Circular Jobs and Skills: A Workforce in Motion

SV Lab Research Insights
Updated for 2026

Sustainability Victoria

VICTORIA State Government

Circular Jobs and Skills: A Workforce in Motion

Authorised and published by
Sustainability Victoria
Level 12, 321 Exhibition Street
Melbourne Victoria 3000 Australia

Circular Jobs and Skills: A Workforce in Motion

April 2026

ISBN: 978-1-920825-90-4

Also available on sustainability.vic.gov.au

Accessibility
This document is available in PDF and Word format on the internet at sustainability.vic.gov.au

Circular Jobs and Skills: A Workforce in Motion

Executive summary

This report expands on Sustainability Victoria's analysis of the workforce capabilities needed for our transition to a circular economy, as published in Circular Jobs and Skills: Planning for our Future. Through a new methodology, this report adds a quantification of circular employment in Victoria. This quantification uses input-output analysis, a macroeconomic technique based on the interdependencies between industries, allowing the flow of circular goods and services to be linked to employment across the entire economy. This approach enables a more comprehensive picture of circular employment than direct industry counts alone.

Combined, both reports provide the most detailed overview of Victoria's circular workforce characteristics developed to date. The comprehensive economic modelling used enables the tracking of Victoria's circular workforce over time, reflecting both natural industry trends and the efficacy of circular policy and programs. It is therefore highly recommended that this methodology be implemented as a standardised, annual process to build a detailed picture of Victoria's circular progress, essential for evidence-based policymaking.

The new methodology refines and expands the findings of the previous report, reiterating the economic and environmental opportunities that can be unlocked by the transition to a more circular economy. However, as reflected by the low circular job numbers described in this document, Victoria's transition is still in its infancy. The solution to accelerated circular progress lies in a whole-of-economy approach. This report provides information on where investment might yield the best results based on the circular employment characteristics of individual sectors:

- **Some sectors exhibit scale without deep, circular transformation;** these are sectors with a relatively high volume of circular jobs, but where that volume is still just a small proportion of total employment in that sector. Although circular outcomes are being achieved in these sectors, circularity is still marginal to how they operate. Sectors like this would benefit from investment in upstream circular solutions, enabling circular benefits to be passed on as these products cascade through their value chains.
- **Some sectors exhibit transformation without scale;** these are sectors that lack larger circular job volumes, but where these jobs represent a larger percentage of the total number of jobs in the sector. This is evidence of circularity playing a more important role in how these sectors operate, but the scale of this impact is still lagging. Sectors like this will benefit from funding and other types of support aimed at growing their scale and impact.
- **Most sectors exhibit neither scale nor depth of circular transformation,** evidence of Victoria's circular infancy but also the room for growth and innovation. This implies a need for education, awareness, and business model support aimed at circular outcomes.

Table 1 provides an overview of the number of jobs in Victoria that currently contribute to circular outcomes, including a comparison with global figures, categorised according to the Key Elements Framework introduced in Circular Jobs and Skills: Planning for our Future.

Table 1 – Overview of circular employment numbers.

Sectors	Victorian circular employment		Global circular employment
	Full-Time Employee Equivalent (FTE)	As a % of total Victorian employment	
Core (fully) circular sectors	63,867 FTE	2%	5%
Enabling (partially) circular sectors	12,075 FTE	0.4%	0.8%
Indirect (induced) circular sectors	31,328 FTE	1%	
Total	107,270 FTE	3.4%	5.8%

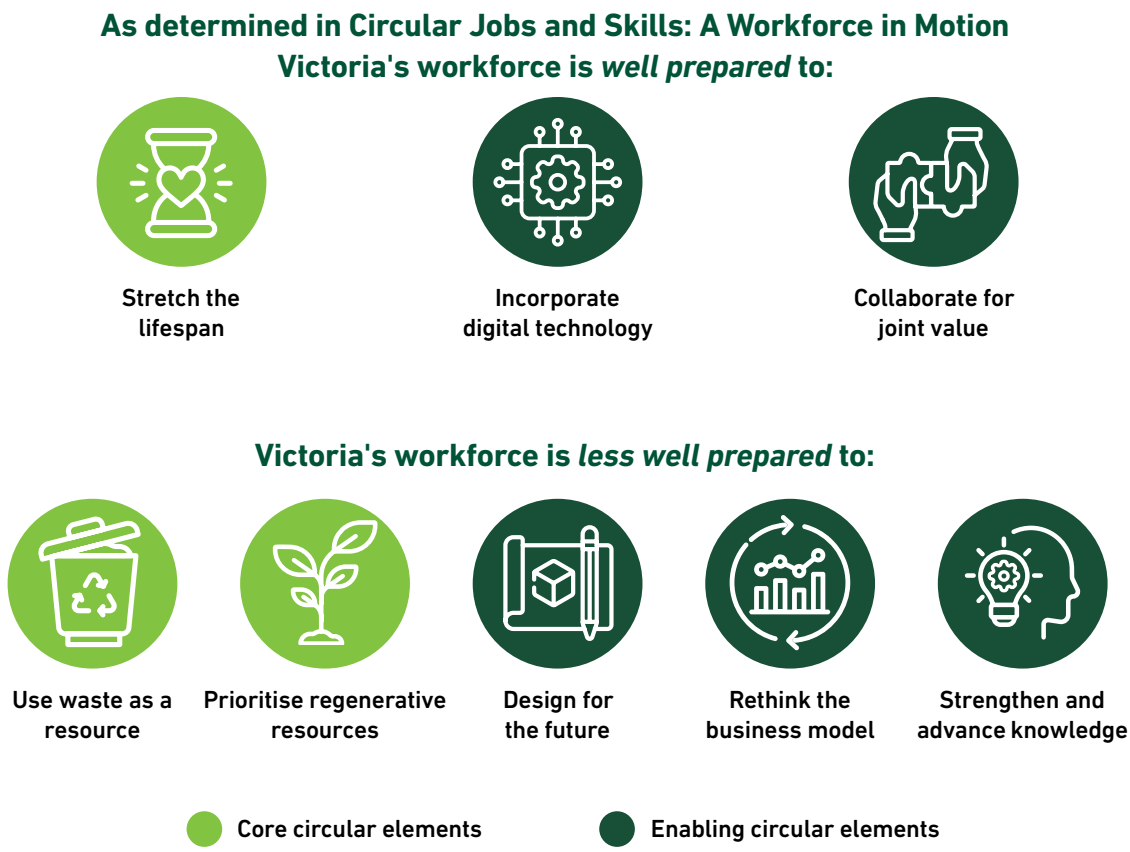
Combined with the capability analysis found in Circular Jobs and Skills: Planning for our Future, this quantification has enabled a more accurate assessment of what Victoria's circular workforce really looks like. As a result, the list of currently typical circular occupations and capability profiles found in the first report have been refined and updated.

Table 2 provides an overview of the updated occupational groups found to be relevant in Victoria's current circular economy. **Figure 1** visualises the resulting changes on how prepared Victoria's workforce is for different types of circular activity. This offers insight into what areas of Victoria's circular economy are better developed or might require support.

Table 2 – Recalculated occupational groups that are proportionally in higher and lower demand in Victoria's current circular economy, when compared to the rest of the economy.

	Higher in demand in Victoria's current circular economy	Lower in demand in Victoria's current circular economy
Occupational groups	Road and rail drivers	Food preparation assistants
	Other clerical and administrative workers	Factory process workers
	Office managers and program administrators	Sales assistants and salespersons
	Automotive and engineering trades workers	Carers and aides
	Design, engineering, science and transport professionals	Food trades workers
	Business, human resource and marketing professionals	Construction trades workers
	Specialist managers	Health professionals

Figure 1 – Overview of how prepared Victoria's workforce is to be effective in different areas of the circular economy.



Contents

Introduction

Sustainability Victoria's remit is to accelerate our state's transition to a circular, climate resilient and clean economy. We deliver leading future-focused research to identify opportunities to shape the circular economy for the benefit of Victoria.

A circular economy describes a system in which we use our resources more sustainably – keeping them in use for longer in a closed-loop system. New products are designed for quality and longevity, things are repaired and reused, and materials are recycled at the end of their life. Landfill is considered a last resort in a circular economy. Achieving circular outcomes means achieving results that align with these principles. This type of economic activity enables significant job growth and cost savings for the community[1,2]. It also minimises the generation of waste and maximises resource efficiency, leading to cost savings, productivity gains and environmental benefits.

A key component in realising these benefits is the capability of our workforce – the transition is unlikely to progress without people who have the skills and education needed for circular work. Released in late 2025, Circular Jobs and Skills: Planning for our Future investigated this topic, providing a framework to help define circular sectors and jobs, as well as an overview of the capabilities needed for Victoria's workforce to effectively engage in circular activities.

The work described in this report builds upon this research by including a quantification of circular occupations in Victoria. Through an updated methodology that uses input-output analysis, this work provides full time equivalent (FTE) estimates for circular jobs in all subsectors of the economy as described by Circle Economy's Key Elements Framework[3].

Combined with Circular Jobs and Skills: Planning for our Future, this work completes Sustainability Victoria's research on circular occupations by investigating both the capability and capacity of our workforce to engage with circularity. The result is a complete baseline that can be used for future circular workforce planning and effective policy design.

It is recommended you review Circular Jobs and Skills: Planning for our Future, as this report builds on its findings.

Methodology

Circular sectors

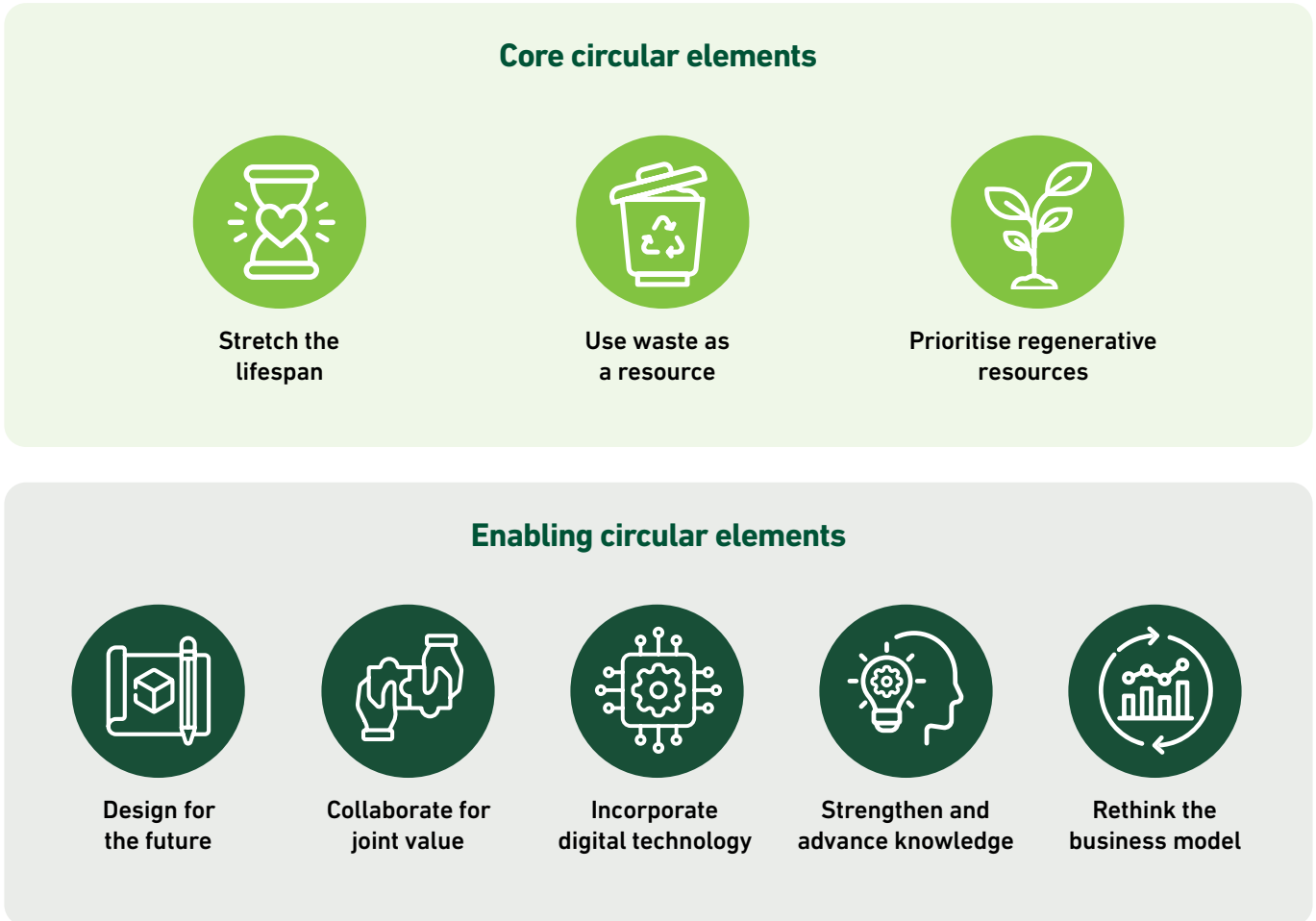
Circular Jobs and Skills: Planning for our Future discussed the complexity of supporting a circular transition due to the diverse and heterogenous nature of circular work. For this reason, Circle Economy's Key Elements Framework was adopted to identify circular sectors, capturing a wide variety of circular activity in a holistic framework to help inform government action.

The Key Elements Framework categorises circular economic activity as shown in **Figure 2**, providing 8 distinct groups – called elements – across core, enabling and indirect activities. These elements reflect the broad scope of how circularity can be achieved and supported.

- **Core circular elements** form the foundation of the circular economy by managing resources in a circular way. This includes a limited number of economic activities that contribute to circular outcomes by keeping things in use, using waste as a resource, or using regenerative materials.
- **Enabling circular elements** support core elements by removing barriers to their implementation. This includes a larger number of economic activities that can support circular outcomes through design, digital technology, business models, collaboration, or education.
- **Indirect circular elements** make use of circular goods and services but do not play a direct role in progressing the circular transition. This includes all other activities in the economy except for those that are explicitly not circular (i.e. fossil fuel extraction and use).

