CANDRIAM
A NEW YORK LIFE INVESTMENTS COMPANY

Investing for a circular future

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Marketing communication

About the authors.

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David has managed the Candriam Sustainable Equity Circular Economy strategy since December 2021, bringing his broad ESG experience to investors. Previously, he was Head of ESG Development at Candriam, where his role was to deliver Candriam's unique blend of sustainability credentials and market wisdom to investors and market participants. Before joining Candriam, David led the growth of sustainable investment strategies in several European countries at Sycomore Asset Management and in Northern Europe at Erste Asset Management. David started his career in finance with BNP Paribas in London on the equity derivative structuring desk in 2007.

David holds an MBA from the University of Cambridge specializing in finance and strategy as well as Masters degrees in political science from the Free University of Brussels and the Catholic University of Louvain.

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Bastien joined Candriam as Senior Portfolio Manager in 2022. Prior to his involvement with the Candriam Sustainable Equity Circular Economy strategy, he managed a number of environment-oriented investment strategies at London based investment FinTech Clim8 Invest. Before that, he spent seven years at Lombard Odier in Geneva as an analyst, and has also been a sell-side analyst in the energy sector.

Bastien holds a masters in Offshore Technology from Cranfield University in the UK, and a Masters in Business Management from HEC in Paris.

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Investing for a circular future.

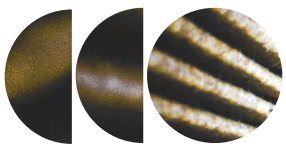
The need is clear. We are consuming our natural resources at a pace equivalent to 1.7 earths, an unsustainable rate. Virgin resources are finite. Meanwhile, non-biodegradable waste is fouling oceans and landscapes which were once thought to be infinite.

The definition remains fluid. The circular economy still lacks both a universal definition, and even a set of widely accepted guidelines. This transformation is creating a wide array of new businesses and investors.

The growth potential is clear. It is estimated that the global economy is only 9% circular.[1] That's a lot of market opportunity. Climate change mitigation will not be achieved without the large-scale deployment of circular economy solutions in housing, mobility, and food.

The shape is beginning to crystallize. While the circular economy is a complex subject, its necessity is being recognized. Local and regional efforts and regulation are growing.

So how does Candriam evaluate a circular investment?



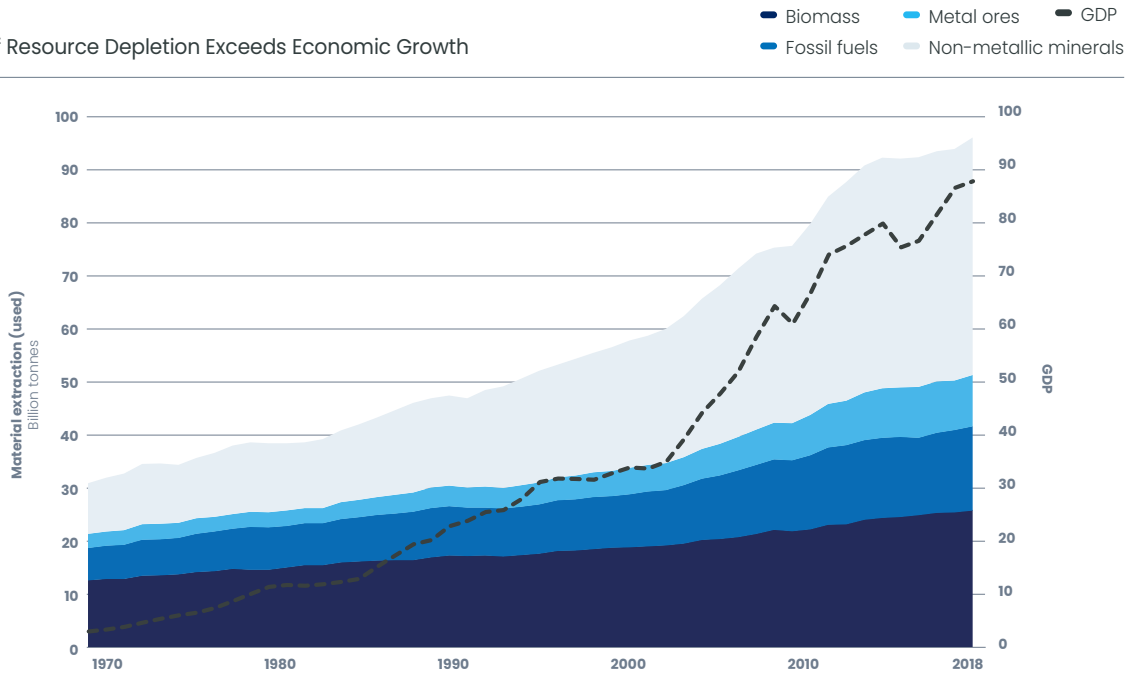

The need is clear. We are consuming our natural resources at a pace equivalent to 1.7 earths, an unsustainable rate.

Executive summary.

Completing the circle of life

To invest in the transition to a circular economy requires an investment-oriented framework. Broad frameworks, such as the EU Taxonomy, are available and their definitions are becoming more precise, but they are not sufficient for investment decision-making. Such a framework should allow investors to make capital allocation decisions that promote the transition to a circular economy, based on the information at their disposal and a framework turning that information into actionable knowledge. Most existing frameworks are either too high-level for investors' purpose, or require perfect information on the companies' processes. Investors typically do not have access to detailed information on processes, even less so when it comes to indicators related to the circular economy. The *company* circularity frameworks which currently exist, such as the Circulytics model offered by the Ellen MacArthur Foundation, are designed to help companies assess their own circularity, using internal data which may not be available to investors. As investors, we do not have the same transparency and granularity as a company assessing itself using its non-public data.

