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Circular economy

Reincorporating waste into productive end uses



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KEY THEMES:

- *Waste reduction and the circular use of materials are critical to reducing natural resource extraction, curtailing associated emissions, reducing waste, and preserving natural ecosystems*
- *Investments in the circular economy provide unique, ROI-driven, non-correlated exposure to diverse end markets seeking to improve operational efficiency*
- *Asset selection is key to identify opportunities with strong unit economics, reasonable execution and scale-up risks, and with suitably experienced management teams*

THE PITFALLS OF LINEAR CONSUMPTION

Globally, the manufacturing of physical goods is driven by the extraction, transportation, and processing of natural resources. Most often, this is done via linear supply chains, whereby goods are made from virgin inputs, consumed by end users, and discarded. Some materials (e.g., aluminum, glass, certain plastics) are recycled in certain geographies, but most waste is landfilled.

The consequences of this system are several:

- The extraction of natural resources has direct and secondary environmental consequences:
 - These activities – mining, oil and gas extraction, forestry – can cause acute local environmental damage and social exploitation if managed improperly
 - Furthermore, the energy used to extract, refine, and transport raw materials and goods is a meaningful contributor to global emissions, accounting for 53% of the world's carbon emissions (which excludes the emissions generated from consuming some of those extracted materials)¹
 - Natural resource extraction, globally, has tripled over the last half-century. If we continue to extract natural resources without intervention or circularization, we could see resource use increase by an additional 60% through 2050²

OPINION PIECE. PLEASE SEE IMPORTANT DISCLOSURES IN THE ENDNOTES.

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- Waste is a major environmental pollutant, especially in geographies without collection or recycling infrastructure:
 - In OECD countries, as of 2020, over 730 million tons of waste is generated annually – ending up incinerated or in landfills where it will never be used again and will contribute to warming-intensive methane emissions³
 - Annually, more than 110 million tons of plastics waste is mismanaged⁴ – often dumped into the local environment and ultimately oceans, impacting local living conditions and threatening biodiversity. This plastic waste has a real and disproportionate impact on emerging markets – it is estimated that plastic pollution costs up to 1 million lives each year in low-and middle-income countries⁵

A CIRCULAR SOLUTION

The antidote to these challenges is to develop ways of living and doing business that limit the extraction of virgin natural resources and reduce the amount of waste that is landfilled or dumped. Disrupting the ‘linear’ flow of materials and replacing it with a ‘circular’ recovery of goods for reuse has been shown to limit resource extraction.⁶

‘**Circular economy**’ is an umbrella description for a range of business models seeking to accomplish these goals. These activities generally fall into one of the following categories:

Extending the useful life of a product or reducing its resource intensity typically through design decisions and choices of material



Facilitating recycling and reuse at every step of the process, from design decisions to systems for capturing and sorting waste to technologies for recycling materials

Improving the utilization of products through different ownership models (e.g., leasing or product-as-a-service)

The drivers of the circular economy

Aside from the environmental benefits of circular supply chains, these business models are driven by a range of commercial motivations:

- **Return on investment:** products and services that reduce waste, utilize lower cost materials, or minimize logistical expenses can deliver tangible bottom-line returns on invested capital



Capital markets activity reflects the underlying momentum behind the circular economy movement

- **Reduce inflationary pressures:** relatedly, businesses that use circular solutions to lower their cost-of-goods-sold can improve affordability for end customers and capture market share, especially in inflationary environments (e.g., thrift stores and other waste-to-retail models)
- **Supply chain resiliency:** sensitive supply chains (e.g., for lithium-ion materials) can be strengthened through the recapture of existing materials
- **Business model innovation:** evolving customer needs can be satisfied through innovations to how products are re-used or provided as a service
- **Regulatory requirements:** federal and local authorities around the globe continue to tighten waste disposal standards for producers, forcing a reexamination of supply chains and product designs
- **Consumer tastes:** end consumers – motivated by their awareness of emissions and pollution trends – are increasingly receptive to innovative products and business models that incorporate circularity. Close to 50% of shoppers under 35 have made a secondhand purchase in the last year⁷

Capital markets activity reflects the underlying momentum behind this movement. Issuances from large corporations such as Apple, Nestle, and H&M with specific use of proceeds dedicated to a circular economy regularly top \$1 billion, demonstrating strong consumer demand for sustainable supply chains and corporate recognition of the supply chain risks associated with the transition.⁸

Fundamental support for the circular economy

We are excited about how the transition to circular supply chains brings with it a host of climate and environmental benefits. From an investment standpoint, we also believe this is an attractive theme that is underpinned by a number of fundamentals:

- **Profit orientation:** reducing raw material intensity and waste can deliver a return on investment for companies and/or improve

affordability for end customers. These are timeless drivers of growth and investment activity, irrespective of consumer tastes or regulations

