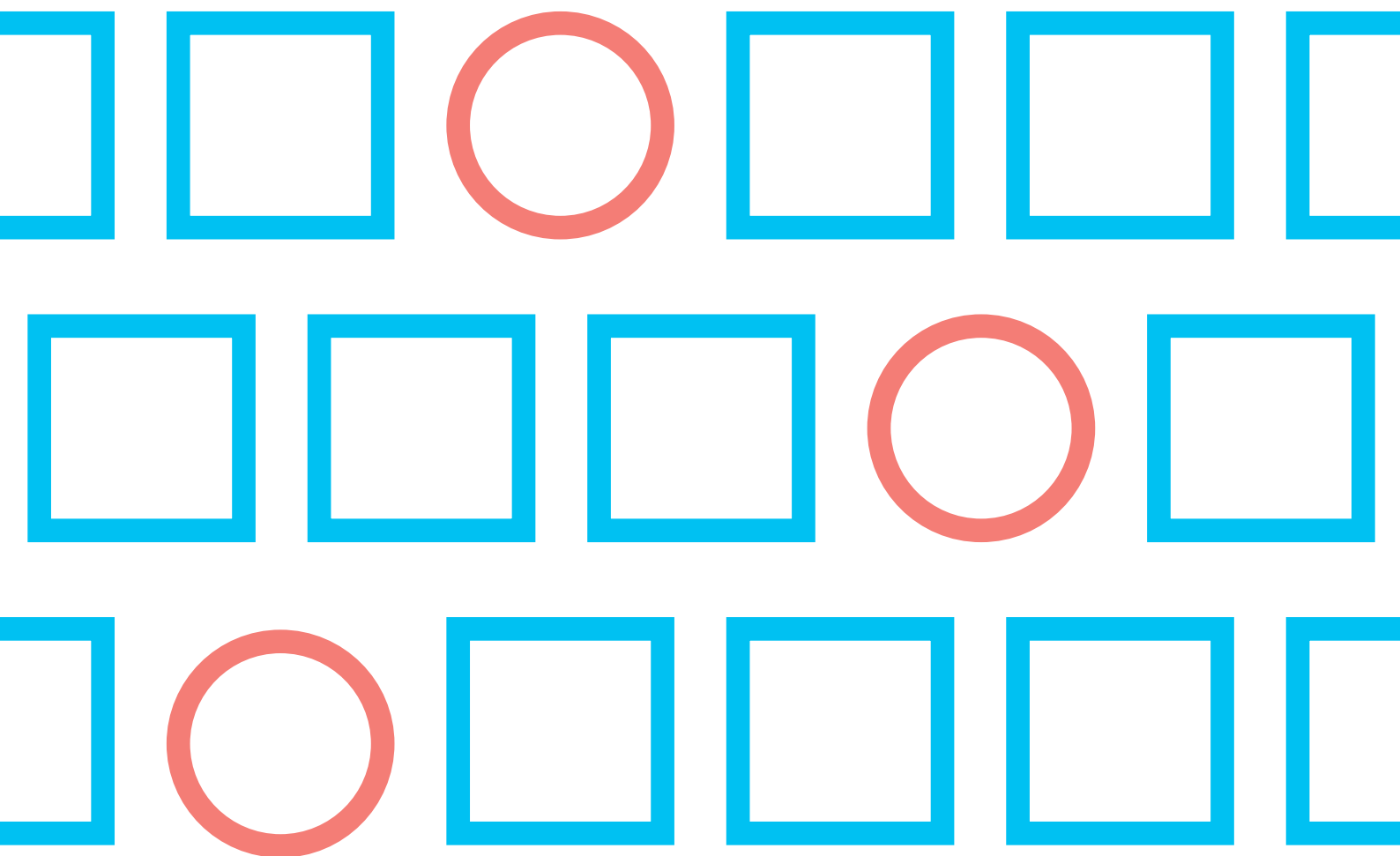


FINANCIAL ACCOUNTING IN THE CIRCULAR ECONOMY

Redefining value, impact and risk to accelerate
the circular transition



ABOUT COALITION CIRCULAR ACCOUNTING

The Royal Netherlands Institute of Chartered Accountants (NBA) and Circle Economy founded the Coalition Circular Accounting (CCA) to identify and overcome accounting related challenges that hinder the transition to the circular economy. The CCA is a group of experts and scientists from finance, accounting and law. Members include NBA, Circle Economy, Invest-NL, ABN-AMRO, Rabobank, Allen & Overy, Sustainable Finance Lab, Impact Economy Foundation and scientists associated with Nyenrode Business University and Avans University of Applied Sciences. The CCA is co-funded by Invest-NL and NBA.

COMMUNITY OF PRACTICE

The CCA partners come together and work in a Community of Practice (CoP) to improve the viability circular business models. A CoP is a pre-competitive environment where experts from various disciplines can co-create open source solutions.

GOAL AND STRATEGY

The CCA's goal is to overcome existing reporting, financing and valuation challenges that hinder the transition to the circular economy. The CCA uses real-life business cases to demonstrate the accounting challenges that circular business models face.

CCA PROJECTS

This overview paper synthesizes the findings and learnings of four publications produced by the CCA:

1. Road-as-a-Service: Pursuing the financial reality of the circular road

2. The Circular Facade: Building a sustainable financial reality with Facades-as-a-Service

3. Valorising Residual Resources: Mitigating food waste—how cooperatives can boost the circular economy

4. How to find the value of circular impact in business: Circular Impact measurement and Financial Reporting

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1 - INTRODUCING CIRCULAR ACCOUNTING	6
2 - FINANCING THE CIRCULAR ECONOMY: REDEFINING VALUE, IMPACT AND RISK	
2.1. WHY CIRCULAR ACCOUNTING	8
2.2. CIRCULAR ACCOUNTING: WHERE DO WE STAND?	9
3 - LOOKING AHEAD: INCENTIVISING THE CIRCULAR TRANSITION	
3.1. REDEFINING VALUE	
3.1.1 VALORISING RESIDUAL RESOURCES	12
3.1.2 CAPTURING VALUE THROUGH CIRCULAR REVENUE MODELS	14
3.2. REDEFINING IMPACT	17
3.3. REDEFINING RISK	20
4 - CONCLUSION	
4.1. KEY LEVERS	22
4.2. KEY ROLES	24

Accounting and financing have the potential to drive the circular transition. Current accounting and reporting techniques that have been designed for the linear economy are often ill-equipped to truly capture the value and positive impact of circular businesses. Circular accounting describes the practice of measuring, analysing and reporting on a company's financial and non-financial performance, to truly reflect the value and impact of circular businesses on all relevant stakeholders. The transition to a circular economy will require rethinking our present way of doing business—and we must not overlook the pivotal role of accounting.

Realising a circular economy is essential for mitigating the worst impacts of climate breakdown and will deliver heightened profit and resilience, trumping our current systems. We are living in a time of rampant pollution and waste, resource scarcity, biodiversity loss and rising global temperatures—all of which are linked to our increasing consumption rates. Circular strategies and business models offer solutions, creating an economy that eliminates waste and pollution, keeps products and materials in use and regenerates nature. In a business-as-usual situation where we continue to live beyond the means of the planet, businesses will also suffer and be prone to a range of risks, including price volatility and supply chain failure. Circular businesses have proven to be resilient to such risks and will—in the long term—amass more profits than their linear counterparts.¹

To reap the benefits of a circular economy, we need to measure the social and environmental impacts of a company, as well as its financials. This is circular accounting. It moves beyond the limited finance-based accounting of a company and rather represents its broader impacts on the environment, society and the economy. A shift to a circular economy will change corporate risks, cash flows and customer relations for businesses. The financial profession will need to adapt to these changes to offer the tools and services businesses will need—including suitable accounting.

