

Supplementary Material

JULY 2024

This document contains supplementary material to the Plastics Circularity Investment Tracker.

- I. Glossary
- II. Research Methodology
- III. Investors Profiled

I. Glossary

This section provides definitions of key terms used in the Plastics Circularity Investment Tracker:

- Plastics Circularity and Plastics Circularity Solutions
- Investment and Investment Categories
- Investment Stages by Deal Types
- Classification of Emerging Markets and High-Income Economies

Plastics Circularity and Plastics Circularity Solutions

Plastics Circularity

Plastics circularity, for the purposes of the Investment Tracker and the report, is defined as a system that drives a circular economy for plastics, which includes technologies, business models or other solutions that eliminate, reduce, reuse, or keep plastic materials in circulation without leaking into the environment.

Classification of Solutions along the Plastics Value Chain

The archetypes in the Investment Tracker can be classified as upstream, midstream or downstream solutions according to where they lie along the value chain.

- **Upstream solution:** One that may eliminate or reduce the use of plastic, such as the development of a new compostable material for use in foodservice packaging. Example archetypes: Materials, Redesign.
- **Midstream solution:** One that requires the participation of a consumer to realize its plastic reduction strategy. Examples might include zero waste stores that depend on consumers bringing their own packaging or refill systems that require consumers to return a package for refill. If the consumer does not fulfill the action, the innovation is unlikely to reduce use of plastic. Example archetype: Refill/Reuse.
- **Downstream solution:** One that occurs after a package or product becomes waste. Downstream solutions include operational platforms that seek to connect plastic waste generators (i.e., consumers) with informal collectors or mobile apps that track and report waste plastic for the purposes of EPR reporting. Other downstream solutions might also include reverse vending machines that collect recyclable plastics and reimburse the user with awards or points that can be redeemed for other products. Example archetypes: Recycling, Recovery.

Note that some archetypes may be cross-cutting, e.g., they may fall under the downstream and midstream, or midstream and downstream parts of the value chain. For example, refill/reuse solutions fall under the midstream and upstream parts of the value chain.

Definitions of Solutions

Solution	Description and examples of companies focusing on the solution ¹
Materials	<p>Firms that focus on the production or use of alternatives to single-use plastics or other applications.</p> <p>Example(s): Fiber-based alternatives, such as molded bagasse, or other compostable substitutes for takeout foodservice ware.</p>
Redesign	<p>Firms that redesign an existing product and/or packaging system with consideration of its performance and value, resulting in products and packaging that are more reusable or recyclable than typical models. Firms included may also redesign existing systems to improve reuse or recycling, such as for the segregation of materials.</p> <p>Example(s): Eliminating polyvinyl chloride (PVC) labels from polyethylene terephthalate (PET) bottles, or shifting from multi-layered packaging to mono-material.</p>
Refill/Reuse	<p>Firms that substitute or eliminate single-use and other plastic products through reuse, refill or product-as-service business models. These firms reflect a diversity of business models intended to eliminate single-use plastics.</p> <p>Example(s): Zero waste or bulk stores that offer refill services if consumers bring their own packaging, or reuse and refill systems that might require a deposit to incentivize the return of packaging.</p>
Services (driving plastics circularity or plastic waste management)	<p>Firms that support, through their services, the actors involved in driving a circular economy for plastics along the whole plastics value chain. These include, for example, firms that offer services that facilitate alternatives to plastics, reuse, account for plastic usage, audit and offer assurance of plastic waste flows, and/or quantify collected waste plastics in line with EPR regulations or voluntarily.</p> <p>Example(s): Service providers that enable organizations to calculate their plastic footprint or firms that offer EPR accounting and reporting services.</p>
Operational Platforms enabling plastics circularity	<p>Firms that offer “on-demand” software, technology platforms, or mobile applications that specifically support a circular economy for plastics. These platforms, for example, allow individual consumers and/or companies to request at-home or business collection of recyclable plastics.</p> <p>Example(s): Operational platforms that facilitate waste collection, recycling, or marketplaces.</p>

¹ As the understanding and knowledge of plastics circularity and investments in plastics circularity improve, we will continue to refine and update these definitions

