate in off-site training is prohibitive;
- When technology is upgraded, vendor or in-house training is a more efficient option for businesses to achieve high-level productivity quickly;
- Restrictions on access to publicly-funded training support;
- There being just two registered training organisations nationally that deliver pulp and paper qualifications, which limits the options when selecting a formal training provider.

This report identifies skills that support the rapid growth of domestic sectors, including for operations associated with re-processing recovered paper, generating energy from biomass and potentially putrescent waste, chain of custody, sustainability, and converted paper manufacturing.

Proposed Schedule of Work 2019–2022

2019-2020	**Project 1: Industry-driven workshop** This project proposes that research be undertaken with industry to establish *why* in-house training is generally preferred to the *PPM Training Package*. The PPM IRC, supported by the Secretariat, will conduct a workshop in the middle of 2019 with industry stakeholders to investigate low engagement levels with the training package, and to ascertain the extent to which industry utilises its infrastructure and quality assurance skills standards. Further research will be conducted as required, and results will be communicated to the Department and AISC, possibly with the submission of one or more cases for change. This process notwithstanding, the PPM IRC advises it considers the following two projects as priorities: **Project 2: Recycling and de-inking recovered paper** This project is to review existing units of competency and develop new units to support the recovered paper and cardboard processing sector, including for processes around pulp de-inking and bleaching for high- and medium-grade paper products. New units will be developed at AQF levels 3 and 4 in pulping operations to address requirements for current recycling and de-inking recovered paper processes.
2020-2021	**Project 1: Automated processes in converted paper manufacturing** This project is to review and develop new units of competency for current operating processes and technologies in paper bag, paper stationery and sanitary paper product manufacturing.
2021-2022	No projects will be set as priorities until the 2019 industry-wide workshop is undertaken and further actions or research is established.
2022-2023	No projects yet identified.

PULP AND PAPER MANUFACTURING INDUSTRY REFERENCE COMMITTEE

The Pulp and Paper Manufacturing Industry Reference Committee (IRC) has responsibility for overseeing the development of industry units of competency, skill sets and qualifications relative to the following sectors:

- Personal and Family Care Products
- Paper Products
- Fibre Based Packaging

Further information about this IRC can be found at:

https://www.skillsimpact.com.au/pulp-and-paper/industry-reference-committee/

Table 1: IRC Membership as at 30th March 2019

Name	Organisation or Area of expertise
Denise Campbell-Burns (Chair)	Construction, Forestry, Maritime, Mining and Energy Union (CFMMEU)
Alan Donnelly	Asaleo Care
Kaye Tyter	Australian Paper
Adele Elice-Invaso	Australasian Pulp and Paper Industry Technical Association (Appita)
Kevin Peachey	Australian Forest Products Association (AFPA)
Yet to be announced	Huhtamaki
Nathan Bright	Norske Skog
James Swan	Orora Group
Terry McDonald	VISY

SECTOR OVERVIEW

Sector Description

The pulp and paper manufacturing (PPM) industry is defined as having primary and secondary manufacturing sectors. The industry's structure is set out below:

Primary manufacturing

- Pulp, paper and paperboard manufacturing[1];
    - businesses that mainly manufacture pulp, paper or paperboard from inputs such as woodchips, clay, lime, dyes, chemical resins and recycled paper.

Secondary manufacturing

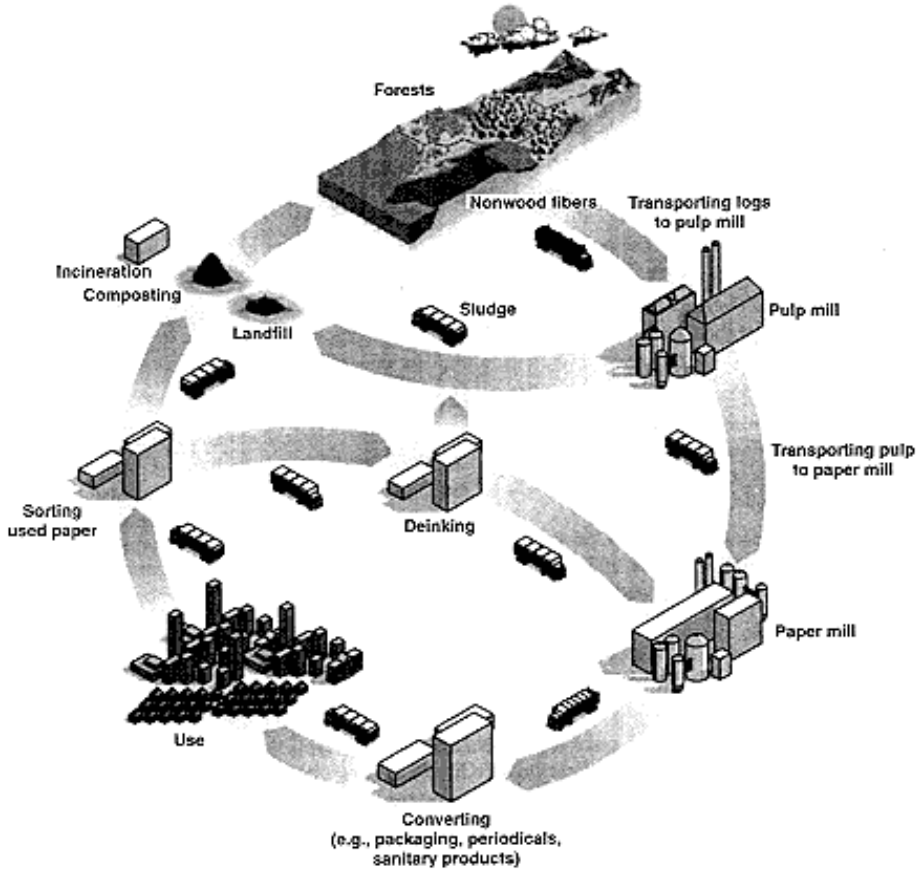
- Corrugated paperboard and paperboard container manufacturing[2,3];
    - businesses purchase and convert paper and paperboard into corrugated paperboard containers, solid paperboard and packaging containers. Industry products include plain cardboard boxes, specialised packaging for various industrial and consumer goods, and beverage and food cartons. Finished products are mainly sold to other manufacturing industries, as well as to wholesalers, distributors and retailers.
- Paper bag and other paper product manufacturing[4];
    - businesses manufacture paper bags and other paper products; e.g. adhesive labels and food packaging items.
- Paper stationery manufacturing[5];
    - businesses purchase paper and paperboard from mills and process it into a range of office, educational and personal paper stationery products, including writing and filing materials, print and copy paper, paperboard games and toys, paper labels, and playing cards.
- Sanitary paper product manufacturing[6];
    - businesses manufacture sanitary paper products such as tissues, nappies, napkins, towels and female sanitary goods. These products are typically sold to groceries, paper product wholesalers and directly to retailers.
- Paper product merchandising.
    - Businesses include wholesalers, manufacturers and merchants who sell, import and export large volumes of paper and paperboard, as well as paper-based packaging, stationery and sanitary products that are distributed through the merchant sector or directly to specialist industries.

