

INVESTING IN THE NEW INDUSTRIAL (R)EVOLUTION

Insights for asset owners and managers
financing the circular economy

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FOREWORD

Over the past 100 years, we've been confronted with abundant evidence that planet Earth is an integrated system. A rapid change in our commercial and consumption behaviors is required to reflect this reality or, given the growing global population, the consequences will be severe. Fortunately, the circular economy, which jettisons the myopic notion that inputs are infinite and that waste can somehow be discarded outside the "system," is emerging. In fact, as the authors of this paper point out, recent trends indicate that we stand at the cusp of another industrial revolution in which a product's lifecycle is essentially infinite.

As a nonprofit global action community of impact investors, Toniic has a front row seat to emerging trends among forward thinking investors. For example, in a longitudinal study called [T100](#), which we launched in 2016, the environment broadly was cited as the top investment priority of participants, who dedicate 100% of their assets to impact. While our members (individuals, family offices, and foundations) feel urgency across a range of social and environmental [impact themes](#) (which we align to the United Nations Sustainable Development Goals ("SDGs")), the scientific evidence that we are now passing an irrevocable tipping point in climate change and resource use gives particular urgency to those investment themes. A circular economy provides an integrated systems-thinking framework to guide our work across the economy in recognition of the radical global interdependence we now observe.

In **Investing in the New Industrial (R)evolution**, the authors describe a systems-level approach and key investment strategies designed to activate circular economy principles. We can see such principles increasingly expressed through our community's investment and eco-system activities. Strategies we see Toniic members deploy successfully across portfolios of all sizes include:

- » the inclusion of circular economy principles in investment policies;
- » active targeting of shareholder engagement, proxy voting and shareholder actions, like Divest/Invest, that move investees from a linear to circular

operating model;

- » due diligence screening that favors investees with innovative reuse strategies; and
- » investments in technologies, products and services that are innovating and accelerating the adoption of circular economy practices.

(R)evolution shares how this shift from a linear to a circular method of design can result in highly efficient production, material reuse and product longevity, inspiring a range of unique benefits for the investor, investee and customer, whether in a developed or developing market.

Yet, significant challenges remain. **(R)evolution** cites the difficulty encountered in identifying circular economy investment opportunities in some asset classes. Toniic members expressed similar sentiment in our [T100](#) report. As well, managing circular economy impact is an important "work in progress" for most investors. Outputs like the Global Impact Investing Network's [Impact Reporting & Investment Standards](#) (IRIS) metrics that target the circular economy principles can be applied within individual investments, but not easily aggregated. Measurement is essential.

We believe that as asset owners and managers – from institutional investors (the subscribers of TIIP) to high net worth individuals, family offices and foundations (the membership of Toniic), and retail investors – recognize the interconnectedness of life on earth, and the interconnected effects of capital deployment, they will be compelled to invest differently. That shift will ultimately increase the cost of capital for those whose investment strategies ignore these risks, and lead to outsized returns for the early visionaries. And it just might help save the planet, too.

Reports like the one you are about to read are important milestones in the evolution of investing theory and, indeed, the evolution of life on earth.

--Adam Bendell, CEO; Lisa and Charly Kleissner, co-founders – Toniic

EXECUTIVE SUMMARY

Over the last 30 years, many investors have recognized that the world's most pressing global and environmental challenges cannot be tackled without harnessing the capital markets and engaging business. In response, the financial community has evolved a variety of approaches that recognize the importance of considerations that transcend the traditional daily challenges of portfolio management. These approaches seek to manage, to the extent possible, risks and rewards at environmental, societal and financial systems levels.

In taking this next evolutionary step asset owners and managers have begun to establish a parallel set of policies and practices alongside their traditional approach to investing at a portfolio level. They are incorporating policies and practices into a number of basic investment activities—beliefs statements, security selection, engagement, targeted investments and manager selection—that intentionally confront systems-level challenges, such as maintaining a sustainable environment and a stable social structure, and that manage their impacts at these levels. Evidence suggests that a key ingredient in successful investments of this kind—which we call systems-level investing—is intentionality. That means intentionally taking steps to impact global systems.

Mounting global social and environmental pressures like increasing income inequality, resource price volatility and climate change have also caused many to question the linear economic model that advocates the onetime use of natural resources to create disposable consumer, industrial and commercial products. Instead, the new emerging circular economy approach advocates a systematic shift towards products that can repeatedly re-enter the production cycle. This approach not only reduces negative societal and environmental externalities, it can also lower production costs, reduce dependence on external commodities, improve margin stability, minimize energy consumption, and increase shareholder value.

The synergies between systems-level investing and the circular economy are boundless. The continued growth

“The circular economy defines an industrial system that is restorative or regenerative by intention and design. It replaces the ‘end-of-life’ concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models.”

Ellen MacArthur Foundation, *Towards the Circular Economy*, 2011.

of the circular economy will require large amounts and varied types of capital. Systems-level Investors could not only provide this capital at reasonable costs, they could further accelerate the growth of the circular economy by implementing best practices honed over the last decade. Given the wide applicability of the circular economy, its increased adoption will create investment opportunities that span asset classes, industries, and geographies. The increasing need for capital will help meet the growing demand for investments in global systems. Investors and asset managers would benefit from investment opportunities that deliver both measurable impact and resilient financial returns.

To be effective, circular economy models need a measurement framework, educational resources, financial products, and a demonstrated track record. Many of these can be adapted from existing tools developed by systems-level investors pursuing global solutions to our most pressing social and environmental problems. The integration of the circular economy into systems-level investing would significantly contribute to the creation of a more stable and sustainable economic order. To make this a reality, these two incredibly powerful forces must make collaboration a priority, and work together with other crucial stakeholders to compliment and augment each other's work.

INTRODUCTION

PGGM, the second largest pension fund in the Netherlands, has traditionally invested in all the usual money-makers, like energy companies, big pharma, and corporate giants. But in 2015, it took a dramatic step. By the end of that year it had allocated 8.9 billion Euros in what it calls “solutions for sustainable development.” In other words, it put billions into investments with the express intention of addressing social and environmental challenges like building housing for poor people, creating environmentally-friendly cars, and making water-saving technologies all while still earning competitive returns. This new way of investing wasn’t a one-off project, nor was it meant to just bring in good PR (although it did). It is part of an increasingly popular approach that is meant to make money—like all of PGGM’s regular investments—while simultaneously making a positive impact on the world. Specifically, PGGM is investing in solutions focused on climate change, water and food, and healthcare.

Systems-level Investing

Over the last 30 years, many investors like PGGM have recognized that the world’s most pressing global and environmental challenges cannot be tackled without harnessing the capital markets and engaging business. In response, the financial community have evolved a variety of approaches that recognize the importance of considerations that transcend the traditional daily challenges of portfolio management. These approaches seek to manage, to the extent possible, risks and rewards at environmental, societal and financial systems levels. They include large institutional investors’ understanding of their role as “universal” investors with a concern for the vitality of the whole economy, not simply for the performance of individual securities, as they believe issues which are externalities to specific investments affect other investments in their wide-ranging portfolios; their stewardship of the assets they control and the impact of their assets on the environment and society, in effect adding an ownership discipline to their buy and sell disciplines; and their obligations to assure the sustainability of the financial, social and environmental systems within which they operate.

In a new report titled “Tipping Points 2016: Summary of 50 Asset Owners’ and Managers’ Approaches to Investing in Global Systems”, The Investment Integration Project (TIIP) examined a diverse set of investors that have taken practical steps to incorporate global issues related to

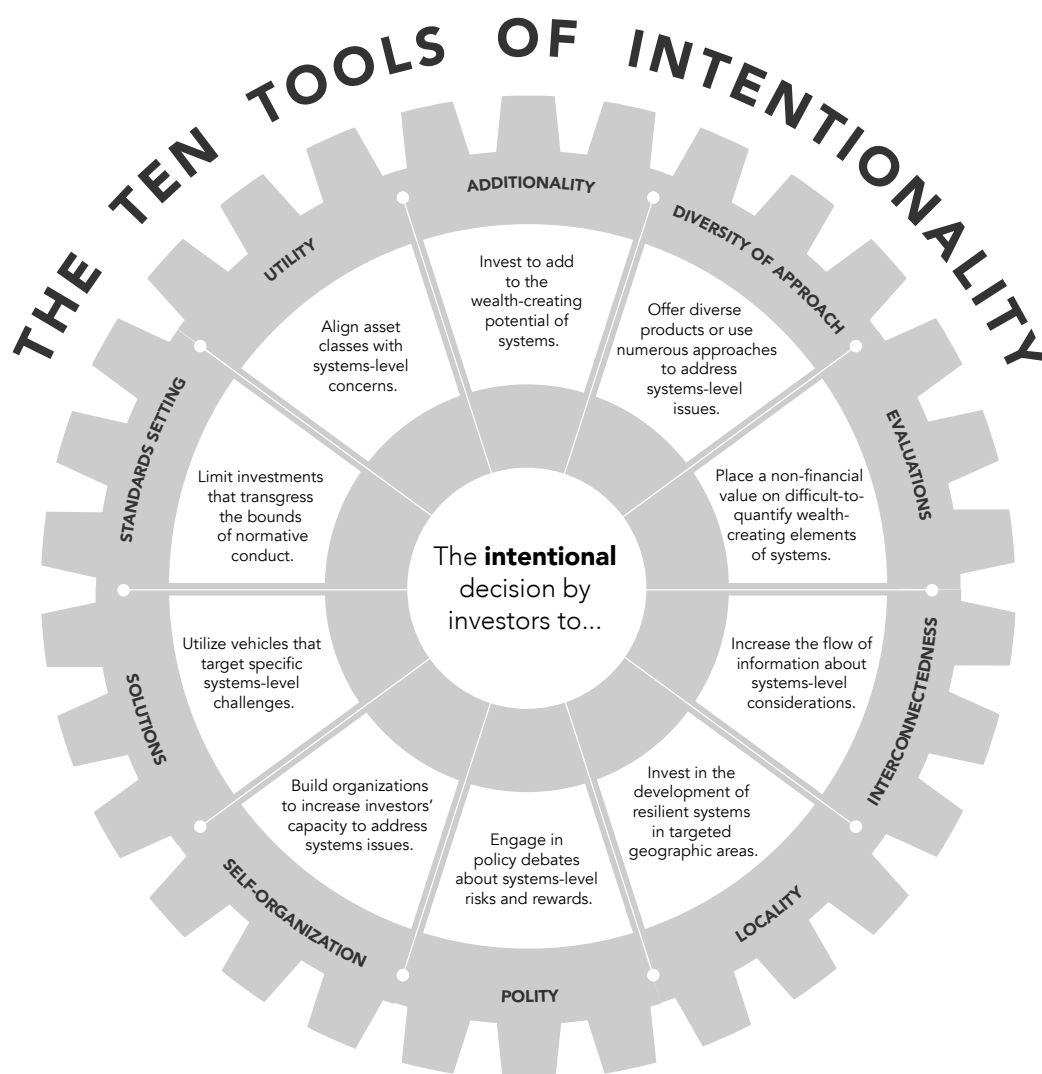
the health, food, and energy systems, as well as others, into their daily investing. Key to TIIP’s findings is that investors are going beyond the integration of conventional investment activities with portfolio level environmental, social, and governance factors to actually harness reliable investment techniques toward two mutually reinforcing ends: one focused on global systems and the other on portfolio management. As our research shows, in taking this next evolutionary step asset owners and managers have begun to establish a parallel set of policies and practices alongside their traditional approach to investing at a portfolio level. They are incorporating policies and practices into a number of basic investment activities—belief statements, security selection, engagement, targeted investments and manager selection—that intentionally confront systems-level challenges, such as maintaining a sustainable environment and a stable social structure, and that manage their impacts at these levels.