Solution	Description and examples of companies focusing on the solution ¹
Digital Mapping	<p>Firms that offer digital technology or platforms that are intended to map and/or trace material flows, document the location of waste management infrastructure, or provide insights on waste volumes or composition.</p> <p>Example(s): Blockchain ledger technology that maps and traces the flow of waste plastics from the source of collection through reclamation and end of life.</p>
Recovery	<p>Firms that directly recover municipal solid waste (including plastic waste) for various purposes, including for recycling. While the principal focus is to ensure collection for disposal rather than for recycling, these businesses support plastics circularity through collection and sorting of plastic waste for recycling before disposal.</p> <p>Example(s): Plastic and waste collection services.</p>
Recycling	<p>Firms that offer informal and formal collection, processing or sorting, and reclamation of waste plastic for recycling, as well as firms with technologies to recycle waste plastic into flakes, pellets, or finished products.</p> <p>Chemical/advanced recycling is included here. Chemical/advanced recycling describes a diverse suite of technologies that use solvents, enzymes, supercritical fluids, heat, and pressure to regenerate polymers, or break down polymer chains to produce monomers or hydrocarbon feedstocks that can be used to create new plastic.²</p> <p>Example(s): Waste management companies and non-profit organizations working with the informal sector to collect waste plastics for recycling, reverse vending machines to collect bottles, and companies that recycle and reclaim plastics.</p>

Investment and Investment Categories

Investment

“Investment” is defined as private financing in “the form of grants, equity/quasi-equity, debt, and blended finance structures, including credit guarantees and other similar financial instruments.” This analysis seeks to capture the allocation of capital flows to companies, and technical assistance accompanying other forms of investment rather than the provision of in-kind investments, such as non-monetary technical assistance. Funding via bilateral or multilateral donor aid agencies, or from national, state or local governments is not included.

Investment Categories

Investment categories for the Investment Tracker are based on the provider of capital for plastics circularity transactions. These include accelerators, incubators, banks, foundations, family offices, corporates, individuals,

² Circularity Concepts. (2022). *Advanced Recycling Technologies and a circular economy for plastics* [online]. Available from: <https://www.circularityconcepts.org/module-3-advanced-recycling-technologies>

investment firms such as private equity and venture capital firms, and the general public through initial public offerings (IPOs). Public funding sources, such as from national/local governments or government departments and agencies, are excluded.

Investment categories and their definitions specific to this report include:

Investment Category	Definition ³
Accelerator / Incubator Investments	Cash, or recoverable funding provided by accelerators, incubators or entrepreneurship support organizations (other than directly by corporate) as part of the early stage of development.
Corporate Investments	Includes investment effected through joint venture, merger, acquisition, secondary transaction involving minority equity purchases from another investor, asset purchases, and/or direct funding. Bonds issued by corporations and grants provided by corporates to startups involved in plastics circularity are also included here.
Financing by Banks	Financing in the form of loans (secured or unsecured), or bonds provided by commercial or multilateral development banks.
Individual / Crowdfunding / Philanthropic Investments	Return-seeking investments received from an individual, a group of individuals or private foundations.
Private Equity	Private equity is a form of financing where money or capital is invested in a company. Typically, private equity investments are made in mature businesses in traditional industries in exchange for an equity or ownership stake. Private equity is a major subset of a larger, more complex piece of the financial landscape known as the private markets.
Initial Public Offering (IPO)	An initial public offering (IPO) refers to the process of offering shares in a private corporation to the public for the first time. An IPO allows a company to raise equity capital from public investors. Secondary offering is also included here.
Venture Capital	Venture capital (VC) is a form of financing where capital is invested in a company, usually a startup or small business, in exchange for equity, debt, or quasi-equity or debt in the company. It is a subset of a larger part of the private markets landscape.

³ As the understanding and knowledge of plastics circularity and investments in plastics circularity improve, we will continue to refine these definitions

Investment Stages by Deal Types

The deal types that fall under each investment stage specific to this report are listed in the table below.