[1] IBISWorld, 2018, C1510 Pulp, Paper and Paperboard Manufacturing in Australia Industry Report
[2] IBISWorld, 2018, C1521a Paperboard Container Manufacturing in Australia Industry Report
[3] IBISWorld, 2018, C1521b - Corrugated Paperboard Container Manufacturing in Australia Industry Report
[4] IBISWorld, 2018, C1528 Paper Bag and Other Paper Product Manufacturing in Australia Industry Report
[5] IBISWorld, 2018, C1523 Paper Stationery Manufacturing in Australia Industry Report
[6] IBISWorld, 2018, C1524 Sanitary Paper Product Manufacturing in Australia Industry Report

As ‘Pulp, paper and paperboard manufacturing’ integrates the value chain of forests and wood resource utilisation, it is here considered the principal PPM manufacturing sector. The secondary manufacturing sectors are those for which ‘Pulp, paper and paperboard manufacturing’ provides the inputs, and are thus considered as ‘downstream’ sectors.

While the *PPM Training Package* includes work functions, competency standards and qualifications that can accommodate some of these downstream sector’s products and processes, this is ancillary to the primary purpose of the training package: primary pulp, paper and paperboard mill operations. The supply chain for these operations is detailed in Figure 1 below.

Figure 1: Pulp, paper, paperboard and paper products supply chain



Source: M.Grieg-Gran, , S. Bass, J. Bishop, S. Roberts, N. Robins, R. Sandbrook, M. Bazett, V. Gadhvi, and S. Subak. 1997. Towards a sustainable paper cycle. Journal of Industrial Ecology 1(3):47–68.

At the end of the financial year in 2018, the industry (excluding ‘Paper product merchandising’) included 679 manufacturing businesses[7], and employed a total of 17,376 people[8]. The paper product wholesaling sector (encompassing ‘Paper product merchandising’) employed 13,258 people across 1,057 businesses[9].

Despite these industry and employment figures, there are just seven pulp, paper and paperboard manufacturing businesses operating in Australia:

[7] Australian Bureau of Statistics, 2018, 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017
[8] Australian Bureau of Statistics, 2018, 6291.0.55.003 - EQ06 - Employed persons by Industry group of main job (ANZSIC), Sex, State and Territory, November 1984 onwards;
[9] IBISWorld Industry Wizard

- ABC Tissue;
- Asaleo Care;
- Australian Paper;
- Encore Tissue;
- Kimberly-Clark Australia;
- Norske Skog Australasia;
- Visy Industries.

Sector Performance

Australia's pulp, paper and paperboard manufacturing industry is a global leader in innovation and sustainability through its energy and water efficiency, use of independently-certified renewable resources and internationally-recognised practices for recycling recovered paper.

In 2018, PPM-related businesses contributed $3.7 billion to Australian gross domestic product (GDP), with a revenue (sales turnover) of $16.1 billion.

Table 2: Industry performance

PPM Sector	Revenue	Domestic Demand[10]	IVA[11]	Exports	Imports
Pulp, Paper and Paperboard	$3.0bn	$3.2bn	$661m	$1.2bn	$1.4bn
Paperboard Container	$712.3m	$862.6m	$171.3m	$6.2m	$156.5m
Corrugated Paperboard Container	$2.8bn	$2.8bn	$748.7m	$2.1m	$70.4m
Paper Stationery	$817.3m	$1.1bn	$162.7m	$48.6m	$298.2m
Sanitary Paper Product	$2.2bn	$2.8bn	$627.8m	$64.2m	$742m
Paper Bag and Other Paper Product	$976.9m	$1.6bn	$273m	$41.1m	$679m
Paper Product Wholesaling	$5.6bn	$5.6bn	$1.1bn	n/a	n/a

Source: IBISWorld Industry Wizard

In aggregate, the industry has contracted over the past five years as domestic demand for printing and communication paper and paper products, such as newspapers and envelopes, has declined relative to consumers' increasing preference for digital alternatives. Similarly, the paper stationery manufacturing industry has also declined due to the trend towards online and digital communication over traditional paper-based documents and mail materials, including envelopes.

The corrugated paperboard and paperboard container manufacturing and paper bag and other paper product manufacturing industries' performances are contingent upon demand from downstream manufacturing industries.

Although some of those sectors have struggled in recent years due to fluctuating consumer demand and volatile markets, others have grown significantly. In 2017-18, consumption in this sector accounted for 1.383 million tonnes of corrugated box materials, with total fibre packaging consumption totalling 1.720 million tonnes. Consumption growth for that year was recorded at 5.3 per cent[12]. This growth was fuelled by a mix of expanded e-commerce activity and food exports.

[10] Domestic demand: a measure of total consumption of an industry's goods and services within this country.
[11] IVA (industry value added): The measure of the contribution by businesses in each industry to gross domestic product (GDP).
[12] IndustryEdge, 2018, Pulp & Paper Strategic Review, Section 6

The sanitary paper product manufacturing industry has experienced difficult trading conditions due to rising import competition and input prices, but does enjoy continued consumption growth, with Australian per capita demand rising to 11.5 kg per person in 2017-18, rivalling the highest consumption levels in the world.[13]

In addition to the above, one of the major and enduring elements of the Australian industry is its ability to recover paper and paperboard at world-leading proportions of consumption. In 2017-18, the industry utilised 1.668 million tonnes of recovered paper and exported a further 1.391 million tonnes, valued at $273 million[14]. The challenges of 2018 – especially Chinese expectations over recovered paper quality – have been met by significant, still emerging additional activity to increase and improve domestic recovered paper reprocessing.

Businesses

There were 679 businesses operating in the aggregated industry at the end of the 2017 financial year (see Table 3), which is 19 fewer than were trading one year previously. Around 87 per cent of all businesses were classified as 'non-employing' or 'small'. There were also 1,057 businesses in the paper product wholesaling sector[15].

Notably, these figures do not include recovered paper businesses (some of which are integrated elements of pulp, paper and paperboard manufacturing firms). These businesses are an integral part of the supply chain for the manufacture of paper and paperboard.

Table 3: Count and size of businesses

	Business Size			
ANZSIC Industry Name	**Non-Employing**	**Small: 1-19 Employees**	**Medium: 20-199 Employees**	**Large: 200+ Employees**
Pulp, Paper and Paperboard Manufacturing	68	61	16	4
Corrugated Paperboard and Paperboard Container Manufacturing	41	69	14	4
Paper Bag Manufacturing	6	7	4	0
Paper Stationery Manufacturing	101	77	22	0
Sanitary Paper Product Manufacturing	13	15	5	3
Other Converted Paper Product Manufacturing	67	60	19	3
Total	**296**	**289**	**80**	**14**

Source: 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017

As stated in the Sector Description above, there are just seven pulp, paper and paperboard manufacturing businesses operating in Australia. That Australian Bureau of Statistics reports that there are 149 (see Table 3), and IBISWorld report 144[16], is indicative of the many 'brand' businesses belonging to major manufacturers.

Industry businesses have traditionally been situated close to customer bases and up- or downstream markets to reduce transport times and costs. As a result, over 75 per cent of industry businesses are in Victoria and New South Wales. These states offer ready access to physical resources, including fibre, water

[13] IndustryEdge, 2018, Pulp & Paper Strategic Review, Section 5
[14] IndustryEdge, 2018, Pulp & Paper Strategic Review, Section 2
[15] IBISWorld Industry Wizard
[16] IBISWorld, 2018, C1510 Pulp, Paper and Paperboard Manufacturing in Australia Industry Report

and energy, in addition to transport hubs for industries that rely on imported materials, such as sanitary paper product manufacturing (for which wood pulp is largely imported).