Figure 1:
The Rate of Resource Depletion Exceeds Economic Growth



Source: Material extraction data from UNEP (forthcoming in 2016b), GDP data from UNSD (2015)

The rate of resource depletion has exceeded the rate of GDP growth for decades. This equation must reverse, or we will run out of resources. A non-circular, or linear, economy creates a wide range of externalities as well. Further, existing carbon targets and regulation can most easily be met by improving circularity in the three major areas of housing, transport, and food and agriculture.

We offer a framework and a scoring model, created by investors and designed for investment decision-making. We propose one method, not the only possible method, to establish the precision needed to translate the high-level concept of circularity into an investment strategy. Our framework identifies companies which help reduce the need to extract virgin resources whilst mitigating waste generation, in particular non-biodegradable waste. It offers a company scoring methodology which enables comparability across industries, and over time. Our intention is to provide clarity and transparency in the parameters we have set for our analysis of, and investment in, circular companies.

We have designed our investment scoring to expand with the available thinking. Therefore we have drawn on the work of others, including the circularity principles of the Ellen MacArthur Foundation:

- Design pollution and waste out of the system.
- Keep material and products in use at an optimal level.
- Build and restore natural capital and regenerate natural systems.

To identify circular companies, we find it useful to categorize them in terms of their circular contribution to *verticals*, or circular business chains, rather than by activity or industry sector. These verticals are:

- Housing and infrastructure
- Mobility
- Food
- Products and consumables
- Healthcare
- Communications and Information Technology

Notably, some specific climate goals already in place cannot be met unless circularity is sharply increased in construction, transport, and food/agriculture (figure 8). This is one way in which our model both fits within existing sustainability frameworks, and is designed to align as much as possible with future circularity frameworks.

The ideal metrics for measuring circular companies, at least as defined in leading academic research,[2] are not yet made widely available by companies. This is not a new problem in sustainable research. But we believe that metrics in areas such as greenhouse gas emissions and workforce data show that investor interest and engagement can lead to the creation and reporting of new data types.

We have designed an investment framework to form a bridge between today's broad circular concepts and tomorrow's data reporting. Our framework analyzes companies across three pillars, consolidated into a single score:

C³S Candriam Circularity Company Score

The Candriam Circularity Company Score

- **Circular results**
- **Circular commitment**
- **Circular momentum**

We measure circularity results in four areas -- Use Less, Recover, Use Longer, and Share. Crucially for an investment process, our scoring is designed to track company progress over time. We hope that by using publicly-available raw company data, sector-specific metrics, and a qualitative assessment we can score companies on a comparable basis, and track changes in those scores over time.

It is our Conviction that we can invest for a circular future.

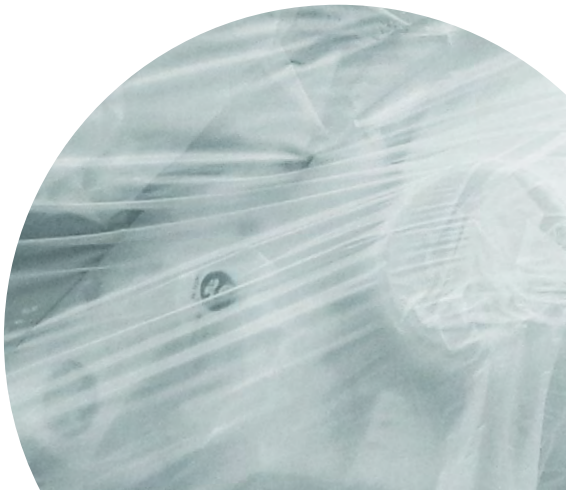
Defining the issue.

The linear economy: Concept

Today's global economy can be thought of as a 'take-make-use-waste', or linear, result from the way we pursue our economic activities. In just the first seven months of the year, our economy uses as much of our global natural resources as can be replenished in a full year. This break-even date arrives earlier each year. If we continue on this path, by 2050, we will be consuming three earths – that is, consuming at three times the replenishment rate.

This linear result has been the foundation of economic growth since the 19th century. In 1733, at the outset of the Industrial Revolution, the earth supported a global population of less than 800 million people. This year our population will surpass 8 billion. Do the math.

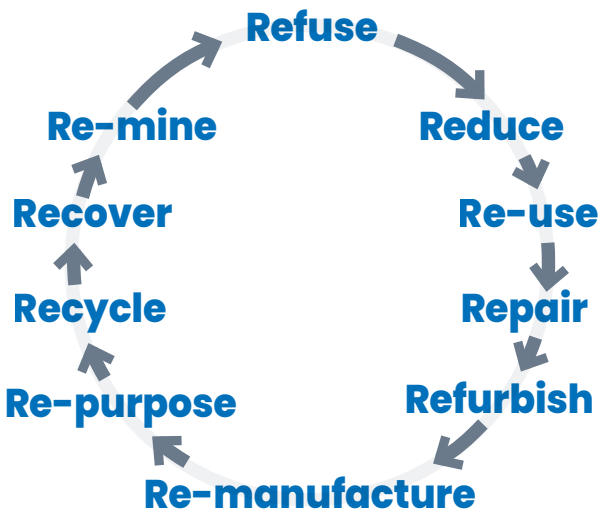
Figure 2:
The Linear Economy



The circular economy: Concept

The circular economy is a societal model[3] in which the need for virgin natural resources is reduced to a minimum, and non-biodegradable waste is eliminated. The aim is to regenerate goods rather than dispose of them. To reuse, refurbish, recycle, and share. We argue for the need for a circular economy in our 2020 paper, Circular Economy: Paradise Restored?