As covered in more depth below, we found that a key ingredient in successful investments of this kind—which we call systems-level investing—is intentionality. That means intentionally taking steps to impact global systems. We identified ten types of intentionality (see Figure 1): solutions, additionality, diversity of approach, evaluation, geographic locality, interconnectedness, polity, self-organization, standards setting, and utility.

Investors use these tools intentionally because modern portfolio theory alone does not naturally lead them to do so. So, for example, some investors like PGGM are intentionally creating investment vehicles that can achieve competitive returns while targeting particular social or environmental problems of substantial systems-related importance. Other investors intentionally seek out sound investments that support and strengthen interrelated economic activities within a geographic region. The Ireland Strategic Investment Fund by mandate invests in enterprises “in a manner designed to support economic activity and employment in Ireland.” Similarly, to contribute to the vitality of Montreal, the regionally focused Caisse de dépôt de Québec has invested in a combination of public transportation and downtown office buildings and hotels.

Others are intentionally pursuing investments that address issues historically underserved by mainstream finance: a practice known as additionality. These firms

FIGURE 1: THE TEN TOOLS OF INTENTIONALITY



Source: This graphic first appeared *Tipping Points 2016: Summary of 50 Asset Owners' and Managers' Approaches to Investing in Global Systems*. The Investment Integration Project (TIIP). New York, NY: November 2016. [pg 14]. The graphic was subsequently adapted for use in Mark Sloss's *Tools of the Trade*. Citywire. England and Wales: January 2017. [pg 31].

choose investments that strengthen often neglected elements of overarching systems – elements that add to these systems' stock of resources, increase their complexity and thereby provide them with additional resilience. This means investing in improved opportunities for broad access to financial services, technology, healthcare or energy for those who have been historically underserved.

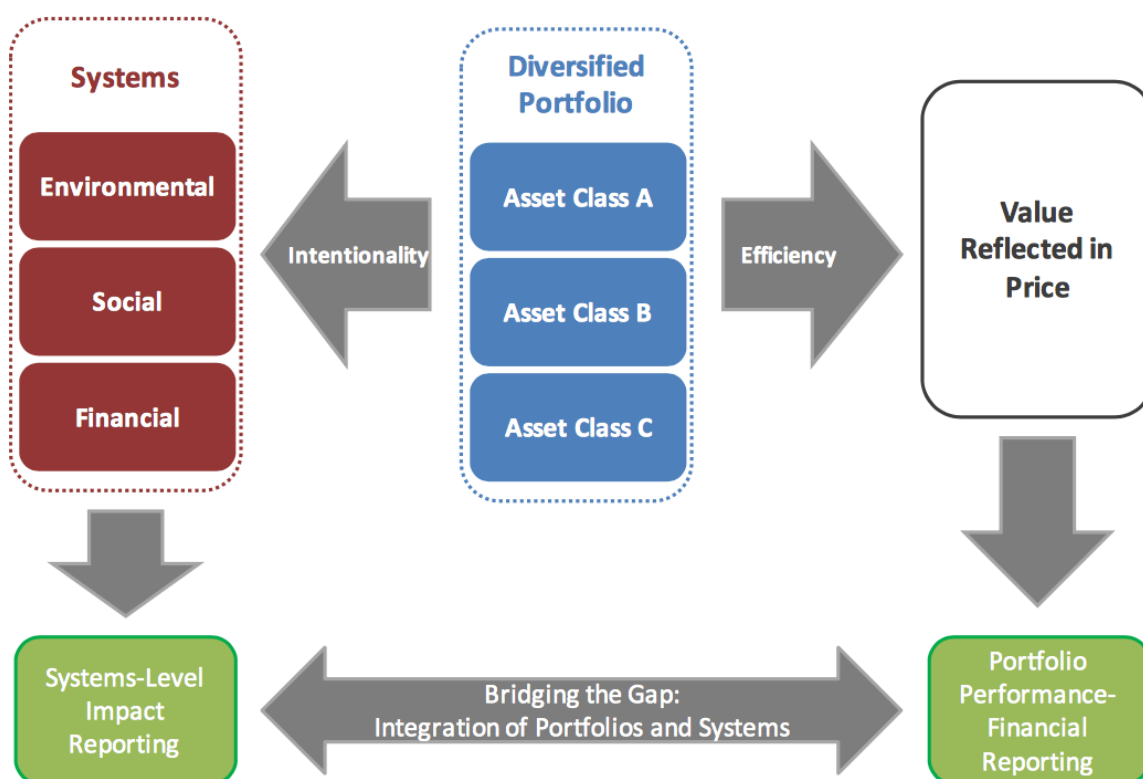
As covered in Figure 2 below, the implication of these individual efforts—and the ten tools of intentionality more generally—is that investors are increasingly managing two goals simultaneously: positive social impacts and making money. On the one hand,

investors—buying and selling in the marketplace daily—manage their portfolios on the basis of price, seeking to maximize their returns while minimizing their risks. At the same time, these investors—with an eye to the long-term preservation and enhancement of the frameworks within which they operate—are seeking to manage their impacts at the environmental, societal and financial systems levels.

The Circular Economy Approach

Around the same time PGGM was ramping up efforts towards systems-level investing, it also joined a group devoted to growing the circular economy, which is the practice of finding innovative ways to use limited (and

FIGURE 2: INTEGRATION OF PORTFOLIOS AND SYSTEMS



Source: *Tipping Points 2016: Summary of 50 Asset Owners' and Managers' Approaches to Investing in Global Systems*. The Investment Integration Project (TIIP). New York, NY: November 2016. [pg 7].

costly) resources like energy, land and materials. This group, the Circular Economy 100, convenes businesses, emerging innovators and governments to collaborate and share insights on how to move away from the traditional waste-ridden linear economy—take-make-dispose approach to manufacturing that is inefficient and unsustainable—and toward more environmentally and socially conscious circular models of providing goods and services—focusing on maximizing resource productivity through both product and business model design.

The circular economy improves upon the traditional linear model that ties economic growth to the one-time use of natural, non-renewable, resources. Instead, the circular economy focuses on designing products that can easily re-enter the production cycle at the end of their life, to be efficiently reused or recycled. The circular economy is rapidly catching the attention of corporations, governments and investors as a powerful framework increasing businesses' manufacturing efficiency, deepening their relationships with customers, hedging against volatility in commodity prices, decreasing

their energy consumption, and subsequently, increasing shareholder value.

Circular Economy as an Investment Opportunity

The circular economy provides ample investment opportunities for investors seeking competitive returns alongside measurable social and environmental impact. Although some may not view it as a core Investment strategy, the circular economy offers compelling evidence that addressing global challenges does not have to result in lower profit margins. In fact, circular economy principles can increase profitability over traditional linear models, especially in the long term. The collective social and environmental impact of a circular approach can significantly increase economic growth by limiting environmental damage and increasing societal resilience (i.e., the ability of people and institutions to respond to social and environmental shocks).

Systems-level investing and the circular economy have similar stakeholders, including public entities,

pensions and sovereign wealth funds, foundations and family offices, and financial services institutions. These stakeholders, which are already driving forward the circular model and systems-level investing, are concerned about long-term societal, environmental, and economic stability. They include:

- » **Public entities:** Governments and international organizations have been increasingly encouraging the use of market-based solutions to social and environmental challenges, and play a key role in providing the legal frameworks and incentives for the development of both systems-level investing and the circular economy.
- » **Pension and sovereign wealth funds:** A growing number of long term investors, including pension funds, sovereign wealth funds, insurance companies, and others, are increasingly treating social and environmental challenges as risk factors that must be addressed as part of the management's fiduciary responsibility. Together, these players control very significant amounts of

capital that have the power to reshape financial markets.