Most larger businesses in the pulp, paper and paperboard manufacturing sector are vertically integrated to some extent and locate their mills closer to forest and other fibre resources, and relatively close to their secondary processing (conversion) operations, which are generally located close to major markets.

Industry Job Roles

Industry job roles related to the *PPM Training Package* are as follows:

Table 4: Industry job roles

Occupation	Description
Water Services Assistant (Pulp and Paper)	Water Services Assistants help to monitor and control the water services systems in the pulp and paper industry.
Pulping Operations Assistant	Pulping Operations Assistants dump paper into pulping vats, operate pulping machinery, and undertake operator level preventative maintenance.
Electricity Generation / Turbine Operations Assistant	Electricity Generation / Turbine Operations Assistants help monitor and control the power generation systems in the pulp and paper industry.
Steam Generation / Boilerhouse Assistant	Steam Generation / Boilerhouse Assistants help Operators stoke, monitor and control steam boilers in the pulp and paper industry.
Stock Preparation Assistant (Pulp and Paper)	Stock Preparation Assistants help Stock Preparation Operators provide a continuous supply of pulp to papermaking machines. They also store the product and prepare it for dispatch to other sectors in the pulp and paper industry.
Chemical Recovery Assistant (Pulp and Paper)	Chemical Recovery Assistants work with Chemical Recovery Operators, assisting in the various chemical and physical processes that turn waste paper into pulp.
Stock Preparation Assistant (Pulp and Paper)	Stock Preparation Assistants help Stock Preparation Operators provide a continuous supply of pulp to papermaking machines. They also store the product and prepare it for dispatch to other sectors in the pulp and paper industry.
Wet End Assistant	Wet End Assistants help Wet End Operators monitor and control the wet end of the paper machine to convert pulp slurry to paper.
Coating Systems Assistant	Coating Systems Assistants help monitor and control coating operations for paper coating. This includes application of clay, white pigment and binder, as part of the paper finishing process.

Electricity Generation / Turbine Operations Assistant	Electricity Generation / Turbine Operations Assistants help monitor and control the power generation systems in the pulp and paper industry.
Chemical Recovery Assistant (Pulp and Paper)	Chemical Recovery Assistants work with Chemical Recovery Operators, assisting in the various chemical and physical processes that turn waste paper into pulp.
Dry End Assistant	Dry End Assistants help Dry End Operators monitor and control papermaking operations which take place as the paper material passes through the dryer section.
Water Services Assistant (Pulp and Paper)	Water Services Assistants help to monitor and control the water services systems in the pulp and paper industry.
Steam Generation / Boilerhouse Assistant	Steam Generation / Boilerhouse Assistants help Operators stoke, monitor and control steam boilers in the pulp and paper industry.
Finishing and Converting Assistant	Finishing and Converting Assistants help set up, operate, and maintain the machinery, systems and equipment used in the paper finishing and conversion processes.
Chemical Recovery Operator (Pulp and Paper)	Chemical Recovery Operators set up, operate and maintain equipment used in chemical recovery operations during the process of converting pulp into paper products.
Electricity Generation / Turbine Operator	Electricity Generation / Turbine Operators manage steam turbine start up and power generation shutdown and inspection in the pulp and paper industry.
Stock Preparation Operator (Pulp and Paper)	Stock Preparation Operators work in the wet end and refining process of papermaking. They monitor and control the stock preparation system, ensuring consistency in the recovered fibre.
Water Services Operator (Pulp and Paper)	Water Services Operators monitor and control the water services systems in the pulp and paper industry. They may be involved with surface water, groundwater, waste water collection and waste water treatment.
Waste Paper Operator	Waste Paper Operators set up, operate and maintain the waste paper sorting/pressing machinery that converts waste material into pulp during pulp and paper manufacturing.
Pulping Operator	Pulping Operators start up pulping systems and co-ordinate and implement pulping plant. They observe and monitor material, dials, or charts to ensure specified consistency of pulp.

Primary Resources Operator (Pulp and Paper)	Primary Resources Operators prepare the woodchip line for production, prepare logs for chip production and manage system shutdown in the pulp and paper manufacturing industry.
Steam Generation / Boilerhouse Operator (Pulp and Paper)	Steam Generation / Boilerhouse Operators manage steam boiler start up and shutdown and stoke steam boilers in the pulp and paper industry.
Wet End Operator	Wet End Operators prepare start-up, monitor and control the wet end of the paper machine to convert pulp slurry to paper.
Dry End Operator	Dry End Operators prepare and start up dry end operations; coordinate and implement dry end shutdown, and operate equipment as part of the paper finishing process.
Chemical Recovery Operator (Pulp and Paper)	Chemical Recovery Operators set up, operate and maintain equipment used in chemical recovery operations during the process of converting pulp into paper products.
Steam Generation / Boilerhouse Operator (Pulp and Paper)	Steam Generation / Boilerhouse Operators manage steam boiler start up and shutdown and stoke steam boilers in the pulp and paper industry.
Finishing and Converting Operator	Finishing and Converting Operators set up, operate, and maintain the machinery, systems and equipment used in the paper finishing and conversion processes. These include winding paper, water marking, perforating, cutting, embossing, laminating, folding, bonding, wrapping and packing of paper and paper products.
Coating Systems Operator	Coating Systems Operators prepare and start-up the coated paper system; coordinate and implement the shutdown of the paper coating system, and operate equipment associated with the application of clay, white pigment and binder, as part of the paper finishing process.
Electricity Generation / Turbine Operator	Electricity Generation / Turbine Operators manage steam turbine start up and power generation shutdown and inspection in the pulp and paper industry.
Paper Coating Systems Operator	Paper Coating Systems Operators prepare and start-up the paper coating system, and modify processes associated with the application of clay, white pigment and binder, as part of the paper finishing process.
Stock Preparation Operator (Pulp and Paper)	Stock Preparation Operators work in the wet end and refining process of papermaking. They monitor and control the stock preparation system, ensuring consistency in the recovered fibre.
Water Services Operator (Pulp and Paper)	Water Services Operators monitor and control the water services systems in the pulp and paper industry. They may be involved with surface water, groundwater, waste water collection and waste water treatment.

Stock Preparation Senior Operator (Pulp and Paper)	Stock Preparation Senior Operators oversee and coordinate the activities of teams that prepare pulp for papermaking machines and dispatch the product to other sectors of the industry.
Waste Paper Senior Operator	Waste Paper Senior Operators are responsible for ensuring the smooth running of the waste paper sorting and pressing processes that convert waste material into pulp. They supervise teams, troubleshoot and rectify process faults, and oversee quality assurance processes.
Pulping Senior Operator	Pulping Senior Operators oversee and coordinate the activities of workers engaged in cooking, bleaching, and screening pulp and in making cooking and bleaching liquors to prepare pulp for use in making paper. They also train workers in operation of equipment.
Water Services Operator (Pulp and Paper)	Water Services Operators monitor and control the water services systems in the pulp and paper industry. They may be involved with surface water, groundwater, waste water collection and waste water treatment.

Source: training.gov.au

Stakeholders

The pulp and paper manufacturing industry is represented by the industry and employee associations at the national level in

Table 5: Stakeholders

Categories
Industry Associations
Australian Forest Products Association (AFPA)
Australasian Pulp and Paper Industry Technical Association (APPITA)
Packaging Council of Australia
Employee Representative Organisations
CFMMEU Forestry and Furnishing Products Division (CFMMEU)
Australian Workers' Union (AWU)
Industry R&D Services Bodies
Bioresource Processing Research Institute of Australia (BioPRIA)
Forest and Wood Products Australia Ltd
Industry Services Bodies
ForestWorks
IndustryEdge

Training Package Overview

Context

Industry undertakes significant training and workforce development activities at the business level, both formal and non-accredited.

