

Navigating the Circular Economy: Concepts, Benefits, and Business Transition Strategies

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The Circular Economy is a model of production and consumption that is an alternative way of doing business (Jensen, 2023; Lacy, Long, & Spindler, 2020). It aims to:

- Eliminate waste and pollution from business activities;
- Extend the useful life of products, components, materials, and resources; and
- Support nature regeneration through sustainable resource use, reduction of synthetic inputs (such as pesticides or herbicides) into the environment, and returning biological resources (such as biosolids used in agriculture) to the environment (Ellen MacArthur Foundation, 2023; Gregson, Crange, Fuller, & Holmes, 2015; IGCC, 2022; Heisel & Hebel, 2022).

Adopting a circular economy approach prompts companies to rethink their business strategy and how a product or service is designed, made, delivered, used, and disposed of (Heisel & Hebel, 2022; Lacy, Long, & Spindler, 2020). The benefits of a circular economy include innovation, lower costs, and improved environmental outcomes (Heisel & Hebel, 2022; Lacy, Long, & Spindler, 2020). A circular economy approach unifies environmental, energy, and other initiatives, achieving multiple common targets such as reduced emissions, more sustainable sources, and improved quality of the product (IGCC, 2022).

This Insight will explore what a circular economy is and how it differs from a linear economy. It will highlight some of the benefits of adopting a circular economy with industry examples from construction, transport, and mining, and suggest strategies for business transition.

What is a Circular Economy? And how does it differ from a linear economy?

In a circular economy, products, components, materials, and resources are considered to occur in biological or technical cycles (Figure 1) [5, 6].



Figure 1 Circular Economy (IGCC, 2022)



The Circular Economy is an alternative way of doing business

“At its core, the circular economy is a transformative approach that goes beyond incremental changes in waste reduction and recycling.”

(H. H. Jensen, 2023)



Biological cycles refer to renewable resources that can be returned to the environment. Technical cycles refer to man-made products, components, and materials such as steel, plastic, and glass (Heisel & Hebel, 2022; IGCC, 2022). A circular economy aims to eliminate waste and pollution, extending as long as possible the useful life of products, components, materials, and resources, as well as supporting nature's regeneration (Ellen MacArthur Foundation, 2023; Gregson, Crange, Fuller, & Holmes, 2015; Heisel & Hebel, 2022; IGCC, 2022). These aims are achieved by designing for longevity, sharing, reselling, and refurbishing. Instead of disposal, items are either recycled, remanufactured, or regenerated, resulting in a continuous loop, with material never leaving the system, only simply changing form (Figure 1) (Jensen, 2023; Lacy, Long, & Spindler, 2020).

The perpetual cycling of materials (where they remain within the system, constantly transforming without leaving) stands in contrast to the currently accepted way of business known as the linear economy. The linear economy follows a “take, make, waste” process (Figure 2) where resources are extracted (take) and manufactured into products, components, and materials (make), which are disposed of after use (waste) or recycled, in some cases (Lacy, Long, & Spindler, 2020). The linear economy relies on continuous resource input (Jensen, 2023), and waste and pollution generated at each stage are often not sufficiently accounted for (IGCC, 2022).



Figure 2 Linear Economy (Rochester Institute of Technology, 2020)

What are some of the benefits and examples of adopting a Circular Economy?

There are many benefits to adopting a circular economy including innovation, reduced costs from reusing assets, and job creation. Such benefits have social, cultural, environmental, and economic value (Figure 3). The benefits and values are often interrelated such that active work to improve one could improve another (Casapu & Dippon, 2021; CSCP, 2024; Ellen MacArthur Foundation, 2024; Krause, 2020; Lycett, 2023; Pratt, 2022; Roosna, 2023; Rudan, 2023).