To push forward the circular transition and unlock business opportunities, we must redefine how we approach value, impact and risk. Redefining involves finding new ways of managing these areas and rethinking our existing approaches, assisted by a change in our mindset and vocabulary. Below we propose how this can be achieved:

VALUE

We must learn to appreciate and quantify the value generated with circular business models. This includes reassessing what we call 'waste' and introducing concepts such as residual value. We should also move away from the existing approach whereby value is considered primarily in the short-term—products being purchased and then disposed of—to one where materials are kept in use for as long as possible.

IMPACT

Impact must be understood (and measured) to capture the long-term social, environmental and economic impacts organisations have on their stakeholders. Non-financial impacts should be listed on companies' income statements and balance sheets alongside financial factors.

RISK

A new approach to risk is needed to steer capital away from non-circular (and often riskier) businesses, and towards ones that promise long-term, stable value creation and positive impact. We need holistic risk assessments which take into account a company's total long-term impact and relationship with the human and natural environment—not only financial returns.

The circular transition calls for multi-stakeholder engagement. To achieve large-scale systems change, all relevant actors must change their mindset and way of doing business. We call on accountants and auditors, financiers, businesses and regulators to act now and play a part in the circular transition. Only cross-sector collaboration can enable a timely and systemic shift to a circular economy. The time is now for this economic shift toward a more resilient and sustainable way of doing business.

This paper concludes a trajectory organised by the Coalition Circular Accounting (CCA) with the goal of identifying and devising solutions to accounting-related challenges in the circular transition. This publication offers a synthesis of learnings from a series of four papers, which—through real-life business case studies—investigated the present arsenal of accounting and reporting solutions and their potential to support the circular transition.

1 - INTRODUCTION

WHAT IS THE CIRCULAR ECONOMY?

Circle Economy's Circularity Gap Report 2020 reported that society consumes over 100 billion tonnes of resources a year, yet only cycles 8.6% of this back into the economy. Over 90% is lost.² The impact of our resource-intensive and consumption-dependent economy on the environment has been destructive: the sixth IPCC report even definitively stated—for the first time—that climate change is driven by human activity.³ We are living in a time of rampant pollution and waste, resource scarcity, biodiversity loss and warming global temperatures—all of which are linked to our rising consumption rates and resource use. The present linear economic model is not fit to support the necessary transition we need to make to reduce the impact of human activity on the planet. International cooperation on climate change has been led by the Paris Agreement's goal of limiting warming temperatures to 1.5-degrees. However, current emissions-reducing pledges largely focus on the clean energy transition—while this is imperative, the Circularity Gap Report 2021 found this would only bring us 15% of the

way toward 1.5-degrees—the remaining 85% can largely be delivered through a transition to a circular economy.⁴

Circularity gives us the tools to transform our linear economy into one where waste and pollution are eliminated, products and materials are reused and nature is regenerated. Circular economy approaches consider the entire life-cycle of a resource: resources should perform at their highest potential for as long as possible, and re-enter into the system to create value again and again, from pre-use to post-use and back again (see the Value Hill, Figure One). In maximising the value of resources, the emissions attached to material flows are spread out and reduced over time, thereby cutting global emissions and safeguarding our finite resources. Hence, attaining the broader objective of sustainability is dependent on the implementation of circularity. While sustainability—which refers to the balanced integration of economic performance, social inclusiveness and environmental resilience—can be seen as a broader goal, circularity is key to achieving it.

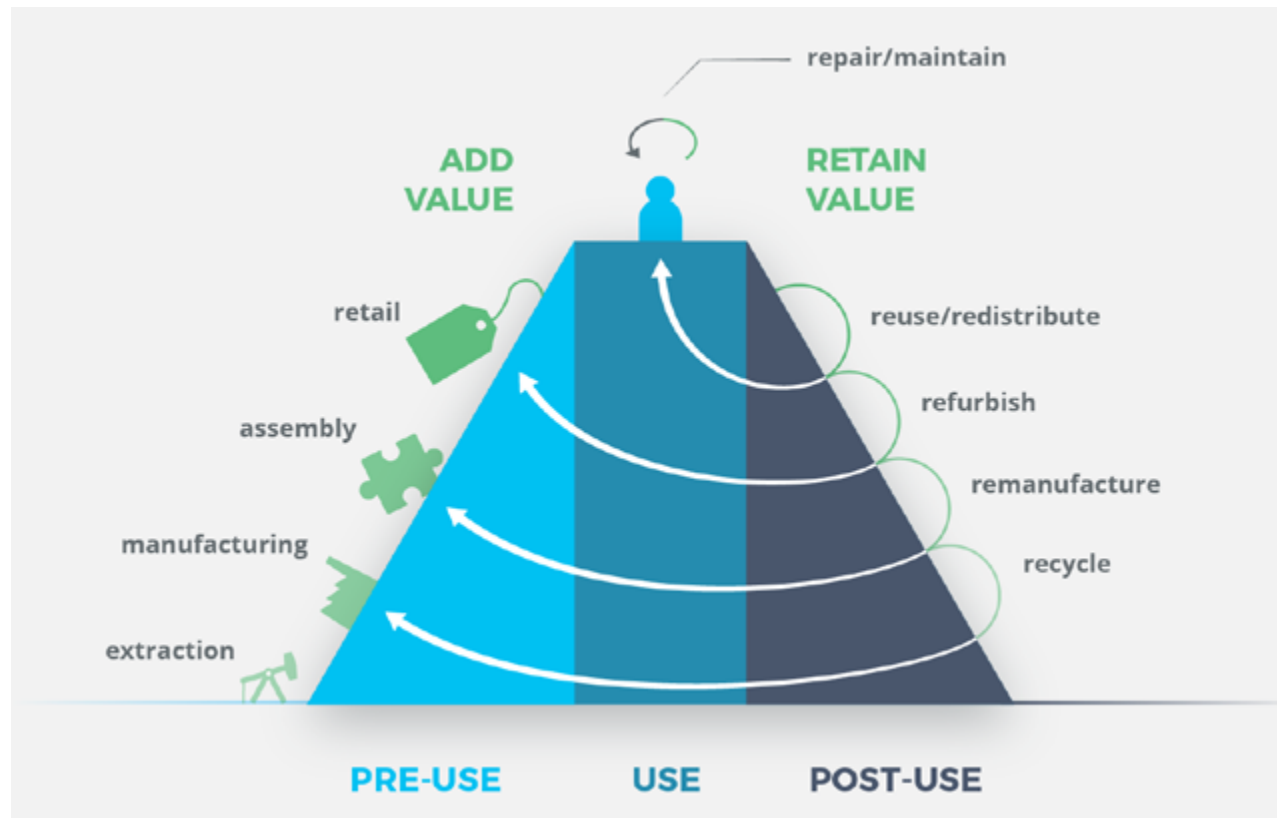


Figure One: Value Hill. Source: Achterberg, Hinfelaar and Bocken (2016)

However, to reap the benefits of the circular economy, we must transform our current economic system, which entails decoupling economic prosperity from the use of natural resources. This will require a different way of doing business. At present, the challenges associated with financing and accounting for circular business are major obstacles for circular business models to be successful. This is despite circular businesses being far more resilient by nature and less risky in the long term than their linear counterparts. This paper offers practical guidelines for overcoming these challenges to enable the shifts towards a circular economy.

ACCOUNTING SOLUTIONS AS DRIVERS OF A CIRCULAR ECONOMY

Accounting is the process of recording financial and business transactions. This paper shows the potential of accounting solutions to act not just as enablers of the circular transition, but as drivers. It explores the opportunities for financing and accounting for circular business and proposes to redefine how we understand value, impact and risk. Redefining value for circular business involves new sources of value, such as extending the lifespan—and capturing the value—of products and materials. From a customer perspective, it means moving away from understanding value as ownership of products, to focusing on the value of the result (or service) delivered by a product. Impact must be understood—and measured—holistically, to capture the long-term non-financial impacts organisations have on their stakeholders. Finally, a new approach to risk is needed to steer capital away from non-circular (and value eroding) businesses, and towards ones that promise long-term stable value creation and positive impact.