Note that in Circular Jobs and Skills: Planning for our Future, indirect circular elements were considered out of scope because the jobs engaged in these activities are not unique to the circular economy. As a result, an analysis of the skills and education required to do these jobs was not included. However, indirect elements are relevant for estimating the number of circular jobs in Victoria because they interact with core and enabling elements, so they have been included in the analysis in this report.

Figure 2 – Key elements of the circular economy.



The Key Elements Framework provides a list of industry sectors that contribute to the described activities in each of the elements. In Circular Jobs and Skills: Planning for our Future, these sectors have been translated to the Oceania-specific Australian and New Zealand Standard Industrial Classification (ANZSIC). The input-output analysis described in this report uses the Input-Output Industry Group (IOIG) classification of sectors instead, so a second translation has been made to re-categorise all circular economic activities. An overview of these re-categorisations can be found in Appendix A, and their impact on the findings is discussed further in the chapter Updated occupations and capabilities.

Quantifying circular jobs

As detailed in Circle Economy's Circular Jobs Methodology[4], and applied by others such as C40 Cities[5], Muñoz et al.[6], and Auckland Council[7], the categorisation of circular sectors shown in **Figure 2** enables input-output (I-O) analysis to quantify circular jobs. I-O analysis is a technique used in macroeconomics to understand interdependencies between different sectors in an economy. By looking at how circular sectors supply the rest of the economy – and vice versa – the demand for circular products and services can be approximated. This circular demand is used to calculate what proportion of the sector in question is circular, which in turn can be used to estimate the number of circular jobs in that sector. These calculations are discussed in detail in Appendix B – I-O calculations.

The I-O analysis in this work makes use of I-O tables produced by the Australian Bureau of Statistics (ABS) under the Australian National Accounts[8], the latest version of which contains data for the 2022–23 financial year.

Limitations

The results of these calculations are bound by the same underlying assumptions and limitations as I-O analysis. The findings in this report should be considered with these limitations in mind. For example, I-O analysis considers the economy as a static system with fixed relationships between individual sectors, lacking supply-side constraints, flexible prices, or budget constraints. This makes the analysis of supply and demand impacts a calculated approximation.

These limitations are described in detail by the ABS[9], the most relevant of which are described here.

The values in I-O tables are volumes of monetary transactions. The correlation between the calculated circular activity in a sector and the jobs that do this work assumes that the volume of these transactions is a good proxy for the number of jobs. This implies full proportionality between monetary transactions and employment, an assumption which requires further investigation.

Furthermore, the I-O tables describe the entire Australian economy. There are no tables available for individual states. This report investigates circular employment in Victoria using Victorian employment figures in the calculations. This assumes the correlation between economic activity and employment is homogeneous across all states, which is a necessary simplification to identify relevant results.

Circular employment in Victoria

The following chapter describes the results of the I-O analysis, providing a quantification of the number of circular jobs in Victoria's economy categorised according to the Key Elements Framework.

As the foundation of the circular economy, core circular sectors are considered fully circular and therefore all jobs in these sectors are circular. Enabling and indirect circular sectors, however, contribute to non-circular outcomes as well, making them partially circular. For these partially circular sectors, the link between absolute job numbers and percentages is of particular interest: the number of circular jobs in a sector is an indication of scale, but considering this number as a percentage of all jobs in that sector says more about the level of circular transformation. Where scale refers simply to the absolute number of jobs – where higher is better – circular transformation is about how well circularity has been embedded in the way a sector operates, relying on circular economy knowledge and skills within existing roles.

For example, if a sector employs 3,000 circular jobs it showcases significant circular scale. But if those 3,000 jobs only represent 1% of all jobs in that sector, circularity is clearly not key to how that sector operates. This would be an indication of scale and a lack of circular transformation. Conversely, a sector could employ only 10 circular jobs, lacking significant scale. But if that sector only employs 50 people in total, circular jobs make up 20%, indicating a circular way of working is more deeply embedded in how the sector operates.

Depending on these metrics of circular scale and transformation of individual sectors, particular types of investment and support can be considered to accelerate circular progress. These characteristics are described in more detail for enabling and indirect circular sectors in this chapter.

Employment in core circular sectors

Through the analysis described in Methodology, Victoria was found to employ 63,867 FTE in core circular sectors. **Table 3** provides a breakdown of this number by IOIG sectors. Note the circular employment figure for *IOIG 2601 – Electricity generation* makes use of a bottom-up correction to ensure non-renewable electricity generation is not included, as further explained in Appendix D.

Table 3 – Overview of current employment in Victoria's core circular sectors.

Key element	IOIG sector	Total Victorian employment	Circular Victorian employment
Stretch the lifespan	9401 – Automotive repair and maintenance	30,789	30,789
	9402 – Other repair and maintenance	14,557	14,557
Use waste as a resource	2801 – Water supply, sewerage and drainage services	8,427	8,427
	2901 – Waste collection, treatment and disposal services	9,311	9,311
Prioritise regenerative resources	2601 – Electricity generation	2,132	783
Total			**63,867 FTE**

Across all identified core circular sectors, the majority of jobs are active in the *Stretch the lifespan* key element. The IOIG sectors that fall under this category include activities focused on the repair of automotive equipment, domestic appliances, electronics, machinery, clothing and footwear. As seen in **Table 3**, most occupations working in these sectors in Victoria are active in automotive repair and maintenance. This highlights the sector's importance in Victoria's current circular economy, driven by activities such as mechanic work, detailing and cleaning, and automotive parts and accessory fitting.

The calculated 63,867 FTE represents about 2% of all jobs in Victoria. With these core circular sectors being the foundation of purely circular activity in the state, they are a key metric in tracking our circular progress. All circular activity is dependent on interactions with these core circular sectors, so any investment, policy or initiative aimed at accelerating circularity should be measured against changes in the cited employment figures.

A recent publication by Circle Economy estimated that 5% of the global workforce is active in core circular sectors[10]. As in Victoria, the majority of people active in this part of the circular economy work in repair and maintenance sectors, indicating that sectoral diversification in the circular economy is still in its infancy. Similar points were noted in Circular Jobs and Skills: Planning for our Future, which provides a capability analysis that suggests Victoria's workforce is currently only partially prepared to be effective in circular activities.

Employment in enabling circular sectors

In addition to the circular material use happening in core circular sectors, enabling circular sectors play a key role in removing barriers to circular progress. Various economic activities such as transport and logistics, design services, education, and digital services are essential for circular outcomes, even though they can also contribute to non-circular outcomes. As such, enabling circular sectors are defined as only partially circular.

Through the calculations described in Methodology, a total 987,760 FTE were found to be employed in these sectors in Victoria. Out of this total, roughly 1.2% of jobs (12,075 FTE) are actively contributing to circular outcomes in Victoria. A breakdown of these numbers by IOIG sectors is provided in **Table 4.**

Table 4 – Overview of current circular employment in Victoria's enabling circular sectors.

Key element	IOIG sector	Total Victorian employment	Circular Victorian employment	%
Design for the future	6901 – Professional, scientific and technical services	199,701	8,613	4.31%
Incorporate digital technology	5701 – Internet service providers, internet publishing and broadcasting, web search portals and data processing	6,861	92	1.34%
	5801 – Telecommunication services	19,940	292	1.47%
Rethink the business model	4601 – Road transport	57,866	658	1.14%
	4701 – Rail transport	10,396	132	1.27%
	4801 – Water, pipeline and other transport	3,120	50	1.59%
	5201 – Transport support services and storage	33,058	274	0.83%
	6601 – Rental and hiring services (except real estate)	6,771	394	5.81%

Key element	IOIG sector	Total Victorian employment	Circular Victorian employment	%
Collaborate for joint value	7210 – Employment, travel agency and other administrative services	45,498	686	1.51%
	7501 – Public administration and regulatory services	113,521	453	0.40%
	8601 – Residential care and social assistance services	176,392	0	0.00%
	9502 – Other services	20,537	47	0.23%
Strengthen and advance knowledge	1601 – Printing (including the reproduction of recorded media)	9,030	142	1.58%
	5401 – Publishing (except internet and music publishing)	7,591	45	0.59%
	8010 – Primary and secondary education services (including pre-schools and special schools)	179,908	0	0.00%
	8110 – Technical, vocational and tertiary education services (including undergraduate and postgraduate)	70,110	158	0.23%
	8210 – Arts, sports, adult and other education services (including community education)	27,460	39	0.14%
Total		**987,760 FTE**	**12,075 FTE**	**1.22%**

As discussed in the introduction of this chapter, for enabling and indirect circular sectors the link between absolute FTE numbers and their corresponding percentage of total employment is of particular interest. Out of all enabling sectors, it is the *Professional, scientific and technical services* sector that employs the largest number of circular jobs at 8,613 FTE. But when looking at that figure as a proportion of all jobs in the sector, it is not as high as the *Rental and hiring services* sector even though that sector only employs 394 circular FTE. These are indicators of scale versus transformation; The *Professional, scientific and technical services* sector showcases a bigger scale of circular impact through sheer job numbers but has not experienced the same depth of circular transformation as the *Rental and hiring services* sector. These circular employment characteristics determine what type of investment will be most effective in driving circular progress:

- Sectors with strong circular scale will benefit from upstream circular innovation. For example, when products are designed from their inception to be repairable or reusable, the large number of circular occupations in the *Professional, scientific and technical services* sector will naturally induce a large amount of repair and reuse activities. In this way, upstream circular innovation will enable the benefits of circular solutions to cascade down the value chain in large numbers.
  As shown in **Table 4** in green, sectors that employ more than 500 circular FTE can be considered relatively large in circular scale.
- Sectors that show stronger circular transformation through a higher percentage of circular jobs will require investment that increases the scale and reach of circular businesses that are already active in these sectors.
  This type of support could include funding for increased production, incentives that benefit circular start-ups, or matchmaking services that simplify client acquisition for such businesses.
  Table 4 provides an overview of these sectors in grey, where a relatively deep level of circular transformation is found in sectors employing more than 5% in circular jobs.
- Sectors that lag in both metrics, including most of the sectors shown in **Table 4**, are disconnected from the transition to a circular economy and require support with circular education, innovation, and business model development.

These imbalances highlight the need for a holistic approach to accelerate the transition to a circular economy.

Employment in indirect circular sectors

Although investigation of indirect circular sectors was not important to understand the capabilities required to effectively engage in circular activities, the opposite is true when estimating the number of circular jobs. As outlined in Methodology, indirect circular sectors can be considered circular to the extent they make use of the goods and services provided by core circular sectors. As a result, all sectors of the economy engage in some level of circularity, except those that are explicitly not circular (i.e. IOIG 601 – Coal mining, IOIG 701 – Oil and gas extraction, IOIG 1701 – Petroleum and coal product manufacturing, and IOIG 2701 – Gas supply).

Through the calculations described in Appendix B, a total of 31,328 FTE were found to contribute to circularity across all indirect circular sectors, equalling 1.66% of total employment in these sectors. Given the large number of sectors in this category, **Table 5** provides a breakdown by ANZSIC division, which groups similar sectors together. Some categories are missing from the table as they are found in either the core or enabling key elements. The detailed breakdown of individual indirect sectors and their circular employment can be found in Appendix C.

Table 5 – Overview of current circular employment in Victoria's indirect circular sectors, grouped by ANZSIC division.

ANZSIC division	Total Victorian employment	Circular Victorian employment	%
A – Agriculture, Forestry and Fishing	59,152	1,333	2.25%
B – Mining	5,898	182	3.09%
C – Manufacturing	184,563	2,642	1.43%
D – Electricity, Gas, Water and Waste	11,319	364	3.22%
E - Construction	273,896	4,995	1.82%
F – Wholesale Trade	89,508	1,350	1.51%
G – Retail Trade	298,269	3,357	1.13%
H – Accommodation and Food Services	195,244	1,995	1.02%
I – Transport, Postal and Warehousing	36,140	1,413	3.91%
J – Information Media and Telecommunication	14,382	98	0.68%
K – Financial and Insurance Services	126,173	748	0.59%
L – Rental, Hiring and Real Estate Services	37,332	673	1.80%
M – Professional, Scientific and Technical Services	67,261	1,896	2.82%
N – Administrative and Support Services	54,128	3,063	5.66%
O – Public Administration and Safety	64,514	1,176	1.82%
Q – Health Care and Social Assistance	269,215	4,181	1.55%
R – Arts and Recreation Services	53,231	986	1.85%
S – Other Services	43,287	875	2.02%
Total	**1,883,512**	**31,328**	**1.66%**

As with enabling sectors and discussed in the introduction of this chapter, the link between absolute employment figures and their corresponding percentages is of particular interest, offering insight into the levels of circular scale and transformation.

As shown in **Table 5**, construction employs the largest number of circular FTE, despite those FTE making up less than 2% of all jobs in that sector. As described before, this is an indicator of scale without strong levels of circular transformation. Because these sectors are indirectly circular, the circular activity taking place is unlikely to be because of conscious pursuit of circular outcomes but rather the coincidental interaction with fully circular products and services. This indicates there is significant room for circular business growth, making investment in upstream circular solutions recommended to leverage the larger number of circular jobs in these sectors. Highlighted in green in **Table 5**, ANZSIC divisions employing more than 4,000 circular FTE can be considered examples of such sectoral groups. Looking at the detailed table provided in Appendix C, particular sub-sectors that fall into this category are:

- Construction Services, employing 3,643 circular FTE which is 2.12% of all jobs in that sector.
- Retail Trade, employing 3,357 circular FTE which is 1.13% of all jobs in that sector.
- Health Care Services, employing 4,181 circular FTE which is 1.55% of all jobs in that sector.