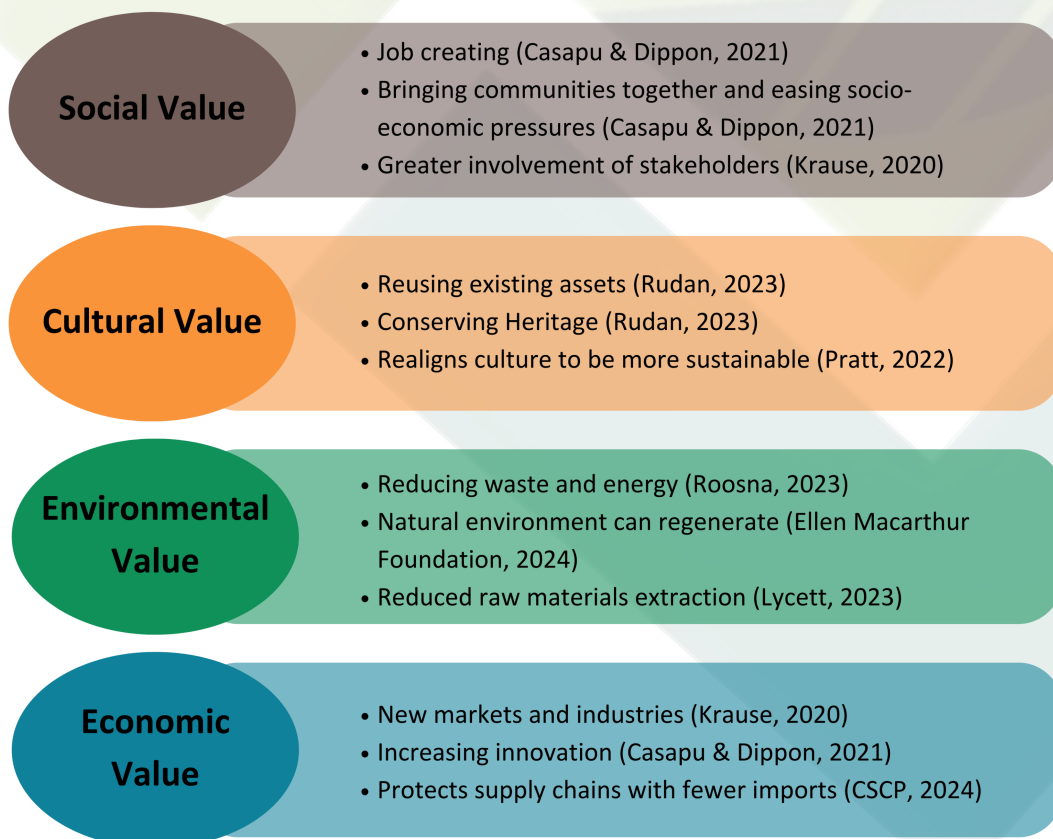


Figure 3 Example of Circular Economy values and benefits



A good example of how the Circle economy has been used in Construction can be found at Curtin University's Legacy Living Lab (L3) building in Fremantle, Western Australia. L3 is a modular building that was designed to test the extent to which Circular Economy could be applied to construction. Today, it is used as a research facility. Circular economy practices applied in L3's construction included:

- Avoided using concrete for structure and foundations, a not easy-to-recycle product.
- Utilised 20 tons of salvaged materials, including steel frames, a staircase, and carpet tiles.
- Utilised harnesses, nuts and bolts, spacers, and magnets, meaning the building can be dissembled and relocated.
- Utilised recycled rubber, plastic, and timber for other building elements (Curtin University, 2021)

Curtin undertook a Lifecycle Assessment of the L3 Circular Economy approach versus linear building practices and found that it avoided about 40 tons of CO2 equivalent (i.e. 5.4 tons CO2e for L3 and 44.5 tons CO2e for linear) (Minunno, O'Grady, Morrison, & Gruner, 2020).



Figure 4 Legacy Living Lab Building (Curtin University, 2021)

While in the transport sector, Booth Transport in Victoria transports milk from farms to processors. Historically the wastewater from rinsing out their vehicles and storage silos was transported offsite for disposal. Booth Transport, supported by the Sustainable Australia Fund, built the Strathmerton Water Treatment Plant, which uses a worm farm to remove organic residue (Figure 5). It then supplies newly treated water (121,000 kilolitres/per annum) to the local farmers for irrigation (Sustainable Australia Fund, 2024).

