Circular Economy In Action

‘The YARN’ - A circular community and library space by Hunters Hill Council

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Hunters Hill Council has built a world-leading circular economy community and library space. Known as The YARN, this circular economy hub is attracting attention not just because of the circular economy story it tells and the repurposed materials used in its making, but because it’s growing the recycling, reusing and repurposing movement. The YARN enables citizens to cut waste and costs, be more sustainable, and participate in the circular economy.

The space embraces sustainable and circular innovations in its fit-out, including tables and benchtops made from tiles made from glass and recycled school uniforms. The YARN opened in October 2020. It is located within a local village arcade, accessible to the local Hunters Hill community and anyone who passes - and it’s attracting a lot of attention. The circular economy space is being used for events and by a broad range of people and organisations who want to participate in the circular economy, expanding community education and awareness.

Action towards moving the current linear economy in Australia to embody the principles and tenets of a circular economy requires large scale economic, social and environmental change. The scale of waste in the office fit-out and construction sector is considerable and is growing steadily in line with the population and the economic growth in big cities.

This project has sought to deliver a sustainable circular fit-out, especially where the initial use is a temporary one. It is proving even in a small council, with a small budget, in a small building it’s possible to design out waste and put in place world-leading circular outcomes.
The most significant outcome of this project, aside from the benefits of showcasing innovation in the waste space, is in the capacity for reaching large numbers of people who would otherwise never hear about the circular economy.

The YARN will be a circular economy conversation starter at kitchen tables, in council chambers, in boardrooms across Australia and in any country looking at taking the first steps to a circular economy in the built environment.

CIRCULAR ECONOMY PROJECT AT A GLANCE

**Sector**  
Local Government

**Materials recycled**  
Glass, school uniforms

**Problem-solved**  
This project removes a critical barrier to the circular economy, by proving the feasibility and repurposing wasted materials back into products that are used in the fit-out of a council community space.

It also solves the problem of engaging with the community on the circular economy by providing both a space and services for people to: share library books, recover materials otherwise destined for landfill and enable collaborative and local approaches.

**New Markets established**  
Circular built environment furnishings

**Circular products created**  
Repurposed tables, benchtops, tiles

**Circular Economy Hub created**  
A community and library space that is also an educational space, meeting place, textile collection facility and materials library.

**Circular Supply Chain Established**  
Partner leads: Hunters Hill Council, NSW Circular  
Design & Technology: UNSW SMaRT  
Microfactorie™, Steelcase designers  
Council processes: New resource recovery procedures and strategic organisational  
Barriers: Difficulties with finding manufacturers
HUNTERS HILL LOCAL COUNCIL AREA

- The smallest local government area (LGA) in Sydney.
- Land of the Wallumedegal, (the snapper fish people) of the Eora nation.
- 9 kilometres north-west of the Sydney central business district on the Lower Sydney North Shore.
- Home to 14,700 residents.
- A high percentage of social housing as a percentage of the total LGA.
- A small, flexible, informal and accessible space
- Several Indigenous and historically significant sites, including Kelly’s Bush, home of the first union green bans.
- A member of the Northern Sydney Region Of Councils.
- A member of the Parramatta River Catchment Group and nestled between the Lane Cove and Parramatta Rivers.

KEY FINDINGS

1. Research is required to solve technical and non-technical problems to transition to a circular economy.

2. New local circular supply chains need industry and government investment to support market demand for circular solutions and helping circular buyers and suppliers to emerge and thrive.

3. Industry requires standardised labeling of product components so that sorting, separation and reuse are possible.

4. Source separation across sectors, including the construction and fit-out industries, helps maintain the high value of clean waste loads.

5. Product stewardship for new products that have been over-ordered in the construction and fit-out sectors enable the tracing, tracking and reuse of these products in other projects, avoiding landfill.

6. Products designed for end of life, that is, for easy recycling, reuse and redesign or repair, should become the norm.

7. The support of innovation which increases material efficiency in the construction sector (through prefabrication and other means), will reduce costs and secure 21st-century jobs.
02 Partners

Hunters Hill Council
Hunters Hill Council was the first council to commit to a circular economy, through a committed team and under the leadership of its General Manager, Lisa Miscamble. As an incubator for innovation, Hunters Hill Council was named Circular Economy Award Winner at the Keep Australia Beautiful NSW 2020 Sustainable Cities Awards.