- » **Foundations and family offices:** Foundations and family offices play an important role in creating the track record needed to bring institutional and retail investors into systems-level investing in the circular economy. Family offices are often driven by a set of core values, usually related to the source of their wealth, and have the greatest flexibility in deploying their capital. Foundations can use charitable contributions to experiment with market-based solutions that are aligned with their mission, and support circular economy initiatives.
- » **Financial services institutions:** The alignment of capital with sustainability and circular economy goals cannot happen without financial intermediaries and institutions. These include investment banks, asset managers, fund managers, etc. The recent influx of systems-related investing products is cause for cautious optimism, though actual products must be carefully scrutinized to ensure intentionality and accountability.

THE CIRCULAR ECONOMY

The Shortcomings of the Traditional Linear Model

The traditional linear “take, make, dispose” economy—in which economic growth is tied to the availability of natural resources—is risky, unsustainable, and wastes significant value. Under this prevailing industrial and economic model, industry uses inexpensive, primarily non-renewable, natural resources to produce goods that are sold to consumers who dispose of them after use (see Figure 3). While the linear economy has made great strides in increasing resource efficiency, several factors raise concerns about the model’s long-term viability. These include:

- » **Commodities—particularly natural resources—are increasingly vulnerable to supply shocks and price volatility.** After a century of steady average declines, commodity prices rose nearly 150 percent between 2002 and 2010. While they fell again in 2011, commodity prices are increasingly vulnerable to supply chain disruptions caused by natural disasters, political unrest, and scarcity. Metals and agricultural output, specifically, have had higher price volatility in the last decade than any time in the 20th century, according to researchers with the McKinsey Global Institute.² Such volatility discourages investment and stifles economic growth.
- » **A rapidly growing global middle class is creating unprecedented demand for products.** The global middle class is estimated to increase from 1.8 billion in 2009 to 3.2 billion in 2020.³ This will be the “largest and fastest rise in disposable incomes ever” and will increase the global demand for goods and services, and for the resources and energy required to manufacture these products.⁴
- » **The environment faces a myriad of costly problems.** The reliance on primarily non-renewable natural resources for powering production and manufacturing goods is causing dire environmental problems, including biodiversity loss, climate change, land degradation, poor soil health, deforestation, and water acidification, among others. These problems have major economic consequences: land degradation alone, for example, costs an estimated US\$40 billion worldwide per year.⁵

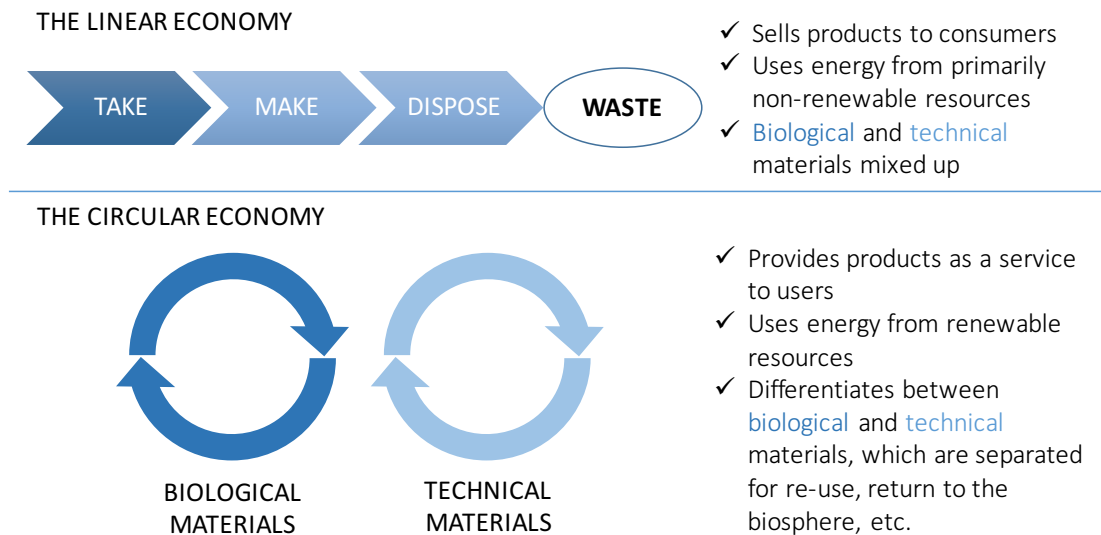
Beyond these concerns, the linear economy perpetuates waste and hemorrhages economic value. In 2014, the largest 5,589 publicly traded American businesses sent 342 million metric tons of waste to landfills and incinerators.⁶ Such disposal does not just propagate environmental ills; it also represents billions of dollars in lost value. Each year, the economy disposes of 95 percent of plastic packaging materials worth an estimated US\$80 to US\$120 billion.⁷ The linear economy further generates waste through product idle time. The average car in Europe, for example, is parked (idle) 92 percent of the time and the average office is used only 35 to 50 percent of the time, even during working hours.⁸

The Circular Framework

The circular economy, which provides a framework for decoupling growth from resource constraints, is an imperative alternative to the resource-dependent and consumption-based linear economy. The circular economy focuses on restoring and regenerating resources, helping industry to abate the financial and environmental risks embedded in the linear economy. It has four core defining features (see also Figure 3):

- » **Value-driven product design** that maximizes product life cycles and the value of products and their component parts and inputs. The circular economy is restorative through the design of products and materials that are made from either pure, non-toxic consumable materials (biological nutrients), or durable materials (technical materials).⁹ Products are designed to be easily disassembled, which enables the industry to optimize their repair, reuse, or refurbishment. Maintaining materials quality throughout these many life cycles is a core goal of circular businesses. Such design also embraces cascading, which considers whether a product originally used in one industry and for one purpose (e.g. clothing) might best be re-used in a different industry and for a new purpose (e.g. furniture upholstery) to maximize value and extend a product’s useful life.
- » **Innovative business models** that embrace service-based approaches and replace consumers with users. In the circular economy, people use rather than own products through leases (e.g. ZipCar), pay-per-use or pay-for-performance contracts (e.g.

FIGURE 3: THE LINEAR ECONOMY VS. THE CIRCULAR ECONOMY



Sources: World Economic Forum with Ellen MacArthur Foundation and McKinsey & Company. Towards the Circular Economy: Accelerating the scale-up across global supply chains. Cologne/Geneva, Switzerland: January 2014; <http://mbdc.com/> (accessed 13 April 2016)

pay-per-lux by Phillips), collective ownership or sharing platforms, and so on. Businesses effectively incentivize users to return products after use. For many products, these service-based business models reduce product idle time, and further maximizes material values (i.e. better retains value).

- » **Closed-loop cooperative value cycles** that replace linear supply chains. Producers, manufacturers, and retailers in the circular economy develop tight logistics loops to enable the regeneration of materials, components, and products to further optimize asset lifecycles.
- » **Value cycles are powered by renewable energy.** Circular industry relies primarily on renewable energy to power circular activities. Because energy needs are lower in circular manufacturing processes than in traditional manufacturing, switching to circular economy practices is easier than many industry leaders believe —and it saves money in the long term.

Beyond the individual benefits for each company, if adopted widely the circular economy can yield substantial large-scale macroeconomic benefits. The circular economy's decreased reliance on non-renewable natural resources coupled with its continuous cycling of materials will have a two-fold macro effect. First, it will reduce demand for raw materials, and thus lower prices. And, second, it will ensure that material supplies are secure,

such that industry is only minimally affected by shocks and disruptions. Beyond these overarching benefits, the circular economy also has the potential to generate net materials savings and spur economic growth, encourage innovation, promote environmental sustainability, and create jobs (see Table 1).

A Trend Towards Circularity

The circular economy has gained significant traction in recent years, with both individual businesses and the broader global economy adopting the circularity approach. The following conditions have converged to make transitions to circularity both possible and beneficial:

- » **Consumer preferences:** Consumers have started to indicate a preference for access over ownership (e.g. cars sharing services like Zipcar), and an inclination for purchasing used goods in second-hand markets. These behaviors appear driven, at least in part, by a desire to save money, protect the environment, and engage with community members via sharing platforms. The sharing economy is rapidly growing and generated an estimated US\$3.5 billion in revenues in 2013.¹⁰
- » **Urbanization.** By 2050, an estimated 6.3 billion people—or about two-thirds of the world population—will live in cities.¹¹ This increased urbanization facilitates efficient and cost-effective reverse logistics (reclaiming materials for reuse) and

TABLE 1: MACRO BENEFITS OF THE CIRCULAR ECONOMY



Net materials cost savings
and economic growth

The circular economy could generate (a) up to US\$520 to US\$630 billion in savings for European manufacturers per year for medium-lived complex products (e.g., office machinery and computers, medical equipment, transport equipment), (b) up to US\$700 billion in worldwide savings per year for fast-moving consumer goods (e.g., toiletries, over-the-counter drugs, processed foods), and (c) between 1 and 4 percent net economic growth over a 10-year period.



Innovation

The circular economy challenges industry to develop standardized and re-usable product components, closed-loop logistics cycles and supply monitoring tools, and service-based business models.



Environmental
sustainability

Circular production and logistics relies on renewable resources, which will reduce carbon emissions, result in less extraction of raw materials, and even improve soil health and land productivity.



Job creation

The effects of the circular economy on labor markets are yet to be determined, but some economists contend that a transition to a more circular economy could mean some job losses in certain industries and companies but an overall net job gain globally.

Sources: ING. Rethinking Finance in a Circular Economy: Financial Implications of Circular Business Models. Amsterdam, The Netherlands: May 2015; World Economic Forum with Ellen MacArthur Foundation and McKinsey & Company. Towards the Circular Economy: Accelerating the Scale-up Across Global Supply Chains. Cologne/Geneva, Switzerland: January 2014; Johan Rockstrom and Mattias Klum. Big World Small Planet: Abundance Within Planetary Boundaries. New Haven: May 2014.

centralized value cycles.