An example from the energy and mining sector is Green Gravity, a start-up from Wollongong, developing technology where weights are lowered and lifted in old mine shafts to store energy generated by solar and wind projects (Figure 6) (Green Gravity, 2024). Green Gravity has partnered with BlueScope Steel and built a prototype in Port Kembla (NSW) to test the technology's capabilities. The use of underground legacy mines demonstrates a circular economy because it uses existing assets, doesn't use new land, fuel, or water, and doesn't produce waste (Waters, 2023).



Figure 5 Strathmerton Water Treatment Plant (Sustainable Australia Fund, 2024)

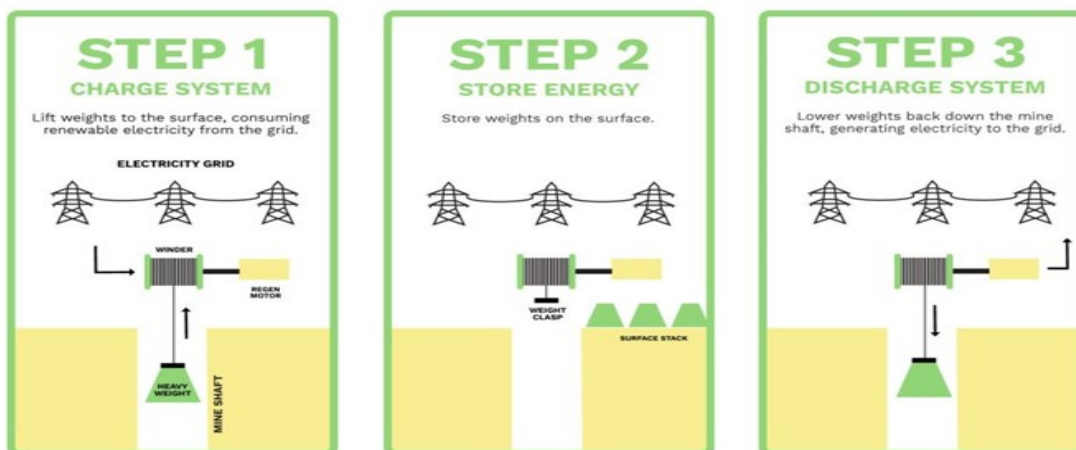


Figure 6 How the Green Gravity storage technology works (Green Gravity, 2024)



Business Transition Strategies

Some of the strategies that can assist a business considering the transition to a circular economy include:

1. Review your product or service design:
 - Can you design out waste/pollution? Veolia has designed Energido, which can recover the heat produced by a sewage system to use in a site's heating or cooling, designing out the need to use additional electricity (Veolia, 2024).
 - Can you design parts that are easily removed and serviced when necessary? Steelcase has developed furniture that can be taken apart for easy repair (Steelcase, 2024).
2. Review your product or service inputs and outputs:
 - Could you use a recycled product as an input? Noveon has developed a technology that uses waste/recycled magnetic material for its line of EcoFlux magnets instead of raw rare earth metals (Noveon, 2024).
 - Can you rent tools or machinery as part of the process? Rentalfill is an Australian company that hires out production and packing machinery and provides services and repairs over the term of the hire (Rentalfill, 2018).
3. Review how your product or service is used:
 - Could you extend the product's use by offering spare parts or repair services?
 - Could the use be extended by a second-hand market?
4. Review what happens to your product or service at the end of use:
 - Is it recyclable or compostable? Could it be repurposed? Interface (a carpet tile and flooring company) takes back used carpets and select vinyl flooring, recycles them back into their manufacturing process or assists with repurposing them as donations (Interface, 2024).
 - Can you reintegrate your product as an input for another? Both Caterpillar and Volvo can take old truck parts and either remanufacture (rebuilt to mint condition) or refurbish (restored to near mint) the parts (Caterpillar, 2024; Martensson, 2023).

These are just some examples of businesses engaging in circular economy practices to demonstrate that transition is possible.

Do you need assistance to make the change?

The Circular Economy represents a shift in how businesses operate emphasising sustainability, resource efficiency, and long-term viability. It provides a wide range of cultural, social, environmental, and economic values and benefits to businesses and the wider community. If you'd like to know more about how Integrate Sustainability Pty Ltd can help you transition towards a circular economy, call 08 9468 0338, or email us at enquiries@integratesustainability.com.au.



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