NSW Circular
NSW Circular is a government-funded body driving the transition to a circular economy. Working with businesses, government, researchers and citizens to remove barriers and scale the circular economy. NSW Circular funded a team inside UNSW SMaRT Center to deliver this innovative project with Hunters Hill Council.

UNSW SMaRT Centre
UNSW hosts NSW Circular and provides in-kind support to NSW Circular across its projects, including Hunters Hill Council. ARC Laureate Fellow Scientia Professor Veena Sahajwalla has provided in-kind support as NSW Circular Director to The YARN project. She is also founder of SMaRT@UNSW (Centre for Sustainable Materials Research and Technology), whose core aims are to develop innovative research for sustainable materials and manufacturing processes. UNSW SMaRT’s work on The YARN was funded by NSW Circular to remove barriers to the circular economy.

Steelcase
For over 105 years, Steelcase Inc. has helped create great experiences for the world’s leading organizations, across industries. Steelcase does this by offering a range of architecture, furniture and technology products and services designed to help people reach their full potential. Together with their partners, they design spaces to help people work, learn and heal. Protecting the environment is in their DNA, and they drive sustainable social, economic and environmental change through their decisions and actions. Steelcase were founded in 1912 and achieved their first Patent in 1914, they have 12,700 Employees and over 800 dealers.
03
Problems solved

This project removes a critical barrier to the circular economy by proving the feasibility and benefits of using repurposed materials in a built environment fit-out. It also solves the problem of engaging with the community on the circular economy by providing both space and services for people to share library books and participate in a range of community services and programs.

This project demonstrates the feasibility of enabling the repurposing of wasted materials back into furniture for the fit-out of a community and library space in a local village arcade. The furniture - tables, table tops and tiles - was created from repurposed textiles and glass.

The YARN also engages the community around circular economy as a concept, hosting a ‘waste wall’, a textile diversion project, and is a drop off point for a range of items to be given a new life:

- Textiles (clothing, towels, sheets, uniforms, and soft toys that are not suitable for donation to charity)
- Tablets, mobile phones
- Household batteries
- Metal coat hangers
- Plastic lids and bread tags
- Dry soft plastic bags
- Printer cartridges
04
The transition to a Circular Economy

4.1 CIRCULAR ECONOMY DEFINED

The circular economy is the new zero carbon economy. It aims to redefine growth, focusing on positive society-wide benefits. Gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system. It is based on three principles:

1. Design out waste and pollution
2. Keep products and materials in use
3. Regenerate natural systems

Adopting these principles will move Australia to a new zero-carbon economy and be necessary for NSW to achieve its net-zero emissions by 2050. If adopted, it will halve the transport, energy and waste emissions of the Greater Sydney area in the next 15 years (Kinesis 2017).
4.2 THE CASE FOR A CIRCULAR ECONOMY

Australia has been consuming resources at a rate that now places us second in the OECD for material footprint per capita and the largest materials user per capita in our region. Our waste story is even more stark - we are currently landfilling 20 million tonnes of waste each year, enough to fill the Sydney Harbour by 2040. Energy use per capita in NSW alone is enough to power an electric car 100 times over, thereby generating nearly three times the global average CO2 emissions per capita. Australia has the third lowest rate of material productivity and the lowest level of manufacturing self-sufficiency in the OECD. For every kilo of materials consumed, we only generate US$1.28 of economic output, which is under half of the OECD benchmark of US$2.90 (Centuria Consulting 2020).