Some sectoral groups show deeper levels of circular transformation, as highlighted in grey in **Table 5**. Only the *Administrative and support services* ANZSIC division shows a relatively high level of circular transformation. These sectors require support aimed at increasing the scale of circular activities taking place. Found in the detailed table in Appendix C, individual sectors that fall into this category are:

- Non Ferrous Metal Ore Mining, employing 139 circular FTE which is 5.54% of all jobs in that sector.
- Knitted Product Manufacturing, employing 7 circular FTE which is 4.83% of all jobs in that sector.
- Pulp, Paper and Paperboard Manufacturing, employing 34 circular FTE which is 4.19% of all jobs in that sector.
- Cement, Lime and Ready-Mixed Concrete Manufacturing, employing 76 circular FTE which is 4.12% of all jobs in that sector.
- Postal and Courier Pick-up and Delivery Service, employing 1,376 circular FTE which is 4.79% of all jobs in that sector.
- Building Cleaning, Pest Control and Other Support Services, employing 3,063 circular FTE which is 5.66% of all jobs in that sector.

All other indirect sectors lag in both metrics, highlighting the need for holistic and effective policy across the entire economy.

Comparison with global benchmarks

Victoria is not alone in its newfound pursuit of circular progress. To put our circular job figures in perspective, **Table 6** provides a comparison with global benchmarks.

Table 6 – Global benchmarks for circular employment.

Jurisdiction	Circular jobs (%)
Victoria	3.4%
Global	5.8%
Gamagori, Japan[11]	1.7%
Switzerland[12]	9.1%
Vancouver, Canada[13]	10.2%
Cairo, Egypt[14]	16.3%
London, UK[15]	8.6%
Athens, Greece[16]	21.3%
Buenos Aires, Argentina[17]	3.7%

An investigation of how Victoria's circular policy and program landscape compares to those of jurisdictions with higher circular job numbers was considered out of scope for this report. It is, however, recommended as a next step to better understand jurisdictional similarities and how Victoria could adopt initiatives that have been proven to accelerate circular progress.

Updated occupations and capabilities

Typical occupations in core circular sectors

The revised methodology makes use of the IOIG sector classification, rather than the ANZSIC used in Circular Jobs and Skills: Planning for our Future. As described in Methodology, this change also led to a refinement in how circular sectors are categorised as per the Key Elements Framework, subsequently leading to new insights about what can be considered typical circular occupations in Victoria's current circular economy. These occupations are shown in **Table 7**. Appendix E provides a comparison with Circular Jobs and Skills: Planning for our Future, showing how the change in methodology has impacted the identified typical occupations.

Table 7 – Currently typical occupations in Victoria's core circular sectors.

Key element	Currently typical occupations
Stretch the lifespan	Motor mechanics
	Panelbeaters
	Airconditioning and refrigeration mechanics
	Electronics trades workers
	Canvas and leather goods makers
	Clothing trades workers
	Car detailers
	Motor vehicle parts and accessories fitters
Use waste as a resource	Other sales assistants and salespersons
	Other machine operators
	Other stationary plant operators
	Truck drivers
	Other factory process workers
	Recycling and rubbish collectors
Prioritise regenerative resources	Engineering professionals, not further defined
	Electrical engineers
	Electrical engineering draftspersons and technicians
	Metal fitters and machinists
	Chemical, gas, petroleum and power generation plant operators

The refined methodology has not impacted the identification of ideal, future circular occupations, described in Circular Jobs and Skills: Planning for our Future. Because of this, the occupations shown in **Table 7** are typical only to Victoria's current circular economy. Given Victoria's circular economy is in its infancy, it is possible these typical occupations are not necessarily the right ones to accelerate circular progress. The difference between current typical and future-ideal circular occupations is described in detail in Circular Jobs and Skills: Planning for our Future.

The occupations identified as typical for Victoria's current circular economy through the revised methodology don't reveal any significant new insights. As shown in Appendix E, the only occupation that wasn't identified in Circular Jobs and Skills: Planning for our Future, is *ANZSCO 3931 – Canvas and leather goods makers,* found in the *Stretch the Lifespan* key element. Although new, it is similar to others in its category, focusing on repair and maintenance of existing products.

The revised methodology has resulted in a reduction in the number of occupations identified as currently typical, primarily due to the sharpened focus and stricter allocation of sectors to the key elements. As a result, the education and skill requirement profiles for each of the core elements now better reflect the types of activities typical for each element. Appendix F compares these new profiles with those found in Circular Jobs and Skills: Planning for our Future, but the conclusions remain the same – Victoria's current workforce is well prepared to engage in the *Stretch the lifespan* key element, but less so for the *Use waste as a resource* and *Prioritise regenerative resources* elements of the circular economy.

Typical occupations in enabling circular sectors

The change in methodology has also enabled a refinement in the identification of occupations that can currently be considered typical in enabling circular sectors. These occupations are shown in **Table 8** and compared to previous results in Appendix E.

Table 8 – Currently typical occupations in Victoria's enabling circular sectors.

Key element	Currently typical occupations
Design for the future	Engineering managers
	Architects and landscape architects
	Graphic and web designers, and illustrators
	Civil engineering professionals
	Building and engineering technicians, not further defined
	Architectural, building and surveying technicians
	Civil engineering draftspersons and technicians
	Signwriters
Incorporate digital technology	ICT managers
	ICT sales professionals
	Computer network professionals
	Telecommunications engineering professionals
	Telecommunications technical specialist
	Telecommunications trades workers
	Other miscellaneous clerical and administrative workers
	ICT sales assistants
Rethink the business model	Transport services managers
	Marine transport professionals
	Transport and despatch clerks
	Other sales assistants and salespersons
	Truck drivers
	Freight and furniture handlers
Collaborate for joint value	Legislators
	Intelligence and policy analysts
	Urban and regional planners
	Primary products assurance and inspection officers
	Inspectors and regulatory officers

Key element	Currently typical occupations
Strengthen and advance knowledge	Other education managers
	Journalists and other writers
	Natural and physical science professionals, not further defined
	Medical scientists
	University lecturers and tutors
	Vocational education teachers (Aus)/polytechnic teachers (NZ)
	Print finishers and screen printers
	Printers
	Survey interviewers
	Printing assistants and table workers

As with the core circular sectors, Appendix E shows the number of typical occupations has been reduced through the sharper focus provided by the revised methodology. The revision has also resulted in some changes to what can be identified as typical occupations in Victoria's current circular economy, impacting the capability profiles of these elements. Appendix F provides a comparison between these new profiles and those found in Circular Jobs and Skills: Planning for our Future.

For the *Design for the future* element, the revised methodology has identified typical occupations to be similar to those that were identified as typical in Circular Jobs and Skills: Planning for our Future, although the list of occupations has shrunk significantly. As shown in Appendix F, this reduced number of typical occupations has impacted the capability profiles of this key element. It appears that this change highlights that Victoria's existing capabilities in this element are not as closely aligned with an ideal, future circular workforce as previously determined. As a result, it can be concluded that Victoria's current workforce is not as well prepared to be effective in this element of the circular economy as shown in Circular Jobs and Skills: Planning for our Future.

For the *Incorporate digital technology* element, the revised methodology has not found significant differences in the identified typical occupations. As shown in Appendix F, the capability profile of this element has not changed much. As such, the conclusion drawn in the previous report remains in place: Victoria's workforce is well prepared to be effective in this element of the circular economy.

For the *Rethink the business model* element, most of the typical occupations identified in Circular Jobs and Skills: Planning for our Future remain in place, although the list has been shortened by the revised methodology. Appendix F highlights the marginal impact this has on the capability profile of this element, so the existing conclusion is retained: Victoria's workforce is not prepared to be effective in this element of the circular economy.

For the *Collaborate for joint value* element, previously identified typical occupations such as HR professionals, child carers, and labourers have been removed as they were not found to play a significant role in Victoria's current circular economy. Instead, legislators, policy analysts, urban planners and product inspection officers have been identified as typical. These newly identified occupations appear to more closely match the ideal, future occupations as found in Circular Jobs and Skills: Planning for our Future. As shown in Appendix F, this is reflected in the updated capability profiles for this key element, changing the previously drawn conclusion: Victoria's current workforce is, in fact, well prepared to be effective in this element of the circular economy.

For the *Strengthen and advance knowledge* element, there is a similar change in the identified typical occupations. Secondary School Teachers and various instructors and tutors have been removed, replaced by occupations such as printers, journalists, and science professionals. This change is caused by the outcomes of the IO-analysis, as shown in **Table 4**, detailing job numbers. The *Primary and secondary education services* sector currently does not employ people who contribute to circular outcomes. Instead, the *Printing, Publishing* and *Technical, Vocational and Tertiary Education Services* sectors were found to contribute more, resulting in the changes in typical occupations that have been identified. These changes deviate further from the ideal, future occupations identified in Circular Jobs and Skills: Planning for our Future, as underpinned by the capability profiles found in Appendix F. Victoria's workforce may be less prepared in this area of the circular economy, a finding that diverges from the previous report.

Typical occupations in indirect circular sectors

As opposed to core and enabling circular sectors, indirect circular sectors do not include activities that are unique to the circular economy. As a result, there are no typically circular occupations in these sectors.

Conclusion Recommendations

Together with the capability analysis provided in Circular Jobs and Skills: Planning for our Future, the quantification of circular employment offered in this report provides the most comprehensive investigation of our circular workforce ever developed in an Australian jurisdiction.
This completes Sustainability Victoria's analysis of this subject, resulting in a foundational evidence base that is essential for effective circular workforce policy and program development.

Recommendations

Based on the findings of this research, we offer several recommendations:

- **Circular progress is within reach by aligning with existing government priorities –** This research highlights the wide variety of activities, sectors and occupations involved in the circular economy. However, circularity doesn't require a complete system overhaul to deliver value. Marginal gains through incremental steps represent genuine, measurable progress. By aligning circular initiatives with other government priorities, low-hanging fruit can be tackled first to achieve small steps towards circular progress. For example, Victoria's most recent Economic Growth Statement provides an overview of which sectors will be prioritised by the Victorian Government. Targeting circular initiatives in these sectors first is a pragmatic approach that could result in synergies that are more likely to find support.
- **The true value of the methodology lies in adopting it as a standardised approach –** The findings of this research highlight the complexity of measuring and tracking circular progress. Our existing metrics such as waste recovery rates, material footprint, or material productivity are insufficient to properly track the capability and capacity of our workforce to meet the demands of a circular transition. It is recommended the capability profile and circular job quantification methodologies provided in this research to be adopted as a standardised, annual approach, enabling more accurate tracking of Victoria's transition to a circular economy and the effectiveness of circular initiatives over time.
- **Circular initiatives are unique and custom to every sector –** As demonstrated in this report, each sector of the economy exhibits unique circular employment characteristics. The types of investment and support that will be effective in bringing about circular progress depend on these characteristics, so it is recommended that circular initiatives be customised to the sector they serve, depending on their circular scale and depth of circular transformation.

The global transition to a circular economy is unfolding within a broader context of a 'polycrisis', where compounding risks from geopolitical instability, economic volatility, and accelerating climate impacts reinforce one another. Recent geopolitical events have exposed vulnerabilities in global supply chains, contributing to material and cost pressures and a renewed focus on short-term economic resilience. In this environment, there is a risk that circular economy investment and longer-term workforce transformation are deprioritised in favour of immediate economic concerns. As detailed in Circular Jobs and Skills: Planning for our Future and this report, the benefits of a circular economy are real, significant, and reliant on a workforce that already has many of the capabilities and skills needed to achieve them. The findings of both reports highlight that pathways to circular benefits are available and open now, but only with deliberate action.

On the findings

The new methodology in this report helps refine and expand on the findings of the previous report, highlighting that the transition to a circular economy can unlock significant benefits. However, Victoria's transition is still in its infancy, as reflected by the low circular job volumes. The solution to accelerated circular progress lies in targeted investment, and this research provides information on how this might yield the best results:

- Sectors that employ larger numbers of circular jobs – like Construction, Health care services, and Professional, scientific and technical services – have the scale needed to make the most out of upstream circular innovation. Investment in solutions that are designed from the start to enable repair, reuse and recycling will naturally induce circular outcomes as they are used by the circular activity taking place in these sectors.
- Sectors where circular jobs make up a larger percentage of the job total – like Rental and hiring services, Knitted product manufacturing, and Building cleaning, pest control and other support services – showcase more depth by better embedding circularity in their way of working. Targeted investment to grow these activities will amplify their impact and support knowledge and practice transfer to other sectors.
- Most sectors show limited progress in both regards, evidence of Victoria's still growing circular economy. This makes investment targeting education, awareness, and business development support for these sectors essential to achieve circular progress.

This contextual, sector-by-sector approach highlights the need for a whole-of-economy plan for circular policy and investment. The fact that Victoria's transition is still developing highlights the significant opportunity for circular growth.

Furthermore, the revised methodology has enabled a refinement of the typical occupations and capability profiles identified in Circular Jobs and Skills: Planning for our Future. Useful for more detailed policy and program development, these profiles highlight gaps and strengths in Victoria's current circular workforce as indicated by how prepared the workforce is to be effective in the key elements of the circular economy. **Figure 3** provides a visual overview of how this level of preparedness has changed through the refinements in this report.

Figure 3 – Overview of how prepared Victoria's current workforce is to effectively engage in different elements of the circular economy.

How this work can be used

The research in this report contributes to the qualitative findings described in Circular Jobs and Skills: Planning for our Future. With I-O analysis, circular occupations have now also been quantified, providing a baseline for further analysis and an evidence base for effective policy development.

For example, one could compare the results of this work with macroeconomic modelling on circular transition scenarios to understand how circular employment in particular sectors will change. CSIRO's work to model Australia's circular economy transition targets[18] also employs I-O analysis to better understand how our economy will change over the course of the circular transition.

The quantification of circular employment is also useful to more accurately measure our progress towards a circular economy. As Australia transitions to meet the targets set out in Australia's Circular Economy Framework[19], our economy will change accordingly. These economic changes will be reflected in future versions of the National Accounts produced by the ABS, which can be used to recalculate the results in this report. Over time, trends in circular employment will become apparent, which can be compared to expected changes to determine the state of our circular progress.

Opportunities and future work

As discussed in Methodology, the number of circular jobs in Victoria have been calculated through I-O analysis, so the results described here are bound by the same limitations as that type of analysis. The primary assumption that enables I-O analysis is that the economy is considered a static system where all intra-sectoral interactions are proportionate and balanced. This removes impacts from things like price and supply constraints so the results should be considered with this limitation in mind.