- » **Changes in policy.** Governments around the world—particularly in Asia and Europe—have started to provide incentives for industries to adopt circular principles. Examples include the European Unions' Waste Framework Directive, which increased landfill costs to incentivize recycling in the construction and demolition industry, and Singapore's Packaging Agreement (an arrangement between government, private, and non-government sectors), which aims to reduce packaging waste from consumer products and save US\$20 million over 5 years.¹² American policymakers are also following suit. The U.S. Environmental Protection Agency's Comprehensive Procurement Guideline program, for example, promotes "the use of materials recovered from solid waste" through designating "products that are or can be made with

recovered materials and recommending practices for buying these products."¹³

- » **Technological advancements.** A number of technologies are disrupting the linear economy and accelerating circular practices, including mobile and cloud technologies, materials and parts reprocessing, energy storage techniques, and 3D printing.¹⁴ Such tools facilitate better material tracking, collaboration and knowledge-sharing, and effective logistics.

Table 2 provides examples of companies that have adopted a circular approach. They are joined by numerous others that UBS has identified as having the potential to emerge as significant circular role models, including: Kingfisher, Marks & Spencer, Neste Oil, Novozymes A/S, Solazyme, Thermo Fischer Scientific, Unilever Plc, and Umicore.¹⁵

TABLE 2: SELECT CIRCULAR ADVANTAGE COMPANIES

Company	Circular Approach	Reported Benefits
BMA Ergonomics <ul style="list-style-type: none"> » Ergonomic chair manufacturer and retailer » Operating for 25+ years » Headquartered in The Netherlands, also serves markets in Belgium and Germany 	<ul style="list-style-type: none"> » Chairs rented to users for 10-year terms » Usage fee decreases for the final 4 years of use; routine maintenance included in rental package » Usage deposit refunded upon chair return » Chairs are made from as much recycled material as possible 	<ul style="list-style-type: none"> » Reduces chair costs for consumers (for chairs made from cheaper recycled materials) » Ensures that customers always use the highest quality chair » Facilitates long-term BMA-customer relationships which generate recurring income
Desso <ul style="list-style-type: none"> » Flooring manufacturer and retailer » Operating for 80+ years » Headquartered in The Netherlands; serves 100 countries across Europe, the Americas, Asia, Africa, and Australia 	<ul style="list-style-type: none"> » Will use only pure, toxin-free, materials by 2020 » Designs carpets for disassembly » Production powered by renewable energy » Collects used carpets and re-uses materials in the flooring and other industries 	<ul style="list-style-type: none"> » Leads to the development of higher quality products » As of 2011, circular approaches responsible for 1 to 4 percent increases in market share annually » Facilitates innovation including invention of proprietary carpet separating technique
H&M <ul style="list-style-type: none"> » Clothing manufacturer and retailer » Operating for 60+ years » Headquartered in Sweden; global reach 	<ul style="list-style-type: none"> » Provides vouchers to customers who return used clothes to stores » Partners with I:CO to reuse and recycle returned clothing, either as new clothing or in other industries 	<ul style="list-style-type: none"> » Collection of used jeans in Pakistan replaced between 20 and 25 percent of virgin materials needed to make new jeans » Broader program aspirations include increased store foot traffic and improved customer loyalty
IBM <ul style="list-style-type: none"> » Computer hardware manufacturer and software developer » Operating for 100+ years » Headquartered in the United States; global reach 	Global Asset Recovery Solutions program: <ul style="list-style-type: none"> » Helps companies upgrade existing IT systems » Provides equipment disposal services that comply with regulation » Buys-back used equipment for “de-manufacturing,” accepts trade-ins » Sells refurbished equipment, guarantees performance 	Since 2002: <ul style="list-style-type: none"> » Has processed over 1.09 billion lbs. of used machines, parts, and material; harvested and sold over 44.4 million used parts » Has processed and sold more than 3,893 rebuilt mainframes since 2002 » In 2014, 97% of the approximately 36 million tons of harvested scrap was resold, reused, or sent to material recycling
Philips <ul style="list-style-type: none"> » Technology company focusing on electronics, healthcare, and lighting » Operating for 100+ years » Headquartered in The Netherlands; operates in Europe, Asia, Australia/ New Zealand, and the Americas 	<ul style="list-style-type: none"> » Leases lighting and healthcare equipment to users, rather than selling products outright to consumers » Uses energy-saving LED lights for its “pay-per-lux” (light as a service) program » Collects used products and refurbishes them for use in subsequent leases 	<ul style="list-style-type: none"> » Serves customers who would have otherwise been unable to afford high up-front purchase costs » Small environmental footprint » Attracting large contracts with major metropolitan areas (e.g. Washington D.C.)
Regeneris <ul style="list-style-type: none"> » IT and electronics firm » Operating for 30+ years » Headquartered in the United Kingdom; serves 27 countries across Europe, Asia, Africa, and the Americas 	<ul style="list-style-type: none"> » Repairs, refurbishes, and re-deploys mobile devices and other electronics 	<ul style="list-style-type: none"> » Revenue grew from US\$28 million to US\$308 million and profits from US\$1.5 million to US\$17.1 million between 2005 and 2015, due to increased use of mobile devices and circular approaches

TABLE 2: SELECT CIRCULAR ADVANTAGE COMPANIES

Company	Circular Approach	Reported Benefits
Renault » Car manufacturer » Operating for 110+ years » Headquartered in France; serves Europe, Asia, Africa, and the Americas	» Operates “re-manufacturing” plant that refurbishes used car parts for use in new cars » Leases batteries as part of new electric vehicle fleet	» Re-manufacturing plant is the most profitable of all of Renault’s operations » Uses 20% of the energy and 30% of the materials required by traditional plants
Ricoh » Electronics firm » Operating for 80 years » Headquartered in Japan; global reach	» Company GreenLine label re-manufactures, re-furbishes, and upgrades office copiers and printers	» Grew 5 percent in just one year; accounts for 10 to 20 percent of sales in targeted markets » Expands company reach to new markets, stabilizing market share

Sources: Company websites (accessed in April 2016); ING. Rethinking Finance in a Circular Economy: Financial Implications of Circular Business Models. Amsterdam, The Netherlands: May 2015; World Economic Forum with Ellen MacArthur Foundation and McKinsey & Company. Towards the Circular Economy: Accelerating the Scale-up Across Global Supply Chains. Cologne/Geneva, Switzerland: January 2014; Butterworth, Jamie and William Burckart. There’s a New Industrial Revolution Underway. Quartz: July 16, 2015; London Business School (Ioannis Ioannou and Amandine Ody-Brasier). DESSO (B) – Going Forward. September 22, 2011.

Challenges to Developing and Financing Circular Solutions

Companies looking to adopt the circularity approach often face several common challenges, including:

- » **Materials complexity.** The materials used to produce even the simplest products have become increasingly complex, and often multiple materials are combined to reduce costs. Materials are thus hard to identify and separate after use, and there are few cost-efficient ways to separate materials without degradation. For example, only around US\$3 worth of raw materials can be extracted from smart phones that contain roughly US\$16 worth of raw materials.¹⁶
- » **Short term transition and development costs.** The development of new circularity aligned products and services will require upfront capital investments. However, many of the circularity models are still in an experimental stage and are not yet profitable.¹⁷ This poses challenges to both early stage entrepreneurs and corporate executives. One possible solution is to leverage different types of patient and concessionary capital, a solution that will be further developed in the next section.
- » **Long term changes in cash flow.** Companies looking to transition from a linear up-front sale model to a circular pay-per-use or

leasing models must effectively pre-finance clients. The new business model will require companies to reconstruct their short-and medium-term financing paradigms, with increased emphasis on timing cash flows.¹⁸

- » **The importance of contracts.** The transition to pay-per-use or leasing models changes the nature of the relationship between the company and the clients, and turns the contract into the principal asset, rather than the product itself. Companies will need to experiment with different contract components such as length, bankruptcy protections, and more. Investors and banking institutions will need to become comfortable with accepting contracts, versus real assets, as collateral.
- » **Legal issues surrounding collateral.** The move towards leasing and servicing models presents legal complexities for companies seeking to use the leased products as collateral. In some cases, leased products may automatically transfer in ownership to the leasing party. This is very common in products such as fixed lights or toilets that are essential to the operating of a real estate unit, and thus legally belong to the real estate owner. This challenge can be overcome by certain legal agreements, but these increase complexity and transaction costs.¹⁹

Measuring Circularity

The first to attempt a cohesive and complete framework for measuring circularity was the Ellen MacArthur Foundation.²⁰ The framework, known as the Material Circularity Indicator (MCI), is designed to measure the circularity of products and companies, and can be implemented for:

- » Assessing the efficacy of new products and services
- » Internal reporting purposes
- » External assessment purposes as part of an investment or procurement process
- » Rating and benchmarking products or companies

The MCI is built to track the following four principles:

- a. Using materials from reused or recycled sources for production
- b. Reusing components or recycling materials after the use of a product
- c. Keeping products in use longer (e.g., by reuse/redistribution)
- d. Making more intensive use of products (e.g. via service or performance models)

Together, these four principles capture two separate components of the circularity approach; Principle A and B refer to the restorative efforts of the company in producing or disposing products, while principles C and D refer to improving the utility of the product.

In addition to the MCI, there are several other initiatives also measuring the impact of circular business practices. For example, Circularity Capital, a specialist private equity firm targeting investments in lower-mid market small and medium enterprises operating in the circular economy (Full Disclosure: a co-author of this report is a founding Partner of Circularity Capital), has developed a methodology for benchmarking and measuring the impact of individual investments across financial, environmental and societal metrics. Initial benchmarks for financial, environmental, and social impact are established prior to completion of each investment and these benchmarks are then used as the basis to measure and report progress on an annual basis. Circularity Capital also evaluates the external impact of investments across its supply chain and the wider economy. The output of the Circularity Capital assessment is displayed in a “performance dashboard” and included in the investor reporting packs.