If we continue in this very limited linear economy model, we will continue to lose those valuable resources that we’ve taken out of the ground, resources that could be better used to develop a more resilient supply chain and ultimately create more jobs. We will also be faced with much harder-to-solve problems such as Australia’s long term water security that continues to be under pressure from other trends like climate change, population growth, and increases in non-residential water use; or the cost of rising waste volumes with the average NSW household waste management fees continuing to increase by over 60% over the next 15 years. Additionally, it will seriously jeopardize NSW’s net-zero by 2050 goal, with only half of that target being achievable even with a transition to using more renewable energy (NSW DPIE 2020). Transitioning our currently linear economy to a circular one holds enormous potential for NSW and Australia. In fact, it has the potential to add $210 billion to Australia’s GDP by 2048 (KPMG, Oct 2017).
4.3 THE CIRCULAR ECONOMIC OPPORTUNITY

The circular economy opportunity is significant and vital if Australia is to thrive in a carbon constrained economy.

This case study with Hunters Hill Council spotlights new circular materials that can replace carbon-intensive, globally sourced materials and products. It also highlights opportunities to save money, reduce waste and carbon and even generate more jobs and industries locally. Moreover, there is significant potential to drive productivity gains and critical efficiencies lost by the ‘take, make and waste’ linear economy of the past.

This is an enormous opportunity in Australia, here’s why:

4.3.1 SCALE OF THE RECYCLING OPPORTUNITY

Resource recovery rates

Australia has been a nation of recyclers, and in NSW, the resource recovery rate has been stuck at a 65% landfill diversion for some years. This is in comparison to South Australia at 82%, Victoria at 72% and WA at 57%.

$750 million landfilled every year

In NSW alone, nearly 30% of the 20 million tonnes of waste generated by households every year goes to landfill, costing them and businesses more than $750 million in waste levies.

Recycling rates increase 43% by 2036

Yet we know that waste and recycling volumes are set to rise significantly by at least 43% by 2036 - a figure that hasn’t taken into account the more recent Covid crisis which has increased waste streams as people feared reuse (Blue Environment 2018).
4.3.2 THE BIG GLASS OPPORTUNITY

Glass recycling can increase from 57%

In 2016-17 nearly 1.1 Mt or 44 kg per capita of glass waste was generated in Australia, with 57% being recycled. Across Australia, recycling rates for glass have been constant at a range of 54% and 61%. One of the significant issues with glass recycling is that in sorting it, there tends to be large amounts of broken glass, which ultimately contaminates paper and cardboard recycling making it challenging to recover. More recently, alternative markets for recycled glass have opened up, including into road base, however, they remain underutilised and undervalued in Australia, but there is significant opportunity for expansion (Blue Environment 2018).

Glass recycling has stayed static at 54% to 61% since 2006

We know glass is an eminently recyclable material. In fact it can be indefinitely reprocessed, and the use of recycled glass results in a significant reduction in the use of energy and raw materials. However, there are considerable contamination issues evident in the glass materials collected for recycling so far in most jurisdictions. Generally, most glass waste sources are from food and drink containers including green, clear and amber glass, and the recycling rate nationally has been wavering between 54% and 61% since 2006. Unfortunately, the sorting of glass through the usual co-mingled recycling collections results in broken glass, becoming a contaminant for other recycled items. For larger recycling plants, this broken glass is recoverable. However, for the majority of smaller plants, the technology to do so is cost prohibitive. Moreover, the alternative markets for broken glass are underdeveloped in Australia (Sustainability Victoria 2013; Blue Environment 2018).

4.3.3 NOT ENOUGH TEXTILE RECYCLING

2/3rds of the world's manufactured PET plastic is used to produce clothing

Excess textiles is a growing waste problem that has yet to be taken seriously by governments across Australia. Every year more than 501m kg of excess and unwanted clothing is sent to landfills around Australia, and that’s not including the 94M kg exported overseas. Nearly two-thirds of the world’s manufactured PET (almost 50m tonnes) is used to produce clothing, while the rest is an input to making plastic packaging and plastic bottles (Ross 2019).

