Commissioned by Feast Watson

Wooden Furniture – disposal and second-hand volumes

Summary

A recent study (2019) has indicated that Australians put furniture reuse (≈ 75%) above disposal (≈25%). Reuse may be through charities/tip shop, online or to friends and family whereas disposal is either directly to landfill (tip) or to hard waste collection. This maybe an evolving trend and counters the original claims that there are considerable volumes of reusable furniture heading to landfill. These findings are supported by a recent Gumtree report that has shown a significant rise in the use of online marketplaces over recent years and a considerable number of items being saved from landfill. Yet, there is a paucity of data associated with specific items heading to landfill or hard waste. A few available audit reports that identify reusable wooden furniture provide an estimate of between 4,932 and 7,399 tonnes that could be recovered. This is not inconsiderable if reflected in volumes of wooden chairs (824,000) or bookcases (261,000), if those are indeed the type of product being disposed. Options for further refinement of data exist.

The charity sector/ tip shop sector has been equally challenging to confirm data, with current estimates of 151,000 – 203,000 tonnes of furniture/ home furnishings being donated to the former. No data is available on what is wooden furniture. However, charities welcome any activity that would drive up the need of these items as they currently represent low value but large volume.

The online marketplace sector is also challenging to access. An extrapolation of some publicly available numbers indicate that 25 million home décor and furniture items are traded each year. The data supports the fact that there is shift from disposal to reuse systems.

Introduction

Feast Watson wants to build awareness of timber waste by encouraging Australians to re-love old pieces of furniture rather than buy new. The challenge, therefore, is to inspire consumers to upcycle items and provide guidance on how best to do it as part of a campaign. The issue, however, is that without some form of baseline data on how much solid timber furniture is available, commentary is limited.

The original proposal was to examine what data is available for waste to landfill and potential routes of disposal of timber furniture. However, as this project developed it seemed worthwhile to examine a wider set of data from charities and online marketplaces and frame the project as part of the circular economy. The focus has therefore been to examine solid wooden furniture (not flat pack / engineered fibre) availability either through second hand markets or household disposal routes.

The Circular Economy (CE)

In a recent Australian Circular Economy Hub (ACE Hub) publication in collaboration with Edge Environment the state of circular economy measurement in Australia was examined. The report describes the circular economy as an economic framework built on the principles of designing products to circulate at their highest value for longer, eliminating waste and

pollution and regenerating nature. The circular economy provides an approach to sustainable production and consumption that can address many critical environmental problems while meeting society's needs. The transition to a circular economy will play a significant role in achieving Australia's and other nations' targets of net zero emissions. Research indicates transitioning to a circular economy can help to reduce 45% of emissions globally and achieve multiple co-benefits across natural systems, society, and the economy. In Australia's case, the economic opportunity in adopting circular economy initiatives across the built environment, mobility, community, and industrial sectors is estimated at $1,860 billion over 20 years to 2040. Further details about the circular economy can be found on the ACE Hub website or through discussions with the Planet Ark team.

To maintain products in circulation there are a number of key strategies that are summarised by the 'R strategies'. The R-strategies can be combined to form a circularity ladder ('R-ladder'). Over the last several years the Dutch Environment Agency PBL has been using such a ladder with six circular strategies. As a rule of thumb, a strategy that is higher up the ladder (and therefore has a lower number), generally, requires fewer material resources or processing steps and therefore causes less environmental pressure. The R-strategies at the top of the ladder (refuse and rethink; reduce) decrease the total use of material resources (narrowing the loop). Those halfway down the ladder (reuse and remanufacturing; repair) postpone the demand for new material resources (**slowing the loop**). Finally, recycling is aimed at closing the cycle of materials (closing the loop). All R-strategies are needed to achieve a circular economy.

In the context of this project the following R strategies are relevant.

- R3: Reuse. The lifespan of products can be extended by using them again (reuse).
- R4: Repair and Refurbish. This strategy is also about extending the lifespan of products, but in this case by repairing them (Repair) or, reusing certain parts (Refurbish), or adapting them to new standards.

A useful reference that relates to both R strategies and furniture is a 2019 publication 'Circular economy practices in the Australian commercial furniture industry'. Unfortunately, this paper deals with the commercial sector and provides no numbers of use.