Figure 3:
The Circular Economy



The circular economy: Definition?

Reduce, re-use, repair, recycle is clear enough in concept. Yet in practice the circular economy is quite complex, and only loosely defined. It is a far less global initiative than those addressing greenhouse gas emissions reduction, and those elements of a circular economy which do exist arise from a broad range of (often uncoordinated) initiatives.

As a result, **the circular economy still lacks a universal definition, and therefore also lacks a set of universally-accepted guidelines.**

Existing frameworks

The existing frameworks were designed for improving circularity, not for investing. They are all complex to implement within an investment context.

We believe they are simultaneously complex, and insufficient, within an investment context.

The Ellen MacArthur Foundation

The Foundation defines the circular economy around **three main principles**:

- Design pollution and waste out of the system
- Keep material and products in use at optimal level
- Build and restore natural capital and regenerate natural systems

The EU Taxonomy and other Regulation

The European Union is not the first political entity to enact circularity legislation. However the EU Taxonomy is the most ambitious, and is at the forefront of establishing a broad and measurable framework. The EU has defined the transition to a circular economy as one of its six environmental objectives, and circular companies will be required to meet "technical screening criteria". These criteria are in draft form, and are expected to be enacted in 2023 or 2024. The complexity of the technical screening criteria and the fact that the taxonomy only applies to companies operating within the EU, limits the investment usefulness of this framework for the next few years.

Regulation is also pending or already in place in nations such as the UK, Japan, and China.

Less specifically, but as a reminder of how circularity is a prerequisite for so much else, the UN Sustainable Development Goals encompass circularity in several of the 17 goals, for example SDG 6 -- clean water, or SDG 12 -- responsible consumption and production.

Figure 4:
Global Circular Markets
Circularity is a prerequisite for many of the UN SDGs

Circular Opportunity
Water & Wastewater Management

Circular Opportunity
Upgrading Infrastructure & Industries for Resource Efficiency

Circular Opportunity
Minimizing Product Life Cycle Waste from Design through End of Life

Circular Opportunity
Placing a Value on, and Minimizing, GHGs

A Sampling of Circular Frameworks

Regulation – existing and pending

The EU Taxonomy – in progress (some recycling at member state level)

UK – planned, some plans at state level, eg Scotland and Wales

Japan – early pioneer, some recycling laws since 1991

China – first laws in 2009

US – some states (at Federal level, only recommendations so far from the EPA)

UN Sustainable Development Goals

Circular objectives are embedded in at least 7 of the 17 SDGs, for example, SDG 6, Clean water and sanitation.

The Ellen MacArthur Foundation

The EMAF defines three main principles for a circular economy.

Numerically, the Foundation makes it Circulytics circularity model available to companies to create their own scores.

The World Business Council for Sustainable Development

The WBCSD offers companies a model for companies to self-score themselves on circularity, as a means to help them understand and address their circularity gaps.

Capitals Coalition Initiative

Principles for evaluating externalities.

From ideology to investment.

> **Not everything that counts can be counted, and not everything that can be counted counts.**
>
> **– Albert Einstein, 1963**

Two main frameworks are in place today for measuring the circularity of a company. The numerical measurement, the CTI or Circularity Transition Indicator from the World Business Council for Sustainable Development, is a self-assessment performed by the company which desires to understand its own circularity. The Circulytics 'measurement' from the Ellen MacArthur Foundation, while independent, is qualitative but offers the advantage of being forward-looking. Again, it is for companies which choose to submit to the analysis, and is not applied to all companies.

Both indicators are designed for the companies to understand their circularity gap and how they can improve from here. The level of granularity required to compute these scores is by no means commensurate with what companies disclose in their annual or TCFD-guided[4] sustainability reports. Admirable efforts, but difficult for investors to rely on these frameworks.

The current lack of circular investment scoring methods should not be surprising given the challenges.

Challenges

Taxonomy – what exactly is a circular activity?

The lack of a widely-agreed taxonomy for measuring circularity of economic activities results in a lack of standardization, and a lack of common goals. For example, for the issue of climate change there is broadly-accepted consensus that the tipping point is 2 degrees Celsius above the 1850-1900 reference period, and a widely-recognized goal of net zero carbon emissions by 2050.

We know the depletion of our resources is unsustainable. We do not yet have an estimate of the tipping point, we lack the more specific targets that the climate change taxonomy offers. Even the most ambitious attempts, such as the EU taxonomy for circular activities, remains a work-in-progress at the moment.

Key indicators

Lack of a consistent taxonomy also means lack of a clear list of circularity metrics to evaluate and compare companies. The 2022 EU proposal for Ecodesign, currently under discussion, lists 14 qualitative criteria. Even this proposal, the most ambitious to date, leaves provides little in the way of data or comparability.