Formal training is mandatory for occupations or activities, such as such as operating forklifts, that require a licence or registration from a professional association or occupational licensing authority. A 'high-risk work licence' is required for such activities as operating cranes.

Large businesses often utilise in-house materials and trainers for non-accredited training, which is sometimes based upon *PPM Training Package* qualifications and units of competency. Pulp and paper manufacturing businesses often take advantage of vendor training to upskill staff promptly in operating new technology rather than wait for the training package to introduce skill standards. Such strategies are also chosen to avoid financial or operational disruption associated with off-the-job training.

Data

The PPM Training Package comprises seven qualifications (see Table 6), 80 units of competency and ten skill sets. There are 37 registered training organisations (RTOs) with PPM *components* on scope, albeit no RTOs currently train PPM *qualifications*.

Table 6: Current PPM qualifications

Current Qualification Code	Qualification Name
PPM20116	Certificate II in Pulping Operations
PPM20216	Certificate II in Papermaking Operations
PPM30116	Certificate III in Pulping Operations
PPM30216	Certificate III in Papermaking Operations
PPM40116	Certificate IV in Pulping Operations
PPM40216	Certificate IV in Papermaking Operations
PPM50116	Diploma of Pulp and Paper Process Management

Source: https://training.gov.au/Training/Details/PPM

NCVER enrolment and completion data for the PPM Training Package is limited due to qualification release dates and, in some cases, negligible activity. Table 7 displays the available data.

Table 7: Qualification enrolments and completions

Qualification	Status	2014	2015	2016	2017	Total
FPP30110 - Certificate III in Pulping Operations *(superseded by and equivalent to PPM30116)*	Enrolments	30	22	1	1	**54**
	Completions	1	20	0	0	**21**
FPP30110 - Certificate III in Pulping Operations *(superseded by and equivalent to PPM30216)*	Enrolments	34	25	27	5	**91**
	Completions	11	14	6	0	**31**

Sources: a) NCVER VOCSTATS, TVA program enrolments 2014-2017; b) NCVER VOCSTATS, TVA program completions 2014-2017

Please see APPENDIX 1 for further *PPM Training Package* data.

Industry Trends: Challenges and Opportunities

The Australian pulp, paper and paper product manufacturing sector operates in a macro environment shaped by a range of dynamic and mainly global factors related to wood and other fibre, markets, trade, technology and environmental challenges. The following paragraphs discuss the issues and industry's opportunities for growth pertaining to these factors.

Resources and environment

Fibre supply

Demand for wood fibre continues to grow as the global population expands and the middle-classes rise and consume more. As a result, fibre resources are becoming ever scarcer. For almost two decades, availability of wood fibre has been a real concern across the world and, as demand develops, the supply is expected to tighten.

Based on the National Plantation Inventory[17], Australia's wood fibre resources are predicted to grow over the next 15 years but not for all the pulp markets. Production has increased only marginally from 4.6 million cubic metres in 2009–2010 to around 5.6 million cubic metres per year during 2015–2016, and is expected to remain at this level until 2054[18].

Secondary fibre, including recovered paper and paperboard, is a massive resource for the industry. Residues from sawmilling and other wood processing activities contribute to the wood fibre supply, also providing opportunities for the industry.

Australia has high rates of paper recovery and utilisation, essentially providing alternative solutions to limited availability of market pulp. The Australian industry recycled 76 per cent of industrial paper and paperboard (mainly corrugated boxes) in 2016-17, which is equivalent to levels in Europe and the US. Recovered paper is an increasingly valuable resource and is now the sole fibre source for many paper products. In 2017, the recovery rate for Newsprint was 75.4 per cent.[19]

Recovered newsprint and packaging papers are two grades with high collection rates. Recycling of office grade paper is also elevated by Australia Paper's de-inking and recycling plant in Victoria's Latrobe Valley.

Environmental sustainability

With continuous innovation and investment, the Australian pulp and paper manufacturing industry has progressively reduced its water and energy footprint for paper and paperboard production. Pulp and paper facilities are currently using water systems that allow all mill wastewater to be reused; for example, for farm irrigation.

Several of Australia's pulp and paper mills produce baseload (continuous supply) electricity and thermal heat from renewable, biomass residues. The sector continues to examine opportunities to develop its delivery of baseload electricity to the grid. A recent development is the move towards investments in Energy from Waste (EfW) at major pulp and paper mills. As experts in handling massive quantities of wood fibre resources and variable recovered paper resources, pulp and paper mills are well-placed to manage these emerging facilities and utilise the energy.

[17] http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018, Table 2.32, p.214
[18] Ibid.
[19] IndustryEdge, 2018, Pulp & Paper Strategic Review, Section 2

An apparent strategic threat to the pulp and paper industry is continuing opposition, on environmental grounds, to the expansion prospects of domestic manufacture, particularly of pulp mills.

A critical challenge for the industry is the volume (and value) of imported paper products and capacity for them to replace locally manufactured products. It has been identified that the greenhouse gas emissions associated with production of locally made paper and paper products (including recycled paper and products) is significantly lower than the emissions associated with imported paper products.

More than 95 per cent of the wood fibre used in the manufacture of pulp and paper and paperboard in Australia is from forests certified by either the Responsible Wood Certification – the endorsed scheme of the Program for Endorsement of Forest Certification (PEFC) – or the Forest Stewardship Council Certification (FSC) and, in some cases, by both.[20]

Business and economics

There is sporadic global growth in paper and paperboard consumption. Two dominant segments – packaging and tissue markets – currently drive growth.

The demand for packaging paper is provided by the growing global consumption of goods, online shopping, trading of food items (involving a variety of retail-ready corrugated containers and cartonboard packaging products) and manufacturing in general. These consumer trends can offer opportunities to Australian pulp and paper producers to shift production and realise growth. However, there are challenges associated with expanding paper and paperboard production.

Australia's manufacturing of converted packaging, mainly corrugated boxes, has increased over the last few years despite the ongoing levels of imports. The value of moulded fibre imports (including egg cartons, fruit trays and medical pulp) reached record levels in 2017. Australia's cartonboard conversion sector (cereal boxes, chilled bottle holders for products such as boutique beer, pharmaceutical packaging and other high-end products) has gone through rationalisation and global vertical integration.

Australia's tissue market is very dynamic, sustained by marketing strategies of the three major retailers and manufacturers for their branded products. However, local producers are under constant pressure from imports of tissue stock, both pre-converted and ready for conversion into tissue products. The bulk of pre-converted tissue product imports consist of pre-converted toilet paper, with China being the dominant supplier.

Australia's demand for printing and communication paper grades declined considerably in recent years. Digitisation is the disrupting factor and agent of change for the newsprint, printing and communication sectors. For a decade, there has been both continuous decline in consumption and rising input costs for printing and communication papers. This culminated in successive rounds of price increases in 2017 and 2018, fuelled by rising global pulp prices. While the value of the paper was increased, the price rises also appear to have placed some pressure on demand.