The structure of this paper is as follows. The following chapter (Chapter Two) introduces circular accounting and discusses its benefits and obstacles to its full implementation. It describes existing circular accounting initiatives and situates circular accounting alongside other tools that evaluate companies' sustainability performance. Chapter Three proposes that, in order to be able to effectively measure, analyse, and report on a company's performance, we need to redefine our present understandings of value, impact and risk. The fourth chapter identifies where action is needed to enable the circular transition and offers practical guidelines for companies, accountants, regulators and financiers. Chapter Four concludes with a call for action addressed to all relevant stakeholders, supported by practical suggestions for next steps.

ABOUT THIS PAPER AND COALITION CIRCULAR ACCOUNTING (CCA)

This report is a product of two years of research by the Coalition Circular Accounting (CCA), which was set up by the Royal Netherlands Institute of Chartered Accountants (NBA) and Circle Economy, and is co-funded by Invest-NL, NBA and the CCA members. The CCA was launched to identify and overcome accounting-related challenges that hinder the shift to the circular economy. It has brought together diverse actors in a multi-disciplinary coalition to explore how accounting can become a lever of change in the circular transition (see colophon for additional information on the CCA).

This overview paper synthesizes the findings and learnings of four publications produced by the CCA, supplemented by new findings and research material. The first two papers in the series explore the questions of financing circular revenue models—specifically, Product-as-a-Service (or PaaS)—through the case studies of a circular road and a circular facade. The third publication focuses on the value of residual resources (or 'waste', in linear terms) and its implications for financing and accounting for circular business. The fourth publication explores the opportunities for measuring organisations' circular impact, and reflecting such data in the annual report and specifically in the financial statements. The key conclusions from these papers are provided in this report (for details about previous publications see the section 'About Coalition Circular Accounting', on page 2).

2 - INTRODUCING CIRCULAR ACCOUNTING

2.1. WHY CIRCULAR ACCOUNTING

Circular accounting describes the practice of measuring and analysing a company's financial and non-financial performance, to truly reflect and account for the value and impact of circular businesses. It moves beyond the limited, finance-based accounting of a company and represents its broader impacts on the environment, society and the economy. Some newly proposed additions to accounting—such as the Integrated Profit and Loss Statement and a multi-capital balance sheet (See Chapter 3.2)—can help achieve these goals, although their broader application is contingent on their further development.



Circular accounting is about making the 'intangible' impacts of the circular economy tangible and measurable in order to disclose them

Closely related is the notion of circular reporting, whereby organisations report on their environmental and social performance, on top of their financial results. It requires companies to not only collect data but to disclose them—revealing their impact, both positive and negative, on the human and natural environments. Circular accounting and reporting are complementary processes that will play a large role in the circular transition when used in tandem.

Both accountants working in businesses (as financial professionals) and auditors (reporting and assurance) can play a role in implementing and promoting circular accounting and reporting practices. Financial professionals should work with their business to redefine their approaches to measuring impact and circular activities, and experiment with new accounting solutions. External accountants can collaborate with businesses by sharing knowledge and insights on the possible use of new approaches, thereby helping to make circular accounting standard practice.

BECOMING CIRCULAR IN A LINEAR WORLD

Currently, circular businesses must fit within the existing legal and financial regulations and use accounting tools that are ill-equipped to capture the true value of circular business models. Businesses that are—or wish to become—more circular struggle to measure and report the value of their curricular activities, as key sources of value are often not adequately reflected on companies' balance sheets or are overlooked. Accounting for circular business may amount to trying to fit square pegs into round holes. Moreover, all too often accounting is dismissed as a technical issue, more likely to follow the wider changes in the economic system rather than drive them. As a result, the integral role of accounting in the circular transition remains underappreciated. However, this paper shows that accounting can become not just an enabler, but a driver of the transition towards a circular economy.⁶

How? Put simply, what gets measured, gets managed. Allowing businesses to measure their resource use and impact to reflect them on their balance sheet, circular accounting will not only enable them to keep a better track of their circularity performance but also incentivise them to improve their record. Companies will be encouraged to become more circular, re-thinking their present strategy and capital allocation choices towards circularity, maintaining product and material value as high as possible and collaborating with their supply chain to retain control over product and material flows. Moreover, circular reporting, which involves collecting and releasing data on circularity performance, will create increased accountability and pressure to act on circularity. It will enable both employees and investors to hold executives accountable for companies' performance. As a result, executives will see circularity not just as a side issue but a strategic issue⁷. Investors will also be able to incorporate such information into their investment decisions, which may lead to more sustainable capital-allocation choices. They will be able to demand more (and better quality) data on companies' circularity performance, thereby further incentivising companies to collect and publish such information and increase transparency.

However, circular accounting still means finding solutions and workarounds for circular business models within the ruleset of the current linear economy. Laws on financial and sustainability reporting currently do not demand that companies collect or release data on their impact and resource use, although some existing initiatives have attempted to change this (see Chapter 2.2). Until regulation is updated to enable an equal playing field—whereby all companies need to account for and report on circularity (and sustainability in a broad sense)—“creative” circular accounting solutions will be required.

2.2. CIRCULAR ACCOUNTING: WHERE DO WE STAND?

Circular accounting is not yet commonplace practice among companies nor accountants, and its benefits are not well-understood. Currently, 96% of companies in the major European stock market indices (such as FTSE, CAC, DAX) publish a sustainability report.⁸ Far fewer, however, integrate sustainability and circularity information into their financial statements⁹. Circular accounting could allow us to see the relationship between financial and circularity performance. This may encourage executives to integrate circular economy factors into their operational, strategic and financial choices.

There is a need for standardised and comprehensive circular accounting guidelines. Despite the mounting pressure to act on climate change and move towards circular solutions, there are currently no universally accepted standards for measuring and reporting on circular impacts. Standardised circular accounting and reporting solutions would require companies to internally collect and publish better-quality data. Standardisation would also guarantee that collected data is comparable, which would make it more reliable, create higher accountability, and allow investors to more easily distinguish between companies based on their circularity performance.

NEW ACCOUNTING INITIATIVES

New initiatives to bridge sustainability and accounting have recently emerged. The Impact-Weighted Accounts Initiative (IWA), launched at Harvard Business School, creates methodologies for financial accounts that also reflect a company's social and environmental impact. Furthermore, approximately 100 large companies, including a dozen companies in the Value Balancing Alliance (VBA), have already put in place or are working towards implementing impact-weighted financial accounts¹⁰.

Yet, until recently there has not been a concentrated effort to develop standardised guidelines. This is now changing. A recent joint statement by the Climate Disclosure Project (CDP), the Climate Disclosure Standards Board (CDSB), the Global Reporting Initiative (GRI), International Integrated Reporting Council (IIRC), and Sustainability Accounting Standards Board (SASB) expressed willingness to work together to develop comprehensive accounting and reporting guidelines in 2021 the IIRC and SASB merged into the Value Reporting Foundation (VRF). Moreover, the International Financial Reporting Standards Foundation (IFRS) is leveraging some of the existing guidelines developed by the GRI, CDSB, CDP, and SAS to bring sustainability into financial disclosure.¹¹ The efforts by these organisations to harmonise and standardise their framework have created the groundwork for the International Sustainability Standards Board (ISSB), which the IFRS is set to oversee alongside the International Accounting Standards Board.¹² These efforts represent a promising starting point for creating universally accepted sustainability accounting standards.