INVESTMENT STRATEGIES TO SUPPORT THE CIRCULAR ECONOMY

Tools of the trade: Key investment activities

While the circular economy clearly holds promise as a means to both make money and fortify investments in a changing world, the ways in which investors can most effectively pursue such opportunities has been less clear. But as we found in [Tipping Points 2016: Summary of 50 Asset Owners' and Managers' Approaches to Investing in Global Systems](#), investors can put these strategies into effect through a variety of key investment activities—in particular, through use of investment beliefs statements, security selection and portfolio construction, engagement, targeted investment programs and manager selection (defined in Table 3). These activities are not new to investment. Most are already well-established as part of mainstream portfolio management. Many organizations, for example:

- » Have formal investment beliefs statements addressing issues such as the efficiency of the market, the relationship between risk and reward, and the value of diversification;
- » Employ security selection techniques that involve disciplines such as investment style (e.g. value or growth), themes (e.g. trends in technology or consumer taste), or regional focus (e.g. emerging markets);
- » Are activist investors engaging with companies, as hedge funds often do, on their business strategies and models;
- » Create funds targeted to particular sectors (e.g. health care, energy); and
- » Set guidelines for their manager selection and monitoring processes (e.g. buy/sell discipline, style drift).

Table 3 unpacks each of these investment activities further and explains how many investors are integrating systems and system-related considerations into them.

Investing in the Circular Economy across Asset Classes

Using the framework below, investors can develop an investment policy or special targeted investment program that prioritizes the circular economy. While it may still be difficult to identify circular economy opportunities in

each asset class, the following examples show that such opportunities exist or are beginning to take shape.

- » **Public Equities.** Ownership of the equities of publicly traded companies is particularly well suited for encouraging incremental progress toward adoption of circular economy strategies at an industry or large corporation level. Because public equity owners do not have controlling interest, they have the potential to influence, but not impose their views on management. A good example of this comes from As You Sow, a shareholder advocacy group, which got the Dr. Pepper Snapple Group—the third largest U.S. soda company after Coca-Cola and PepsiCo—to adopt a comprehensive post-consumer packaging and recycling program.²¹
- » **Private Equities** are similar to public equities but with a greater opportunity for direct influence. Private equity owners often have controlling interests in companies, or are investors in funds of companies with controlling interest, so as owners they have much more influence. Some pension funds—a la Canadian pension fund model—actually take direct control of their private equity investments. This would give an opportunity in various industries to directly test out circular economy technologies that could become models within or across industries. In this context, Taaleri, a Finnish wealth management group headquartered in Helsinki, launched in 2016.²² The fund's target size is 25-40 million Euros and will focus on three particular themes, including: renewable energy, recycling and material handling, and energy-saving solutions.²³
- » **Fixed Income.** Two particular opportunities exist within the fixed income sphere. The first is with the municipal bond market, which could specifically invest in water utilities and waste-water treatment facilities that are making progress on water reuse and recycling. Also, as an investor in general obligation bonds, investors could engage with local governments to encourage public policies that would facilitate a variety of circular economy strategies. The second opportunity would be participation in the rapidly emerging field of green bonds. Green bonds come in all sizes and shapes

TABLE 3: KEY INVESTMENT ACTIVITIES USED BY FIRMS TO EXECUTE SYSTEMS AND SYSTEMS-RELATED APPROACHES

Investment beliefs statements. Guiding beliefs about systems and related approaches, outlined in formal beliefs statements that either focus on or include systems considerations or through less formal mediums.

- » Most commonly, firms express the belief that proactive consideration of ESG issues will reduce risk, foster sustainability and generate long-term value.
- » Statements also reflect a belief that firms have a responsibility to generate positive social impact alongside their pursuit of financial return or, at a minimum, that positive social and financial return are not mutually exclusive.
- » Some firms note in their statements that there is a synergistic relationship between the environment, society and the financial system and that the health of one impacts the health of the others.

Security selection and portfolio construction. Incorporation of systems and related considerations into the investment selection process.

- » Typically executed through the integration of ESG considerations into security selection alongside financial analysis to proactively identify for investment companies with relatively strong ESG performance and/or to avoid those with poor performance; also integrated into ongoing monitoring.
- » Some firms develop assessment matrices and scoring tools and otherwise apply a quantitative approach, selecting only those firms for investment that attain a minimum required score or rank well relative to their peers.
- » May include construction of themed or “tilted” portfolios, such as a “carbon-free” portfolio comprised solely of renewable energy investments and/or that avoids non-renewable resources or one that favors firms with relatively low exposures to carbon-related risks.
- » Also commonly executed through excluding from investment specific industry sectors, types of companies (or specific companies) and/or countries whose behaviors do not align with firm systems motivations and beliefs.
- » Common exclusions include: weapons manufacturers and distributors, tobacco companies and countries with known human rights violations (e.g. Sudan, Iran).

Engagement. Communication with, and monitoring of, companies invested in to promote systematic progress and improvements, and to remediate issues that hinder the pursuit of the firm’s systems goals.

- » Used to promote best practices and address identified risks; preferred by many firms as a way to improve company- or industry-specific performance, as opposed to divestment/exclusion (referred to as “last resort” actions by some).
- » Executed in a variety of ways, from communicating with companies through letters, phone calls and visits to filing shareholder resolutions independently or with other investors.
- » Typically focused on the specific issue(s) identified at companies and on a case-by-case basis; however, some firms engage companies invested in on pre-determined “engagement themes.”
- » Firms also express ESG and other systems-related preferences by exercising shareholder voting rights.
- » Some firms contract with third-parties to engage with companies and vote on their behalf and in accordance with firm systems and related beliefs and objectives.

Targeted investment programs. Impact or solutions-focused investment that aims all investments in a portfolio toward a specific positive solution (versus portfolio weighting, which might focus only a portion of the portfolio toward targeted positive impact, or more commonly toward avoiding negative impact).

- » Ranges from being the sole investment strategy employed to one of many investment options used or offered.
- » Used to generate positive impact across a variety of issues, from economic development and inclusion to healthcare and renewable energy; environmentally-focused objectives are the most common foci, however.
- » Includes place-based investing, investing in a particular geographic location to facilitate growth and economic development among other region-based goals.
- » May include investments in targeted social impact bonds or green bonds.

TABLE 3: KEY INVESTMENT ACTIVITIES USED BY FIRMS TO EXECUTE SYSTEMS AND SYSTEMS-RELATED APPROACHES

Manager selection. Incorporation of systems or related themes into the selection and monitoring of external vendors used to manage assets.

- » Commonly includes requiring managers to disclose information about ESG-related risk identification and management approaches as part of selection due diligence and ongoing monitoring.
- » In some instances, managers must prove only that they have an established policy for dealing with systems and related risks, in others the policy must meet certain firm standards.
- » May include encouraging managers to join recognized industry organizations focused on systems and related issues (e.g. the United Nations Principles for Responsible Investment).
- » Some firms select only those managers that have a documented track record of generating positive economic or social impact.

Source: This chart is adapted from *Tipping Points 2016: Summary of 50 Asset Owners' and Managers' Approaches to Investing in Global Systems*. The Investment Integration Project (TIIP). New York, NY: November 2016. [pgs. 22 and 23].

and currently have not placed a particular emphasis on the circular economy, but investors could let local governments, corporations or non-profits such as hospitals and universities know that there are potential buyers, which can help create a market for green bonds with a circular economy theme. For instance, in 2014, "Goldman Sachs acted as lead bookrunner on the DC Water and Sewer Authority's US\$350 million green bond offering. The capital raised is funding new infrastructure to address combined sewer overflow issues, helping to improve water quality, reduce flood, and restore the District of Columbia's waterways."²⁴ The green bond, which was the first of its kind to have a 100-year maturity, matched the life of the asset and spread financing costs across generations that will benefit from the project.

- » **Real Estate.** The current trend toward LEED and similar environmental certification schemes in commercial and residential properties opens the door for institutional investors for circular economy considerations with a real estate allocation. If LEED or another certification is already a criteria, they can add circular economy to that, looking for properties with water recycling or zero-net energy drawn from the grid. For example, the Delta Development Group, a Netherlands-based 'Cradle to Cradle' inspired real estate development firm, initiated the Park 20|20, which is the world's first full service Cradle to Cradle inspired office park.²⁵ Delta is achieving this via material identification and tracking, reverse logistics activities, supply and value chain integration/optimization, Cradle to Cradle design (for disassembly and nutrient recovery), and high- level quality assurance through

the use of materials that are safe and healthy for the biosphere.²⁶

- » **Venture Capital.** Venture capital presents opportunities to invest in innovative startups that are promoting disruptive circular economy technologies. By way of illustration, Synergy Energy, a venture capital firm specializing in incubation and early stage investments, invested in a UK-based start-up called Project Health. Founded in 2013, Project Health supports the distribution of off grid solar power and distributed energy storage by providing a near real-time monitoring system for battery health. Project Health's Smart Battery Dashboard warns owners and operators of batteries of asset misuse or failing assets and supports optimization of the battery's use cycle. The value of this kind of technology is that it "...is an enabler for the service economy because assets can be protected and maintained remotely, allowing people to rent products or pay for use."²⁷
- » **Real Assets.** For investors with a long-term time horizon, timber can be an appealing asset. To the extent that forests are sustainability managed, they can participate in the circular economy theme. For instance, Kingfisher, a home improvement company with over 1,100 store and growing cross channel operations across 10 countries in Europe, is actually helping to regenerate working woodlands and find a second life for its waste wood. What this means in practice is that "rather than just preventing deforestation, it means working towards net reforestation; and rather than just improving energy efficiency it means helping to create homes that are zero carbon or net energy generators."²⁸

Examples of Investing in the Circular Economy

Given the nascent nature of investing in the circular economy as a theme, little data exists on capital deployed and impact reported in the sector. In lieu of this data, we have chosen to expand on the stakeholders’ impact theses and implementation strategies in Table 4 below.