Seed	Early Stage	Later Stage	Exits
Accelerator/Incubator	Early-stage VC	Blue Loan	Buyout/LBO
Angel	Series A	Green Loan	IPO
Capitalization	Series B	Conventional Debt	Joint Venture
Convertible Note	Series C	Corporate Asset Purchase	Merger/Acquisition
Crowdfunding	Series D	Corporate Bonds	Public Investment Second Offering
Grant	Venture Round	Corporate/Strategic Investments	Reverse Merger
Pre-seed Round		Debt - General	Spin-off
Seed Round		Debt Refinancing	
		Dividend Recapitalization	
		Green bond	
		Later-Stage VC	
		Leveraged Recapitalization	
		Mezzanine	
		Expansion	
		PE	
		PE Growth/Expansion	
		PIPE (Private Investment in Public Equity)	
		Post IPO - debt and equity	
		Restart - Later VC	
		Secondary Transaction - Open Market	
		Secondary Transaction - Private	
		Series E	
		Sustainability-linked Bonds	

Seed	Early Stage	Later Stage	Exits
Sustainability-linked Loans			

Classification of Emerging Markets and High-Income Economies

From the World Bank’s classification of countries based on their Gross National Income per capita data for 2025, emerging economies considered for the purpose of the Investment Tracker include the countries categorized as “Low-income economies”, “Lower-middle-income economies”, and “Upper-middle-income economies” as described in the table below.⁴

Group	Gross National Income Per Capita	Example Countries
Low-income economies	≤US\$ 1,145	Afghanistan, Burundi, Yemen
Lower-middle-income economies	US\$ 1,146-US\$ 4,515	India, Kenya, Viet Nam
Upper-middle-income economies	US\$ 4,516-US\$ 14,005	Argentina, Brazil, China, Malaysia, Thailand, South Africa
High-income economies	>US\$ 14,005	Australia, Chile, Germany, Netherlands, UK, US

II. Research Methodology

Types of Investment Covered in the Investment Tracker

The Investment Tracker seeks to capture all third-party private investments in plastics circularity.

The Circulate Initiative consulted various databases (Crunchbase, Environmental Finance, Net Zero Insights, PitchBook Data Inc., and Tracxn) covering private market transactions and filtered data for third-party investments made in plastics circularity solutions globally for the review period. We cross-checked the information compiled from these databases against publicly available information. We included known deals from publicly available sources and those identified through discussions with investors that were not captured by the databases. We categorized investments according to investment categories and archetypes, and aggregated the data to generate insights while maintaining the transactions’ anonymity.

We screened the transactions included in the Investment Tracker to meet one or more of the following criteria:

- Plastics circularity is a core function of the business operations of the investee company. For example, a company that is involved in producing bioplastics.

⁴ World Bank. (2024). *World Bank Country and Lending Groups* [online]. Available from: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>

- Where plastics circularity is not a core function of the investee company, the investment should be directly attributed to a plastics circularity-linked purpose. For example, an investment in a fast-moving consumer goods company for the collection of polyethylene terephthalate (PET) bottles for recycling.
- The use of proceeds of the investment fall within one of the eight solution archetypes tackling the plastic pollution challenge defined above.

For companies where plastics circularity is not the core function, we conducted additional reviews of the company's business and the relevant transaction to ascertain suitability for inclusion in the Investment Tracker. Details of reviews undertaken for various sectors are available in the [Frequently Asked Questions document](#) (see question no. 16).

The following additional considerations apply to debt financing, including loans, sustainability-linked bonds, green bonds, and blue bonds:

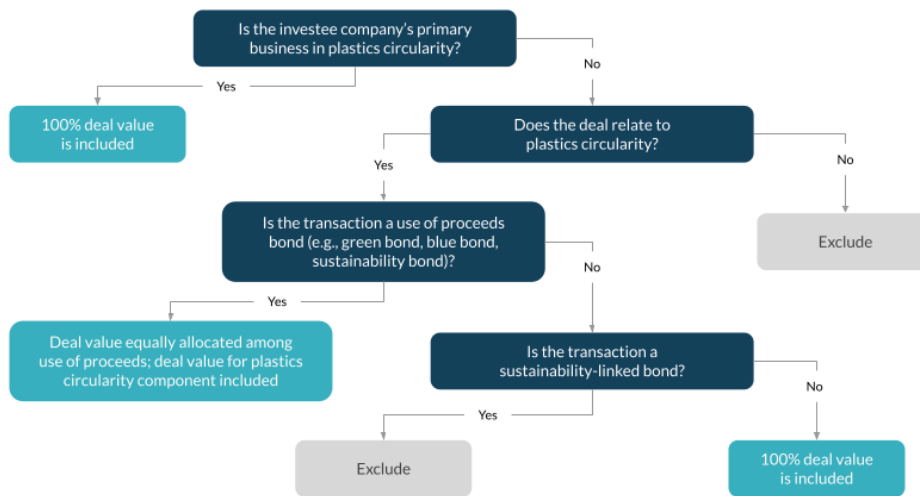
- Loans, syndicated or otherwise, for which information is not available in the public domain or through the databases accessed are excluded.
- Sustainability-linked bonds:
 - Issued by plastics circularity-focused companies are included in their entirety.
 - Issued by other companies are excluded. Proceeds from sustainability-linked bonds are intended to be used for general purposes and information on the exact quantum of money applied to plastics circularity is typically unavailable. For example, a US\$ 100 million sustainability-linked bond issued by a fast-moving consumer goods company is excluded even if one of the key performance indicators relates to recycling.
- Use of proceeds bonds (e.g., green bonds, blue bonds, sustainability bonds):
 - Issued by plastics circularity-focused companies are included in their entirety.
 - Issued by other companies, and where a part of the use of proceeds is allocated for plastics circularity, are included as the use of proceeds for these bonds are more specific. For these transactions, the total quantum of the investment is divided into equal proportions among the various use of proceeds indicated by the issuer. For example, US\$ 25 million is included in the year of issue from a US\$ 100 million green bond issued by a fast-moving consumer goods company that has reported four types of use of proceeds, one of which relates to recycling.

The Investment Tracker excluded the following data:

- Public funding; e.g., local government investment in waste management services.
- Paycheck Protection Program in the US: a loan backed by the U.S. Small Business Administration, provided to small businesses during the Covid-19 pandemic.
- Transactions involving spin-off, debt conversion, debt repayment, internal company projects, sale-leaseback facility, and share repurchase.

- Investments in alternative materials if the products were not primarily intended to replace plastics; e.g., investments in firms producing glass bottles for alcoholic beverages without the intention of replacing plastic.
- Deals where the investee’s primary business is not in plastics circularity or instances where the amount of financing received for such purposes was unavailable.
- General debt transactions for which information was unavailable in the public domain or through the databases accessed for the study.
- Money collected in a pool of funds or bonds raised in a collective manner by development finance institutions, where allocation of funds to specific companies is unavailable.
- Proceeds from the purchase or sale of plastic credits.

Figure 1: Decision Tree for Screening Plastics Circularity Deals and Deal Value



Investor Profiles

The Investment Tracker profiles 24 investors in plastics circularity (see Part III for the list of investors). The centrality of plastics circularity to their overall investments was the primary criteria for selection of these investors for profiling. While information on the exact quantum of investment or of the assets under management was not always available, company documents, publicly available materials and conversations with various stakeholders provided useful guidance to evaluate the relative importance of plastics circularity to each investor’s operations.

The value of investments and the number of deals were considered when shortlisting investors. However, it must be noted that the investors profiled are not necessarily those who have invested the largest amounts or had the most deals. Several other considerations such as having a variety of investors (corporates, venture capital providers,

non-profits etc.), providers of different types of capital (equity and debt), and the spread of investors across different geographies were all considered when selecting the investors to be profiled.

III. Investors Profiled

Following are the 24 investors profiled in the Plastics Circularity Investment Tracker.

1. Aavishkaar Venture Management Services Private Limited
2. Alliance to End Plastic Waste Inc., The
3. Alpla Group
4. Ambipar Group
5. Asian Development Bank
6. BASF Venture Capital GmbH
7. Biffa plc
8. Circulate Capital LLC
9. Closed Loop Partners LLC
10. Dow Venture Capital
11. Foundation for Innovation and Social Entrepreneurship (Social Alpha)
12. Indorama Ventures Public Company Ltd
13. International Finance Corporation
14. Katapult Group AS
15. Kohlberg Kravis Roberts & Co LP
16. PepsiCo Greenhouse Collaborative Accelerator
17. Plug and Play Ventures
18. Regeneration.VC
19. S2G Ventures
20. Safer Made
21. Sagana GmbH
22. Unreasonable Group
23. Valor Management LLC
24. Waste Management Inc