- **Standalone viability:** improving the circular flow of materials does not typically earn government incentives or subsidies, providing insulation from political changes
- **Portfolio diversification:** circular economy investments are possible in a wide range of industries, allowing the construction of unique, non-correlated portfolios
- **Climate impact:** investments into this theme have the potential to unlock a flywheel of benefits across waste reduction, limiting emissions, and curtailing direct material extraction

Common challenges

As with any investment theme, there is a set of familiar topics that we expect to encounter when evaluating circular economy businesses:

- **Capital intensity:** as the circular economy deals in physical commodities, many business models require physical plants, transportation assets, and storage sites to operate, all of which can impact returns if not well-understood
- **First-of-its-kind risk:** companies developing a new product or service must navigate a series of execution challenges around early commercial facilities, including scaling pilot-stage technology and guiding complex construction projects
- **Supply chain reorganization:** circular economy players are reorganizing supply chains, by definition. To ensure full asset utilization, operators must form feedstock and offtake relationships that can scale without friction and to the benefit all participants
- **Value proposition:** to support the capital expenditure and supply chain changes needed to ‘circularize’ a particular activity, it is critical that there be (a) high enough volumes of material and (b) attractive unit-level economics
- **Management teams:** many companies in this space are graduating from a ‘pilot’ offering to a scaled commercial product or service.

Navigating this successfully often requires the addition of different skills and experiences to the management team

- **Impact alignment:** finally, while general efficiency gains in existing operations are commendable, as part of our mandate we seek businesses whose environmental impact is linked directly to revenue-generating activities



*With Onepak's tech-enabled reverse logistics services, **more electronics have longer useful lives, and more e-waste is properly recycled***

Case study: 

Onepak provides tech-enabled reverse logistics services for IT hardware and e-waste. Onepak serves a variety of ecosystem players (logistics providers, hardware OEMs, corporate IT users, IT asset disposal (ITAD) firms, and individual consumers) with its easy-to-use platform, ReturnCenter. Arranging traceable transportation from reputable providers resolves a critical pain point in the industry. With this solution, more electronics have longer useful lives, and more e-waste is properly recycled.

From an investment standpoint, we were drawn to Onepak for many of the reasons described above. The core service is driven by the ROI calculations of existing customers seeking an effective solution for their transportation needs. Second, the company's platform is an asset-lite service offering that can scale quickly. Finally, Onepak is led by an experienced team that has been building tech-enabled solutions in this space for nearly twenty years.

INNOVATIONS ON THE HORIZON

As the circular economy matures, we see a number of themes continuing to develop:

- **Technology enablement:** the ongoing digitization of economic activity both highlights and enables companies to extract value from avoidable waste
- **Small scale focus:** we believe decentralized, capex-light solutions will be easier to finance, execute, and ultimately scale than larger facilities requiring several things to go right
- **New technologies:** finally, we expect to see the continued development of technologies to treat existing untreated linear waste streams (e.g., tires, textiles) as well as emerging flows (e.g., lithium-ion batteries)

Case study: 

America's Thrift Stores ("ATS") is a for-profit thrift store chain with 25 stores and over 2,500 material donation locations across the Southeastern US. Central to ATS's business model is the financial incentive it has to maximize the value of used textiles and other durable household waste streams. To enable its unique product monetization strategy, the company employs a data-driven approach to retail merchandizing and supply chain optimization.

ATS is a good example of impact aligning with commercial performance. By sourcing its products via donation channels, the company can pass along the savings from its low cost-of-goods-sold and create an attractive value proposition for end customers.

NUVEEN'S FOCUS AREAS

We are excited about the opportunities we are seeing in the circular economy space, particularly those with the following characteristics:

- Capital-light, enabling services delivering a high-ROI value proposition
- Decentralized, small-scale solutions than can grow in small steps to mitigate risk
- Select larger, capital-intensive businesses with a unique moat and track record
- Electronic waste and other unique waste streams with high embedded value
- Proven business models seeking to grow their existing commercial-scale operations

For more information, please visit our website, nuveen.com/impact.

Endnotes

- 1 Jonathan Watts. "Resource extraction responsible for half world's carbon emissions" The Guardian, 12 Mar 2019, <https://www.theguardian.com/environment/2019/mar/12/resource-extraction-carbon-emissions-biodiversity-loss#:~:text=Extraction%20and%20primary%20processing%20of,26%25%20of%20global%20carbon%20emissions.> Accessed 29 May 2024.
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- 6 Bianchi, Mario and Mauro Cordella. "Does circular economy mitigate the extraction of natural resources? Empirical evidence based on analysis of 28 European economies over the past decade", Ecological Economics via Science Direct, Jan 2023, <https://www.sciencedirect.com/science/article/pii/S0921800922002683#bb0085>. Accessed 29 May 2024.
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- 8 Weick, Mark and Nicole Ray. "Rethinking bonds: How bond financing can advance circularity", Ernst & Young, 29 Aug 2023, https://www.ey.com/en_us/insights/climate-change-sustainability-services/rethinking-bonds-financing-circularity. Accessed 29 May 2024

Sources

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