TABLE 4: SELECT Solutions-focused Investors in the Circular Economy

Company	Impact Thesis	Implementation Strategy
PGGM <ul style="list-style-type: none"> » Holland based, private pension fund service provider » Manage pension assets in excess of US\$220 billion » Invest in public and private equity, debt, real assets, commodities, and infrastructure around the globe 	<ul style="list-style-type: none"> » An economy that continues to be based on linear principles is not sustainable » The circular economy can enhance financial, social, and ecological value » Worked with Circle Economy and Sustainalytics to develop metrics to measure their impact » Established the subgroup Finance within the CE100 (The Ellen MacArthur Foundation's Circular Economy 100 program) 	<ul style="list-style-type: none"> » Contribute to the transformation of the present-day economy into a circular economy by engaging companies in dialogue on issues like waste » Invest in circular businesses » Measure and reduce the CO2 footprint of the investment portfolio
Circularity Capital <ul style="list-style-type: none"> » UK-based private equity firm » Invests US\$1.3-7 million in growth stage Small to Medium sized Enterprises (SMEs) operating in the circular economy across Europe » Positive circular economy screen for origination of investment opportunities » Operational partner approach to supporting investee management teams » Integrated approach to evaluating impact across financial, environmental, and social metrics to support investment performance 	<ul style="list-style-type: none"> » Today's economic growth is largely dependent on a take-make-dispose linear model of extraction, production, consumption, and disposal » Circular economic practices "design out" waste and drive more value » Seek out businesses that can out-perform the market and their linear competitors by applying the circular economy framework » Specific focus on "inner loops" of circular economy – "beyond recycling" – and higher value restoration of products and components 	Invest in three types of businesses: <ul style="list-style-type: none"> » Circular Economy Transformers: SMEs moving from a linear to circular operating model » Circular Economy Operators: SMEs that operate in an industry that inherently lends itself to reuse strategies » Circular Economy Enablers: businesses with a product or service that will support the acceleration of the circular economy
Closed Loop Fund <ul style="list-style-type: none"> » NY-based private impact investing fund » Investing US\$100 million to increase the recycling of products and packaging 	Seeking to boost the recycling sector by: <ul style="list-style-type: none"> » Proving the market for single-stream expansion and modernization by maximizing recycling profitability » Attracting additional and cheaper capital to the sector » Increasing recycling access » Scaling solutions that improve recycling sustainability 	<ul style="list-style-type: none"> » Provide zero interest loans to cities and below market loans to companies for recycling infrastructure » Invest in recycling collection, sorting, and processing for reuse
ING <ul style="list-style-type: none"> » Dutch multinational banking and financial services corporation » One of the world's largest financial services companies, with over US\$18 billion in revenue in 2015 	<ul style="list-style-type: none"> » Seek to decouple growth from resource use » View sustainability as part of their risk strategy » Develop services beyond traditional banking to support customers in their transition to circular economy models 	<ul style="list-style-type: none"> » Commit to grow their sustainable business portfolio and investing in best practice companies » Apply a holistic and in-depth analysis of clients' financial flows » Develop intelligence on the circular economy and engage their customers through roundtables, seminars, and workshops
European Investment Bank <ul style="list-style-type: none"> » The European Union's nonprofit long-term lending institution, established in 1958 » A publicly owned international financial institution owned by the EU member states 	<ul style="list-style-type: none"> » Circular economy has the potential to boost competitiveness, foster sustainable economic growth, and generate new jobs » Aim to grow the circular economy through a combination of loans, risk reducing instruments, and advisory services 	<ul style="list-style-type: none"> » Offer medium and long term loans with fixed or variable interest rates » Also offer combined loans and grants, depending on the project » Co-financed projects worth US\$11 billion between 2005-2014 » In 2015, made an additional US\$24 billion available to impact businesses

Sources: data retrieved on July 27, 2015, from: PGGM: <https://www.pggm.nl>, <https://www.ellenmacarthurfoundation.org/ce100/directory/pggm>; Circularity Capital: <http://www.circularitycapital.com/>; Closed Loop Fund: <http://www.closedloopfund.com/>; ING: <https://www.ingwb.com/>; European Investment Bank: <http://www.eib.org/>

SYNERGIES AND SHARED BEST PRACTICES

Opportunities for Collaboration

The circular economy is a relatively new concept within the ecosystem of systems-level considerations. But investors can help grow the circular economy and create synergies that not only help circularity but also solve some of the challenges of systems-level investing.

Potential synergies include:

- » **Circularity measurement:** The lack of data and reporting on circular economy standards is a major challenge for investors. As mentioned previously, the Ellen MacArthur Foundation is developing circularity indicators around the core Material Circularity Indicator (MCI) to standardize the sector.²⁹ While this is an important step forward, these metrics could be better integrated into the ESG reporting systems developed by Morningstar, MSCI, etc., as well as into impact reporting frameworks such as IRIS, SASB, and GIIRS. This integration will allow the circular economy to benefit from the increasing prevalence of sustainability metrics, and inform how prevailing systems and reporting frameworks consider issues associated with the circular economy.
- » **Circularity as a lens, not an asset class:** For many years, impact-oriented investments were seen as distinct asset classes and often associated with below-market rate, private investments. In recent years, there is a growing realization that investing with impact, rather than being a separate asset class, is a lens that can be applied to all asset classes, sectors, and risk-return profiles. This has prompted a growing movement of investors who are going 'all-in' on impact by seeking to align 100 percent of their diversified portfolios with their values and mission.³⁰ This important shift in mindset may help investors think of circularity as a lens, as well, which they can view all their investments through. Supporters can and should attempt to align significant parts of their portfolio with the circularity mission by seeking best in class investments in every asset class. While opportunities in some asset classes such as cash equivalents may be hard to come by, this approach will ensure the maximum effectiveness of the investor, and highlight gaps in the circular economy investing continuum.

- » **Financial modeling and capital stacks:** The impact investing industry has become adept at constructing capital stacks that leverage the investment goals, appetite for risk, and motivations of different stakeholders.³¹ Experiential products may include first loss capital, guarantees, grants, concessional philanthropic loans, public financing, as well as standard tranches of debt and equity. These structures have allowed investors to pilot new impact investing products and strategies, and standardize the ones that are most successful. Since a similar set of stakeholders is working to promote impact investing and the circular economy, the financial models developed in the former can be used to propel the latter forward. Thus, investors looking to pilot circular economy business models and strategies can use the different types of capital committed to the sector, which likely include grants, below market rate debt, first loss capital, and more.

Potential systems-level investing challenges that circularity can address include:

- » **Perception and awareness:** The core circularity principle of driving resource productivity can intuitively be associated with strong financial performance, and may face fewer objections from investors fearing a tradeoff between sustainability and financial returns. A strong financial track record for the circular economy may help mainstream investing strategies such as ESG integration.
- » **Shortage of systems-level investment opportunities:** The potential reach of the circular economy, and the large amounts of capital needed to support the transition to such an economy, may be a significant source of investment opportunities. This is true both in private markets as well as public ones, and systems-level investors looking to take a more active approach will have a chance to do so across asset classes.

Resources for Accelerating Investing in the Circular Economy

To grow the circular economy, investors must have resources and information to help them identify and streamline the investment process. Several types of resources developed over the past decade for

systems-level and related investors could be expanded or emulated to promote the circular economy.

Though not an exhaustive list, the types of resources below have gained traction with systems-level and related investing and may be helpful to consider. They include:

- » **Information on financial intermediaries:** The United States Social Investment Forum (USSIF) hosts a “Financial Services Directory” that enables institutional asset owners, family offices, and high net worth individuals and their advisors to find separate asset and fund managers with expertise in sustainable and responsible investment strategies.³²
- » **Information for financial advisors:** Envestnet, an online service provider for financial advisors and institutions, provides advisors with information on four kinds of impact integrated managers: ESG, negative screens, global sustainability, and community investing. The selection criteria for each approach was developed in collaboration with Veris Wealth Partners and includes the manager’s investment process, availability of SRI/ ESG data, ongoing impact evaluation, and more.³³
- » **Comparison of public securities:** MSCI provides a variety of indices that incorporate negative screens, high ESG ratings, environmental factors, and different combinations of these strategies. Indices further focus on companies’ size and geography, mimicking MSCI’s overall Index Framework.³⁴ For example, MSCI KLD 400, an index frequently used to benchmark the returns on investing in companies with high ESG ratings, is comprised of 400 US securities that provides exposure to large, mid and small cap companies with outstanding ESG ratings, and excludes companies whose products have negative social or environmental impacts.
- » **Resources on private funds:** ImpactAssets 50 (IA 50) is an annually updated list of experienced impact investment firms and potential investment options.³⁵ The selection criteria include a minimum of three years of impact investing experience and US\$10 million in assets under management, recoverable assets, access for US investors, commitment to impact measurement, and more. An example of a company listed on the IA 50 is Bamboo Finance, a commercial private equity firm specializing in investing in business models that benefit low-income communities in emerging markets and has over US\$250 million in assets under management.
- » **Investment databases:** The Global Impact Investing Network’s (GIIN) ImpactBase is a global platform for investors to explore impact investing opportunities and investigate the market landscape across asset classes, impact themes, geographic targets, fundraising status, assets under management, and other parameters.³⁶ Examples of funds listed on ImpactBase include the Alliance Fund II, which is investing US\$350 million in the construction stage of US-based small and mid-sized energy projects focused on clean energy infrastructure; and the Flexible Capital Access Program (FlexCAP), a Habitat for Humanity International program which enables affiliates to borrow against selected mortgages in their portfolios.³⁷

These indices and resources have been developed to showcase systems-level and related investment opportunities to investors. While it may be early to develop this suite of resources for investing in the circular economy, the current dearth of information on such investment opportunities is a clear impediment to the development of the sector.