Aspects of the circular economy that have not been considered in this work are the impact of informal sectors, the geographical distribution of circular work, and the role of women, to name a few. Research by Circle Economy suggests that more than half of global circular economy employment is informal[20], warranting further research to understand the role of such jobs in Victoria. The geographical distribution of the circular jobs identified in Victoria will determine what type of local incentives, policies and investment would be most effective. This information will be particularly useful for local government authorities and circular economy networks. Lastly, the role of women in the circular economy is important to understand how gender disparities can be avoided. Given the circular transition relies on whole-of-economy changes, understanding and avoiding such inequalities is essential to ensure they are not carried over to a new economic order. Each of these topics present avenues for further investigation.

Finally, the outcomes of this research by Sustainability Victoria provide a baseline for policy and program development. Translating the research outcomes into effective workforce policy through initiatives like the Clean Economy Workforce Development Strategy[21] is a suggested next step for Victorian policymakers.

Statement on the outcomes of the Silver Review

In December 2025, the Victorian Government released its response to the Independent Review of the Victorian Public Service, led by Helen Silver AO. Following that review, the Government determined that Sustainability Victoria and its functions would be abolished, with the organisation closing on **30 June 2026**.

This report represents the culmination of Sustainability Victoria's research into Victoria's circular workforce – research that has helped shape understanding of this emerging field over many years. After 30 June 2026, this work will be transferred to the Victorian Skills Authority (VSA) and all enquiries about this research can be directed to vsa.enquiries@ecodev.vic.gov.au

Appendices

Appendix A – Circular sector translations

Table 9 provides an overview of the 8 key elements identified by Circle Economy, and the ANZSIC sectors that were active in each of the elements in Circular Jobs and Skills: Planning for our Future. The final column of the table shows the corresponding IOIG sectors that have been identified as part of the revised methodology.

As the IOIG classification is less detailed than the ANZSIC classification, multiple ANZSIC sectors tend to be contained in a single IOIG sector. In addition to this, various ANZSIC sectors have been removed from the analysis as they weren't found to contribute meaningfully to circular progress. An example is ANZSIC sector 2391 – Shipbuilding and repair services: although repair is in the name of the sector, the actual volume of repair activities captured by this ANZSIC code is negligible for the purposes of this research. The use of the IOIG classification and the sharpening of what is considered circular has resulted in the significantly lower number of sectors shown in **Table 9.**

Note that n.e.c. stands for *'not elsewhere captured'*, capturing certain sub-classes or specialisations of occupations that do not have their own unique code in the ANZSCO classification. N.f.d. stands for *'not further defined'*, usually used when not enough information was available to classify the occupation in more detail.

Table 9 – Updated circular sector translations.

Key element	ANZSIC industry sectors		IOIG industry sectors	
Stretch the lifespan	2391	Shipbuilding and repair services	9401	Automotive repair and maintenance
	2392	Boatbuilding and repair services	9402	Other repair and maintenance
	2393	Railway rolling stock manufacturing and repair services		
	2394	Aircraft manufacturing and repair services		
	2399	Other transport equipment manufacturing n.e.c.		
	3504	Motor vehicle new parts wholesaling		
	3505	Motor vehicle dismantling and used parts wholesaling		
	3921	Motor vehicle parts retailing		
	3922	Tyre retailing		
	9411	Automotive electrical services		
	9412	Automotive body, paint and interior repair		
	9419	Other automotive repair and maintenance		
	9421	Domestic appliance repair and maintenance		
	9422	Electronic (except domestic appliance) and precision equipment repair		
	9429	Other machinery and equipment repair and maintenance		
	9491	Clothing and footwear repair		
	9499	Other repair and maintenance n.e.c.		

Key element	ANZSIC industry sectors		IOIG industry sectors	
Use waste as a resource	1831	Fertiliser manufacturing	2801	Water supply, sewerage and drainage services
	2811	Water supply	2901	Waste collection, treatment and disposal services
	2812	Sewerage and drainage services		
	2911	Solid waste collection services		
	2919	Other waste collection services		
	2921	Waste treatment and disposal services		
	2922	Waste remediation and materials recovery services		
	3212	Site preparation services		
Prioritise regenerative resources	2612	Hydro-electricity generation	2601	Electricity generation
	2619	Other electricity generation		
	2620	Electricity transmission		
	2630	Electricity distribution		
Design for the future	6921	Architectural services	6901	Professional, scientific and technical services
	6922	Surveying and mapping services		
	6923	Engineering design and engineering consulting services		
	6924	Other specialised design services		
	6999	Other professional, scientific and technical services n.e.c.		
Incorporate digital technology	5420	Software publishing	5701	Internet service providers, internet publishing and broadcasting, web search portals and data processing
	5910	Internet service providers and web search portals	5801	Telecommunication services
	5921	Data processing and web hosting services		
	5922	Electronic information storage services		
	5801	Wired telecommunications network operation		
	5802	Other telecommunications network operation		
	5809	Other telecommunications services		

Key element	ANZSIC industry sectors		IOIG industry sectors	
Rethink the business model	4610	Road freight transport	4601	Road transport
	4710	Rail freight transport	4701	Rail transport
	4810	Water freight transport	4801	Water, pipeline and other transport
	5211	Stevedoring services	5201	Transport support services and storage
	5212	Port and water transport terminal operations	6601	Rental and hiring services (except real estate)
	5219	Other water transport support services		
	5220	Airport operations and other air transport support services		
	5291	Customs agency services		
	5292	Freight forwarding services		
	5299	Other transport support services n.e.c.		
	6611	Passenger car rental and hiring		
	6619	Other motor vehicle and transport equipment rental and hiring		
	6620	Farm animal and bloodstock leasing		
	6631	Heavy machinery and scaffolding rental and hiring		
	6632	Video and other electronic media rental and hiring		
	6639	Other goods and equipment rental and hiring n.e.c.		
	9531	Laundry and dry-cleaning services		
Collaborate to create joint value	7211	Employment placement and recruitment services	7210	Employment, travel agency and other administrative services
	7510	Central government administration	7501	Public administration and regulatory services
	7520	State government administration	8601	Residential care and social assistance services
	7530	Local government administration	9502	Other services
	7720	Regulatory services		
	8710	Child care services		
	8790	Other social assistance services		
	9551	Business and professional association services		
	9552	Labour association services		

Key element	ANZSIC industry sectors		IOIG industry sectors	
Strengthen and advance knowledge	1611	Printing	1601	Printing (including the reproduction of recorded media)
	1612	Printing support services	5401	Publishing (except internet and music publishing)
	5411	Newspaper publishing	8010	Primary and secondary education services (including pre-schools and special schools)
	5412	Magazine and other periodical publishing	8110	Technical, vocational and tertiary education services (including undergraduate and postgraduate)
	5413	Book publishing	8210	Arts, sports, adult and other education services (including community education)
	5414	Directory and mailing list publishing		
	5419	Other publishing (except software, music and internet)		
	5700	Internet publishing and broadcasting		
	6910	Scientific research services		
	6940	Advertising services		
	6950	Market research and statistical services		
	8022	Secondary education		
	8023	Combined primary and secondary education		
	8024	Special school education		
	8101	Technical and vocational education and training		
	8102	Higher education		
	8211	Sports and physical recreation instruction		
	8212	Arts education		
	8219	Adult, community and other education n.e.c.		
	8220	Educational support services		

Appendix B – I-O calculations

Depending on the category of circular sectors under review, the following calculations can be made to estimate the number of jobs that is circular:

Core circular sectors

Core circular sectors include economic activities that form the foundation of the circular economy; these sectors enable the circular use of materials by using regenerative resources, keeping products in use, or using waste as a resource. Therefore, all of the activity in these sectors is assumed to be circular:

$$\text{Circular Activity}_{\text{core}} = \Sigma Z_{\text{core}} = 100\%$$

Where Z is economic activity.

All jobs active in these sectors are assumed to contribute to circular outcomes.

Enabling circular sectors

Enabling circular sectors are partially circular. They can enable circular outcomes by supporting core circular sectors, but also interact with non-circular sectors, as discussed in Circular Jobs and Skills: Planning for our Future. The proportion of the enabling sectors that is circular is assumed to be determined by how much they supply their goods and services to the core circular sectors – or in other words, to what degree core circular sectors demand goods and services from enabling sectors.

This demand is found in the I-O tables, but to understand the total output that is required of an enabling sector to meet this demand, we run the Leontief Inverse. The Leontief Inverse, also called the requirement coefficient, describes how much the output of a sector needs to increase to meet a particular demand. These coefficients are also provided by the ABS, in Table 10 of the National Accounts[22]. As a result, the calculation to find the output of enabling sectors that is circular is as follows:

$$\text{Circular Activity}_{\text{enabling}} = \Sigma Z_{\text{enabling to core}} * L$$

Where Z is economic activity, and L is the Leontief Inverse.

To find circular employment in this sector, the resulting output is taken as a proportion of that sector's total economic activity and then multiplied by the sector's total employment:

$$E_{\text{enabling circular}} = \frac{\text{Circular Activity}_{\text{enabling}}}{\Sigma Z_{\text{enabling}}} * E_{\text{enabling total}}$$

Where Z is economic activity and E is employment.

Indirect circular sectors

Finally, indirect circular sectors include all remaining sectors of the economy, save for those that are explicitly not circular – *Coal mining, Oil and gas extraction, Petroleum and coal product manufacturing,* and *Gas supply.* Although the remaining sectors of the economy are not directly progressing our circular transition, they indirectly support it by occasionally using circular goods and services. An example would be a baker: baking bread is not a circular activity, but the baker could make use of repair services to fix their oven, or use ingredients sourced from regenerative agricultural practices. So, the extent to which these indirect sectors are circular is dependent on their demand for goods and services produced by the core circular sectors. Of note here is that a proportion of this demand can also come from international sources, which is not consistent with circular principles. To account for this, we include the Material Import Dependency (MID) – which is given by the ABS as a percentage – in the calculation to ensure we only consider the demand for local goods and services. The resulting calculation is as follows:

$$\text{Circular Activity}_{\text{indirect}} = \Sigma Z_{\text{core to indirect}} * (1 - \text{MID}) * L$$

Where Z is economic activity, MID is the Material Import Dependency, and L is the Leontief Inverse.

The circular employment in these indirect sectors is found by taking this output as a proportion of the sector's total economic activity, and multiplying that figure by the sector's total employment.

$$E_{\text{indirect circular}} = \frac{\text{Circular Activity}_{\text{indirect}}}{\Sigma Z_{\text{indirect}}} * E_{\text{indirect total}}$$

Where Z is economic activity and E is employment.

Appendix C – Circular employment in indirect sectors

Table 10 provides details on circular employment in each indirect sector, as opposed to the ANZSIC division-based overview provided in Employment in indirect circular sectors.

Indirect circular sectors include all sectors of the economy, except for those captured by core and enabling key elements, and those classified as being specifically not circular (i.e. *Coal mining, Oil and gas extraction, Petroleum and coal product manufacturing,* and *Gas supply*).

Table 10 – Detailed overview of circular employment in Victoria's indirect circular sectors.

ANZSIC division	IOIG	Sector	Total sector employment	Circular employment (FTE)	Circular employment as %
A – Agriculture, Forestry and Fishing	101	Sheep, grains, beef and dairy cattle	32,251	709	2.20%
	102	Poultry and other livestock	3,915	106	2.72%
	103	Other agriculture	15,591	417	2.67%
	201	Aquaculture	314	8	2.63%
	301	Forestry and logging	1,551	1	0.05%
	401	Fishing, hunting and trapping	495	6	1.15%
	501	Agriculture, forestry and fishing support services	5,035	86	1.71%
B – Mining	801	Iron ore mining	196	1	0.43%
	802	Non ferrous metal ore mining	2,550	139	5.45%
	901	Non metallic mineral mining	2,055	19	0.94%
	1001	Exploration and mining support services	1,097	22	2.05%
C – Manufacturing	1101	Meat and meat product manufacturing	13,562	88	0.65%
	1102	Processed seafood manufacturing	258	1	0.57%
	1103	Dairy product manufacturing	10,020	72	0.72%
	1104	Fruit and vegetable product manufacturing	3,650	36	0.99%
	1105	Oils and fats manufacturing	425	8	1.83%
	1106	Grain mill and cereal product manufacturing	1,795	31	1.71%
	1107	Bakery product manufacturing	16,096	141	0.88%
	1108	Sugar and confectionery manufacturing	3,834	73	1.91%
	1109	Other food product manufacturing	4,803	47	0.98%
	1201	Soft drinks, cordials and syrup manufacturing	2,113	38	1.82%

ANZSIC division	IOIG	Sector	Total sector employment	Circular employment (FTE)	Circular employment as %
	1202	Beer manufacturing	1,793	23	1.28%
	1205	Wine, spirits and tobacco	4,285	46	1.07%
	1301	Textile manufacturing	360	2	0.58%
	1302	Tanned leather, dressed fur and leather product manufacturing	294	1	0.32%
	1303	Textile product manufacturing	3,052	86	2.81%
	1304	Knitted product manufacturing	143	7	4.83%
	1305	Clothing manufacturing	3,305	25	0.77%
	1306	Footwear manufacturing	295	6	2.04%
	1401	Sawmill product manufacturing	1,886	17	0.88%
	1402	Other wood product manufacturing	5,290	117	2.21%
	1501	Pulp, paper and paperboard manufacturing	815	34	4.19%
	1502	Paper stationery and other converted paper product manufacturing	4,587	115	2.50%
	1801	Human pharmaceutical and medicinal product manufacturing	7,086	149	2.10%
	1802	Veterinary pharmaceutical and medicinal product manufacturing	35	0	0.61%
	1803	Basic chemical manufacturing	3,588	56	1.55%
	1804	Cleaning compounds and toiletry preparation manufacturing	2,373	34	1.44%
	1901	Polymer product manufacturing	9,458	214	2.26%
	1902	Natural rubber product manufacturing	247	5	2.18%
	2001	Glass and glass product manufacturing	1,982	54	2.70%
	2002	Ceramic product manufacturing	658	7	1.06%
	2003	Cement, lime and ready-mixed concrete manufacturing	1,844	76	4.12%
	2004	Plaster and concrete product manufacturing	1,427	15	1.08%
	2005	Other non-metallic mineral product manufacturing	2,045	10	0.47%
	2101	Iron and steel manufacturing	6,046	123	2.04%
	2102	Basic non-ferrous metal manufacturing	4,405	39	0.89%