Australians throw away almost as much clothes as they buy every year

On average, Australians will purchase 27 kilograms of new textiles every year and promptly throw away nearly 23 kilograms – two-thirds of which is made of plastics and synthetic fibres that will break down very slowly, if ever (Milburn 2016). More importantly, textile waste leaches toxic chemicals as it decomposes in landfill, potentially contaminating precious groundwater; while decaying organic fibres like wool leach large amounts of ammonia and methane (Caulfield 2009). The ABC’s War on Waste highlighted that Australians throw away 6,000 kilos of fashion and textile waste every 10 minutes (ABC 2019).
4.3.4 A TREASURE TROVE OF E-WASTE

10% of the world’s gold & 30% of silver make electronics but only 20% is recycled

Another problem—waste is e-waste. Globally 44.7 million tonnes of e-waste is generated annually, holding up to US$ 65 billion worth of precious minerals like gold, silver and platinum. E-waste is expected to increase by 8% every year and by as much as 17% to 52.2 million tonnes in 2021 in Australia, it is also the fastest-growing component of the municipal solid waste stream (Cleanaway 2018). 10% of the world’s gold and 30% of silver goes into making electronics, yet only 15% to 20% of the 50 million tonnes of e-waste developed each year are recycled (LeBlanc 2020). In addition to plastic and glass, electronic products contain base and special metals including cobalt, tin and antimony as well as precious metals like silver, gold, and platinum, all of which can be fully recovered (Cleanaway 2018).

Key facts:

1. Producing a computer along with its monitor takes at least 1.3 tonnes of water, 21.7 kilos of chemicals, and 240 kilos of fossil fuels.

2. Compared to disposal in landfills or by incinerators, reusing or recycling computers can create 296 more jobs per year for every 9071.8 tonnes of computer waste processed.

3. Only 20% of e-waste is documented to have been collected and recycled, despite high-value recoverable materials such as copper and gold (LeBlanc 2020).
4.4 A CIRCULAR BUILT ENVIRONMENT

“The transition to a circular economy is particularly relevant for the built environment due to the fact that construction is one of the largest sectors of today’s global economy, representing 13% of GDP and employing 7% of the world’s working age population. Additionally, the built environment uses almost half of the world’s materials extracted every year. Current projections estimate that by 2060, across the world, the equivalent of the city of Paris will be built each week. Moreover, buildings and construction account for more than 35% of global final energy use and nearly 40% of energy-related CO2 emissions. If current urbanisation trends continue, it is estimated that material consumption by the world’s cities will grow from 40 billion tonnes in 2010 to about 90 billion tonnes by 2050. These negative externalities are, in large part, a product of our current linear ‘take-make-waste’ economy, which relies on fossil fuels and does not manage resources already in use for the long-term. There is a clear and urgent need to reverse this trend of growing resource extraction, replacing it with a system that works (Google and Ellen MacArthur Foundation 2019).

4.4.1 GLOBAL CONSTRUCTION INDUSTRY OUTPUTS INCREASE $12.7 TRILLION

Research suggests that the global construction industry’s output is likely to increase to at least $12.7 trillion in 2022, up from $10.6 trillion in 2017. Despite this promising outlook, the industry has gained only 1% of productivity in the last 20 years due to lack of digitization. This creates an opportunity for an added $1.6 trillion by innovating in this area (Jones 2019). The global COVID-19 pandemic has strengthened the case for improving the quality and energy efficiency of the built environment. “Existing problems surrounding poor quality constructions have also been laid bare, with those living in low-quality housing in the cities of high-income countries being confined to small, rigidly designed, and energy inefficient buildings” (Ellen MacArthur Foundation 2020).

Actions like these in the construction sector will help to drive down the high costs that are experienced, while also increasing the sector’s overall efficiency that hasn’t seen a major disruption to date. The other most pressing need in the Construction sector is for harmonised source separation of all excess resources, something that is becoming necessary across sectors not just the construction industry. Separation of waste types enables a cleaner stream of waste that has a higher value in its next use, and can be better handled by the next user if it is in a clean and uncontaminated state.