Notably, print buyers have engaged in substitution towards lower-priced grades of paper. Demand for Newsprint continues to fall on an ongoing basis and will not recover. Catalogue grade paper has exhibited more stability over the last half decade than other grades of Printing and Communication paper due to the print emphasis of many retailer's advertising campaigns. However, even that has begun to wane in the last year.
There is a dramatically improved market share of the sole domestic copy paper producer. The exchange rate, combined with a successful Anti-Dumping action, has reduced the levels of imported product in a market dominated by imports just three years ago.

[20] AFPA, 2018, National Pulp & Paper Industry Sustainability Report

Australia's total imports of pulp were stable in 2018 when compared with the prior year. Marginally higher tissue production is the primary driver.

In addition to its extensive utilisation of recovered paper to manufacture a wide range of paper and paperboard products, Australia exports recovered paper to the rapidly growing pulp and paper industry in Asia. China has been the leading destination until recently when exports declined significantly. The decline in 2018 was dramatic – amounting to a fall of more than 300,000 tonnes. The fall was driven by Chinese prohibitions on lower quality imports of recovered paper, that impacted the market across the globe.

This market situation threatens the economics of paper recovery and therefore re-processing in Australia and elsewhere. This is both a significant challenge and an opportunity for the industry, and one that is under active consideration. Significant investments have already been made in re-processing and further are expected.

Emerging products and markets

Bioenergy and bioprocessing are considered the next economic wave or markets of the future. The attention is on facilities such as pulp and paper mills that can extract new value from fibres and residues via chemical processing.

The industry has focused on a group of bioproducts that are primarily energy related. Kraft pulp mills involving large chemical plants are already burning their pulp by-product – lignin and black liquor – to create energy for use in the mill.

Global developments suggest that a more significant and valuable output than the generation of energy is yet to be realised by bioprocessing facilities like pulp and paper mills. Considerations exist to transform chemical pulp mills into integrated forest biorefineries to produce higher value-added products such as ethanol, polymers, carbon fibres and diesel fuel in addition to the pulp. Current bioprocessing developments from pulp residues deliver products such as bioplastics, biocomposites and green chemicals that can replace inorganic and non-renewable chemicals.

A biorefinery can also refine wood into the following types of products:

- Cellulose, including pulp, textile fibres and nanomaterials (like nanocrystalline cellulose)
- Lignin, including pellets, active carbon and emulsifiers
- Hemicellulose, including base chemicals, sugars/alcohols and hydrogels
- Extractives, including fatty acids and tannin.

Under certain policy conditions, and with a growing demand for bioenergy and products made of dissolving pulp and nanocellulosic fibres, the industry has the opportunity to develop into a producer for new, niche markets and achieve higher resource utilisation and improved financial results.

More immediately, there is continued expansion in the moulded pulp sector, all growth for which is currently supplied by imports. As sustainability concerns are focussed onto plastics, fibre sacks and bags are also growing their total market share.

Technology

Many pulp and paper manufacturing industry investments have focused on process improvement, efficiencies and refinements, mainly to serve small markets for traditional pulp, paper and paperboard products.

Other industry investments are substantial and pursue consolidation and diversification into related areas, including biomass electricity generation. In these cases, there is a need to be on an efficient scale and directly linked to resource access.

The increasing demand for containerboard (Corrugated Boxes) appears to be inevitable. Mill conversions from newsprint to containerboard (Corrugated Boxes) production represent an opportunity for some businesses; however, conversion investments cost almost as much as a new paper machine (between $150 million and $850 million) and contribute to a tightening of markets.

Integrated pulp and paper mills already allocate significant funds to renewable biomass energy production, where energy (thermal and electrical) is a major and essential by-product of the total production process.

Australian Paper and SUEZ intend to finalise waste supply arrangements for the Energy from Waste (EfW) project by 2020 and construction of the EfW facility is planned to begin soon after, with completion expected in 2024 at the company's Maryvale Mill.[21]

Cross-sectoral concerns/dependencies

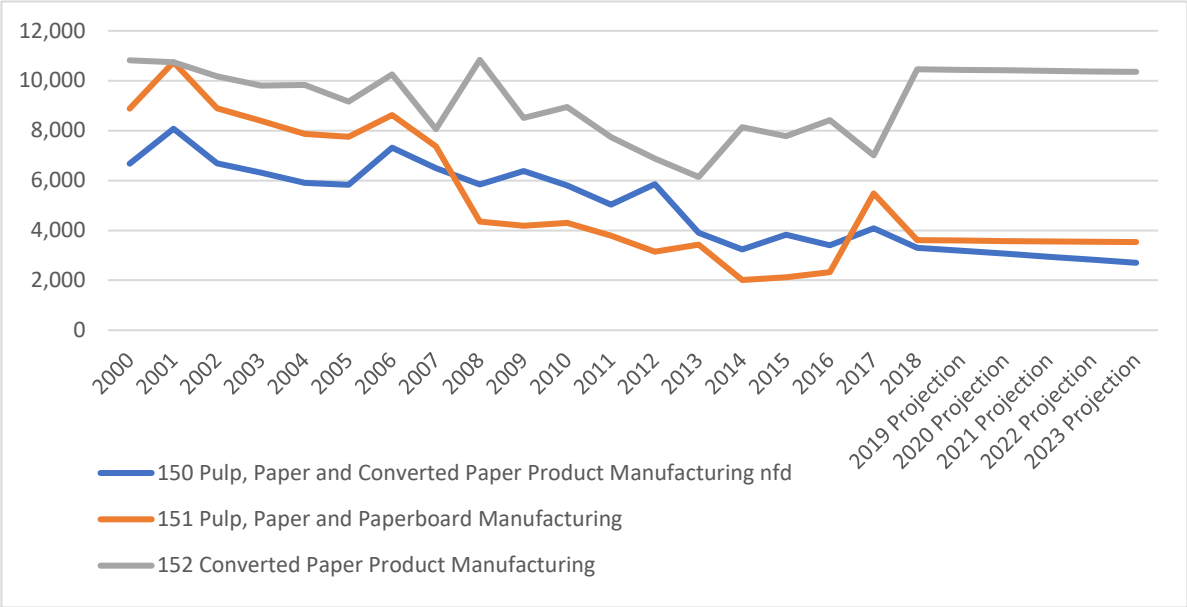
Infrastructure development is crucial for the efficient movement of products and for competitiveness. New physical infrastructure such as air-freight and the digital networks that support real-time supply chain management have the potential to facilitate increased productivity and exports.

[21] http://ausfpa.com.au/media-releases/congratulations-to-australian-paper-on-energy-from-waste-partnership/, accessed February 2019

EMPLOYMENT AND SKILLS OUTLOOK

Total employment in the pulp and paper manufacturing industries has shown a generally downward trend since 2000, though this is punctuated by sharp fluctuations. While total industry employment in 2018 (17,376) was over 34 per cent lower than in 2000 (26,362), employment in the converted paper product manufacturing sector reached its highest level (10,459) in 2018 following a 49 per cent surge from the previous year. Meanwhile, between 2017 and 2018, employment in the pulp, paper and paperboard manufacturing fell by 34 per cent (1,871). Total industry employment is expected to stabilise, however, with only a five per cent contraction projected to 2023 (see Figure 2).