In this review wooden furniture that meets these R strategies may be sourced from more than the traditional waste streams. A review of how furniture is disposed of is included to assist in determining volumes, but three areas have been explored, hard waste collection, charities, and online marketplaces, as will be seen each has limited information requiring a level of interpretation and interpolation. Other streams may exist such as house clearance, auction rooms, antiques stores, and second-hand goods stores but these have not been reviewed.

Methodology

A broad-spectrum approach was pursued to establish what data was available

Published waste data

Within Australia a range of statistics are available including a National Waste Report. This and other documentation were reviewed to provide a general overview as to whether any relevant statistics were available on waste wooden furniture.

Network contacts

The table below shows the range and number of contacts made to identify what data is available. Results will be discussed in subsequent sections, but the majority of feedback was that they were not aware of any actual data but often suggestions were provided of where to look next. The table shows information of who was contacted and where positive results were obtained.

Category	Contacts	Hard Rubbish	Charity	Online
Consultants	5			
Waste Consultant	7	2 x Audit data ongoing dialogue	1 x Useful data	
Waste Industry	1			
Timber Industry	2			
Academics	8			
State Government	14	Vic State data NSW Council audits		
Local Government	8			
Federal Government	4			
CE Specialist	4			
International CE	5			
Charities	3		No specific data	
Internal Planet Ark	4			
Online Marketplace	1			Nil response

Academic Papers and online publications

A range of papers and articles were collated to examine potential options for data sources and methods for analysis. These are referenced in the text and will be made available.

Results

Where is furniture disposed of?

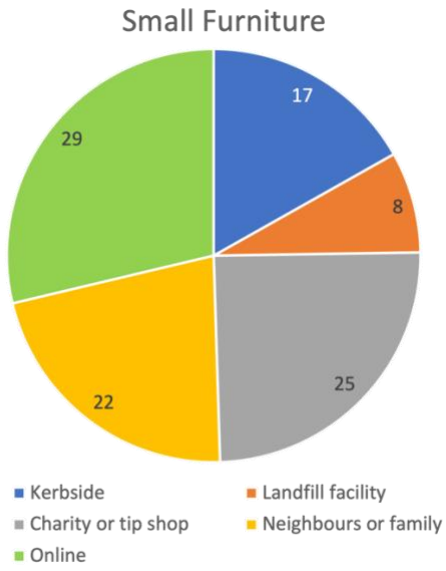
During this review one 2020 paper [1] examines the fate of items that don't fit with the kerbside bin system. This is important in that the study is recent (2019-2020) and includes the fates that reflect current practices. Solid wood furniture is not specifically identified rather small furniture and large furniture are identified as separate categories.

Residents were surveyed (n = 292) and asked what they had disposed of in the previous 12 months, 75% indicated small furniture and 54% large furniture. The reasons across all items for disposing of were unwanted household items (74% of respondents) followed by getting rid of items that no longer had a use (68% of respondents) and disposing of broken items (53% of respondents).

Examining the fates of the furniture, the survey asked through what route they had disposed of the furniture. There are two major categories that seem relevant to this study.

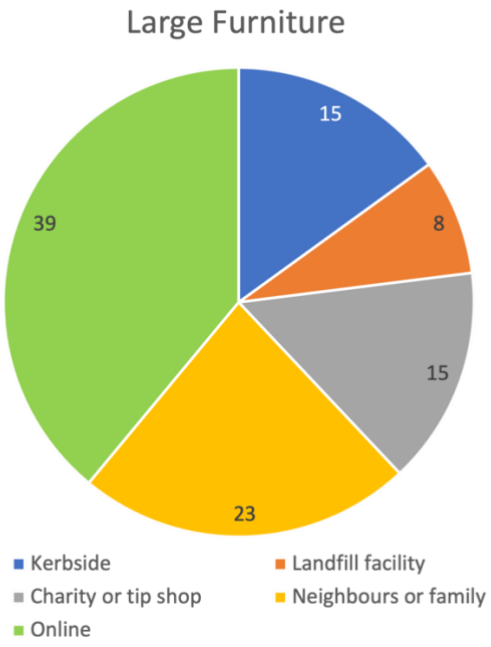
- Disposed - landfilled or likely to be landfilled (kerbside /hard waste)
- Reuse – Online sales, charity or tip shop and neighbours or family

Small furniture is less likely to be disposed of 25% than reused 75% and most likely to be sold online.



For large furniture again a similar figure for disposal 23% and therefore 77% for reuse, with a clear emphasis to be resold online 39%.