ANZSIC division	IOIG	Sector	Total sector employment	Circular employment (FTE)	Circular employment as %
	2201	Forged iron and steel product manufacturing	36	1	1.89%
	2202	Structural metal product manufacturing	6,234	92	1.47%
	2203	Metal containers and other sheet metal product manufacturing	1,876	15	0.81%
	2204	Other fabricated metal product manufacturing	4,134	47	1.15%
	2301	Motor vehicles and parts; other transport equipment manufacturing	16,252	296	1.82%
	2302	Ships and boat manufacturing	1,844	17	0.90%
	2303	Railway rolling stock manufacturing	1,334	27	1.99%
	2304	Aircraft manufacturing	1,622	34	2.09%
	2401	Professional, scientific, computer and electronic equipment manufacturing	5,716	27	0.47%
	2403	Electrical equipment manufacturing	3,718	39	1.05%
	2404	Domestic appliance manufacturing	730	7	0.91%
	2405	Specialised and other machinery and equipment manufacturing	6,270	82	1.31%
	2501	Furniture manufacturing	8,680	115	1.33%
	2502	Other manufactured products	2,262	47	2.06%
D – Electricity, Gas, Water and Waste Services	2605	Electricity transmission, distribution, on selling and electricity market operation	11,319	364	3.22%
E – Construction	3001	Residential building construction	47,637	855	1.79%
	3002	Non-residential building construction	25,158	138	0.55%
	3101	Heavy and civil engineering construction	29,323	360	1.23%
	3201	Construction services	171,778	3643	2.12%
F – Wholesale Trade	3301	Wholesale trade	89,508	1350	1.51%
G – Retail Trade	3901	Retail trade	298,269	3357	1.13%
H – Accommodation and Food Services	4401	Accommodation	21,142	214	1.01%
	4501	Food and beverage services	174,102	1781	1.02%
I – Transport, Postal and Warehousing	4901	Air and space transport	7,432	37	0.50%
	5101	Postal and courier pick-up and delivery service	28,708	1376	4.79%

ANZSIC division	IOIG	Sector	Total sector employment	Circular employment (FTE)	Circular employment as %
J – Information Media and Telecommunications	5501	Motion picture and sound recording	7,851	84	1.08%
	5601	Broadcasting (except internet)	4,372	11	0.26%
	6001	Library and other information services	2,159	2	0.11%
K – Financial and Insurance Services	6201	Finance	63,235	282	0.45%
	6301	Insurance and superannuation funds	27,789	97	0.35%
	6401	Auxiliary finance and insurance services	35,149	369	1.05%
L – Rental, Hiring and Real Estate Services	6700	Imputed rent for owner-occupiers	1,551	4	0.28%
	6701	Actual rent for housing (uses same ANZSIC code as 6700, so not included in analysis)	n.a.	0	0.28%
	6702	Non-residential property operators and real estate services	35,781	669	1.87%
M – Professional, Scientific and Technical Services	7001	Computer systems design and related services	67,261	1,896	2.82%
N – Administrative and Support Services	7310	Building cleaning, pest control and other support services	54,128	3,063	5.66%
O – Public Administration and Safety	7601	Defence	11,396	94	0.83%
	7701	Public order and safety	53,118	1,082	2.04%
Q – Health Care and Social Assistance	8401	Health care services	269,215	4,181	1.55%
R – Arts and Recreation Services	8901	Heritage, creative and performing arts	16,429	409	2.49%
	9101	Sports and recreation	29,329	513	1.75%
	9201	Gambling	7,473	63	0.85%
S – Other Services	9501	Personal services	43,287	875	2.02%
Total			**1,883,512**	**31,328**	**1.66%**

Appendix D – Overview of changes to the results of Circular Jobs and Skills: Planning for our Future

The research in this report is an addition to the findings discussed in Circular Jobs and Skills: Planning for our Future developed through the increased accuracy of the revised methodology. Some of the findings in the first report need to be updated to make use of this improvement.

Reclassification of circular sectors

The analysis used in both Circular Jobs and Skills: Planning for our Future and this report use Circle Economy's Key Elements Framework as a foundation to categorise core, enabling, and indirect circular sectors[23]. The Key Elements Framework describes these sectors using the international ISIC classification, which were corresponded to the Australian ANZSIC classification for Circular Jobs and Skills: Planning for our Future. However, the Australian I-O tables make use of the separate IOIG classification (input-output industry groups). For the work described in this report, a new correspondence had to be made between the ISIC sectors in the Key Elements Framework and the IOIG sectors in Australia's I-O tables. These sector translations can be found in Appendix A.

Bottom-up correction for renewable energy generation

A disadvantage of using the IOIG classification is that it is not as detailed as the ANZSIC classification. This limits the nuance that can be found in individual sectors. Although Employment in core circular sectors describes that employment in core circular sectors can be considered fully circular, a bottom-up correction needed to be made to ensure non-renewable electricity generation was not included in the analysis using *IOIG 2601 – Electricity generation.* The ANZSIC classification offers more detail by separating this section into ANZSIC *2611 – Fossil Fuel Electricity Generation, 2612 – Hydro-electricity Generation,* and *2619 – Other Electricity Generation.*

The required correction was made by using the ANZSIC classification to understand what proportion of electricity generating jobs are focused on renewable energy, which was found to be 36.73% for 2022/23. This figure was used throughout the I-O analysis for every calculation that involves a sector-to-sector interaction with renewable electricity generation.

Recalculation of occupational intensity

Circular Jobs and Skills: Planning for our Future investigated which occupations are most typical in the identified circular sectors through a metric dubbed 'occupational intensity'. This is a measure of how prevalent certain occupations are in specific sectors. The switch from using ANZSIC classification to the IOIG classification in this report has meant that a new categorisation of circular sectors was required, as shown in Appendix A. As a result, the occupational intensity across these new sectors was recalculated accordingly. **Figure 4** offers a visual overview of the results, showing which occupational groups have been found to be more prevalent in Victoria's current circular economy using the revised methodology.

As a result, **Table 11** provides an overview of what occupational groups are higher in demand in Victoria's current circular economy, when compared to the rest of the economy.

Figure 4 – Recalculated occupational intensity comparison of ANZSCO sub-major groups.

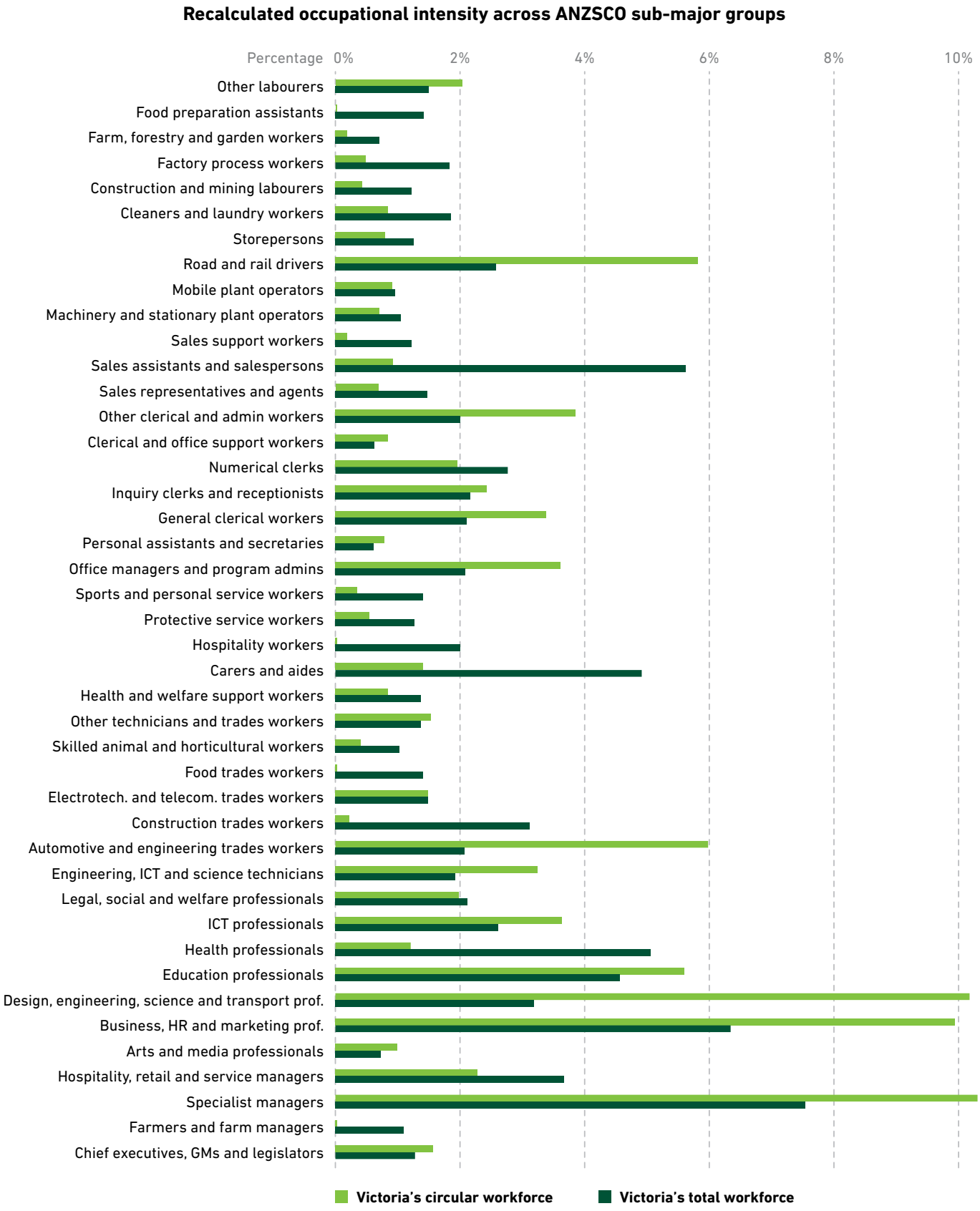


Table 11 – Recalculated occupational groups that are proportionally in higher and lower demand in Victoria's current circular economy, when compared to the rest of the economy.

	Higher in demand in Victoria's current circular economy	Lower in demand in Victoria's current circular economy
Occupational groups	Road and rail drivers	Food preparation assistants
	Other clerical and administrative workers	Factory process workers
	Office managers and program administrators	Sales assistants and salespersons
	Automotive and engineering trades workers	Carers and aides
	Design, engineering, science and transport professionals	Food trades workers
	Business, human resource and marketing professionals	Construction trades workers
	Specialist managers	Health professionals

Appendix E – Changes in typical circular occupations

Table 12 provides an overview of how the revised methodology in this report has changed the typical circular occupations identified in Circular Jobs and Skills: Planning for our Future. Note that **Table 12** provides occupations to the 4-digit ANZSCO unit group level, whereas the detailed tables in Circular Jobs and Skills: Planning for our Future drilled down to the 6-digit ANZSCO occupations. As the revised methodology makes use of the former, occupations are provided in that classification to enable the comparison shown in **Table 12.** With a few exceptions, no new typical occupations have been identified. For all key elements, the revised methodology has resulted in a smaller number of occupations having been identified as typical.

Note that n.e.c. stands for *'not elsewhere captured'*, capturing certain sub-classes or specialisations of occupations that do not have their own unique code in the ANZSCO classification. N.f.d. stands for *'not further defined'*, usually used when not enough information was available to classify the occupation in more detail.

Table 12 – Overview of how typical occupations have changed due to the revised methodology.

	Typical occupations as identified in Circular Jobs and Skills: Planning for our Future		Updated typical occupations	
Key element	**ANZSCO code**	**Unit group**	**ANZSCO code**	**Unit group**
Stretch the lifespan	3212	Motor mechanics	3212	Motor mechanics
	3241	Panelbeaters	3241	Panelbeaters
	3421	Airconditioning and refrigeration mechanics	3421	Airconditioning and refrigeration mechanics
	3932	Clothing trades workers	3932	Clothing trades workers
	8111	Car detailers	8111	Car detailers
	3423	Electronics trades workers	3423	Electronics trades workers
	8994	Motor vehicle parts and accessories fitters	8994	Motor vehicle parts and accessories fitters
	6213	Motor vehicle and vehicle parts salespersons	3931	Canvas and leather goods makers
	3243	Vehicle painters		
	3242	Vehicle body builders and trimmers		
	2339	Other engineering professionals		
	3211	Automotive electricians		
	3233	Precision metal trades workers		
	3232	Metal fitters and machinists		
	3991	Boat builders and shipwrights		
	6219	Other sales assistants and salespersons		
	8999	Other miscellaneous labourers		

	Typical occupations as identified in Circular Jobs and Skills: Planning for our Future		Updated typical occupations	
Key element	**ANZSCO code**	**Unit group**	**ANZSCO code**	**Unit group**
Use waste as a resource	6219	Other sales assistants and salespersons	6219	Other sales assistants and salespersons
	7119	Other machine operators	7119	Other machine operators
	7219	Other stationary plant operators	7219	Other stationary plant operators
	7331	Truck drivers	7331	Truck drivers
	8399	Other factory process workers	8399	Other factory process workers
	8996	Recycling and rubbish collectors	8996	Recycling and rubbish collectors
	2331	Chemical and materials engineers		
	2339	Other engineering professionals		
	5619	Other clerical and office support workers		
	7212	Earthmoving plant operators		
	8211	Building and plumbing labourers		
Prioritise regenerative resources	2333	Electrical engineers	2333	Electrical engineers
	3123	Electrical engineering draftspersons and technicians	3123	Electrical engineering draftspersons and technicians
	3232	Metal fitters and machinists	3232	Metal fitters and machinists
	3992	Chemical, gas, petroleum and power generation plant operators	3992	Chemical, gas, petroleum and power generation plant operators
	2322	Surveyors and spatial scientists	233	Engineering professionals, n.f.d
	3129	Other building and engineering technicians		
	3233	Precision metal trades workers		
	3422	Electrical distribution trades workers		
	5411	Call or contact centre workers		
	5619	Other clerical and office support workers		
	6393	Telemarketers		
	8999	Other miscellaneous labourers		