Academic research is expanding. The Cambridge Institute of Sustainable Leadership (CISL) writes that measuring a company's progress from linear to circular requires "a deep understanding of value chain material flows . . . supply chains, efficiency of operation, and . . . post-production, including the use phase".[5] The CISL proposes that ideally, metrics would measure:

- Whether inputs materials are from virgin, certified sustainable or reused resources
- Operational efficiency in terms of different types of direct waste streams
- The durability and reparability of products
- Alternative business models (such as "servicization", leasing and the broader sharing economy)
- End-of-use phase material flows, including material to landfill, incineration, recycling, and/or re-manufacturing.

The CISL then concludes that it is not possible to apply these metrics today.

The Data Problem

Comparable data for circularity across a large number of companies is probably years away. The data problem which plagues all sustainable investing hinders circular investing as well. Circular data availability lags that of some other extra-financial metrics because of the lack of a taxonomy, and the lack of KPIs (Key Performance Indicators).

Consider again the comparison between circularity data and climate change indicators. The 2-degree climate change scenario led to a net zero carbon target, which in turn led to the independent calculation and reporting of Scopes 1, 2, emissions for companies. Contrast this with the example of plastic waste. With no standard to calculate percentage of waste recycled, companies reported plastic waste shipped to China as 'recycled'. Some of this was not being recycled, and in 2017 China banned imports of most plastic wastes. Lack of reporting standards – and tracking – made this calculation 'shortcut' possible.

The Candriam circular investment framework.

The need

General agreement on taxonomy, metrics, data, and reporting seems several years away. Even the existing measurements, mostly CTI and Circulytics, rely on willing companies to volunteer to the analysis. These companies are typically already interested in a better understanding of their own circularity. While in future these scores may perhaps be widely communicated to investors, this is probably several years in the future.

That is why Candriam has built our own circular investment framework, based on publicly available information. Our intent is to provide a comprehensive model enabling investors to quantify a company's exposure to, and contribution to, a more circular economy.

It is our conviction that investing in circular companies requires a multi-metric, but single-figure score. There are several reasons we felt the need to develop a numerical circularity score incorporating an array of quantitative and qualitative information into a single metric. One reason is to allow comparability between companies, including within and across sectors. Another reason is to overcome some of the data quality pitfalls.

In designing the Framework, the guiding principle has been that circularity assessment is akin to a police investigation starting from a cluster of small evidence that, when pieced together, form a coherent picture of reality. When it comes to circularity no single factor provides the full picture about the company's alignment and contribution. Our goal is therefore to gather evidence from the company's activities, its historical performance, and its commitments, and to complement these elements with our own assessment of its circularity credentials.

> **In designing the Framework, the guiding principle has been that circularity assessment is akin to a police investigation starting from a cluster of small evidence.**

We believe that a company's journey towards more meaningful and impactful circularity can hardly be summarized from a few high-level metrics around use of recycled materials or delivery of reused products, but requires instead a more holistic analysis of the company's commitment to circularity.

A word on 'Enablers' and 'Transformers'

For pure players in a naturally circular sector such as metal recycling, the company's activities already provide significant evidence of the company's circularity. For most companies with a potentially significant impact on the circular economy, the nuanced evidence demands a more comprehensive analysis.

A distinction is often made between 'Enablers' providing goods and services which facilitate the transition to a circular economy, and 'Transformer' companies which are becoming more circular themselves. Enablers typically appear in a limited number of sectors such as metals and mining, chemicals, capital goods, utilities or information technologies, while Transformers are more widely distributed among high-impact industries.

Comparisons can become awkward. The circularity of Enablers can often be measured by the share of activities providing circular solutions. The circularity of Transformers cannot be measured in this straightforward way. By definition, Transformers are companies that are starting from a given, and often low, level of circularity and are seeking to become more circular. Frequently they accomplish this transition in part by using solutions provided by the Enablers. Attractive in concept, in practice distinguishing between Enablers and Transformers is defeated by the diversity and complexity of businesses in the real world and the efforts of the best Enablers to also Transform their own operations into a more circular model. That being said, it follows from their higher degree of specialization that Enablers will tend to obtain a higher circularity score than Transformers.

To resolve these issues, the Candriam Circularity Framework does not explicitly distinguish between Enablers and Transformers. Every company is analysed using the same framework and the same three key dimensions.

Circular Verticals

A more circular economy requires the economy to transform its most resource-intensive value chains. To measure how companies are contributing to a circular transition, we can draw on some existing concepts. For our circular investment framework, we organize companies according to six **verticals**, or **circular value chains**:

- Housing and infrastructure
- Mobility
- Food
- Products and consumables
- Healthcare
- Communications and IT

Reasoning in terms of verticals, or economic value chains, rather than by sectors or activities helps us to broaden our perspective. We are able to identify circular businesses activities that are sometimes missed. One example is software companies which create digital replicas of physical assets (so-called digital twins) that can be used to assess wear, plan maintenance, and extend the life of an asset. We add ecodesign as a horizontal contributor to these six verticals. For the sake of not overloading the model we treat ecodesign within each vertical or within the Communications and IT one.

Circular economy and climate change mitigation

Large scale deployment of circular economy solutions in housing, mobility, and food verticals would contribute substantially to climate change mitigation (figure 5). The relationship between a linear economic model and growth in greenhouse gas emissions has been established. Our verticals approach offers insight into the areas where increased circularity can have the greatest contribution to decarbonization.