It is also worth noting the promise of recent regulatory initiatives such as the Corporate Sustainability Reporting Directive (CSRD), that will in fact contain an obligation to report on circularity, recently passed by the European Union (EU). These regulations will require companies to collect data on sustainability performance and make it publicly available, thereby paving the way for implementing comprehensive sustainability reporting measures. Moreover, the new EU Taxonomy will help guide accountants and auditors on how sustainability can be conceptualised and measured, facilitating the task of integrating sustainability impacts into reporting practices.

These efforts represent a significant push for integrated accounting and reporting standards. However, they currently pay insufficient attention to (the value of) resource flows—a key indicator of circularity. Instead, they prioritise carbon disclosure which, while highly important, remains insufficient. As noted above, the circular transition has the potential to bring us over 80% of the way to the 1.5-degree goal. Overlooking measures of circularity is, therefore, deeply problematic when seeking to capture companies' true impact on the natural environment. Moreover, carbon disclosure does not consider resource scarcity and supply security. Comprehensive circular accounting and reporting is necessary to ensure that such measures remain accurate and credible.

The development, acceptance and practical application of such standards will require collaboration among diverse actors: from companies, to financiers and regulators. This, in turn, requires that we redefine our present understanding of value, impact and risk. The remaining chapters outline how this can be achieved and what role these diverse stakeholders need to play to help achieve this goal.



3 - FINANCING THE CIRCULAR ECONOMY: REDEFINING VALUE, IMPACT AND RISK

Our present way of doing business is linear: resources and materials are extracted, transformed into products and then quickly discarded as waste. Value is created in this economic system by producing and selling as many products as possible. To both enable and reap the benefits of the circular transition, we need to re-consider our present understanding of critical business concepts. To do so, we can begin by redefining value, impact and risk. This chapter considers each of these areas individually.

3.1. CIRCULAR ACCOUNTING: WHERE DO WE STAND?

3.1.1. Valorising residual resources

Residual resources are leftovers often generated in production processes, such as in the form of side products or cut-off trimmings. In the linear economic model, the term 'waste' is often used to describe residual resources, but this disincentives innovative approaches to maintain their value. We propose that the term 'residual resources' is adopted instead to encourage a change in mindset towards embracing the hidden value of resources.

Unless residual resources can be used elsewhere, they typically have no value for the producer. Despite their potential value, they are often ignored and under-priced. Therefore, mitigating waste by using residual resources is not only important from a sustainability point of view, but it is at the core of generating new business opportunities in the circular economy.

The price of residual resources

Pricing residual resources poses significant challenges. While a higher price more strongly incentivises the up-cycling of residual resources, this price cannot be adopted until the market has proven that it will pay this price. The availability of applications—and markets—for residual resources will determine the value of products and materials made from these materials.

Mature second-hand markets will be key to adequately value and price residual resources and further incentivise their reuse.

Currently, the absence of mature residual resource markets means that the estimated price is lower than the expected future value. The lack of certainty regarding its future economic value in upcycled applications (such as premium products) creates difficulties for recording the correct value of resources on the company's balance sheet. This negatively impacts the business case and, in turn, has implications for the company's total valuation and its attractiveness to investors.

The absence of mature markets and uncertainty regarding the future economic value means that residual resources are best treated as contingent assets. **Contingent assets** are assets whose potential economic benefit depends on future events that are not under the control of the company. Marking residual resources as contingent assets can help overcome the pricing and accounting challenges in the short term. But it is an imperfect solution as it does not enable companies to take into account the expected (higher) value of the up-cycled application of residual resources—a value that can potentially make the difference between a business case being profitable or not. This illustrates the need to create possibilities for better pricing of residual resources in circular business cases and enable the inclusion of their value in the balance sheet.

Depreciation and harvest value

Besides residual resources, we also have to look at the value of products and materials after their useful life. Following current accounting rules, assets are depreciated throughout their useful life. Their value declines over time and when an asset is no longer used it is depreciated to zero, meaning it no longer has value. This does not do justice to the fundamental idea of a circular economy, in which resources are used in ongoing cycles. For instance, in the built environment we see a wider mindset shift away from demolition costs, towards potential yields. In this context, we propose to talk about **harvest value**. Accountants are in a key position to discuss this within their businesses and adjust depreciation schemes accordingly. Again, the emergence of mature second-hand markets is key as well as stricter environmental legislation. Finally, current grey areas in tax measures allow for rapid depreciation of assets. A shift in tax policy is therefore a key incentive.

CASE STUDY ONE

INTELLIGENT FOOD: VALUING UP-CYCLED RESIDUAL PASTRY DOUGH



IntelligentFood is a startup set up to reduce food waste. The company—which owns no production facilities, employs no chefs and has no logistic capacities—provides an attractive alternative for food companies that have residual food resources due to surpluses and leftovers in the production process. IntelligentFood uses residual food to develop new food concepts in an open innovation setting and connects different external parties through the IntelligentFood cooperative. The starting point of its business case is the production process of Europastry, which produces residual dough, currently sold to animal feed producers. IntelligentFood saw the opportunity to avoid the downcycling of the residual dough and instead use it to produce biscuits.

IntelligentFood's cooperative structure brings the partners together as members of the cooperative, allowing them to share profit and work towards the common goal of mitigating food waste. The cooperative members contribute labour, cash, or in-kind.

The pricing challenge. IntelligentFood experienced the accounting challenge of adequately reflecting the value of residual pastry dough as its use changed from a low-value application (animal feed) to a high-value one (a biscuit ingredient). Four distinct methods of accounting for this residual resource have been identified: (i) Production cost of the dough (price of virgin dough); (ii) The price of the dough if used for animal feed (can be used as a bottom purchase price); (iii) Contingent asset (recognising the potential economic value dependent on future events, such as the success of the cookies and the cooperative); (iv) Future mature market (once this business model is scaled up, price can be set based on supply and demand). Due to an absence of a mature market, referring to a 'contingent asset' was deemed to be the most appropriate solution in this case.

For more information on the Case Study see: "[Valorising residual resources. Mitigating food waste — how cooperatives can boost the circular economy.](#)" Coalition Circular Accounting, 2020.

3.1.2. Capturing value through Circular Revenue Models

The linear economy follows the **take-make-waste** approach: resources are extracted from the earth, processed, assembled into commodities, and sold to the market. After the sale, the producer loses control over the product¹³. To maximise sales and profits, producers develop goods that last for only a short period, pushing consumers to quickly replace them with new products (i.e. planned obsolescence). This model incentivises unsustainable production and consumption.

Circular business models are characterised by strategies to (1) Narrow resource cycles (use less resources) through innovations in the production and design of products, such as resource efficiency and optimised logistics; (2) Slow resource cycles (use resources for longer) by increasing product longevity through design for durability, repairing and remanufacturing, for example; (3) Close resource cycles (use resources again) by making sure that all resources are reused in new product life cycles after use, through reverse logistics and take back systems, for example.¹⁴ Moreover, circular business models enable saving energy and greenhouse gas emissions because fewer new products need to be produced.

Circular revenue models allow us to capture value with circular strategies and can be distinguished depending on economic ownership structure. Examples include deposit models, lease and rent models, the Sell-and-Buy-Back model (where the user becomes a temporary economic owner and may sell the product back to the producer), as well as the Product-as-a-Service (PaaS) model, where the economic owner of a product is entitled to the use-value of an object¹⁵.

Circular value chains

Rather than operating on their own, businesses in the circular economy collaborate in a network of companies that manage and pool resources and products in ongoing cycles. This is a circular value chain. Certain organisational forms can play an enabling role in creating and managing circular value chains. This enables engaging various organisations from producers and distributors to logistics providers around a (collection of) product(s). In order to lead the effort of bringing together different actors and aligning their circular objectives, it is necessary to recognise a new role in the circular economy: the **Circular Value Chain Director**. The increased interdependence between organisations taking part in these value chains can be seen both as a strength and a weakness from a financial perspective. Clearly defining and allocating risks and rewards while allowing flexibility is key.