“What this means for Australia and the nation’s largest state, is a significant opportunity to go circular. Construction materials can be replaced with reused, recycled and reformed materials. This report examines reformed materials critical to a circular economy”

CEO NSW Circular, Lisa McLean
4.4.2 THE SCALE OF THE FIT-OUT WASTE PROBLEM

Research into the waste associated with office fit-outs, and construction and demolition waste specifically, suggest it is a national problem that has a number of barriers. In particular, four underlying issues that are acting to impede the implementation of best practices in waste management, including:

- The rigidity of construction practices
- Construction project characteristics
- Awareness, experience and commitment; and
- Nascent nature of waste management (1)

In Australia, we know that construction and demolition waste management is regulated through the three levels of government, with State and Local Governments taking the implementation role. The Federal Government sets the national policy and the lower tiers of government are expected to implement that. In 2016-17 Australia generated 831 kg of construction and demolition waste per capita, which rose by 2% over an 11 year period. To put that in context, the construction sector produces $5.2bn in revenue each year in Australia, growing at 3% per year. One of the biggest challenges for making significant changes in this sector, as far as recycling and repurposing of materials is concerned, is the great difference in waste management practices between jurisdictions and who is ultimately responsible. This makes a national approach significantly more complex (Shooshtarian et al. (2019)2). The other more complex issue is the lack of labelling of components and their makeup, making recycling more difficult if it’s not known what they product is made with.

(1) (Udawatta et. al 2018)
4.5 NEW CIRCULAR SUPPLY CHAINS

The global COVID-19 pandemic initiated lockdowns in more than 100 countries across the world, as a result it has seriously impacted supply chains in most sectors. None more so than in the built environment sector, where very suddenly people were confined to their homes and local areas. It limited the capacity of construction supply chains to function normally, thereby creating significant shortages and delays in accessing raw materials. In some cases the shutdown of many building sites was necessary, leaving the industry in financial straits (Ellen McArthur Foundation 2020). What is needed at this juncture is significant industry and government investment and support in new local Circular Supply Chains, so that materials can continue to be used by other organisations thereby reducing the risks associated with events like a global pandemic.

THE GLOBAL MARKET FOR ENVIRONMENTAL GOODS WILL TRIPLE BY 2030

The global market for environmental goods (ESG) is expected to grow exponentially by 2030, tripling from 2011 to 2030, a faster growth rate than the wider economy. The NSW Treasury estimates that this opportunity in NSW is approximately $43.9 billion, along with 44% of Australia’s ESG business innovation (NSW Treasury 2019). In the building sector, the market size of multi-unit apartments in Australia is worth $45 billion and has grown 3% per year on average between 2015 and 2020 (Ibis World 2020).

NSW Circular is working with its research and industry partners to catalyse new circular supply chains in solar panels, textiles and plastics in 2021. NSW Circular believes a pivotal barrier to the circular economy is the lack of circular supply chains in Australia capable of supplying, collecting, processing, reforming resources for new product markets locally. To mitigate this, industry and government investment is needed in new local circular supply chains supporting market demand for circular solutions and helping circular buyers and suppliers emerge and thrive.

As the circular economy grows and materials are designed to stay in the market longer and longer, waste is being designed out altogether. Design has a significant role to play. As new products come into a circular economy they should be designed for end of life, designed for easy recycling, reuse and redesign or repair.
Circular innovation by Australia’s smallest Local Government:

5.1 ‘THE YARN’: A DEEP DIVE

The Council wanted to create a dynamic, agile and community accessible space that embraces circular solutions and evolves to take on more activities beyond that of a traditional library. They wanted to showcase their circular materials and prove a new circular market.

They identified the following repurposed materials for the fit-out:

- Table tops made from recycled textiles and glass
- Benchtops made from recycled school uniforms and glass
- Tiles made from recycled school uniforms and glass

Their starting point was the new tables. A collaboration then began between Hunters Hill Council staff, designers from table supplier Steelcase, and NSW Circular through its in-kind partner SMaRT@UNSW. The partners worked together to create a new Circular Supply Chain for the tables. Through these partnerships, it was possible for the Council to tap into new technologies, innovation and thought leadership required to build the tables. The partnership enabled them to think about problems differently, use circular economy principles and connect with a research organisation - in this case, SMaRT@UNSW. SMaRT@UNSW used textile and glass waste, turning it into inlays to make the tables.

“Bringing the circular economy out to people in a language they will be able to relate to has been a very important part of this project.”