[1] Benchmarking, characterising, and valuing the resources in household bulky waste clean-up services. Stanes, E., Wright, S., Chad, P. and Ng, J. University of Wollongong.



It should be noted that this is one study of the Illawarra Shoalhaven area and how valid it is to be extrapolated to other areas is unclear. The full paper should be read for detailed conclusions, but it would indicate that the residents favour reuse over disposal which may reflect the area or more sustainable trends and the rise of the online marketplace.

Disposal

National Waste Report Data

The National Waste Report of 2020 covers the 2018-2019 data set. The report shows that Australia generates some 60 million tonnes (Mt) of waste, NB this excludes ash as

- Municipal Solid Waste (MSW) 13Mt, 0.5t/ capita
- Commercial and Industrial (C&I) 21.9 Mt, 0.87t/ capita
- Construction and demolition (C&D) 27Mt. 1.1 t/ capita

Of this a proportion gets recycled the rest will head for landfill

- MSW – 5.1 Mt, 0.2 t/ capita
- C&I – 12Mt, 0.47 t/ capita
- C&D – 21Mt, 0.82 t/ capita

Timber sits within the organics category of which 14.3 Mt were generated of which timber is 5%. However, this is a very broad category and contains wastes across C&D and has no specific breakdown. The authors of the report aren't aware of any specific data for furniture and suggest landfill audits would be the way forward.

From a C&D and C&I perspective waste processed is unlikely to contain furniture as this will most likely be scavenged prior to collection. Any wood waste collected is either processed as mulch if untreated or if chemically treated it may be used as feedstock for new treated wood products.

The Australian Packaging Covenant Organisation (APCO) recorded that some 462,000 tonnes of wooden packaging were placed on the market in the FY 2019-20 and 171,000 tonnes (37%)

were recovered. Again, not relevant to this study, but required elimination from further analysis.

The conclusion is that there are no national data collected that can be used to estimate solid wooden furniture volumes. Since the national data relies on state and local government input it seems that there is unlikely to be any formerly collected information. Responses from local government representatives indicated that they are keen to know as they develop their circular economy programmes and will be examining opportunities for reuse.

Office Furniture Stewardship

As part of the National Product Stewardship Investment Fund (NPSIF) the Department of Agriculture, Water and the Environment (DAWE) awarded a grant to a consortium of industry bodies aimed at solving the problem of commercial office furniture going to landfill. Edge Environment, in collaboration with Good Environmental Choice Australia and the Global Product Stewardship Council, will use the funding to design a product stewardship scheme that will help reduce their estimate of 30,000 tonnes of furniture – much of it in perfectly good condition – that ends up in Australia's waste stream each year.
Conversations with the scheme managers indicated the data was focussed on commercial furniture, with data collected from the Better Buildings Partnership (BBP), which were then extrapolated across the country based on known waste volumes and tenancy churn rates. The data was therefore not relevant to the objectives of this project.

Hard Rubbish collection and waste audits

The original articles identified in the Feast Watson brief used audits to estimate the volume of landfill waste that comprised wooden furniture. The data was based on a 2015 study by EC Sustainable which indicated potential volumes of wooden furniture waste (200,000 tonnes pa) ending up in landfill. EC Sustainable has been contacted and discussions are ongoing as to the nature of the audit data available. A more recent survey (2021) of hard waste by EC Sustainable of Lake Macquarie City Council indicated that 2.7% of rubbish was solid wood furniture. The amount of reusable wooden furniture (not textile covered) was 33.99% of 2.7%, therefore, of total hard waste 0.92% of hard waste was reusable wood furniture.

Other waste consultants have been contacted and many reports read but few identify wooden furniture as a category, usually wood or furniture.

Anne Prince Consulting (APC) has included solid wooden furniture and reuse as categories in reviews of hard waste. One council supplied a 2014 report of hard waste audits by APC that indicated that 37.4% of hard waste was furniture 23.4% of waste was wooden furniture and that 6.35% of the total hard waste was reusable wooden furniture. However, the data is relatively old, and practices may have changed based on the data recorded above and the more recent data from EC Sustainable. Anne has shared some data over the phone which is more recent and indicates that figures of 1.5% to 1.7% are more representative. Further discussions are ongoing with Anne Prince to determine if more recent data is available, and estimates can be refined. Anne has offered to delve further into her database to refine the information at a cost of $2500 to cover time and data IP.