Product-as-a-Service (PaaS)

In the **Product-as-a-Service (PaaS)** model, the service provider retains ownership of the products rather than transferring them to the end-user. The user pays a recurring fee over the period of time during which they access the product.¹⁶ Put differently, customers purchase the desired result, rather than the equipment that delivers that result. Figure Two shows a circular PaaS supply chain, where the retail/sales company is replaced by a service provider.

PaaS incentivises service providers to create value by offering high-quality, durable products that can be easily upgraded, repaired, refurbished and/or taken back at the end of their useful life. Every additional use-cycle of a product minimises additional costs and increases profit margins.¹⁷ PaaS also helps create long-term relationships between service providers and customers and guarantees recurring cash flows. The customer no longer bears the risk of product failure or the responsibility for its maintenance, repair or recycling.

PaaS is distinct from traditional models in that its value delivery involves a higher number of stakeholders, including the manufacturer, service provider, and the user or customer. For PaaS to succeed, achieving a win-win-win between all stakeholders is key: all parties should collaborate transparently and share financial costs and rewards in a fair-minded way.

The value proposition should allow ongoing circular processes on the back end and services on the front end at a price point that is convincing for all parties involved. In this sense, PaaS is distinguishable from ordinary leasing or renting. To be competitive, the total cost of usage should not exceed the (conventional) total cost of ownership.

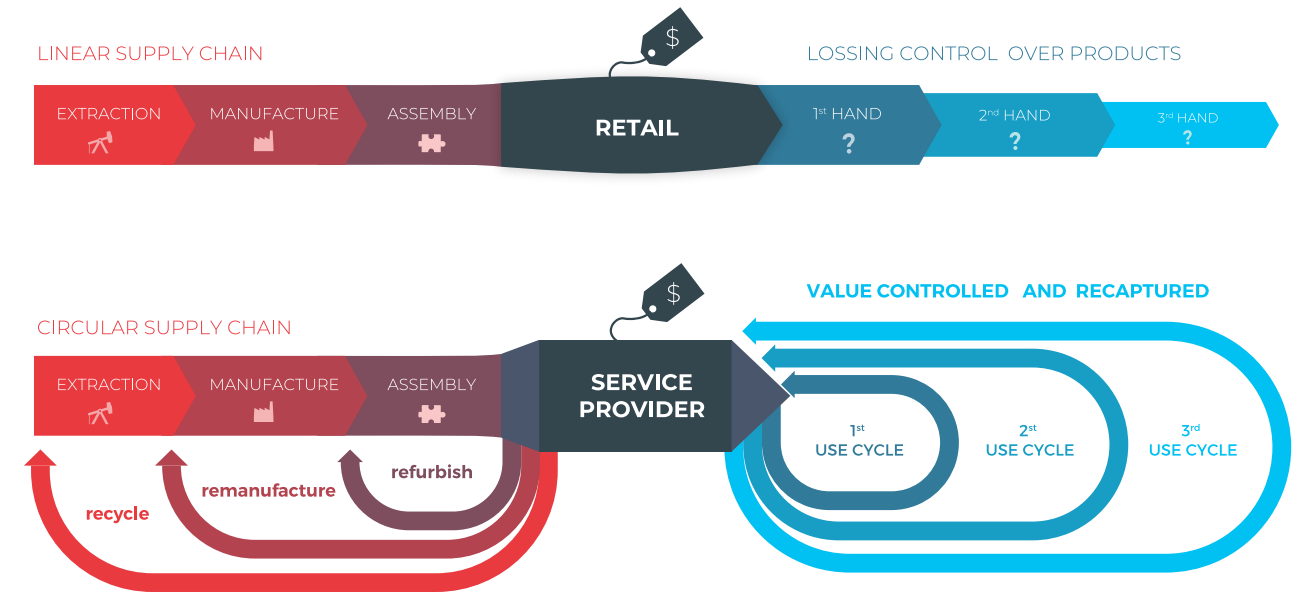


Figure Two. Controlling and recapturing value in multiple use cycles vs losing control over products. Source: Fisher & Achterberg, 2016.¹⁷

CASE STUDY TWO A CIRCULAR ROAD



Road-as-a-Service is a pilot project in the Overijssel province in the Netherlands, led by Dutch construction and infrastructure company Dura Vermeer.

In this new model, the client (Overijssel) is the legal owner of the road while the contractor (Dura Vermeer) retains the economic ownership of the raw materials of the constructed road and the use of the road as a service. Both parties enter into a contractual obligation while the road is in use.

The client covers a periodic payment for the services of the contractor based on functional requirements of the road, such as safety and availability. It is the contractor, however, who bears the costs of road maintenance.

Because, based on contractual agreements, the contractor is entitled to collect the residual value at the end of the contract term, the company is incentivised to use durable, long-lasting materials and to optimise the maintenance and (re-)use of the road and the raw materials used in the process.

For more information on Case Study two see: *"Pursuing the financial reality of a circular road. A pathway to Road-as-a-Service."* Coalition Circular Accounting, 2020.

For Case Study three, see: *"The circular facade. Building a sustainable financial reality with Facades-as-a-Service."* Coalition Circular Accounting, 2020.

CASE STUDY THREE A CIRCULAR FACADE



Building facades are traditionally purchased by the owners of the building or apartments directly from the provider. The Facade Service Company, comprising three Dutch construction firms—Alkondor, Blitta and De Groot and Visser—have collaborated to deliver a new model: Facade-as-a-Service. This new service, which can be smartly controlled through sensors and remote control, entails protection against wind and water, ventilation, light regulation, and energy generation.

Instead of transferring ownership of the facade in a traditional manner, the Facade Service Company remains its owner and bears responsibility for its maintenance. This model incentivises the provider to develop a sustainable, future-proof facade and to account for technological innovation and adaptability in the design phase. Standardisation and modularity of facade components ensure that the parts can be easily adapted and/or replaced. While such a model guarantees a longer lifespan, the materials can be recycled at the end of the facade's life cycle.

3.2. REDEFINING IMPACT

Consider the question: What difference do you make with your company and who is it for? What is its value to society? In a linear economy, companies' impact is understood primarily in terms of financial performance and creating value for shareholders. In a future circular economy driven by impact, organisations measure, report and steer based on their impact, which also reflects the non-financial impacts and their implications for society and the natural environment. Disclosure is a great way to demonstrate progress towards a circular economy. It provides assurance to a range of stakeholders, with frameworks that help companies get the right data – and get the data right. Also, it creates an internal momentum and focus on circularity, by forcing everyone in the organization to consider circularity in design, processes and operations.

MEASURING IMPACT: OPPORTUNITIES, OBSTACLES, AND DEBATES

Impact measurement methodologies exist to meaningfully integrate impact data into decision making. Most commonly, the environmental, social, and governance (ESG) criteria are used as a set of standards to analyse companies' performance and guide the decisions of socially conscious investors. One of the most common ways of conceptualising organisations' impact was pioneered by the International Integrated Reporting Council (IIRC).¹⁹ In 2013, it launched a new value creation framework, in which the triple bottom line of social, environmental and economic value (also referred to as People, Planet, Profit) was expanded into the Six Capitals Framework, to encompass financial, manufactured, intellectual, human, social, and natural capitals. Regarding circularity, there is currently no standardised metric available. Several bodies, such as the EU (taxonomy), ISO and several private and non-profit organisations, are currently creating metrics for measuring circularity. When we can start applying these at scale this will be an important game-changer for sustainability measuring and reporting.