Prof Veena Sahajwalla

The Council sees The YARN as a vertical circular economy education system for citizens, which activates each citizen’s willingness to reduce their material impact in their community.

The next step for Council is to use the repurposed materials in other buildings to set a precedent among local governments to do the same.
5.2 EMBEDDING CIRCULARITY & SUSTAINABILITY IN POLICY

Commercial space fit-outs generate large amounts of waste and excess materials that generally go straight to landfill (BBP Strip Out Waste Guidelines 2018). Hunters Hill Council had a desire to be a circular economy leader in the local government sector. The council’s Draft Sustainability Action Plan and Community Service Plan outline key sustainability commitments, including driving the circular economy and waste minimisation.

The built environment places significant pressure on natural resources. Looking at how it could transition to a circular economy, Hunters Hill Council considered its own spectrum of influence to seize the agenda and deliver an Australian-leading outcome. Their approach reflects the importance of government leadership on circular economy:

“government through subsidies, laws and tax incentives, is crucial to the strategic performance of decision-makers to introduce circular principles and make buildings and the built environment more sustainable” (2)

The YARN project is enabling the Council to address a number of key themes in its Community Plan, including: waste management education, providing opportunities for the community to engage and learn, giving back to the community, and a space to engage with community groups.

“We always talk about Hunters Hill as being ‘tiny but mighty’ and really agile. Being smaller can be an advantage when addressing problems and the solutions in many ways.”

General Manager, Lisa Miscamble

(2) (Munaro, Tavares and Braganca 2020)
5.3 TESTING CIRCULARITY IN A COMMUNITY SPACE

Embedding circular economy into physical space like The YARN hub is critical to the transition to a circular economy. Citizens and local networks need locations to anchor new circular businesses and services, solutions and systems.

The opportunity to test the use of repurposed materials in a local government community space is invaluable. Hunters Hill Council’s aim was to show the local community that recycled or repurposed materials can be used in a way that is aesthetically pleasing and functional. And the community has responded positively: by offering textile donations to the waste wall and showing a keen interest in the make-up of the recycled building materials on display at The YARN.

The space is also:

- a textile recovery space to collect waste textile materials
- an education and community space to teach and engage local residents

The YARN also engages the community around circular economy as a concept, hosting a ‘waste wall’, a textile diversion project, and is a drop off point for a range of items to be given a new life:

- Textiles (clothing, towels, sheets, uniforms, and soft toys which are not suitable for donation to charity)
- Tablets, mobile phones
- Household batteries
- Metal coat hangers
- Plastic lids and bread tags
- Dry soft plastic bags
- Printer cartridges

According to the Hunters Hill Council, ‘The YARN is really showing the community we mean what we say when we talk about doing things that are innovative but still meeting the needs of the community. The space itself is a fantastic resource, and the Council is seeing the community respond positively to the donated materials and reused materials in the space. The community is already a part of the project and It’s going to provide so many opportunities for young people in the area. They are saying ‘wow, a circular economy is possible!’
5.4 ECONOMIC
AND SOCIAL IMPACT

Resourcing for the long term is essential to deliver on the circular economy vision established by the Council for this community and library space project. It is needed to secure investment to trial new circular approaches, to manage and work with partners like Steelcase to develop circular tabletops.

Ensuring the project has buy-in from the leadership has been critical to securing long-term economic commitment. Buy-in at a General-Manager level has enabled a faster roll out and deeper understanding of the long-term value of embracing circular economy innovation.

The YARN project presents a significant opportunity to scale, bringing in new resource streams, applying circular economy principles to more projects, and expanding into new jurisdictions through partnerships with other stakeholders, including NSW Libraries and regional local councils. While also enabling the local community’s involvement in an initiative that both shares information with them and includes them in the experience. It represents a significantly different approach to social inclusion and community engagement within the topic of the Circular Economy. By creating a space that all members of the local community can learn and share knowledge about the importance of a zero carbon economy and a transition to a circular-focused, Hunters Hill Council is demonstrating its commitment to change.