CONCLUSION

Two complementing forces are driving investments in the new industrial revolution. The first is demand for investment products that simultaneously provide financial returns and address systems-level social and environmental challenges. The second is the realization among corporations, governments, and financial institutions that the linear economic approach is inefficient and unsustainable, and that a shift towards a circular approach is necessary and inevitable.

Finding synergies between these two forces offers all stakeholders clear and immediate benefits. For advocates of the circular economy, this means smarter and more affordable capital to finance their efforts; they can also benefit from lessons learned by systems-level and related investors. For investors, the circular economy opens a host of investment opportunities delivering strong financial returns alongside measurable social and environmental impact.

Since the circular economy approach covers multiple sectors and asset classes, it offers investors diverse

investments that are inherently hedged against systems-level risks. Investors can execute a number of basic investment activities—beliefs statements, security selection, engagement, targeted investments and manager selection—to pursue and cultivate these opportunities further.

There are challenges to developing these types of circular economy investments but the market is already evolving to respond to this opportunity.

The circular economy should be seen as a lens rather than an asset class and unlocking its full potential will require the collaboration of multiple stakeholders: governments and other regulatory bodies must ensure the adequacy of legal frameworks and create incentives; foundations and family offices must pilot and experiment with products and configurations; investors must demand information and products; and financial intermediaries must develop expertise and products to meet client demand. The road is long, but the potential for a new economic order is incalculable.

Can the Circular Economy Unite ESG and Impact Investing?

By Stephen Freedman, UBS

In recent years, we have seen a flurry of environmentally-focused policy initiatives, the marked growth in corporate responsibility efforts and the noticeable pickup in investor interest in sustainable investing solutions. While these efforts certainly contribute to bringing the global economy onto an environmentally sustainable path, much remains to be accomplished.

Consider the following. According to the Global Footprint Network, humanity is using environmental resources amounting to 1.65 times the resources our planet can regenerate in a year. In other words, we are consuming 65% more than our budget and thereby severely depleting our natural capital. Putting this in terms that may be easier to relate to, this represents the same overdraft (i.e. deficit) that the US Federal government experienced in 2009, the worst fiscal year in recent history. The difference is that the Federal deficit has since then been reduced by approximately 70% while our environmental deficit continues to grow.

The problem is that, so far, sustainability initiatives often amount to applying a Band-Aid on a bleeding patient. They often merely extend the useful life of products or materials by a few years. A good example is the recycling of plastic bottles. This is somewhat of a misnomer as it involves turning bottles into lower grade products rather than making new bottles. Such “downcycling” merely delays the actual disposal. It remains anchored in a linear approach to economic activity based on resource extraction, processing, use and disposal.

In contrast, the emerging circular economy (or closed-loop economy) paradigm aims at fully closing the loop of economic activity. Much like biological processes from which it is inspired, it seeks to create an infinite cycle where the outputs from each activity become the inputs into other activities, thereby minimizing waste. Following early examples such as glass and scrap metal recycling or composting, the range of practices that fit into this philosophy keeps growing. Energy recovery from waste (e.g. anaerobic digestion), techniques of regenerative agriculture or biodegradable packaging have become increasingly widespread. However, the potential to adopt similar principles across the entire economy appears

limitless if human ingenuity and engineering is truly deployed in search of solutions. Think of what could be achieved if circular “cradle-to-cradle” product design was as the core of each and every product development initiative.

Greater adoption of the circular economy concept in business and investing has many interesting implications. One of them is a likely convergence between different approaches within the broader field of sustainable investing.

UBS Wealth Management as many others, makes a distinction between *ESG integration* (a.k.a. ESG investing) and impact investing.¹ The former is defined as a form of enlightened self-interest, i.e. an attempt to incorporate all financially relevant (i.e. material) environmental, social and governance (ESG) considerations into investment decisions. This approach is not primarily about “saving the world” but rather aims to be thoughtful about how sustainability-related risks and opportunities are factored in by investors; it is primarily about doing well. Impact investing on the other hand is defined as a form of double bottom line investing where the desire to achieve an attractive financial return coexists with an intention to produce a positive impact on the environment or society (*doing good while doing well*).

Both approaches may have some overlap at times but are fundamentally distinct. Interestingly, the advent of closed-loop thinking can be expected to blur this delineation and lead to a unified framework for sustainable investing.

The circular economy equates doing well to doing good both for companies and for investors who fund them. It drives private enterprise to improve its own private bottom line while at the same time enhancing the common environmental bottom line. Private benefits may arise, for instance, from achieving greater resource efficiency, limiting dependencies on suppliers or reducing uncertainties from volatile input prices. These are all features that profit-oriented investors should want to track and reward, whether they are investing in listed companies or funding private ventures. At the same time, the promotion of closed-loop thinking within companies and the broader ecosystem that surrounds them benefits society at large. It does so by enabling a decoupling of

1. See “Adding Value(s) to Investing: Sustainable Investing”, UBS WM CIO, March 2015.

economic growth from the depletion of natural resources, thereby placing the economy on a sustainable path. This inherently high potential for positive impact should be highly appealing to impact investors.

Since the onset of the industrial revolution, economy and ecology have often been at odds. Their common Greek root has been forgotten. The circular economy enables

policy makers, businesses, investors and civil society to merge these concepts back together in a mutually beneficial way.²

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A Circular Economy Will Reset Finance

By Frido Kraanen, PGGM and Working Group FinanCE

For centuries, most traditional economies have barely budged from a linear model of production whereby goods are created and, once used, more or less forgotten. These products may be out of sight, but they have not disappeared. Some items, like coffee cups or takeout containers, serve their purpose in just minutes yet remain, like thousands of other types of products, in landfills or waterways for hundreds of years. As the challenges of pollution, fresh water access, and resource availability become more pronounced, the utility of these linear production processes is finally being called into question. What if products could be created to be functional from beginning to end? That's the vision of a "circular" economy, which is not "resource efficiency" or "smarter recycling"; rather, we're referring to a production process which consciously considers a product's entire lifecycle.

PGGM is a Netherlands-based pension service provider, having over 200 billion Euros in assets under management for 2.8 million participants of eight pension schemes. A little over two years ago, we became a member of the CE100 platform of the Ellen MacArthur Foundation and founded the Working Group FinanCE, where now fifteen organizations (investors, banks, accountants, academics) are studying the consequences of an economy that will be increasingly based on circular principles.

This working group has a goal that is threefold: understand the implications of a circular economy on the business and financing models of companies, determine how a transition to a circular economy can be supported and accelerated by the financial system, and share our findings and conclusions with colleagues, clients, and academics.

At the beginning of 2016, the working group published our inaugural report, [*Money makes the world go round \(and will it make the economy circular as well?\)*](#). For the working group members, many of whom were taking a deep dive in the concept of circular economy for the first time, the anticipated benefits, particularly on the financial industry, were even greater than expected. The conclusion of this exploration is astonishing: an economy based on circular principles has the potential to fundamentally transform business and finance as

we know it, from company structure to supply chains to household expenditures. We're talking about the possibility of a tectonic shift in the macro-economy.

All financiers, not only the ones that have "corporate social responsibility" commitments, should consider lending their hand to promote a circular economy. Given the current and pending resource scarcity of multiple, critical material inputs in the coming years or decades plus the resultant impact on prices and therefore business survival itself, a linear economy is simply not sustainable. This is not some wish by a green activist, but a fact-based economic forecast. I submit to you five reasons why the transition to a circular economy is very relevant for financiers:

- » Increasingly, a linear business carries risks. Just as there is a growing awareness of the risk of climate change to the economy, so can we see that not adopting circular principles will eventually lead companies to a lagging market position and decreased valuations. Linear risks currently pervade our portfolios!
- » Businesses have been positioning themselves to become more sustainable so as to better handle increasingly dynamic and challenging global conditions. Quality of management will be more and more determined by the ability of leaders to instill resiliency and agility within an organization, and not just as it pertains to resource scarcity.
- » Engaging with circular entrepreneurs provides us with an opportunity to see the future and improve our knowledge of an economy that is more considerate of a product's lifecycle. The solutions presented by these entrepreneurs often embrace new smart technology, sharing platforms, or ownership models, giving us insight into potential investment opportunities.
- » Non-financial value is of growing importance for company stakeholders. And the reverse is true: stakeholder influence is of growing importance for companies. The transition to a sustainable, circular business model will be increasingly demanded, not just as a nice extra for reputational purposes, but as a core tenet of business.

- » Banks and investors, besides being “the money,” have a duty to use their positions of influence as a steering tool. The move towards a circular economy should not be a sub-divisional goal of some far-removed CSR department, but rather an integral part of a corporation’s investment strategy. Through capital and engagement, financiers should be supporting, incentivizing or otherwise promoting the shift toward a circular economy.

In short, just as with any investment opportunity we undertake, the circular economy is about opportunities, risks and impact. The macro-economic gains of transitioning from a linear to circular economy, forecasted in billions of dollars of GDP, are impressive enough. But there are other advantages as well. To start, a circular economy is more labor-intensive and will therefore provide more jobs, especially among less educated populations. Secondly, resource dependency will diminish as economies will be less reliant on virgin stock from distant locations. Last but not least, a circular economy will avoid some of the negative externalities that societies in a linear economy must continually bear.

The transition to a circular economy would be a true systemic change. However, we see that all stakeholders are still thinking of the linear economy as a default model. This includes governments that favor, for instance through their tax systems, companies with a linear mode of production. But the risks of a linear economy are outweighed by the opportunities of a circular economy, and a coordinated transition is therefore necessary. The financial sector has a role to play and, as a public pension plan, we take this responsibility seriously, not just for our own benefit, but society’s. This huge, unavoidable change of our economies will mean a reset of our financial rules, attitude and assessments. And the sooner, the better. A managed transition, with the financial industry playing a major role, will be quicker, less costly and more effective – a true financial benefit!

Frido Kraanen is the Director of Societal Impact at PGGM and Chair of the Working Group FinanCE.