The specific factors taken into account by various institutions and methodologies to estimate impact vary, and they may be assigned different units and weightings. These methodological choices are subjects of important debates. First, the choice of indicators is key. These differ depending on different sectors. Initiatives such as the Capitals Coalition have developed sector-specific guidelines, including quantitative capital indicators, to contribute to the

process of standardisation. Further, institutions need to choose between measuring absolute or marginal impact. Businesses are advised to start with measuring absolute impact as this can give a valuable first insight. To really understand the impact and link specific managerial decisions to it, it is necessary to measure marginal (or relative) impact, since only then can we understand the difference between the realised value and the value in the counterfactual scenarios for the chosen indicators. What's more, some impacts, such as carbon emissions, diversity and health, may be more or less difficult to quantify (and monetise) than others, depending on existing frameworks and measurement tools. Finally, it remains contested how impacts can best be quantified and if monetisation is adequate as a means of quantifying impact.

These debates are essential to devising adequate, fair, and usable impact measurement methodologies, which can be scaled up. While standardisation of methodologies is key to allow for comparing companies' performance across different indicators, it is not without risks. Contestation through ongoing debate helps ensure that our methods remain accurate in a rapidly changing world, and that the standardised methods are both rigorous and practical. Yet, companies should not be held up by these debates. They must start now to develop the internal capabilities for data collection and reporting. Moreover, developing adequate standard frameworks is easier when different techniques have already been tested by businesses. The first step for companies is, therefore, to begin collecting data and measuring their impact. The next step is to reflect circular impact adequately in financial statements. This is not only important for the reporting side, but also for financiers to make the right investment decision.

ACCOUNTING FOR IMPACT

At present, financial statements constitute the most important indicators of businesses' financial position and continuity. These financial statements and calculated ratios (solvency, liquidity and return on equity) inform the decision making processes by the management and investors. However, financial statements find their origin in linear business models, whereby companies and their auditors tend to depreciate material assets over time, not accounting for external costs and benefits, and not able to appreciate the value of residual resources and harvested products and materials. As a result, the (financial) value of circular impact remains hidden.

Companies can relate their impact to their profit and loss account. One way of doing so is by using Impact Institute's **Integrated Profit & Loss (IP&L)** approach, which generates a systematic, representative and quantified overview of an organisation's impact for all stakeholders and across all six capitals identified by the IICR (see above).

The IP&L approach allows for integrating impact into financial results and for reporting an organisation's impact over a given time period (typically a year). It offers a twofold extension to the traditional profit and loss statement to encompass (i) the financial impact on all stakeholders—such as its clients, employees and society—and (ii) the impacts for all types of capitals, including non-financial ones. The IP&L approach aims to provide a holistic assessment of an organisation's impact. Negative and positive impacts of different dimensions are disclosed separately to prevent an inappropriate netting effect, e.g., a negative impact on the climate is not offset by a positive impact on employees. Positive impacts are calculated by com-

paring them to the outcomes of a chosen reference scenario, while negative ones are estimated by referring to the costs of restoration or compensation. To assess the value of negative social or environmental impacts, the Impact Institute uses monetisation factors based on the True Price methodology, which enables a comparison of social, environmental and financial impacts (See Figure Three below).

FROM IP&L TO A MULTI-CAPITAL BALANCE SHEET

A **multi-capital balance sheet** offers an alternative way of presenting companies' impact data. While several initiatives have applied similar concepts in their impact measurement and reporting techniques¹⁹, a multi-capital balance sheet has not yet been implemented at scale. A major obstacle to scaling this solution involves the challenge of monetising relevant externalities.

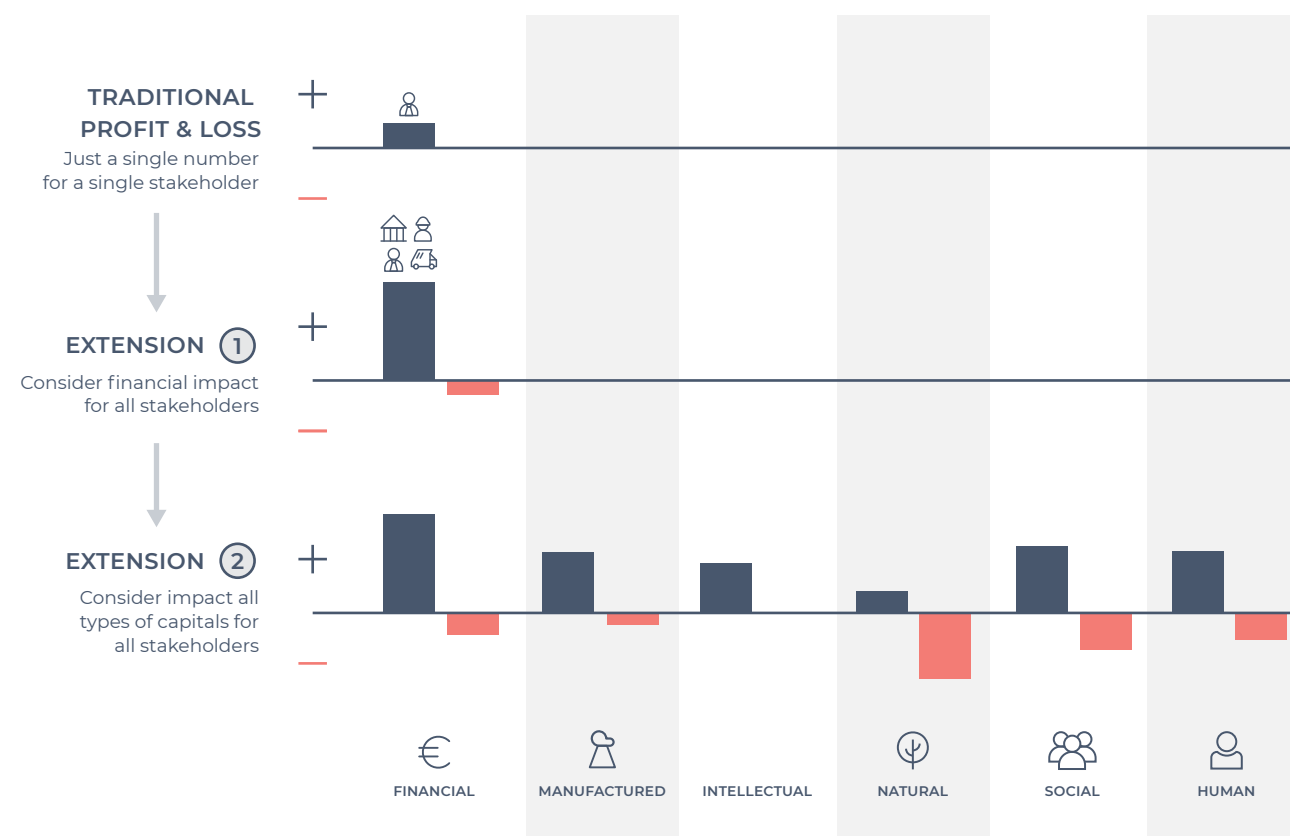


Figure Three. Integrated Profit & Loss (IP&L) approach. Extending Profit & Loss to integrate (1) stakeholders and (2) capitals. Figure adapted from the Impact Institute.

Crucially, there is no obligation yet to integrate impact data into (financial) reporting in a standardised way. Impact information is reported separately to financial accounts. While the new EU Corporate Sustainability Reporting Directive (CSRD), expected to be implemented in 2023, will put an obligation on businesses to report impact data, the issues of sustainability and

financial reporting continue to be treated as largely separate matters.²⁰ At present, sustaining the meaning of the impact data, while adhering to the practices and paradigms of the mandatory financial reporting guidelines and legislation, can amount to a mismatch. Standardisation and increased regulatory efforts are needed to encourage impact reporting at scale.