Figure 2: Employment levels and projections to 2023[22]

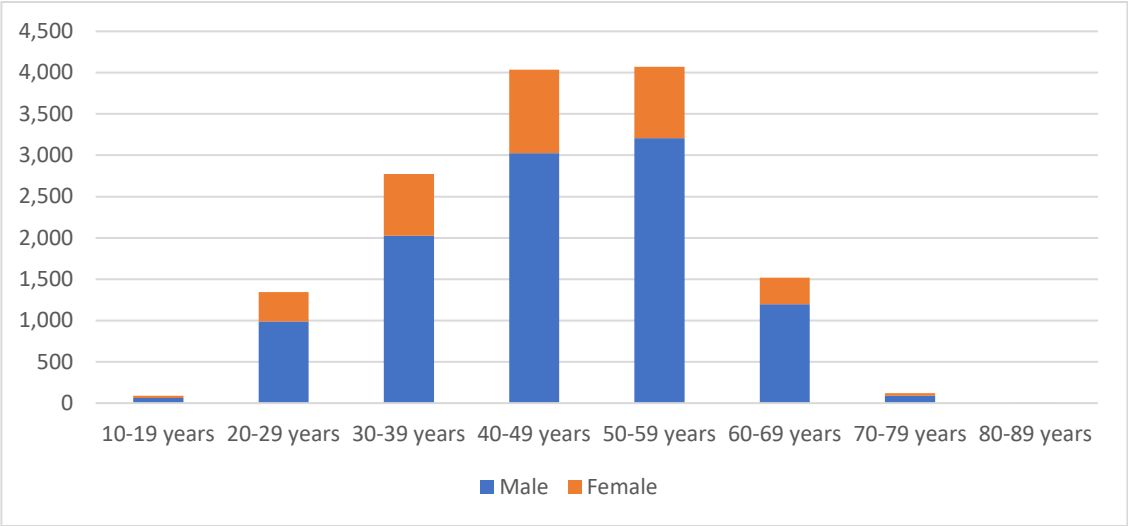


Sources: a) Australian Bureau of Statistics - 6291.0.55.003 - EQ06 - Employed persons by Industry group of main job (ANZSIC), Sex, State and Territory, November 1984 onwards; b) Labour Market Information Portal, 2018 Industry projections - five years to May 2023 (% growth projected)

The modest contraction detailed above is in the context of an ageing workforce, 41 per cent of whom are over the age of 50 years (see Figure 3).

[22] The 'nfd' beside '150 Pulp, Paper and Converted Paper Product Manufacturing nfd' means 'not further defined'. This is used by ABS when a respondent did not provide adequate information for the response to be put into a category at a more detailed level.

Figure 3: Industry age groups and sex



Source: ABS, 2016 Census - Employment, Income and Education

Industry Priority Skills

The PPM IRC recognises that its situation, while not unique, is challenging for the national training system. While the IRC and its members understand that there is recognition they do conduct the training required to operate their extensive, technical and complex facilities, it is equally obvious that this currently results in few, if any, enrolments in qualifications. Though it is reassuring that the extensive workplace-based training, skills formation and skills recognition the sector undertakes is often 'mapped' to competency standards, there is great potential for directly partnering industry training with training package standards and assessment.

Prior to any 'drive' by the industry to encourage enrolments, a timely analysis of the interrelationship between workplace training and the VET system must be considered.

The priority skills identified for training package competencies, at this time, relate to those that support the recovered paper and cardboard processing sector, including pulp de-inking and bleaching processes for high- and medium-grade paper products, and the adoption of technologies in paper bag, paper stationery and sanitary paper product manufacturing. Further skills requirements will emerge as industry sectors transform chemical pulp mills into integrated forest biorefineries to produce higher value-added products such as ethanol, polymers, carbon fibres and diesel fuel (in addition to pulp).

2019-2020 PROJECT DETAILS

The Proposed Schedule of Work 2019–2022 is on page 3.

Project 1: Industry Workshop

Description

This project is for research to be undertaken with industry to establish *why* in-house training is generally preferred to the *PPM Training Package*. The PPM IRC, supported by the Secretariat, will conduct a workshop in the middle of 2019 with industry stakeholders to investigate low engagement levels with the training package, and to ascertain the extent to which industry utilises its infrastructure and quality assurance skills standards. Further research will be conducted as required, and results will be communicated to the Department and AISC, possibly with the submission of one or more cases for change.

Rationale

Industry's participation in the review of specialist operators for last year's *PPM Pulp and Paper Manufacturing Training Package* project reflected a willingness to engage with the national training system. It is now time to ensure that the currency of these standards can be adopted through an effective engagement between the pulp and paper manufacturing industry and VET industry, and to broaden the discussion to include a wider range of roles and educational pathways in the industry.

Project 2: Recycling and de-inking recovered paper

Description

This project is to review existing units of competency and develop new units to support the recovered paper and cardboard processing sector, including for processes around pulp de-inking and bleaching for high- and medium-grade paper products.

New units will be developed at AQF levels 3 and 4 in pulping operations to address requirements for current recycling and de-inking recovered paper processes.

Rationale

Australia's recovery and recycling of paper and paperboard has increased dramatically over the last 10 to 15 years. By 2016, the recycling rate for all paper and paperboard was 73.7 per cent. This equals about 3.077 million tonnes of recovered paper and paperboard annually, with more than half being re-processed for local use[23]. The remaining part is exported to North and South-East Asia, where there is a demand for fibre.

Consumer awareness of environmental issues, together with a growing demand for Australian-made recycled office, printing, envelope and stationery paper, and expansion of the containerboard market, have provided local paper and cardboard companies with the opportunity to invest in recycling operations.

The use of recycled fibre in paper manufacturing also consumes less energy, water and chemical agents (e.g. bleach) compared to virgin fibre, as it requires less raw material and energy to pulp recycled paper products than virgin wood chips.

[23] AFPA, 2016 National Pulp & Paper Sustainability Report. [www] http://ausfpa.com.au/wp-content/uploads/2017/09/AFPA-Sust-Report_vF.pdf.

The majority of recovered paper and cardboard is re-processed by large manufacturers, including Visy, Amcor, Australia Paper and Norske Skog in New South Wales, Victoria and Queensland.

Most recovered papers are used to produce brown-grade papers and boards. However, there has been a substantial increase in the use of recovered papers to produce, through de-inking, white-grade papers, such as newsprint, tissue and market pulp. Visy and Amcor process both high-, medium- and low-grade waste paper into a wide range of recycled paper products. Australian Paper's new de-inking and recycling plant in Latrobe Valley (Victoria) processes high-grade (office) waste paper into recycled copy paper, envelope and printing paper. Norske Skog converts waste catalogues and newsprint into recycled newsprint.

The recovered paper and cardboard re-processing sector involves producing recycled pulp from recovered papers (waste paper sorting, re-pulping, cleaning and screening), de-inking and bleaching (when the pulp is for manufacturing white paper, newsprint, tissue and market pulp), and manufacturing paper by using pulp (which may be virgin or recycled).

The IRC proposes developing new units to address the current skill needs for the production of recycled pulp from recovered papers. Specific skills gaps and competency requirements are identified in the following critical areas:

- Sorting recovered paper, including the ability to operate technology and processes for handling, identifying and separating paper grades for recycling.
- Recovered paper pulping and contaminant removal, including knowledge of techniques for producing pulp slurry and removing contaminates such as clay, metals and glue. Also required is knowledge of contaminants in different paper grades and impacts on product quality, recycling infrastructure and workplace health and safety.
- De-inking recycled pulp, including knowledge of treatments for removing the ink and their function. The first step is performed during pulping (slushing) and involves ink detachment from the surface of the disintegrated fibres. In the second step, the detached ink particles are removed from the pulp slurry by washing or flotation.
- Bleaching of recycled pulp, including knowledge of the processes and chemicals used for bleaching de-inked pulp.