Figure 5:
Interconnection between Circularity and Climate Mitigation

	Housing / Infrastructure	Mobility / Transport	Food / Nutrition	Products	Healthcare	Communications
CO2 reduction potential, gross(Gt)	**18.5**	**8.1**	**7.5**	**1.8**	**0.2**	**0.2**
Materiality	Very high	High	High	Moderate	Low	Low
	Ex: Resource-efficient construction, Natural housing solutions, Reduce floor space, Increase durability, circular materials	**Ex:** Reduce travel, Improve vehicle utilization, Durable vehicles	**Ex:** Healthy diet, Reduce excess, sustainable agriculture	**Ex:** Chemical-free, Circular consumables, Durable products	**Ex:** Circular healthcare	**Ex:** Efficient design of ICTs

Source: Candriam, Circle Economy, Goldman Sachs investment research

C³S Candriam Circularity Company Score

A three-dimensional framework

After identifying the circularity candidates through the use of six verticals, the Candriam Circularity Framework assesses and scores their contribution across three pillars to create a score.

- **Circular results – 60%**
- **Circular commitment – 20%**
- **Circular momentum – 20%**

The Candriam circularity scoring model.

No single metric can capture a company's circularity.

We have designed a model which combines a number of metrics to generate a single-score result which is both useful to investors, and as accurate as possible given the current fragmentation of taxonomy and data.

Figure 6:
The Candriam Circular Company Scoring Model

Circular Commitments

The Circular Commitments score assesses the company's **resources**, level of **strategic integration** and credibility to make the economy more circular.

Circular Results

The Circular Results are based on a detailed assessment of how the company contributes to circularity through its **products**, **service**, as well as the way it **operates**.

Use Less
Integrate renewable, biodegradable, recyclable inputs in value chain and reduce need of raw materials.

Recover
Provide or enable waste collection, waste sorting, treatment, recycling, upcycling, downcycling.

Use Longer
Extend product life through eco-conception, repair services, refurbishment, second-hand markets.

Share
Allows consumers and businesses to share use an/or ownership of products or for companies to optimize use phase through products as a service.

Circular Momentum

The Circular Momentum adopts a **forward-looking** perspective to evaluate the company's **circularity trend**: how much and how fast is the company transforming itself or helping others to transform themselves towards greater circularity.

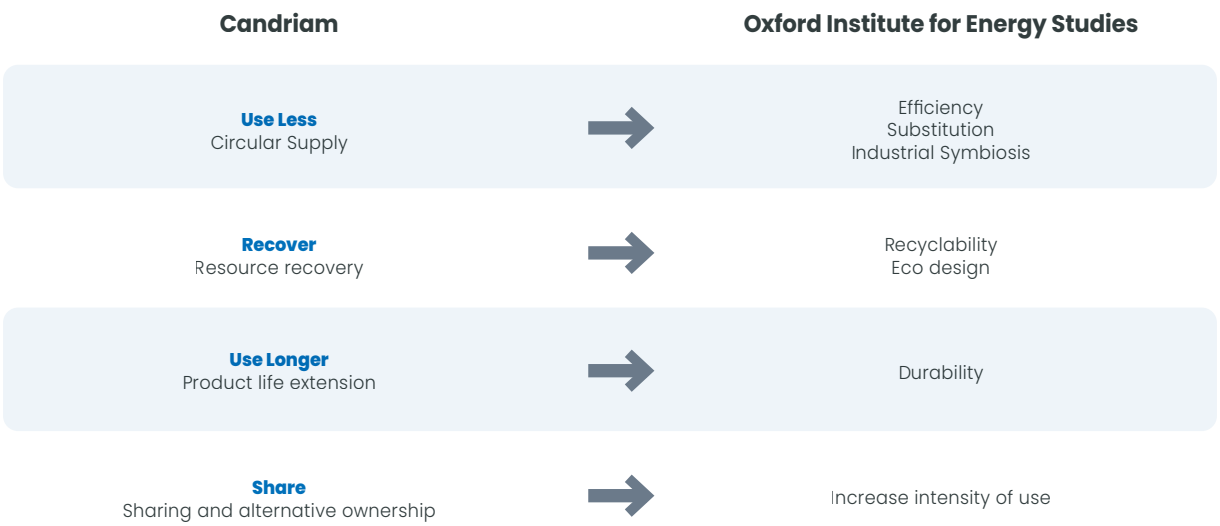
Circular results – 60%

The circular *Results* are the core of the Candriam Circularity Framework. Commitments and Momentum provide valuable insights, but actual contributions are what ultimately matter to transform to a circular economy.

After an extensive review of the Reuse/Recycle/Repair (figure 3) and other frameworks, we rely particularly on the Oxford Institute for Energy Studies report of April 2021.[6] The OIES framework relies on seven levers that support the decarbonization of our economies while allowing for the decoupling of economic growth from resource consumption.

We translate these seven circular levers into four Circular Results that we call **Use Less**, **Recover**, **Use Longer**, and **Share**. *Every company, no matter the nature of its contribution the circular economy, will need to contribute to at least one of these four circular results.*

Figure 7:
Candriam Circularity Framework – Four Circularity Results



> **Every company, no matter the nature of its contribution the circular economy, will need to contribute to at least one of these four circular results.**

Use Less

Renewable materials, in our model, are those which come from nature and can be replenished in a timeframe compatible with production. That is, use less than one earth, not the 1.7 earths we are using today. Renewable materials are often also biodegradable, again within a timeframe, and without human intervention. We distinguish renewable from recyclable, as recycling requires some input of energy and active treatment of the material before it can be reintegrated into the supply chain.

Indicators used include the proportion of materials which are renewable or biodegradable, but also whether at least an equal amount can be replenished, and replenished without compromising other environmental objects. Other ways to Use Less include increased efficiency of resources, or reuse such as sourcing refurbished or recycled inputs.

