

Circular Economy Incognito: Mapping Circular Activities and Employment in Victoria, Australia

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Introduction

Circular economy (CE) policymaking is becoming increasingly popular amongst various levels of governments in Australia and is beginning to engender urban planning changes. Many of these policies focus on supporting larger-scale recycling activities and waste management sectors with an emphasis on maximising the ecological benefits of a CE transition. However, there is little understanding of how key circular activities contribute to diverse and equitable economies and employment opportunities.

This is a critical, yet underappreciated facet of facilitating the circular economy transition, given that a socioeconomic restructuring of this magnitude, will still depend on the viability of socially beneficial labour opportunities (Moreau *et al.*, 2017; Schroeder, Anggraeni and Weber, 2019; Padilla-Rivera, Russo-Garrido and Merveille, 2020; Schröder, Lemille and Desmond, 2020). Currently many circular economy policies focus on the proportion of materials circulated versus wasted and the technologies and innovation involved in improving this.

As a result there are critical gaps with understanding the diversity of employment available in circular activities, where they are and how accessible they may be to people of varying skills, ages, incomes and cultural and linguistically diverse groups. Understanding the nature of these jobs and their location patterns will contribute significantly to key knowledge gaps in urban planning and policymaking to facilitate an equitable circular economy transition.

Our study addresses this gap by analysing the spatial patterns of growth and decline for key circular activity sectors between 2011-2016 using Victoria, Australia as a case study. The study involves a structural analysis to classify 'circular activities' using ANZSIC industry codes (4-digit) (ABS, 2019) and draws from primarily 2016 ABS Census data (using TableBuilder) to identify key characteristics of the workforce, including skills required of common occupations, qualifications, age, cultural and linguistic diversity, wages and income. The study also involves quantitative spatial analyses including a location quotient analysis and shift-share analysis.

Uncovering Australia's Circular Economy

In Australia transitioning to the CE has been touted to generate substantial positive economic outcomes – a recent report from KPMG (2020) estimates that a fully implemented circular economy by 2048 will likely create 17,000 additional full-time jobs and contribute \$210bn (present value) in GDP. However, there has been little research about the contributions of core existing CE sectors (recycling, reuse and

repair) to sustainable and equitable urban economies in Australian cities and their location patterns.

In other parts of the world like in the US or in Europe, there have been some efforts to classify and measure the contributions of key employment sectors to facilitating circular economy outcomes (Burger *et al.*, 2019; Llorente-González and Vence, 2020). These studies have classified activities which contribute to one or more of the defined circular activities or '10rs' (refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle, recover) (Kirchherr, Reike and Hekkert, 2017; Potting *et al.*, 2017).

Previous studies also analyse the workforce and capital characteristics to account for the types of occupations, skills required, labour-intensity and wealth distribution (Burger *et al.*, 2019; Llorente-González and Vence, 2020). Circular industries in this study (which fully contribute to the recirculation of used goods) are defined by this study as:

- Reuse – involving the restoration (and at times refurbishing) and resale of household goods like clothing, domestic appliances, bicycles and furniture to reduce overall demand for new goods. A significant proportion of social enterprises and charities make up this sector and are typically referred to as 'reuse organisations'.
These jobs are typically characterised as low-skill, very labour-intensive, low-wage and low capital intensity.
- Repair – involving the repair, refurbishing and repurposing of technical equipment, automotive vehicles and electronics (like computers and televisions)
These jobs are typically characterised as low to medium-skill, somewhat labour-intensive, average-wage and low capital intensity.
- Recycling & recovery – involving the collection, recovery and remediation of large volumes of solid, liquid, hazardous and other wastes
These jobs are highly varied, ranging from low to high skills, provide typically average or higher wages but also many low-wage opportunities and operate with varying levels of capital intensity and labour-intensity.

This creates a picture of the heterogeneity of labour characteristics in the existing circular *economy*. There are some notable limitations with this approach. Many industries in Australia adopt circular practices and recirculate used, scrape and wasted goods and products. We identified numerous industries which partially engage in circular activities (waste generation and demand for mined resources), making it difficult to discern the share of 'circular jobs' in each industry. These industries include paper manufacturing and printing; petroleum & coal product; various metal smelting manufacturing; key construction services; non-automotive vehicle manufacturing and repair; and several retail sub-sectors (mainly car retailing)

making up a significant share of Australian jobs. For this study, all industries classified as 'circular' engage in activities which are all fully circular.

Our structural analysis of the 2016 ABS Census (at the 4-digit ANSZIC industry code level), classifies just under 2% of Australia's jobs (just over 190,000) as being fully circular. Including about:

- 24,600 reuse jobs (comprising about 0.2% of the total jobs in Australia)
- 150,380 repair jobs (comprising about 1.4% of the total jobs in Australia)
- 17,620 recycling & recovery jobs (comprising about 0.2% of the total jobs in Australia).

The Significance of the Reuse Sector and its Decline

While the overall employment levels of circular activities are increasing in Australia, the reuse sector currently faces significant decline. This has significant implications for job access as governments facilitate the transition to the circular economy – given that reuse jobs (particularly in reuse organisations) typically have low-skill requirements (Llorente-González and Vence, 2020; Watson & Lane, 2011).

A substantial proportion of job opportunities in activities like used goods retail and clothing and footwear repair are occupied by people with a Year 11 or less equivalent of qualifications, who are also involved in various forms of training as part of their work. These jobs provide key opportunities for workers and jobseekers who are disadvantaged and find it difficult to find work, for varying reasons including language barriers, disability or age factors. This is likely because many organisations involved in reuse are social enterprises and charities which typically engage in 'social procurement' (McNeill 2020).

Our findings show that this decline is most apparent in High Street areas of inner-city Melbourne and regional centres Geelong, Ballarat and Bendigo, where reuse activities typically concentrate. There is some growth in more industrial areas to the metropolitan fringes of Melbourne and regional areas where concentration patterns are emerging with other circular activities like waste collection, recovery and remediation. High Street areas are typically far more accessible for workers and customers from a transport perspective than fringe areas and this has implications for both overall access to low-skill jobs which provide experience and training; and for the ongoing viability of reuse shops and facilities.

This is particularly significant given that most reuse jobs pay low wages, limiting the income available for housing and transport costs. These trends have likely been exacerbated as a result of the COVID-19 lockdowns given shocks to retail sectors and for low-skill, high-touch workers and seekers overall (Grodach and Martin, 2020).

The Role of Urban Planning and the Need for Further Research

While there has been some discussion of reuse geographies in Australia, there are significant gaps that would be needed to be addressed in better understanding the role of governance (Bulkeley and Gregson 2009; Bulkeley, Watson, and Hudson 2007; Watson and Lane 2011), particularly to intervene in this decline and maximise their socioeconomic potential.

Given that planning is a key governance mechanism for enhancing environmental, economic and social outcomes, there is an emerging debate about its role in facilitating the circular economy transition aligning with sustainable development principles (Bolger and Doyon 2019; Ortega Alvarado et al. 2021; Turcu and Gillie 2020; Fusco Girard and Nocca 2019). However, there is a significant need for further research into the land use needs of reuse organisations and how they relate to the generation of labour opportunities and socioeconomic benefits provided.

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