	Typical occupations as identified in Circular Jobs and Skills: Planning for our Future		Updated typical occupations	
Key element	**ANZSCO code**	**Unit group**	**ANZSCO code**	**Unit group**
Design for the future	1332	Engineering managers	1332	Engineering managers
	2321	Architects and landscape architects	2321	Architects and landscape architects
	2324	Graphic and web designers, and illustrators	2324	Graphic and web designers, and illustrators
	2332	Civil engineering professionals	2332	Civil engineering professionals
	3121	Architectural, building and surveying technicians	3121	Architectural, building and surveying technicians
	3122	Civil engineering draftspersons and technicians	3122	Civil engineering draftspersons and technicians
	3996	Signwriters	3996	Signwriters
	2249	Other information and organisation professionals	312	Building and engineering technicians, n.f.d
	2322	Surveyors and spatial scientists		
	2323	Fashion, industrial and jewellery designers		
	2325	Interior designers		
	2326	Urban and regional planners		
	2333	Electrical engineers		
	2335	Industrial, mechanical and production engineers		
	2339	Other engineering professionals		
	2343	Environmental scientists		
	2724	Social scientists		
	3123	Electrical engineering draftspersons and technicians		
	3125	Mechanical engineering draftspersons and technicians		
	3999	Other miscellaneous technicians and trades workers		

	Typical occupations as identified in Circular Jobs and Skills: Planning for our Future		Updated typical occupations	
Key element	**ANZSCO code**	**Unit group**	**ANZSCO code**	**Unit group**
Incorporate digital technology	1351	ICT managers	1351	ICT managers
	2252	ICT sales professionals	2252	ICT sales professionals
	2631	Computer network professionals	2631	Computer network professionals
	2633	Telecommunications engineering professionals	2633	Telecommunications engineering professionals
	3424	Telecommunications trades workers	3424	Telecommunications trades workers
	5999	Other miscellaneous clerical and administrative workers	5999	Other miscellaneous clerical and administrative workers
	6212	ICT sales assistants	6212	ICT sales assistants
	2612	Multimedia specialists and web developers	3132	Telecommunications technical specialists
	2613	Software and applications programmers		
	2621	Database and systems administrators, and ICT security specialists		
Rethink the business model	1494	Transport services managers	1494	Transport services managers
	5912	Transport and despatch clerks	5912	Transport and despatch clerks
	6219	Other sales assistants and salespersons	6219	Other sales assistants and salespersons
	7331	Truck drivers	7331	Truck drivers
	8911	Freight and furniture handlers	8911	Freight and furniture handlers
	1336	Supply, distribution and procurement managers	2312	Marine transport professionals
	1499	Other hospitality, retail and service managers		
	2311	Air transport professionals		
	5995	Inspectors and regulatory officers		
	7219	Other mobile plant operators		
	7311	Automobile drivers		
	8115	Laundry workers		
	8116	Other cleaners		

	Typical occupations as identified in Circular Jobs and Skills: Planning for our Future		Updated typical occupations	
Key element	**ANZSCO code**	**Unit group**	**ANZSCO code**	**Unit group**
Collaborate for joint value	5995	Inspectors and regulatory offers	5995	Inspectors and regulatory officers
	2231	Human resource professionals	1113	Legislators
	2249	Other information and organisation professionals	2244	Intelligence and policy analysts
	4211	Child carers	2326	Urban and regional planners
	8999	Other miscellaneous labourers	3113	Primary products assurance and inspection officers
Strengthen and advance knowledge	1344	Other education managers	1344	Other education managers
	2421	University lecturers and tutors	2421	University lecturers and tutors
	2422	Vocational education teachers (Aus)/ Polytechnic teachers (NZ)	2422	Vocational education teachers (Aus)/ polytechnic teachers (NZ)
	3921	Print finishers and screen printers	3921	Print finishers and screen printers
	5615	Survey interviewers	5615	Survey interviewers
	2414	Secondary school teachers	8995	Printing assistants and table workers
	2415	Special education teachers	3923	Printers
	2492	Private tutors and teachers	2124	Journalists and other writers
	2493	Teachers of English to speakers of other languages	234	Natural and physical science professionals, n.f.d.
	3114	Science technicians	2346	Medical scientists
	4512	Driving instructors		
	4523	Spots coaches, instructors and officials		

Appendix F – Comparison of capability profiles

As discussed in Methodology, the revised methodology has resulted in an updated list of occupations that can be considered typical in Victoria's current circular economy. These typical occupations form the foundation of the education and skill profiles described in detail in Circular Jobs and Skills: Planning for our Future, and so need to be updated to reflect the revised methodology.

Figures 5 to 20 provide a visual comparison of the education and skill requirements of the currently typical and future ideal circular occupations found in Circular Jobs and Skills: Planning for our Future and the updated currently typical occupations as identified in this report. Note the education requirement profiles have been updated to include the latest changes in how Census data is reported by the ABS, providing more detail.

Note the skill profiles make use of data from the Australian Skills Classification. This framework will be superseded by the new National Skills Taxonomy, and is relevant only for research purposes and the comparisons provided in this report[24].

Stretch the lifespan

Figure 5 shows the average education levels that have been attained by circular occupations in the *Stretch the Lifespan* element have not changed much in light of the revised methodology. Likewise, the average skill levels across these occupations, shown in **Figure 6**, remain similar. If anything, the updated skill levels now more closely resemble the skill profile needed by an ideal circular workforce. Because of this, the conclusions drawn in Circular Jobs and Skills: Planning for our Future remain in place, with Victoria's workforce being well prepared to be effective in this element of the circular economy.

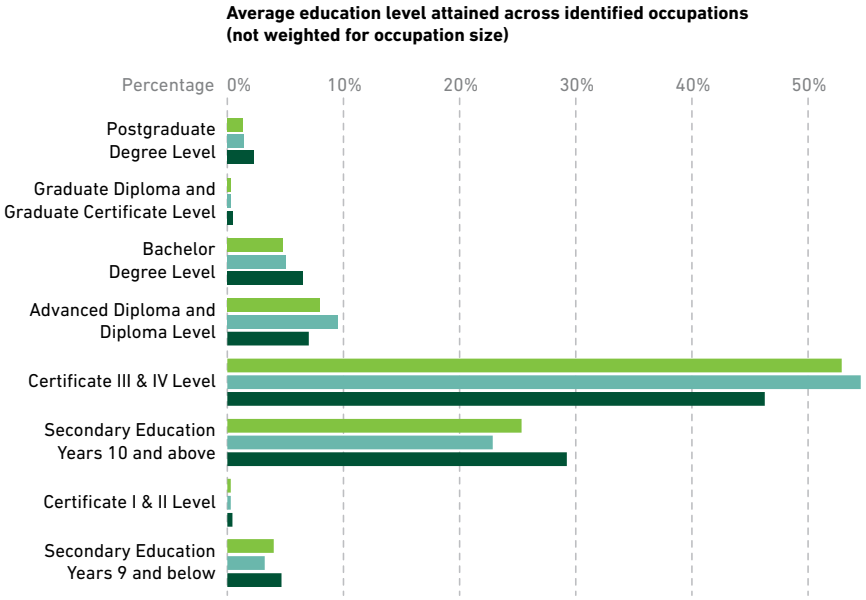


Figure 5 – Stretch the lifespan – Education requirement profile.

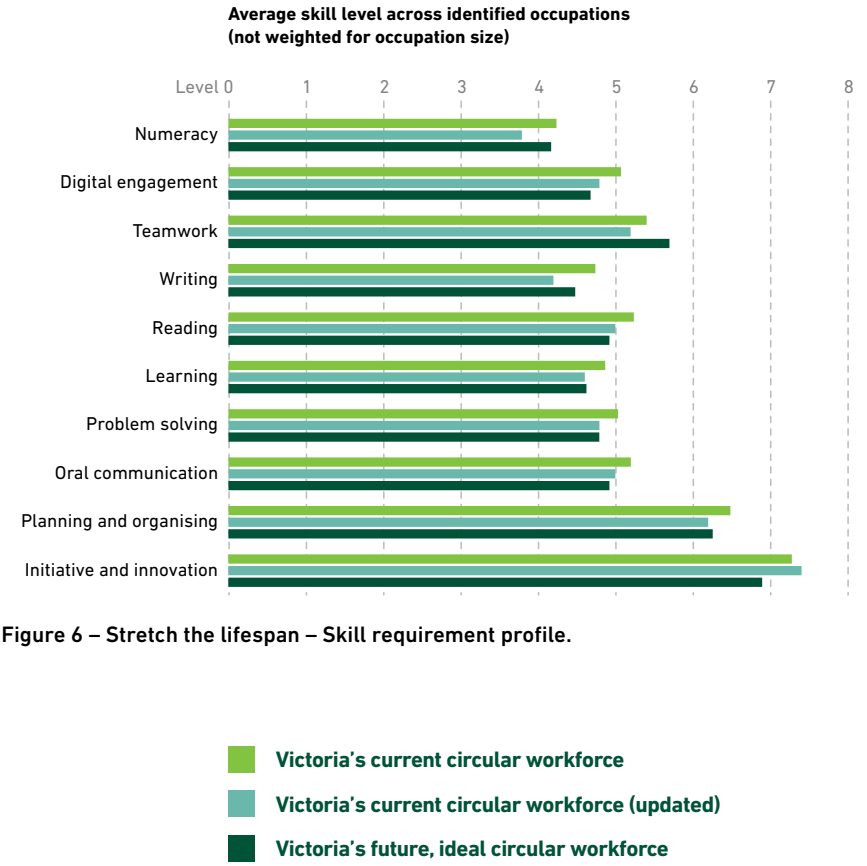


Figure 6 – Stretch the lifespan – Skill requirement profile.

Use waste as a resource

Circular Jobs and Skills: Planning for our Future concluded that Victoria's workforce is not well positioned to be effective in the *Use waste as a resource* element due to the mismatch of the education and skill profiles between current and ideal occupations. Although the revised methodology improves upon this slightly, shown in **Figures 7 and 8**, the differences with future circular workforce are still significant enough to retain the same conclusion that Victoria is not well prepared for this element of the circular economy.

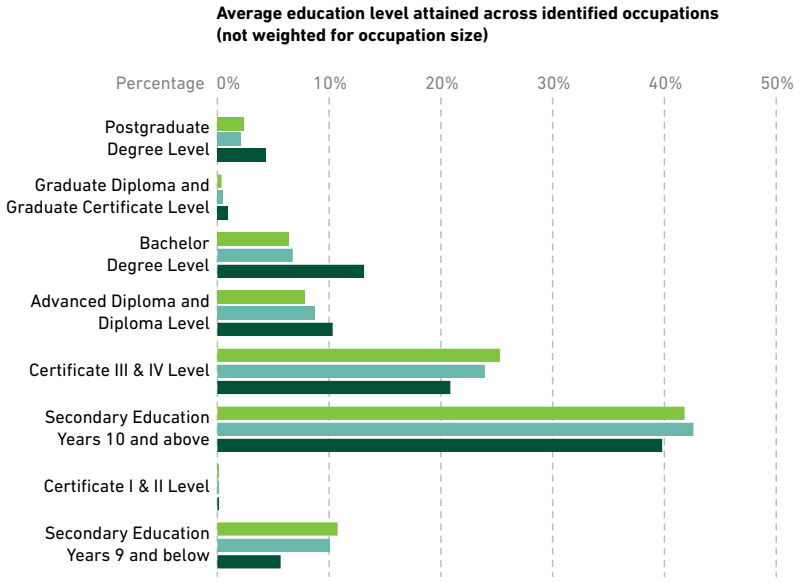


Figure 7 – Use waste as a resource – Education requirement profile.

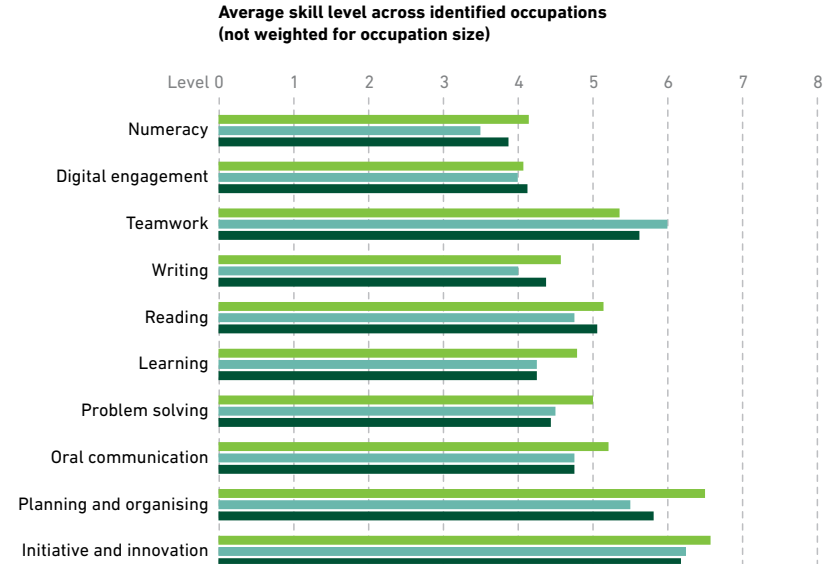
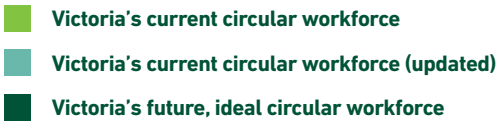


Figure 8 – Use waste as a resource – Skill requirement profile



Prioritise regenerative resources

As evident from **Figure 9**, the updated education requirements profile for the *Prioritise regenerative resources* element now more closely resembles the profile of an ideal, future circular workforce. But the skill requirements profile has gone the other way, shown in **Figure 10**, increasing the gap with the ideal profile. These differences are significant enough for the original conclusion from Circular Jobs and Skills: Planning for our Future to remain in place: Victoria's circular workforce is currently not well prepared to be effective in this element of the circular economy.