The data associated with the result of 6.35% by APC was collected from the Southern Sydney Regional Organisation of Councils (SSROC) which represents the regional interests of the 16 Member Councils in the Southern Sydney metropolitan area dwellings across. With a population of about a million people and over 350,000 residences, across a culturally diverse and densely populated area. The audit was conducted over four days in May 2014. A total of 134 premises were audited, including single dwellings (SDS) and low-rise multi-unit dwellings blocks (MUDs). Although the data is relatively old, the details demonstrates the nature of surveys undertaken by APC.

What is the right figure?

The work by the University of Wollongong and the more recent studies by EC Sustainable and APC would indicate that practices have shifted away from disposing to hard rubbish and landfill and rather reuse is more of the norm. The higher value of 6.35% would therefore appear not to representative of modern conditions and that an estimate of 1 – 1.5% is closer to the mark

Scaling up

The state of Victoria through the auspices of Sustainability Victoria collects hard waste data from across the state from councils (54%) that offer the service. This is a figure of 112,036 tonnes. To extrapolate this further, national statistics taken from NSW Circular's Benchmark Data were used to calculate hard rubbish data based on population distribution and MSW volumes. These figures were then averaged to provide an estimate of 4,932 – 7,399 tonnes of reusable wooden furniture disposed of by hard waste. NB NSW figures are taken from the 2019-2020 resource recovery report.

State	Total core waste production 2019 (Mt)	Population	Popn	Popn tonnes HW	MSW (Mt)	MSW %	MSW tonnes HW
NSW	19.4	8,129,000	32%	189,017	4.12	33%	189,017
VIC	17.25	6,651,100	26%	112,036	2.97	24%	112,036
QLD	12.31	5,130,000	20%	86,413	2.6	21%	96,557
SA	4.41	1,759,200	7%	29,633	0.76	6%	28,224
WA	5.67	2,639,100	10%	44,455	1.45	12%	53,849
NT	0.44	244,800	1%	4,124	0.17	1%	6,313
ACT	1.1	427,400	2%	7,199	0.3	2%	11,141
TAS	0.96	537,000	2%	9,046	0.2	2%	7,427
	Total	25,517,600		481,923	12.57		504,566
		% Reusable wood furniture		1			1
		Total reusable furniture		4,819			5,046
		Average @1%		**4,932**			
		Average at 1.5%		**7,399**			

Further refinement may be possible following discussions with APC. It should be noted that this is just an estimate and that with more time further refinements might be possible, exploring more recent data and actual hard waste recycling across the other states. However, data is sparse. NB more refined information on hard waste data may be available for individual states but time has constrained further analysis.

The data used in the calculations above reflects hard waste collection services in the state of Victoria as the baseline (plus NSW actual). Additional volumes of material may be available from those councils that only supply hard waste drop off services through resource recovery centres/ tip shops. This reflects the more rural regions and may therefore not be significant extra volumes.

It is worth noting that scavenging is not permitted by a number of councils and that fines may be issued.

Discussions with Anne Prince also highlighted that the hard waste system is highly variable with socio economic area – better areas have higher value waste. Also influencing the value are things such as rain and weather along with vandalism. This data from Anne also represents wooden furniture that is clearly reusable and requires little work to be used. This does not mean it is pristine.

Charities

The charities have been undergoing a period of disruption due to the COVID pandemic and the availability of labour and associated community needs. This has been followed by the east coast floods and an associated demand for charity services.

One piece of useful data has been identified from South Australia in a Green Industries report (2019 – 20) which surveyed reuse in South Australia. There were an estimated 14,000 tonnes of home furnishings and goods reused across the state. This was a top line figure based on surveys of charities and is a basis for a large calculation. Using the state population data from the NSW Circular's Benchmark project and the SA data as the reference standard, when scaled up an estimated total of 203,000 tonnes of home furnishings are processed by charities.

State	Total core waste production 2019 (Mt)	Population	Popn %	Charity Tonnes
NSW	19.4	8,129,000	32%	64,692
VIC	17.25	6,651,100	26%	52,931
QLD	12.31	5,130,000	20%	40,825
SA	4.41	1,759,200	7%	14,000
WA	5.67	2,639,100	10%	21,002
NT	0.44	244,800	1%	1,948
ACT	1.1	427,400	2%	3,401
TAS	0.96	537,000	2%	4,274
			Total	203,073

In order to complete the analysis, it is necessary to know what proportion would be solid wooden furniture?