Catalyzing the Wealth Management Industry Toward Environmental and Societal Change

By Anna Snider, Bank of America Merrill Lynch

In 2015, Bank of America (the Bank) launched the Catalytic Finance Initiative (CFI) as a way to advance innovative financing structures with the goal of driving at least US\$10B of investments in renewable energy, energy efficiency and energy access, including access to lower income communities. This is part of a broader US\$125B commitment by 2025 that the Bank has towards climate change and the demands on natural resources.

This initiative represents a number of convergences occurring between the capital markets and the pursuit of impact. While many investors still regard environmental, social and governance (ESG) investing as a niche investment approach, the goal of shifting capital towards those corporations and entities that consider their broader role in society has gained ground. Corporations have been responding to increasing requests by investors for transparency, data and a long-term strategy that accounts for how management teams think about their businesses' effect on both the community and society at large.

Client demand for impact-oriented investment solutions is also a source of this convergence. In 2014, half of clients surveyed said that they would likely increase their ESG investments if they performed competitively. While the Millennial demographic and women across age groups led the way in interest, respondents across all surveyed generations identified healthcare quality and access, the environment and education³ as top concerns. The themes reflected above are in areas that clients are interested in ameliorating, and those same areas have been identified in research that we call "A Transforming World."

This work identifies long-term, structural investment opportunities where private capital (in addition to other traditional sources of capital) is required to address systemic issues. Themes include alternative and efficient

energy, water and sustainable assets and gender and income inequality, among others.⁴ We believe that these global themes will shape our future while also providing the opportunity for portfolio growth and aligning client financial goals with positive systemic change.

Until relatively recently, it was challenging for most investors to access these solutions. However, a range of investment strategies across multiple asset classes (equity, debt, both public and private) have been developed with the intention of addressing these systemic issues. For example, clients can now incorporate social issues into their investment portfolios that reflect innovative gender equality strategies, advancements in healthcare and improving local communities. In the environmental arena, investment opportunities that reflect circular economy focused solutions span from the redirection of capital to resource-efficient companies to alternative energy solutions. Green bonds (which the Bank helped to pioneer) are an important tool to facilitate solutions-based financing for the US\$93T of investment in low-carbon infrastructure required through 2030E. Without action, the global cost of climate change could rise to 1-5% of GDP/year, while global investment portfolios could lose up to 45% of their value by 2020E.⁵

There remain many challenges in moving the wealth management industry to adopt ESG investing, let alone the circular economy. Among them is the persistent belief that these strategies do not help meet financial goals⁶ and a lack of awareness about both the types of solutions and the innovation that has occurred in this space. This requires continuous "mainstream" education, as well as academic and empirical research. Traditional ways of considering fiduciary risk and responsibility need to be challenged (despite rulings such as the Department of Labor's October, 2015 ruling on environmental, social and governance based investing⁷ and the IRS ruling on foundations investing in impact⁸) to help unlock capital flows. Measurement techniques and metrics that prove

3. Bank of America Merrill Lynch ESG Market Research. 2014.

4. 2016 BofAML: A Transforming World.

5. Climate Capital – Global Green Bonds Primer. 12/01/2015. BofAML Global Research.

6. With all the improvements in the impact investing space, smart use of impact data has been shown to help reduce portfolio volatility by helping managers identify risks beyond the balance sheet and even help spot opportunities in the marketplace. In fact, companies that demonstrate ESG prudence have been able to reduce risk and potentially enhance shareholder value. As a result, these benefits can actually help lead to enhanced risk management and performance of a portfolio.

7. [ERISA IB 2015-01](#)

8. Internal Revenue Code (IRC) Section [4944](#).

the positive effects of these investment approaches, especially at a systemic level, require further definition and development, and even different timeframes within which the evaluations are conducted.

More transparency is needed from companies regarding the effects of production and practices on society and the environment. However, both institutional investors and a new generation of investors, including a significant cohort of women, are demanding this – and companies are responding. Furthermore, large industry groups, including Principles for Responsible Investing, U.S. SIF: The Forum for Sustainable and Responsible Investment, and Ceres, have been successful in helping to shape policy. They have also been successful in mobilizing the investor community, along with the financial service industry, to consider social and environmental factors in their mandates.

Ultimately, we believe that investing with the intention of having a positive systemic impact is not a convenient trend, but a long term structural change in how the capital markets will direct financing in the future – a sustainable opportunity we like to refer to as Impactonomics™.⁹

Anna Snider is a Managing Director and Head of Due Diligence for the Chief Investment Office within Global Wealth & Investment Management (GWIM), a division of Bank of America Corporation. In this role, she is responsible for manager research across all asset classes for the wealth management businesses. She also defines and executes investment strategies focusing on impact strategy research, thought leadership and investment implementation.

9. <https://www.ml.com/articles/investing-for-maximum-impact.html>

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This report is the result of a multi-year effort that began in 2015 with the release of *Bringing Impact Investing Down to Earth: Insights for Making Sense, Managing Outcomes, and Meeting Client Demand*, which was published by the Money Management Institute. While that report generally examined the growing client demand for investing with impact and the obstacles to truly widespread adoption within the wealth management industry, it also included a specific focus on how circular economy business models create new investment opportunities.

The response to that work was decidedly positive, and we realized quite early on that we had struck a chord with a growing class of investors that were eager for us to explore the concept further. Thus we spent the subsequent year and a half working with investors of all types and sizes to better articulate the opportunities, address the challenges, and pinpoint the breakthroughs needed for investment capital to more easily flow to financing the circular economy. For instance, we partnered with The Impact Investor Club, PGGM, the UK Social Stock Exchange, and the Ellen MacArthur Foundation on an event for the Disruptive Innovation Festival. During the event we explored how investing with impact and circular economy strategies provides the opportunity for social and environmental impacts as well as financial returns, all while decoupling growth from resource constraints.

Also of note was the work we did with the Clinton Global Initiative (CGI) to support CGI's broader program on the circular economy in advance of its 2016 annual meeting in New York City. To this end, we informed the creation of a number commitments to action, as well as convened key stakeholders on May 26, 2016 in London on the circular economy as a framework for innovation and investment. The meeting, hosted by CGI member Hogan Lovells, brought together senior representatives from business, government, academia and finance.

These efforts helped inform and enhance the report you now hold. Having said that, we would be remiss if we did not specifically acknowledge a few folks that were instrumental in the development of this body of work. We would thus like to thank members of both the TIIP (Steve Lydenberg, Jessica Ziegler, and Will Creighton) and Circularly Capital (Ian Nolan, David Mowat, and Andrew Shannon) teams who contributed their boundless talents and energy to making the analysis contained here as strong as possible. We would also like to express our gratitude to Ian Banks (Ellen Macarthur Foundation), Maria Mahl (Arabesque); and Avi Deutsche (LAVAN) for their many substantive contributions and insights.

Last but not least, we want to thank the folks sharing the masthead with us. Adam Bendell, Lisa and Charly Kleissner (Toniic), Stephen Freedman (UBS), Frido Kraanen (PGGM), and Anna Snider (Bank of America Merrill Lynch) are each helping to bridge the divide between financial markets and the circularly economy via thought leadership, investor community building, and innovative investing. Their willingness to join us on this journey has been a limitless source of inspiration and support.

We view this report as a key tool for investors to utilize as they begin to turn their attention to the circular economy. We look forward to making additional contributions to this promising area in the years ahead.

AUTHOR INFORMATION AND ABOUT TIIP

William Burckart. Mr. Burckart is the President and COO of The Investment Integration Project (TIIP), a provider of data and analysis that enables institutional investors to make the connection between portfolio-level decisions and systems-level considerations. He has been at the forefront of impact investing and has contributed to the field through groundbreaking research, including leading a multi-year field building effort focused on the financial services industry in collaboration with the Money Management Institute; managing the production of (and is a contributing author to) the *New Frontiers of Philanthropy: A Guide to the New Tools and Actors that Are Reshaping Global Philanthropy and Social Investing* (Oxford University Press: 2014), and was involved in the writing of the *Status of the Social impact investing Market: A Primer* (UK Cabinet Office: 2013) that was distributed to policymakers at the inaugural G8-level forum on impact investing. Mr. Burckart is a visiting scholar of the Federal Reserve Bank of San Francisco, serves on the Global Advisory Council of Cornerstone Capital Group, and is a founder or co-founder of two impact investment advisory firms (Burckart Consulting and Impact Economy).

Jamie Butterworth. Mr. Butterworth is a founding Partner of Circularity Capital and former CEO and part of the founding team of the Ellen MacArthur Foundation, a global hub for circular economy innovation. Mr. Butterworth has developed a deep understanding of how the circular economy drives value, working with a number of the world's leading brands to support them in successfully deploying circular business models. Mr. Butterworth has also been instrumental in developing and launching the Circular Economy 100, a platform for multinationals, SMEs, academic institutions and municipalities to capture the commercial opportunities of the circular economy. Mr. Butterworth is a business fellow of Oxford University's Smith School and has contributed to a number of forums on the circular economy including at the World Economic Forum and the European Commission Resource Efficiency Platform.

About The Investment Integration Project (TIIP). TIIP helps institutional investors understand the big picture, or “systems-level,” context of their portfolio-level decisions. This is important because “systems-level” events, such as economic crises, ecosystems under stress, and societies in turmoil can disrupt the best-laid plans of investors and cost them dearly. Even seemingly “local” issues are now having much greater impact than they once did as the world becomes increasingly interconnected. TIIP designs, provides and maintains data and analytics that enable institutional investors to make this important connection between portfolio-level decisions systems-level considerations. TIIP's research portal and database of investor profiles, market analysis, and practical guidance provides a way to better match investors, benchmark systems strategies, and optimize program development. Investors leverage TIIP's data and analytics to solve program inefficiencies, enhance impact measurement, and boost absolute returns. Learn more at www.tiiproject.com.

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