Recover

Beyond the use of recycled materials (Use Less), companies can Recover resources downstream from manufacturing. This might include collecting used materials at the end of their life, sorting them to aid in reuse, or processing them so that they can be used as raw materials rather than extracting or creating virgin materials. Waste and water treatment can be a 100% circular resource, when managed in a way which permits its reinjection into the production process.

Use Longer

It is possible to create long-lasting products which change through their lifetime, benefitting the consumer and generating ongoing revenue streams. Since the longer the useful life of a product, the less often a new one will need to be manufactured, designing products which can be upgraded by the users can delay obsolescence, while designing products which can be repaired can extend life. (In your grandfather's day, TVs could be repaired.) Some companies are making it easier for consumers to purchase refurbished products; they can extend their circularity by facilitating second-hand marketplaces.

Share

We share holiday homes by co-owning, so why not power tools, bicycles, and cars? Or one can share the service from the product –- for example a ride sharing service, instead of renting an actual car.

To be considered, a company must contribute to at least one of the four results --- Use Less, Recover, Use Longer, or Share. Given the variety of business activities, companies are usually scored on one or two of these areas. In scoring Results, we again have a scale to 10, on which a 5 indicates a company which is in line with its peers.

C3S Candriam Circularity Company Score

for a large industrial company

To be considered circular, a company business model must address one or more of the four elements of results. Given the diversity of industries, company business models typically address one or two.

Circular results – 60%		**7.2**	
Use Less	Renewable/Biodegradable	**7**	Direct supply green power, overall ca. 5% raw materials from renewable resources, ca 5% recycled content. Although small numbers in absolute terms, they are above peers.
	Efficiency gains	**5**	Emphasis on resource efficiency, mainly water
	Reused	**7**	Pronounced emphasis on product reuse, including design, most wood fiber from certified sources
Recover	Collecting/Sorting	**6**	Significant effort to capture, recover, and recycle raw materials waste during manufacturing.
	Recycling	**10**	Recycling is the priority in its strategy.
	Waste/Water treatment	**0**	Majority of waste water sent for external treatment.
Use Longer	Long-lasting		
	Reuse/Refurbish		
	Repair		
Share	Sharing services		
	Product as a service		

Circular commitments – 20%		**6.3**	
	Strategy	**9**	Ambitious circularity strategy includes designing products to be recycled, uses up to 70% recycled materials in its products
	Resources	**5**	Strong R&D but amount dedicated to circularity not disclosed
	Management	**5**	Circularity takes high place in strategy, but not in compensation

Circular momentum – 20%		**7.0**	
	Momentum	**7**	Emissions reduced 14% since 2016, renewable electricity supply rose from 7% to 33% in two years, future objectives established

C3S: Circularity score	**7.0**	

Circular commitments – 20%

Our ***Commitment*** dimension corroborates -- or qualifies -- the circular business assessment. Distinguishing between a company's circularity *commitments* and its circularity *outcomes* enables investors to consider supporting factors separately from the results achieved. We determine commitments through considering the company's strategy, investments/resource allocation, and management focus/communications. If *outcomes* and achievements are based on historical, or backwards-looking information, then *commitments* may provide a more forward-looking view or forecast. Given the current weakness in data availability, and the concept that future achievements of a company matter more than past performance, we think analysis of strategy and resources provides valuable insights.

Ultimately the circular outcomes should converge towards what the commitments describe and make possible. Ideally, commitments enable future outcomes. However the assessment of commitments needs to carefully attempt to differentiate what is likely to materialize, from commitments not backed by real ambition or resources.

The qualitative Circulytics model from the Ellen MacArthur Foundation makes a similar distinction. Companies use the Circulytics method to help them gauge their own transition towards a circular business model.

We assign a score of 1 through 10. A company which is seriously lagging will score 3 or less, a company which appears to respect circularity but offers no evidence beyond the legal minimum requirements will score from 3 to 5, and so forth. Some indicators include membership in a well-recognized circular economy initiative such as the WBCSD, the Ellen MacArthur Foundation, or GreenBiz, or the assessment by Circulytics, if any.

C3S Candriam Circularity Company Score

for a raw materials company

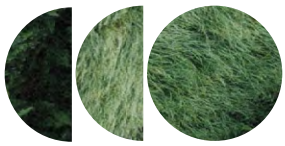
To be considered circular, a company business model must address one or more of the four elements of results. Given the diversity of industries, company business models typically address one or two.

Circular results – 60%		7.7	
Use Less	Renewable/Biodegradable	**7**	100% of company's main supply is renewable raw material. However other ancillary raw materials used to produce finish product are non recyclable.
	Efficiency gains		
	Reused	**8**	Company has goal to generate zero waste from its main productions by reusing the waste generated through production. Significant progress in waste material recovered for re-use, diversion to alternate uses, and use in generation of clean energy.
Recover	Collecting/Sorting		
	Recycling		
	Waste/Water treatment		
Use Longer	Long-lasting		
	Reuse/Refurbish		
	Repair		
Share	Sharing services		
	Product as a service		

Circular commitments – 20%		5.7	
	Strategy	**8**	Integration of environmental impact assessment across the company's value chain, in partnership with Athena Sustainable Materials institute.
	Resources	**4**	Research not a material factor in this business.
	Management	**5**	Circularity evident in management communication and product certifications, but no link to executive compensation.