An alternative report The Charitable Reuse and Recycling Sector's Commitment to Circularity Indicates that 15% of donations are furniture. A recent report by MRA Consulting, provides a figure of 1,005,952 tonnes of products being donated to the charitable reuse and recycling sector. The focus of this report was textile waste, but it does provide a baseline for comparisons. The figure of 15% would yield a value of 151,000 tonnes.

A conversation with Martin Nordstrom Sustainability Manager at Salvos Stores (South Australia) yielded no direct volume data. However, Martin provided several noteworthy comments. Based in South Australia which has for a long time been the leading state for recycling, the consumer knows where to dispose of items as there is information available. Consequently, there is little dumping, rather recycling and recovery are the norm. Furniture by weight is 18% of materials but in value to the organisation it represents a lot less than 1%. The organisation would welcome any activity that would drive demand as this drives up the value of low-quality items that need work, which are generally good but need work and are hard to sell. Martin would welcome contact to assist in the promotion of reuse activities.

It is hard to provide a better estimate for the charitable sector, it should also be noted that much of what is donated will be directly passed on to those in need. However, some of the volume will pass through charitable stores for fund raising and provides one potential route for items for repurposing and reuse.

Online marketplaces

There are several online marketplaces available within Australia. In 2020 Gumtree published a report examining the online marketplaces and goods traded in the second-hand economy. Some 89 million items are traded annually of which 28% are home décor and furniture i.e., 25 million items. Chairs were 17% of the most common pre-loved or unused items traded. These are significant numbers but how much is solid wooden furniture is unclear and numbers should be used with caution, however given that there are several platforms it should be expected that a considerable number are traded.

In 2021 Gumtree published a report with Planet Ark which has some clues to how the market dynamics of preloved/ unwanted items has changed with data indicating it has grown 89% in the past 10 years. In just the year of the report, 86% of Australians have saved pre-loved items from going into landfill by selling them in the circular economy. On average these individuals saved approximately 16 items, which equates to 110 million items being saved from landfill in the past 12 months. The conclusion in the report is that for these Australians already trading in the circular economy as a means of practising sustainability, 56% are aiming to reduce and recycle more, 50% are wanting to reduce waste they send to landfill and 33% are wanting to be conscious consumers. Included in the items Australians are most likely to consider buying from the circular economy, 42% said second hand office furniture, 41% dining tables and 37% home décor and furniture items.

Further conversations are required to determine if a more robust figure on wooden furniture can be developed. However, the information supplied would indicate that there has been a steady growth of trading online and a significant shift away from disposal to landfill.

Furniture Weights

There are some published lists of furniture weights for example some commercial enterprises and associated with the UK's furniture reuse network. The weights can be used to provide some perspective of the number of items that may be available for reuse from the weight-based data of 4,932 tonnes.

Furniture Item	Kg	Items / tonne	Items
Bedside cupboard / table / unit	15	67	330,444
Bureau	20	50	246,600
Dining/ Kitchen Chair	6	167	823,644
Chest of Drawers	25	40	197,280
Wooden Desk	27	37	182,484
Dressing Table	34	29	143,028
Dining Table	30	33	162,756
Wardrobe Double	55	18	88,776
Sideboard	35	29	143,028
Bookcase	19	53	261,396

If the figure of 4,932 tonnes is reasonable then this still represents a considerable number of items as shown in the final column above.

Literature

Circular Economy. Opportunities in the Furniture Sector

- 2017 report from EEB the European Environmental Bureau examined the opportunity for reuse of furniture in the CE and policy mechanisms for improvement.
- The authors faced a similar problem of lack of available data on furniture that was being disposed of to landfill but estimated some
- Through a variety of calculations, the authors estimate that 10 million tonnes of furniture are discarded by businesses and consumers in EU Member States each year
- Whilst reuse of furniture is common, this tends to be on a small scale and with local social goals in mind rather than larger scale environmental and economic ones.

Flemish Reuse study

- The study revealed that in 2019, the Flemish network of reuse centres accounted for 11% to 19% (depending on the category of goods) of total reuse.
- Based on the share percentage of the reuse network, the authors calculated the amount of reuse for the four main product streams per capita in Flanders:
- Furniture reuse was 14.9 kg reuse/capita
- How this is interpreted in an Australian and wooden furniture context is unclear.