Repurposing materials into beautiful, high value products requires the participation of multiple stakeholders. This can stimulate the economy, building jobs in local areas and unlocking innovation. In the new Covid reality, Australian manufacturing, business, local government and research sectors have a crucial role in proving circular economy concepts.
5.5 ADVANCED MANUFACTURING & PROCESSING

**SMaRT@UNSW**

The use of SMaRT@UNSW Green Ceramics Microfactorie™ technology to develop the new tables and "SMaRT@UNSW Green Ceramics demonstrates the potential for next-generation circular economy infrastructure.

SMaRT@UNW has an aspiration to scale its Microfactorie™ model in other jurisdictions beyond the UNSW campus. Prof. Veena Sahajwalla believes the technology is replicable across the state and can be easily taken up by regional communities, equipping communities to repurpose materials themselves.

"The multiplier and modular nature of the Microfactorie™ concept and the whole advancement of technology of micro industries, means that renewable materials can be renewed/repurposed in a Microfactorie™ potentially anywhere. We can prove that jobs can be created when the quality of the product exists, the skills exist and they can support the local economy, micro-manufacturing can happen anywhere. This technology will be even more important as small regional communities are faced with the mounting costs of dealing with waste, as the waste import bans start impacting them."

- Prof Veena Sahajwalla

**Steelcase**

Steelcase is a United States-based furniture company founded in 1912 in Grand Rapids, Michigan. The company produces office furniture, architectural and technology products for office environments. It services the education, health care and retail industries as the largest office furniture manufacturer in the world. "Steelcase has long kept a strong commitment to sustainability and environmentally-conscious design as a company. For years, engineers and designers have developed innovative solutions to create more sustainable products, such as planked veneer and the New Black textile collection, created entirely from Steelcase scrap fabric. Sustainability efforts have been amplified by working with other like-minded organizations such as Duvaltex. Founded in 1947, Duvaltex's first material offering was made with yarn recycled from old wool blankets. Since the partnership, Steelcase and Duvaltex have worked together on a series of projects, including the New Black textile collection, a Closed Loop program with Designtex in 2011, a Cradle to Cradle Certified™ product in 2005 and the first recyclable polyester for commercial interiors in 1995. Keeping the tradition, Steelcase continues to explore more eco-friendly solutions in future product development, including the possibility of utilizing SEAQUAL® YARN in other new materials". The partnership with The Hunters Hill Council has enabled Steelcase to continue to push the boundaries of material sourcing and sustainability.
The opportunities for scaling projects like The Yarn are enormous but challenging to achieve without a consensus of effort and capacity. The Yarn enables the community to see first hand what the real application of Circular Economy principles looks like while also raising awareness around what other opportunities exist for all communities. There are a number of challenges to scaling solutions such as what The Yarn is demonstrating, including the reality of the state of recycling in Australia, the need to educate the consumer and the community about the problems with the status quo, and difficulties with getting all the necessary resources and stakeholders together, and in agreement to a process. Scaling such projects requires developing the required supply chains and end-users, a process that hasn’t been necessary in business as usual but is now vital. The Circular Economy is a new economic development model that in its infancy requires development of the networks and connections to enable new products and services to be created that reduce resource consumption and ultimately inefficiency and waste.
07

Key Findings

The YARN case study highlights some key industry-wide barriers and opportunities that require discussion and new approaches as we scale.

1 Research is required to solve technical and non-technical problems to transition to a circular economy.

2 New local circular supply chains need industry and government investment to support market demand for circular solutions and helping circular buyers and suppliers to emerge and thrive.

3 Industry requires standardised labeling of product components so that sorting, separation and reuse are possible.

4 Source separation across sectors, including the construction and fit-out industries, helps maintain the high value of clean waste loads.

5 Product stewardship for new products that have been over-ordered in the construction and fit-out sectors enable the tracing, tracking and reuse of these products in other projects, avoiding landfill.

6 Products designed for end of life, that is, for easy recycling, reuse and redesign or repair, should become the norm.

7 The support of innovation which increases material efficiency in the construction sector (through prefabrication and other means), will reduce costs and secure 21st-century jobs.