CASE STUDY FOUR MEERLANDEN: MEASURING CIRCULAR IMPACT



Dutch governmental organisation Meerlanden is an innovative material and energy recovery company which focuses on creating green energy. With approximately 500 employees, it performs this service for nine different municipalities and about 4,000 companies. Meerlanden has a clear vision and directly contributes to the Dutch government's goal of becoming entirely circular by 2050. Acting as a 'circular value chain director,' they actively engage in retaining as many materials in the global resource streams as possible and uncover unseen value of different waste streams.

The Impact Institute investigated how Meerlanden's impacts could be quantified. They focused specifically on the company's organic waste stream, analysing how waste is collected and processed into new resources. Using Impact Institute's measurement methodology, we developed a resource compass, which displays impacts ranging from CO₂ emissions to employee wellbeing and scarce materials preservation.

The compass is an example of application of the IP&L methodology on the specific scope of organic waste. The results allowed for monetising Meerlanden's impact across four capitals—natural, human, manufactured, and financial—and 23 individual impacts. The impact was estimated by comparing it to a reference scenario.

The findings revealed that Meerlanden's method of organic waste recycling has a substantially lower negative environmental impact than residual waste incineration, while products produced through recycling create economic value (manufactured capital) that almost equals the financial value of energy created by incineration. While the specific quantifications could be—and, indeed, should be—contested to ensure that they reflect the best scientific standard, the findings offer a reliable estimation of the impact of Meerlanden. They are sufficient to estimate what role the company plays in the local environment and society and to identify areas for improvement. These results suggest that the Impact Institute's method can be scaled up and applied to other waste streams as well.

For more information on Case Study four see: "[How to find the value of circular business. Circular impact measurement and financial reporting.](#)" Coalition Circular Accounting, 2021.

3.3. REDEFINING RISK

The current application of risk assessment models is based on the linear economy, and a narrow conception of risk revolving around the question of whether businesses can adhere to their short- and long-term financial obligations. Risk evaluation frameworks, in line with non-financial disclosure and reporting initiatives, highly prioritise climate-related risks while neglecting risks associated with resource use and scarcity. Generally, risk assessment frameworks reflect a strong discrepancy between the short- and medium-term vision inherent to business activity on the one hand and the long-term perspective that must be adopted to estimate risk and rewards in the circular economy on the other. To successfully finance circular business models, the concept of risk must be redefined to encompass **non-financial, long-term aspects** relating to societal and environmental well-being. This conception of risk is coherent with the Dutch corporate governance code (2016), which prescribes that executive boards of all listed companies must focus on the long-term creation of value for the company, and shall take into account the relevant interests of the stakeholders for this purpose.²¹

Rather than considering social and environmental factors as a separate, non-financial category, it can be useful to think about them as **pre-financial information**. Indeed, the effects of environmental degradation, among others, are becoming increasingly likely to materialise on balance sheets.²² Research has shown that in the near future, climate change and environmental depletion will likely have serious consequences for the stability of the financial system.²³ Therefore, the translation of non-financial to pre-financial information into financial terms has the potential to accelerate the adaptation of risk assessment models to become consistent with our changing understanding of environmental, resource and societal risks.



In the end, all non-financial aspects have a financial side.

– Björn Aarts, Rabobank

RETHINKING MATERIALITY

In this context, the issues of impact and risk are tightly correlated. The concept of **double materiality** allows for re-imagining the position of a company in a wider social and environmental system. Traditionally, factors such as climate change or resource depletion would be considered material to an organisation when they may have implications for its financial performance. Double materiality extends this concept, and further captures the company's impact on its wider social and natural environment, on top of what is considered financially material. Put differently, double materiality recognises that companies are not just responsible for managing the ESG risks to their own value, but must take responsibility for the actual and potential adverse impacts of their own decisions on a wider set of stakeholders. As a recent report showed, identification of matters that are material to enterprise value 'is incomplete unless the organisation has first identified its material impacts on sustainable development'²⁴.

How positive and negative impacts will affect financial performance, however, depends on the time horizon and economic, climate and social developments. What is financially immaterial today can become material tomorrow. The phenomenon of stranded assets has proven this. Assets which face unexpected depreciation such as oil fields—which can lose economic value due to higher costs through CO₂ taxes—constitute serious financial risks to companies. This view is captured by the notion of **dynamic materiality**, which encourages us to consider organisations' potential future impact.

IMPACT INTEGRATED RISK MANAGEMENT

Initiatives concerning non-financial disclosure and reporting try to identify and quantify the impact a company has on the environment and society as a whole. Complementary to this is the identification and quantification of the impact that societal and environmental dynamics have on the company itself. The notion of dynamic materiality can inform a long-term vision where future pre-financial risks are taken into account. Requiring disclosure of pre-financial information of this kind can be extremely valuable to enable the transition towards **impact-integrated risk management**. This approach can additionally enable consumers and financiers to spot early signs of future financial risks stemming from factors like resource depletion, climate change and increased social inequality, thus influencing a company's **license to operate**. Updating risk models accordingly implies an enhanced level playing field.

LINEAR RISKS

Linear business models that fail to adapt to a circular economy will be exposed to substantial risks in the long run. But what exactly are the **risks the linear economy poses to businesses and financiers**? Companies that continue to engage in linear business practices, such as utilising non-renewable resources and prioritising the sale of new products, are set to experience negative financial consequences. The Task Force on Climate-related Financial Disclosure (TCFD) has formulated a climate-related risk framework.²⁵ Linear business models can incur market risks, including increased price volatility or decreased investors interest, as well as operational risks, such as the scarcity of a material that negatively impacts the supply chain. Furthermore, the emergence of new consumer preferences and competitive circular business models can undermine the success of a linear firm business strategy. Finally, new regulation, standardization or even lawsuits²⁶ can pose a significant legal and reputational risk to businesses that fail to implement circular solutions.²⁷ All these risks, even though some may not be financial in nature, can have serious financial consequences and will likely materialise on balance sheets.



A company with a sustainable circular business model currently has a higher financing risk profile than a traditional linear company. That's the problem.

– Rob van Willigen, ABN AMRO

RETHINKING FINANCIAL RATIOS

To increase the comparability of companies, financial ratios have been developed. Financial ratios are calculated with specific formulas and based on the numerical values taken from the financial statements. They provide a quantitative analysis to assess a company's solvency, liquidity, leverage, growth, margins, profitability, rates of return, valuation, and more. Related ratios, explained in some detail below,

have been developed over many centuries and are designed to give the capital providers an insight into the risks they are taking with investing in the firm.

Financiers have the opportunity to actively contribute to directing capital towards circular business activities. However, the narrow conception of risk upon which traditional risk evaluation models are built does not facilitate these types of investments. One of the issues that financiers encounter when attempting to support circular business models is concerned with interpreting financial ratios. These ratios are calculated based on the financial statements and allow comparability between companies. Over the course of time intervals have been agreed upon for certain sectors and certain types of businesses in the linear economy. However, in the circular economy, we assume other values regarding residual and harvested resources and companies' impact. Moreover, we see new constellations of businesses in circular value chains. We need to reassess the current financial ratios and potentially recalibrate them based on our new understanding of circular value creation, impact and risk.

Rethinking financial ratios is specifically important for PaaS business models. In PaaS, products remain the property of the service providers, and this is reflected on their balance sheet. This is referred to as a balance sheet extension. This has implications for the solvency ratio, in particular, which is lower for companies that employ PaaS, compared to those which sell products. (transferring ownership). Whereas a low solvency ratio could indicate that the company is not financially sound and unable to service its debts, in a PaaS model it can be a sign that the company is maintaining a grip on its assets and raw materials. These can be redeemed at the end of the products' lifespan and can be used for a new production cycle, therefore enabling a new cash flow. In the context of a circular economy, this can be a sign of long term stability. However, as long as low solvency ratios will be seen as an indicator of financial risk, financiers will be deterred from investing in such companies and it will prevent proving that low solvency ratios in a circular business model can be an indicator of long term stability. This will in turn disincentivize businesses themselves from transitioning to PaaS or other circular models.