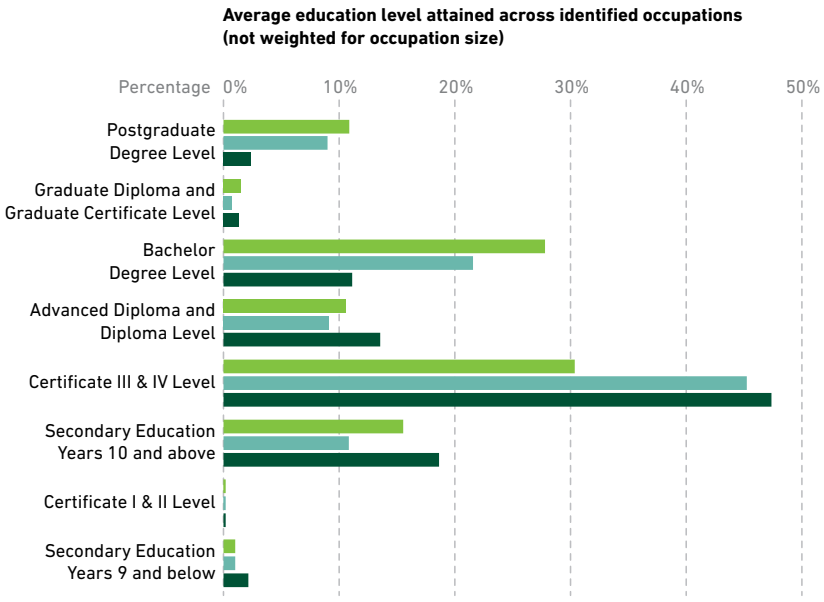


Figure 9 – Prioritise regenerative resources – Education requirement profile.

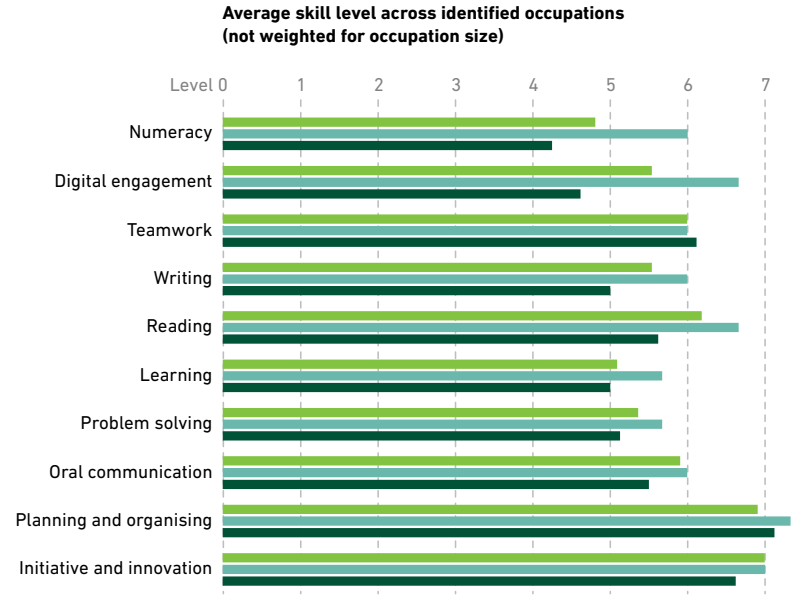
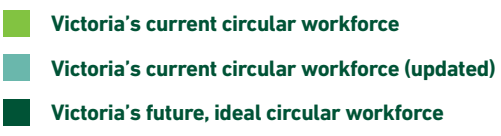


Figure 10 – Prioritise regenerative resources – Skills requirement profile.



Design for the future

As shown in **Figures 11 and 12**, the revised methodology has resulted in a bigger gap between the capability profiles of Victoria's current and ideal, future circular workforce. As detailed in Circular Jobs and Skills: Planning for our Future, ideal occupations in this element include various different types of designers, urban planners, and even research and development managers. According to the revised methodology, currently typical occupations in this element appear limited to engineering and technician professionals, and graphic design experts. Because of this, it can be concluded that Victoria's current workforce is not well prepared to be effective in this element of the circular economy, contradicting the findings of Circular Jobs and Skills: Planning for our Future.

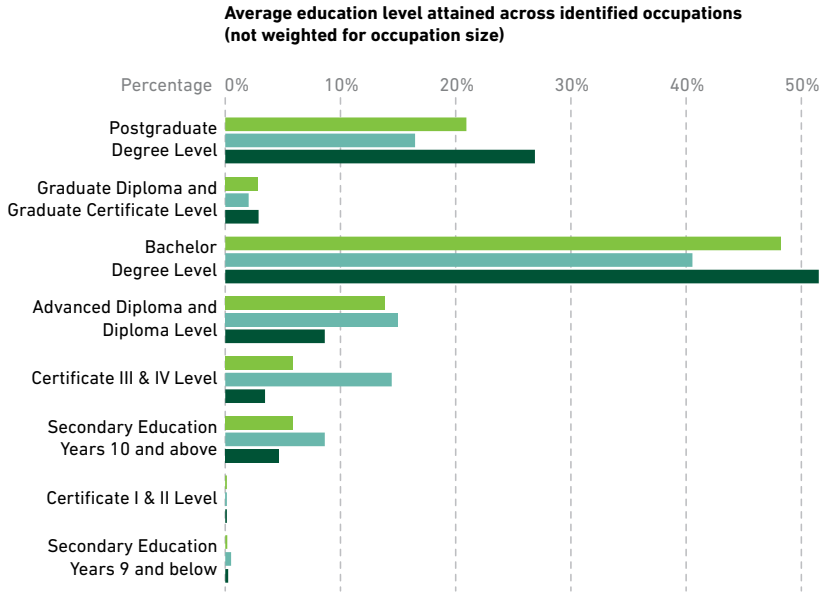


Figure 11 – Design for the future – Education requirement profile.

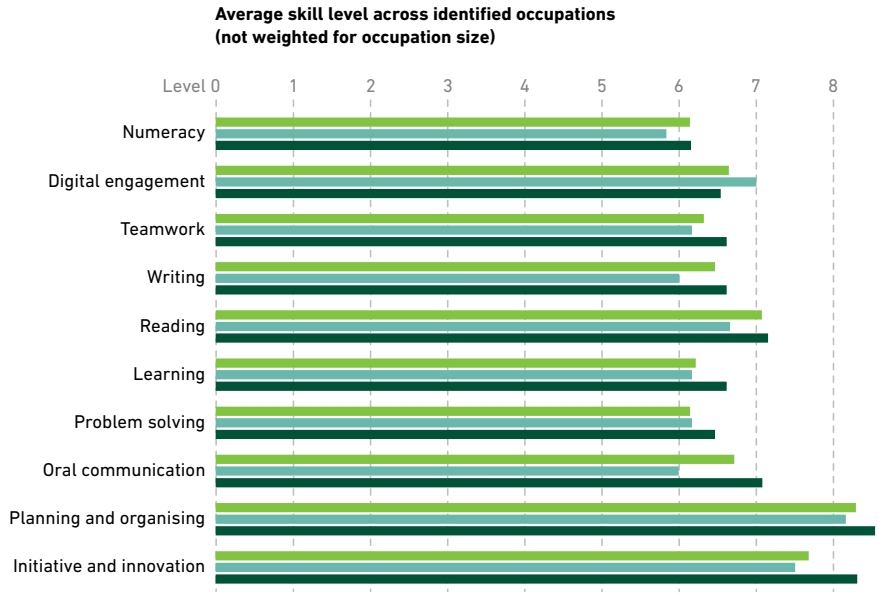


Figure 12 – Design for the future – Skills requirement profile.

Victoria's current circular workforce

Victoria's current circular workforce (updated)

Victoria's future, ideal circular workforce

Incorporate digital technology

Figures 13 and 14 show the revised methodology has not significantly impacted the capability profiles of the *Incorporate digital technology* element. The results appear largely consistent, so the conclusion from Circular Jobs and Skills: Planning for our Future can be retained: Victoria's current workforce is well prepared to be effective in this element of the circular economy.

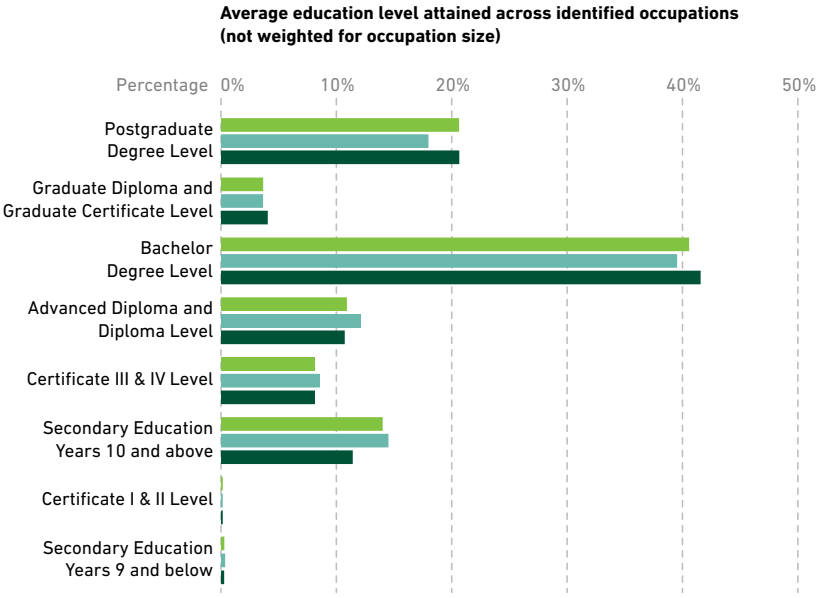


Figure 13 – Incorporate digital technology – Education requirement profile.

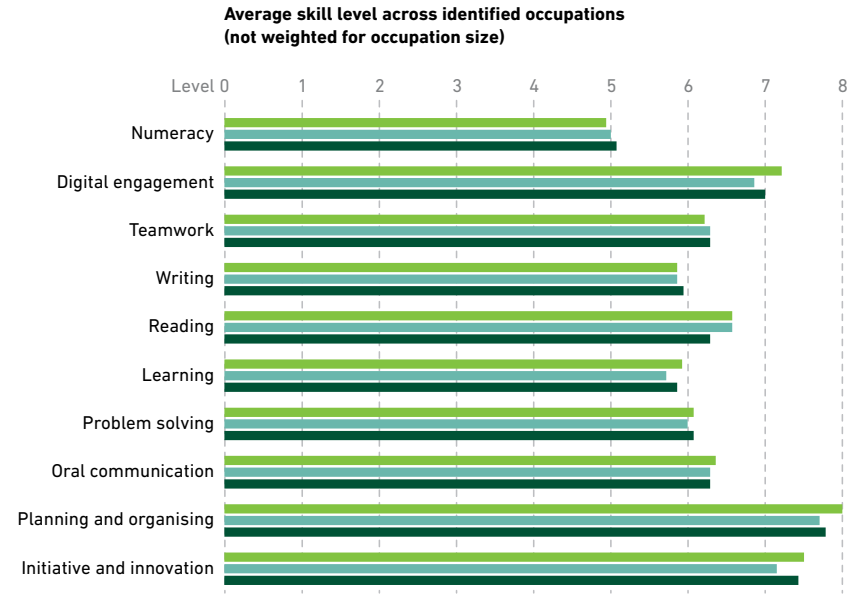


Figure 14 – Incorporate digital technology – Skills requirement profile.

Victoria's current circular workforce

Victoria's current circular workforce (updated)

Victoria's future, ideal circular workforce

Rethink the business model

The revised methodology has resulted in an increased gap between Victoria's current workforce capabilities and those required from an ideal circular workforce for this element, shown in **Figures 15 and 16**. This strengthens the conclusion drawn in Circular Jobs and Skills: Planning for our Future: Victoria's current workforce is not well prepared to be effective in this element of the circular economy.

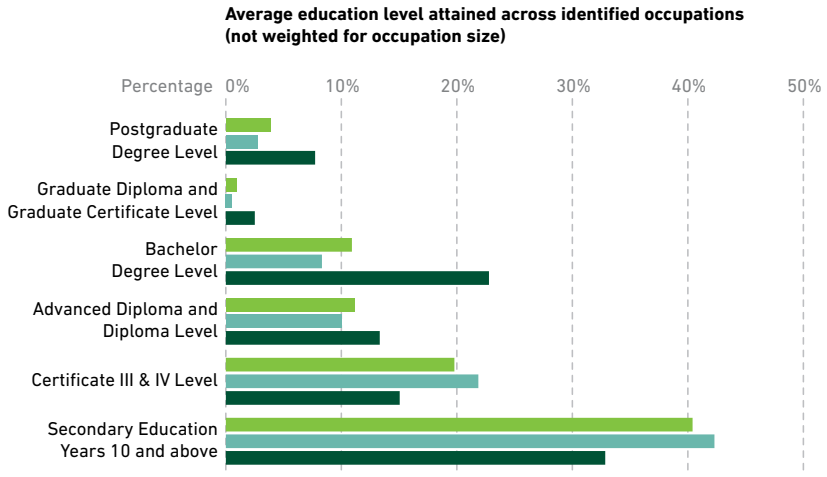


Figure 15 – Rethink the business model – Education requirement profile.