Circular momentum – 20%		4.0	
	Momentum	**4**	Company is at a high level of circularity, but that is in part because the product lends itself to circularity, and the company does not seem to aspire for significant improvement.

C3S: Circularity score	6.5	



Circular momentum – 20%

The ***Momentum*** dimension creates a dynamic link the company's historical results, strategy, and future circular progress. To create a dynamic view, we assess how credible and ambitious the company's circular commitments are and whether recent circularity achievements bode well for the future. For example, a forestry company might have a natural level of circularity and score well on Results, but less so on Commitment – without Momentum we might expect that it might continue to produce wood sustainably but could disappoint by not seeking additional circularity possibilities up or down the value chain.

When assessing the circular momentum of a company, we consider three elements:

- Do the objectives support a *more circular* economy?
- Are the objectives *ambitious enough*?
- Are the company's actions and strategy *credible* to achieve their goals?

We assign a score of 1 through 10. A score below 5 indicates a company which is losing ground or going backwards. By contrast, a score above 8 indicates the company has strong, well-defined ambitions and is demonstrating the means to achieve them.

For more on this topic, see our forthcoming Technical Paper.

C3S Candriam Circularity Company Score

for a software company

To be considered circular, a company business model must address one or more of the four elements of results. Given the diversity of industries, company business models typically address one or two.

Circular results – 60%		6.3	
Use Less	Renewable/Biodegradable	**7**	Products enable customers to save energy and reduce materials used, thereby contributing to the transition to the circular economy. This is achieved through better design enable the use of new renewable materials as well as reducing the use for raw materials.
	Efficiency gains		
	Reused		
Recover	Collecting/Sorting		
	Recycling		
	Waste/Water treatment		
Use Longer	Long-lasting	**7**	One large customer used a software product to reduce its duplicate parts by 40% and improve efficiency 70%. Emerging product use that shows the potential for contribution to increasing product lifespan through the company's software.
	Reuse/Refurbish		
	Repair	**7**	A software product enables remote service, reducing travel and enabling more timely and targeted product maintenance, thereby reducing product downtime and increasing product useful life.
Share	Sharing services		
	Product as a service	**5**	Early days, but this is part of the company's growth strategy.

Circular commitments – 20%		5.3	
	Strategy	**6**	Pursuing current strategy and software product lineup should help customers increase their circularity.
	Resources	**6**	R&D/sales above average, but percent for circularity not disclosed.
	Management	**4**	Good direction, but only beginning in that direction.

Circular momentum – 20%		6.0	
	Momentum	**6**	Products promote a more circular economy, but conversely, it the benefit results from the choice of the customer, not the company.

C3S: Circularity score	6.1	

Conclusion: Investing in the circle of life.

The need is clear

We know we are depleting our natural resources and raw materials. What we do *not* know is where the tipping point is. We also do not know when there will be a global recognition of the problem and an organized circular approach. But we *do* know that the momentum is building.

Action is gaining momentum

Some circularity efforts require a local touch – for example, recycling. Achieving a circular economy on a worldwide basis, so that we are not merely shifting resource problems from one region to another, requires a global definition, and a global framework. The current lack of common goals is being progressively filled in through business-led and regulatory initiatives.

The momentum for a framework, and for definable goals, is growing. The EU Taxonomy, part of the EU Green Deal, lists a circular economy as one of its six environmental objectives. A draft proposal for EU technical standards defining circularity has been released. Academic research is gaining momentum, including the Cambridge Institute of Sustainable Leadership (CISL) whose work we acknowledge in our model, and the Candriam-sponsored Chair in Regenerative Economics at the University of Louvain.

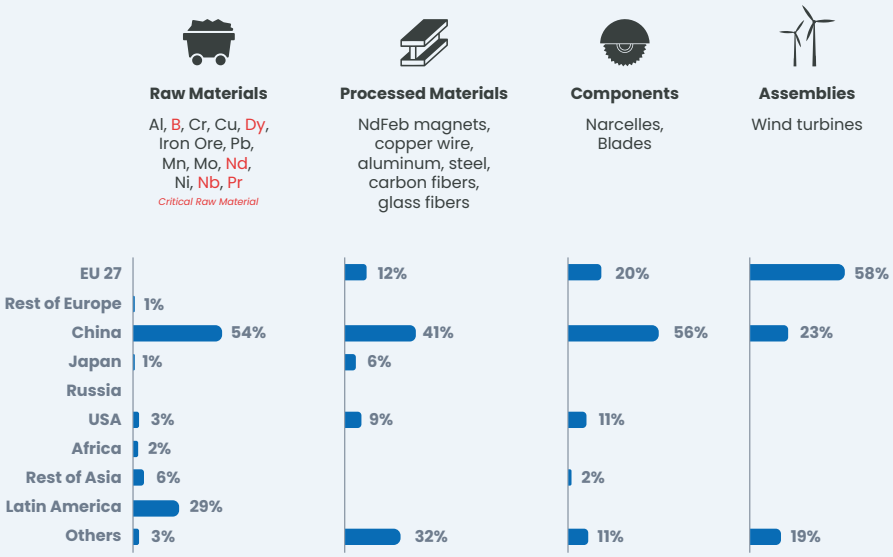
Market potential – a factor of ten?

Consider some possibilities. The ***potential*** is significant -- it is estimated that the global economy is only 9% circular.[1] The circular economy is projected to reach $4.5 trillion by 2030.[7]

Circular Approaches to Ensure Essential Materials

Over the last decade, we have witnessed trade disruptions -- and there may be more on the horizon. Whether supply issues are policy-driven, such as tariffs, Covid lockdowns, or carbon taxes -- or result from geopolitical tensions, raw materials supplies are a rising concern.