Addressing the Minister's Priorities

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 *Pulp and Paper Manufacturing* IRC will seek to identify industry's expectations of training delivery. Information will be presented in the *PPM 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 the pulp and paper operations industry.

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.

Consultation Plan

The *Pulp and Paper Manufacturing* IRC has proposed and agreed upon the following project consultation plan:

- Working groups will be established to gain technical expertise and guidance for the sub-projects during the development stage. Subject matter experts and companies proposed to be part of the working groups are provided in the list below.
- Project updates on the Skills Impact 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 with project updates and input sessions during relevant industry events.

Scope of the Project

The project is expected to commence in 2019 and be completed within 12 months from its approval. Based upon previous experience, the project should allow enough time for engaging with industry stakeholders. The project relates to a small but important number of units that are highly specific to specialist responsibilities in the sector.

Qualifications

There will be no qualifications reviewed as part of the project

Units

No current Units of Competency will be reviewed
Up to eight new units may be developed

Skill Sets

Up to one new Skill Set may be developed

IRC SIGNOFF

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 **Pulp and Paper Manufacturing IRC** by its appointed Chair:

_____

Name: Denise Campbell-Burns

_____

Signature

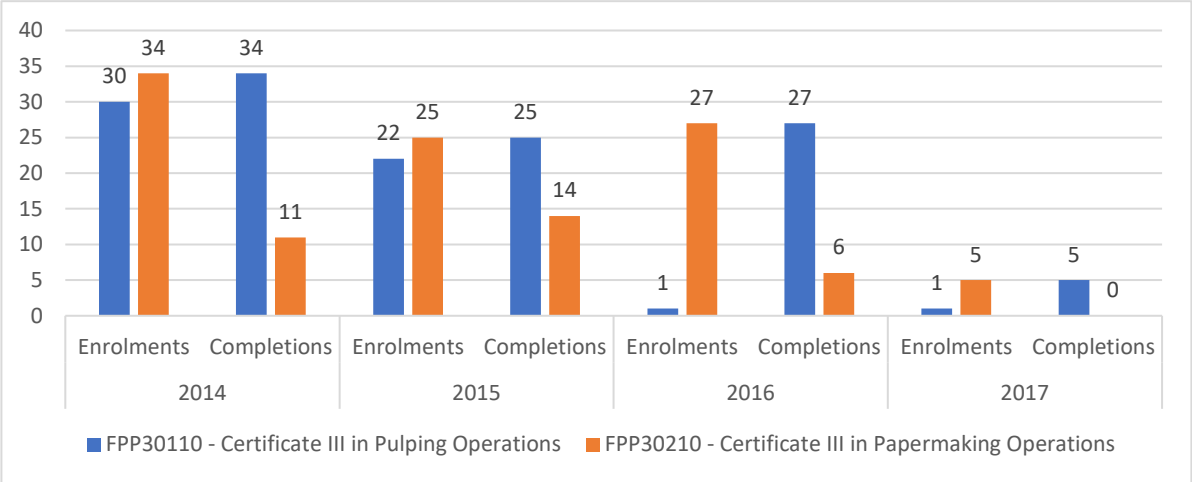
_____

Date: 28th April, 2019

APPENDIX 1: PPM TRAINING PACKAGE DATA

Between 2014 and 2017, enrolments and completions were only recorded for two qualifications: *FPP30110 - Certificate III in Pulping Operations* and *FPP30210 - Certificate III in Papermaking Operations*, which are both superseded by, and equivalent to, their namesakes in the *PPM Training Package* (see Figure 1 and Table 3). Both qualifications are intended to lead to the occupation 'Paper and Pulp Mill Worker' (ANZSCO code 839411).

Figure 4: PPM qualification enrolments and completions



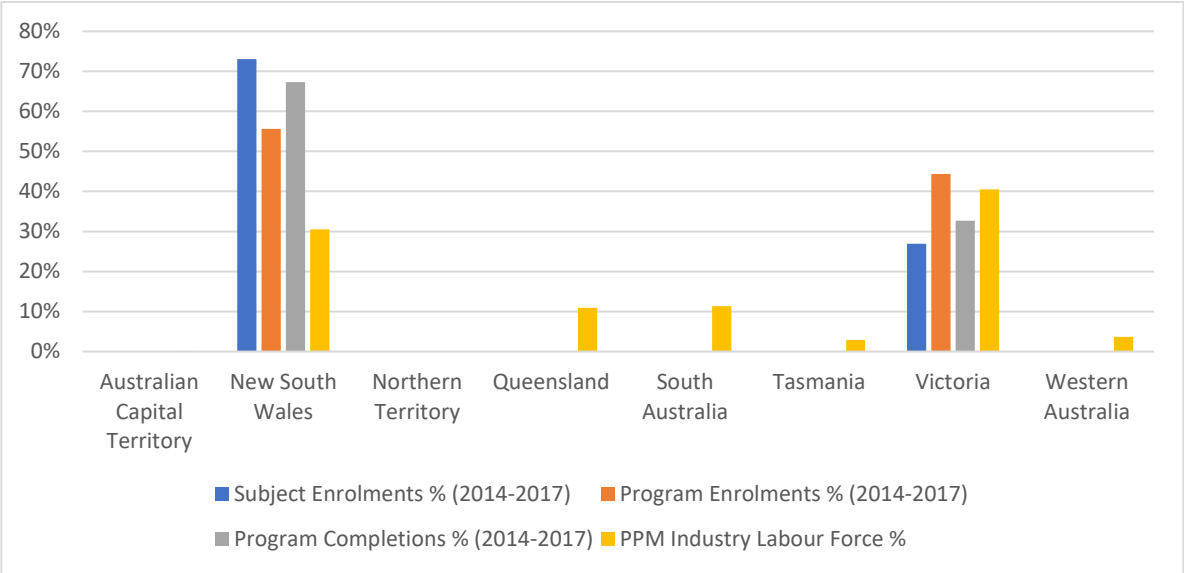
Sources: a) NCVER VOCSTATS, TVA program enrolments 2014-2017; a) NCVER VOCSTATS, TVA program completions 2014-2017

All enrolments and completions in these qualifications were conducted through TAFEs in New South Wales and Victoria in inner and outer regional areas[24]. While no program training activity has been recorded in New South Wales after 2015, the state still accounts for 56 per cent of enrolments and 67 per cent of completions since the start of 2014.

That all training activity has been in New South Wales and Victoria is understandable given those states' high share of the PPM-related labour force (see Figure 5).

[24] Over 10 per cent of enrolees were from non-English-speaking backgrounds. There were no enrolments by Indigenous people or people with disabilities.