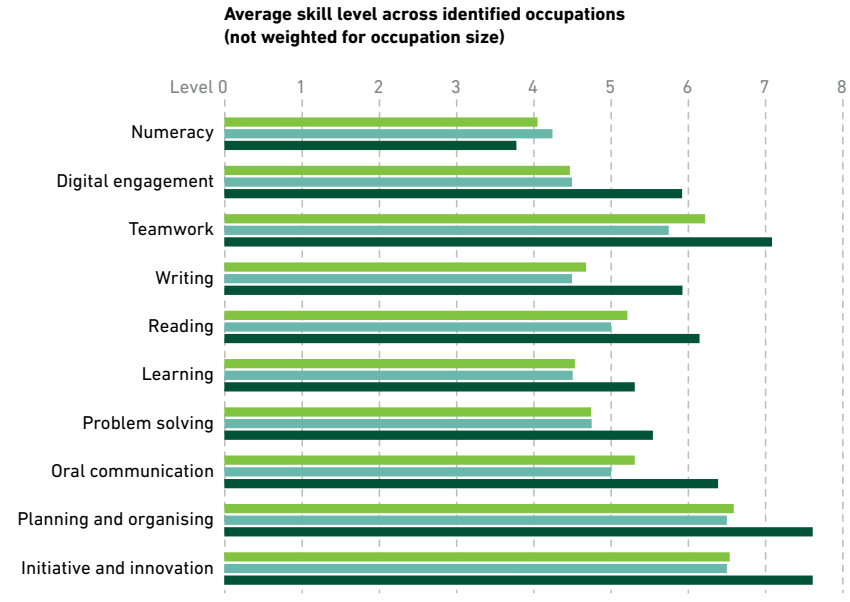


Figure 16 – Rethink the business model – Skills requirement profile.

Collaborate for joint value

As detailed in Circular Jobs and Skills: Planning for our Future and shown in **Figures 17 and 18**, Victoria's workforce is not well prepared to be effective in this element of the circular economy. This was primarily attributed to the fact that the occupations identified as typical in this space did not match what one would expect from the activities taking place in this element.

However, the revised methodology resulted in significant changes in the identified typical occupations. The identified occupations are now similar to those identified in an ideal, future circular workforce. As a result, it appears that both the education and skills requirement profiles now much more closely resemble those of an ideal workforce, and it can be concluded that Victoria's workforce is well prepared to be effective in this element of the circular economy.

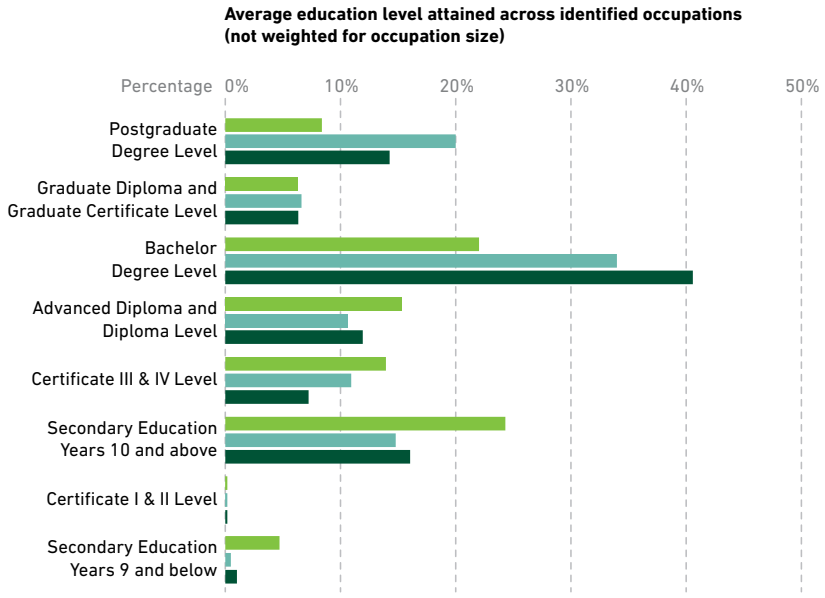


Figure 17 – Collaborate for joint value – Education requirement profile.

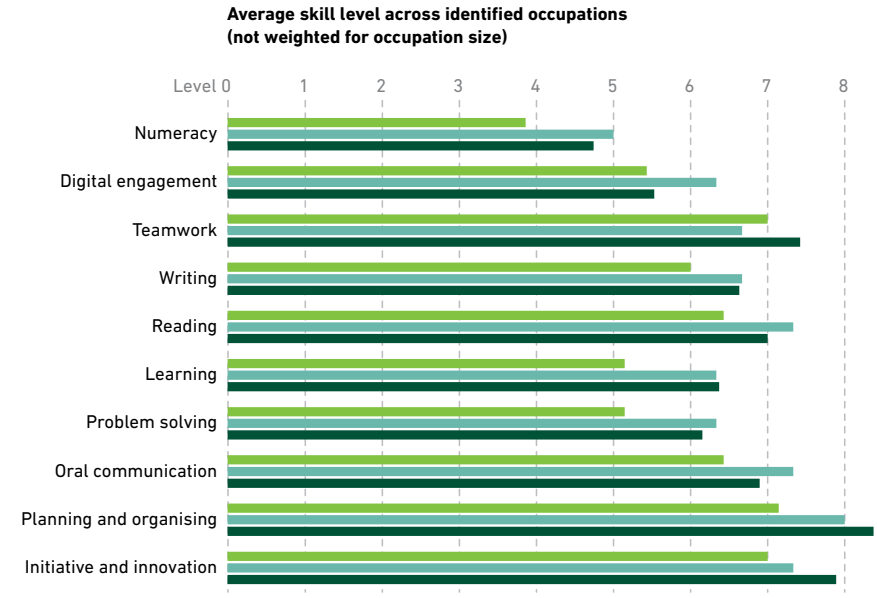
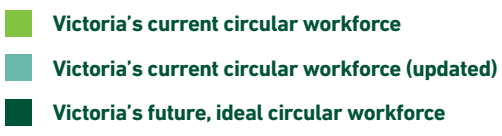


Figure 18 – Collaborate for joint value – Skills requirement profile.



Strengthen and advance knowledge

The revised methodology has resulted in the capability gap between Victoria's current and ideal circular workforce increasing for this element, as shown in **Figures 19 and 20**. As detailed in Circular Jobs and Skills: Planning for our Future, ideal occupations in this element include educators of all kinds and levels, statisticians, market research professionals, and data analysts. The newly identified occupations found to be typical in Victoria's current circular economy, however, appear limited to university and VET teachers, printing professionals, and science professionals, as detailed in Appendix E. This explains the increased gap in recorded workforce capabilities, resulting in the new conclusion that Victoria's workforce is less prepared to be effective in this element of the circular economy.

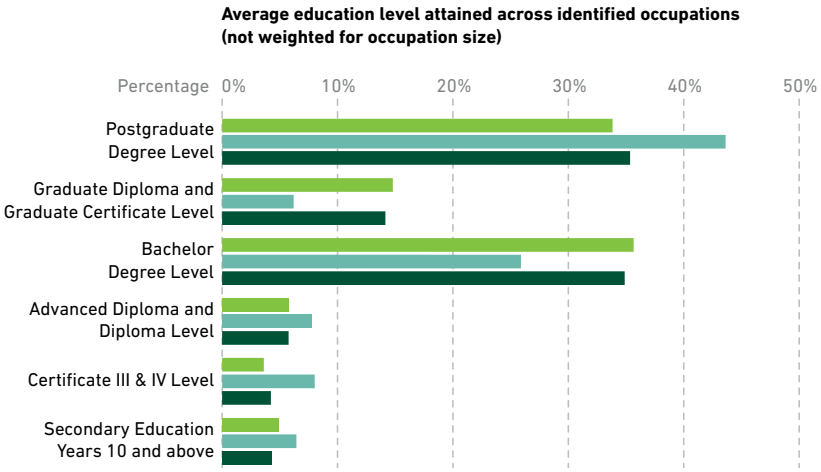


Figure 19 – Strengthen and advance knowledge – Education requirement profile.

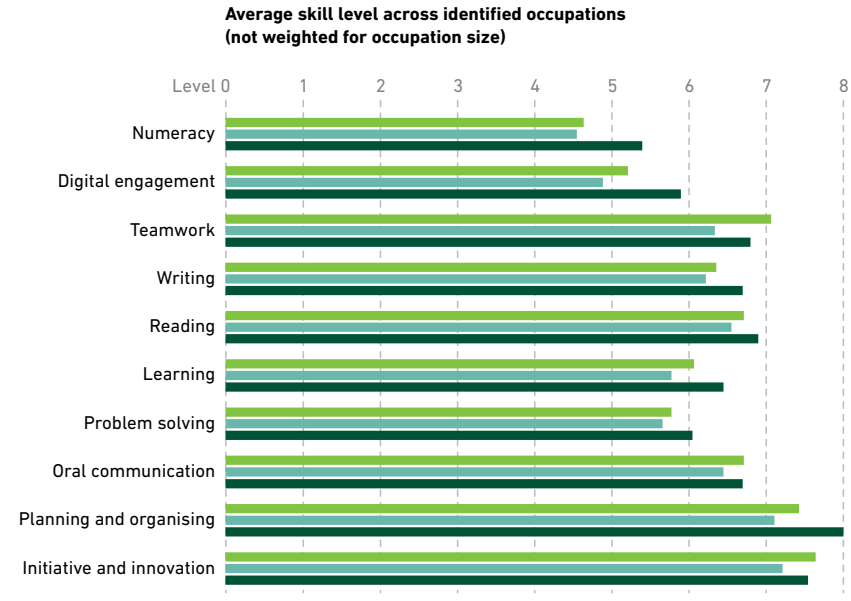
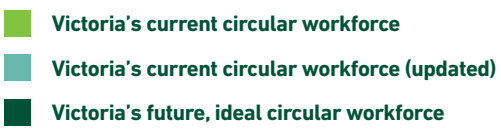


Figure 20 – Strengthen and advance knowledge – Skills requirement profile



Sources

1 Economics, K. P. M. G. (2020). Potential Economic Payoff of a Circular Economy. KPMG Economics: London, UK.

2 Charitable Reuse Australia (2024). Measuring reuse activity and impacts in NSW. Accessed on 17/12/2024, available through https://www.charitablereuse.org.au/wp-content/uploads/2024/06/Reuse-in-NSW-Executive-Report-Oct2024-Version.pdf

3 Circle Economy (2021). *The Key Elements of the Circular Economy Framework*. Accessed on 24/03/2026, available through https://www.circle-economy.com/resources/the-key-elements-of-the-circular-economy-framework

4 Circle Economy (December 14, 2021). *Circular Jobs Methodology*. Accessed on 25/03/2026, available through https://www.circle-economy.com/resources/circular-jobs-methodology

5 C40 Cities (October, 2025). *Tracking global good green jobs in cities.* C40 Cities Climate Leadership Group and Circle Economy. Accessed on 25/03/2026, available through https://www.c40knowledgehub.org/s/article/Tracking-global-good-green-jobs-in-cities?language=en_US

6 Muñoz et al. (January 13, 2022). *Tracking a Circular Economy Transition Through Jobs: Method Development and Application in Two Cities.* Frontier in Sustainable Cities, Sec. Smart Technologies and Cities, Volume 3 – 2021, https://doi.org/10.3389/frsc.2021.787076

7 Tātaki Auckland Unlimited (September, 2023). *Tāmaki Makaurau Auckland's green employment.* Accessed on 25/03/2026, available through https://www.knowledgeauckland.org.nz/publications/tamaki-makaurau-auckland-s-green-employment/

8 ABS (2025). *Australian National Accounts: Input-Output Tables*. Accessed on 25/03/2026, available through https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-input-output-tables/latest-release

9 ABS (2026). *Using I-O tables for analysis*. Accessed on 25/03/2026, available through https://www.abs.gov.au/statistics/detailed-methodology-information/concepts-sources-methods/australian-system-national-accounts-concepts-sources-and-methods/edition-8/chapter-22-input-output-tables/using-i-o-tables-analysis

10 Circle Economy (December, 2025). *Employment in the Circular Economy – Leveraging circularity to create decent work*. Accessed on 23/03/2026, available through https://www.circle-economy.com/resources/employment-in-the-circular-economy

11 Circle Economy (2023). *The first circularity data explorer for a Japanese city*. Accessed on 25/03/2026, available through https://www.circularity-gap.world/gamagori

12 Circle Economy (2022). *Baseline analysis of circular jobs in Swiss cantons*. Accessed on 25/03/2026, available through https://www.circle-economy.com/resources/baseline-analysis-of-circular-jobs-in-swiss-cantons

13 Circle Economy (February 2022). *Circular Jobs Bulletin 2022.* Accessed on 25/03/2026, available through https://legacy.circle-economy.com/resources/circular-jobs-bulletin-2022

14 Ibid.

15 Circle Economy (May 2022). *Circular Jobs Bulletin 2021.* Accessed on 25/03/2026, available through https://legacy.circle-economy.com/resources/circular-jobs-bulletin-2021

16 Ibid.

17 Ibid.

18 CSIRO (2024). *Modelling Circular Economy Transition Targets.* Accessed on 25/03/2026, available through https://research.csiro.au/circulareconomy/modelling-circular-economy-transition-targets/

19 Australian Government (2024). *Australia's Circular Economy Framework.* Department of Climate Change, Energy, the Environment and Water. Accessed on 25/03/2026, available through https://www.dcceew.gov.au/environment/protection/circular-economy/framework

20 Circle Economy (December, 2025). Employment in the Circular Economy – Leveraging circularity to create decent work. Accessed on 23/03/2026, available through https://legacy.circle-economy.com/resources/employment-in-the-circular-economy

21 Victorian Government (2023). *Clean Economy Workforce Development Strategy 2023 to 2033 – Supporting clean energy jobs planning through data and insights.* Accessed on 25/03/2026, available through https://www.vic.gov.au/clean-economy-workforce-development-strategy-2023-2033

22 ABS (26/03/2025). *Australian National Accounts: Input-Output Tables methodology.* Table 10 – Total requirement coefficients (indirect allocation of imports). Accessed on 25/03/2026, available through https://www.abs.gov.au/methodologies/australian-national-accounts-input-output-tables-methodology/2022-23#data-content-and-structure

23 Circle Economy (2021). The Key Elements of the Circular Economy Framework. Accessed on 24/03/2026, available through https://www.circle-economy.com/resources/the-key-elements-of-the-circular-economy-framework

24 Jobs and Skills Australia (2026). *National Skills Taxonomy.* Accessed on 26/03/2026, available through https://www.jobsandskills.gov.au/data/national-skills-taxonomy

Sustainability Victoria
Level 12, 321 Exhibition Street,
Melbourne VIC 3000
Phone (03) 8626 8700
sustainability.vic.gov.au

Published by Sustainability Victoria.
Circular Jobs and Skills: A Workforce in Motion
 REB009

Sustainability Victoria

VICTORIA State Government