Across the supply chain, many important products are geographically concentrated. Below, we show that of a basket of 14 important raw materials such as aluminum, boron, and nickel are sourced from a limited range of countries. Not included in this calculation? Lithium and cobalt, whose mining and recycling are a topic of their own.



Source: Critical Raw Materials for Strategic Technologies and Sectors in the EU - A Foresight Study

Climate change mitigation should provide a strong economic ***catalyst*** for circular solutions even before clear circular frameworks or goals are in place. Climate goals cannot be achieved without the large scale deployment of circular economy solutions in housing, transportation, and agriculture. Existing and expanding climate change goals and regulation are already pushing circular solutions, whatever we call them.

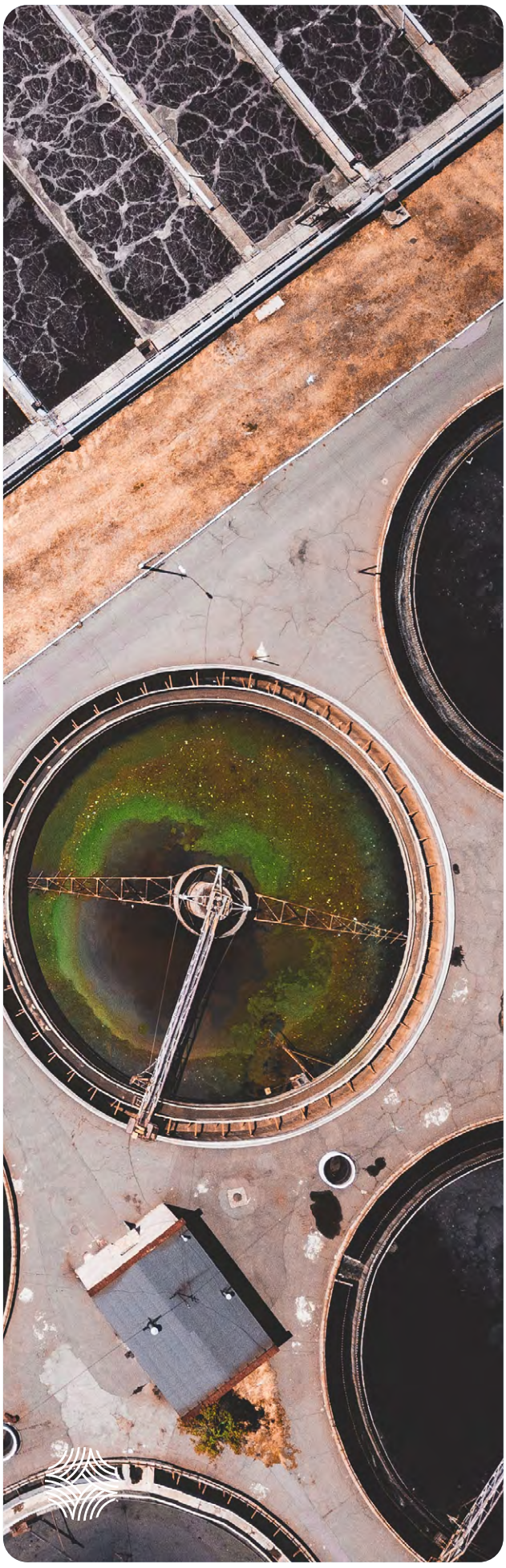
Another potential catalyst for a more circular economy is security of supply. Even before we deplete our resources, might geopolitical tensions cut us off from certain natural resources such as cobalt, lithium, or . . . *oil*?

Circular investing today

Investing need not wait for a global framework and numerical targets. Candriam launched our first Responsible fund in 1996 and established our in-house ESG analysis team in 2005, both before the creation of the UN PRI. Investing ahead of the crowd is difficult, but we have been here before – and succeeded.

Our Candriam Circularity Framework was created with the aim of identifying, and scoring, the contribution of companies to a circular economy. It is not enough to identify the potential for circularity – to create a robust investment process there must be a rigorous framework for quantifying the extent of each company's circular contribution.

Our model is intended to be used by any interested investor willing. The scoring is based on publicly available raw company data, and a qualitative assessment of the company's credibility and resources in moving its achievements forward. As for other topics in environmental, social, and governance analysis, the more investors engage with companies, the more information is collected and disclosed by them. We welcome everyone to join us.



Notes & References.

1 Circular Gap Reporting Initative. CGI, accessed 24 August, 2022.

2 For example, the Cambridge Institute of Sustainable Leadership (CISL).

3 The circular economy in reality is less a societal or economic model than the result of the implementation of a multitude of strategies than enable society to achieve the goal of circularity.

4 Task Force on Climate Disclosure.

5 The Cambridge Institute of Sustainable Leadership (CISL), August 2019. In-search-of-impact-report-2019.pdf (cam.ac.uk), Accessed 24 August, 2022.

6 Oxford Institute for Engergy. Beyond Energy: Incentivizing Decarbonization through the Circular Economy - Oxford Institute for Energy Studies (oxfordenergy.org), Accessed 24 August, 2022.

7 Accenture. The Circular Economy Could Unlock $4.5 trillion of Economic Growth, Finds New Book by Accenture | Accenture, Accessed 24 August, 2022.

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AUM as of 30 June 2022

600

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