Figure 5: State proportions of enrolments, completions and the PPM-related labour force

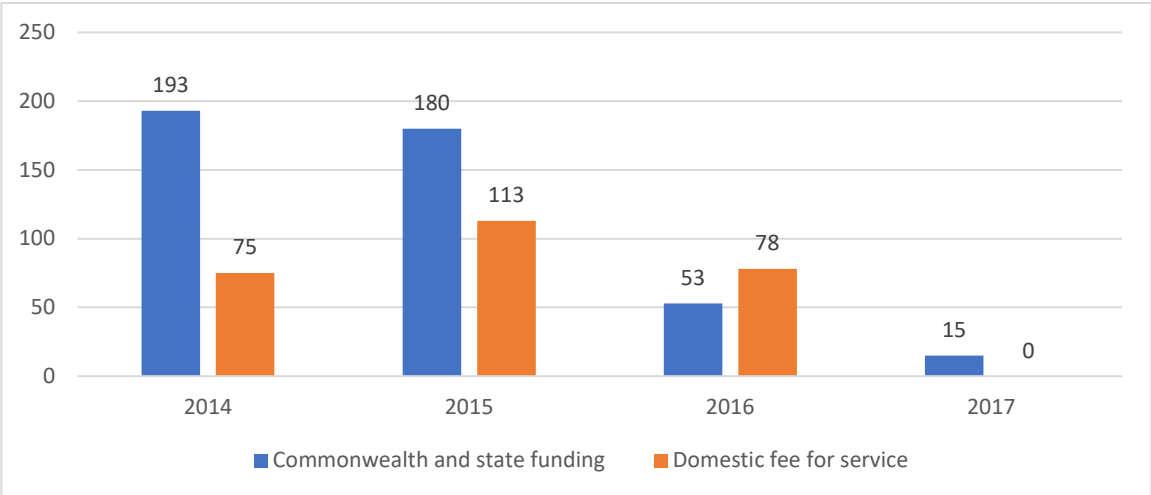


Sources: a) NCVER VOCSTATS, TVA subject enrolments 2014-2017; b) NCVER VOCSTATS, TVA program enrolments 2014-2017; c) NCVER VOCSTATS, TVA program completions, 2014-2017; d) Australian Bureau of Statistics -6291.0.55.003 - EQ06 - Employed persons by Industry group of main job (ANZSIC), Sex, State and Territory, November 1984 onwards.

All stand-alone subject enrolments between 2014 and 2017 were also in New South Wales and Victoria, with 82 per cent (588) through TAFEs and the rest (129) through RTOs.

Subject enrolments are, however, declining. This trend coincides with rates of government funding falling sharply after 2015 (see Figure 6).

Figure 6: Subject enrolment funding sources



Source: NCVER VOCSTATS, TVA subject enrolments 2014-2017

Table 8: Unit enrolments

Unit	2014	2015	2016	2017	Total
FPPCSK310A - Operate process control equipment	23	0	0	0	**23**
FPPDEO210A - Monitor and control dry end operations	11	2	0	0	**13**
FPPDEO320A - Prepare and start up dry end operations	0	6	0	0	**6**
FPPDEO330A - Co-ordinate and implement dry end shutdown	0	5	0	0	**5**
FPPENV210A - Identify and monitor environmental discharges/emissions	11	0	0	0	**11**
FPPEPG210A - Monitor and control power generation system	0	0	0	0	**0**
FPPEPG320A - Manage a power generation system startup	1	0	0	0	**1**
FPPEPG330A - Co-ordinate power generation system shutdown	1	0	0	0	**1**
FPPFCO320A - Prepare and start up finishing and converting operations	19	8	7	0	**34**
FPPFCO340A - Troubleshoot and rectify finishing and converting systems	5	12	9	2	**28**
FPPMHV210A - Operate overhead crane	12	87	48	0	**147**
FPPNUM210A - Estimate and calculate basic data	8	7	17	1	**33**
FPPNUM320A - Measure and calculate routine workplace data	14	0	3	0	**17**
FPPOHS310A - Contribute to OHS processes	43	30	13	0	**86**
FPPPRM210A - Undertake operator level preventative maintenance	16	0	0	0	**16**
FPPPRS210A - Identify and rectify problems in the workplace	27	41	23	0	**91**
FPPPUL210A - Monitor and control pulping operations	0	8	0	0	**8**
FPPPUL320A - Prepare and start up pulping system operations	0	6	0	0	**6**
FPPPUL330A - Co-ordinate and implement pulping plant shutdowns	0	12	0	0	**12**
FPPQAS210A - Apply basic quality practices	0	0	12	1	**13**
FPPREC210A - Monitor and control chemical recovery operations	2	0	6	4	**12**
FPPREC320A - Prepare and start up chemical recovery operations	2	0	0	1	**3**
FPPREC330A - Co-ordinate and implement chemical recovery shutdowns	0	0	0	1	**1**
FPPSPR210A - Monitor and control stock preparation systems	10	6	0	0	**16**
FPPSPR320A - Prepare and start up stock preparation system for production	0	4	0	0	**4**
FPPSPR330A - Co-ordinate and implement stock preparation system shutdown	0	7	0	0	**7**
FPPSTM210A - Monitor and control boiler operation	0	3	0	0	**3**
FPPSTM320A - Manage steam boiler startup	0	1	0	0	**1**
FPPSTM330A - Shut down and bank steam boiler	0	6	0	0	**6**
FPPSUS210A - Apply sustainable work practices/policies	42	20	1	3	**66**
FPPWEO210A - Monitor and control wet end operations	12	12	0	0	**24**

FPPWEO320A - Prepare and start up wet end operations	3	14	0	0	**17**
FPPWEO330A - Co-ordinate and implement wet end shutdown	3	15	0	0	**18**
Total	**265**	**312**	**139**	**13**	**729**

Source: NCVER VOCSTATS, TVA subject enrolments 2014-2017

APPENDIX 2: INDUSTRY REGULATIONS AND STANDARDS

The pulp and paper manufacturing industry in Australia operates under regulations at both the federal and state government levels, which relate to environmental standards and industry's impact on forest resource depletion, water and the level of chemical pollution.

The federal government regulates the industry through the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, the centrepiece of federal environmental legislation. Most investment proposals need to meet the EPBC Act requirements. In some cases, specific legislation is required to develop and operate a particular mill (e.g. the Penola Pulp Mill project was approved by the *Penola Pulp Mill Authorisation Act 2007*). In other cases, mills are approved with conditions under the EPBC Act (e.g. the federal government approval of the Gunns Bell Bay Pulp Mill in 2007 came with a requirement that Gunns develop an environmental impact management plan).

State and territory governments regulate the industry through the *Environmental Protection Act 1970* and regulations, which differ between states and territories and are monitored by state-based EPAs.

Other national legislation that directly or indirectly affects this industry includes:

- Illegal Logging Prohibition Act 2012
- Regional Forest Agreement Act 2002.

Industry producers and wholesalers are required to meet general workplace regulations and workplace health and safety regulations, including those related to major hazardous facilities in some states.

Wholesalers must also 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 them.

Also, the industry implements two voluntary forest certification schemes: the Responsible Wood Certification Scheme (RWC) and the Forest Stewardship Council Scheme (FSC), which typically require forest management practices to be more stringent than the legislation alone. Both schemes have forest management standards and chain-of-custody standards. The latter apply more specifically to this industry, with reference to printing and communication grade papers and related paper products.

APPENDIX 3: INDUSTRY PRIORITY FOR GENERIC SKILLS

The Industry Reference Committees were consulted on ranking the generic skills priorities for industry from a list provided by the Department of Education and Training. Table 9 outlines the advice received.

Table 9: Industry priority for generic skills

Rank	Generic Skill
1	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.
2	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.
3	Language, Literacy and Numeracy (LLN) skills Foundation skills of literacy and numeracy.
4	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.
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	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.
7	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. Ability to work with large amounts of data: facts, figures, number crunching, analysing results.
8	Science, Technology, Engineering and Maths (STEM) skills Sciences, mathematics and scientific literacy.
9	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.
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