4 - LOOKING AHEAD: INCENTIVISING THE CIRCULAR TRANSITION

Circular accounting and reporting have the potential to not only enable, but drive the circular transition. However, this shift to a circular economy requires several complex changes to our present ways of doing business. In order to push forward the circular transition—and to be able to unlock business opportunities under the new circular economy—we must redefine value, impact and risk. The following key levers of change require action to unlock further opportunities for circular activities.

4.1. KEY LEVERS

Data and measurement. Data collection and impact measurement are necessary preconditions for reporting companies' non-financial performance. Measurement should seek to quantify companies' effect on a diverse set of stakeholders, reflecting their interrelationship with natural and human environments. Importantly, we should aim to quantify not just companies' short-term impacts, but the long-term ones, to account for their sustained and expected impact. Measurement efforts will vary in complexity—resource streams are easier to quantify than the impacts of goods—but we have to start making assumptions and determining system boundaries. Existing frameworks, such as the Circular Transition Indicators (CTI) help companies get the right data – and get the data right. Additionally, resources and databases, such as the Global Impact Database²⁸, can offer guidance for how data can be collected and utilised. Measuring increases transparency and benchmarking and will further increase the demand for and use of impact measurement.

Experimentation for circular innovation. Experimenting with circular strategies and revenue models can allow businesses and accountants and financiers to become frontrunners in uncovering and proving the value of circular business. Accountants and financiers should be prepared to think creatively to value and valorise new revenue models, ownership models, depreciation models and financing structures. Financial sector regulators should allow for experimentation, for instance in 'regulatory sandboxes'. Moreover,

organisational models such as the cooperative structure can help companies re-conceptualise their relationship with diverse stakeholders and the environment. Such new strategies are much needed. This is particularly true given the often slow pace of regulatory change, and added time needed for global adoption of adequate standards. Action is needed now to ensure a vast adoption of circular economy practices in a wide array of industries.

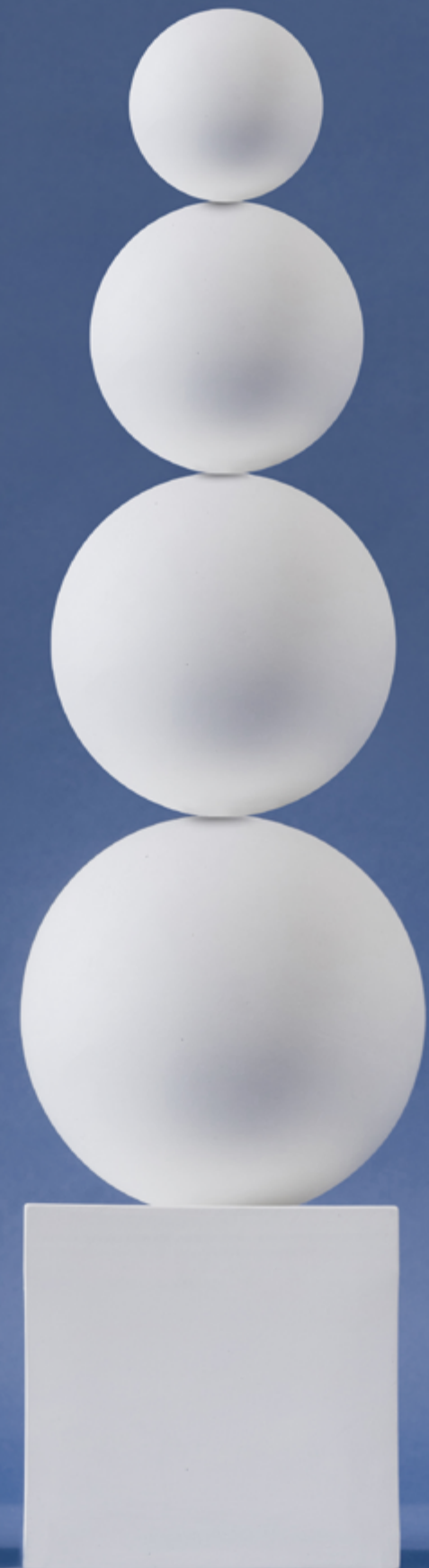
Integrating impact data into financial accounts. To leverage the collected information, data should be integrated into organisations' financial accounts. It has recently been accepted within financial markets that climate-related impacts on a company can materialise and therefore require disclosure. It is important to consider taking this notion a step further, to treat companies' impacts on the environment and society as material. Solutions such as the Integrated Profit and Loss Statement allow for bringing together information on companies financial performance and their non-financial impact. This brings sustainability issues to the forefront, incentivising improved capital allocation decisions by investors and executives. Disclosure is a great way to demonstrate progress towards a circular economy. It provides assurance to a range of stakeholders. Also, perhaps more importantly, it creates an internal momentum and focus on circularity, by forcing everyone in the organization to consider circularity in design, processes and operations. GRI's and SASB's move towards more 'closed loop' indicators such as GRI 306 and the first circular metrics are being audited for companies such as with Philips, Microsoft and Swinkels.

Standardisation. Credible comparison of companies' impact requires the standardisation of measurement techniques. Such standardisation would encourage a level-playing field for circular businesses. While investors would be able to look beyond financial performance, customers will be able to consider more than the price of the product, and move towards selecting companies based on their positive circular impact. This would set in motion a new competitive dynamic, whereby companies would seek to demonstrate positive sustainability performance, thereby further incentivising the adoption of circular business models.

The frameworks being developed by organisations such as the IFRS and legislative efforts such as CSRD pave the way for widespread standardisation. However, the continued collaboration and timely widespread adoption of such standards remains essential. Currently, there is no standardised metric on circularity. Several bodies, such as the EU (taxonomy), ISO and several private and non-profit organisations, are currently creating metrics for measuring circularity. When we can start applying these at scale this will be an important game changer.

Collaboration. The circular transition involves a system-wide change and therefore demands that a variety of actors undertake concerted action to achieve it. Companies, financiers, accountants, and regulators must collaborate with knowledge institutions and civil society to jointly overcome obstacles to the circular transition and recognise that their progress is co-dependent. For example, data collection by companies from suppliers enables smarter decisions by financiers, putting pressure on regulators to act on the newly-available information. Sharing knowledge and experience as well as communicating progress is important to hasten learning and the speed of the transition. Efforts that bring together diverse stakeholders in pre-competitive settings, can help unlock the potential of cross-sector cooperation to create tangible and actionable solutions.

Mindset change. The circular transition is enabled by a mindset change. Viewing waste and pollution as design flaws rather than inevitable by-products of the things we make can push us towards structuring our production processes differently. The language of redefining value, impact and risk is far more than a rhetoric exercise. The vocabulary we use to describe our reality can shape what we perceive to be the solution scope for the challenges we encounter. For example, refraining from talking about 'disposing of waste' to focus on 'valorising residual resources' can lead to uncovering their previously unnoticed and undervalued uses.



4.2. KEY ROLES

The complexity and multi-level nature of systemic change requires all relevant stakeholders to take action and move away from linear take-make-waste practices. Cross-sector collaboration and a mindset change are key to enable a timely and systemic shift to a circular economy.



COMPANIES

Businesses must begin by determining boundary conditions and collecting data. Recognising that adequately quantifying their impact will be a product of a learning journey, companies must start now to develop the internal capabilities for data collection and reporting. They can approach an advisory organisation for methodological support or consult initiatives providing best practices for inspiration. Companies that do so are likely to gain a competitive edge under a new impact economy. We recommend that companies take a bottom-up approach and are willing to share learnings and results to fast track industry wide standard development and prevent single companies from inventing the wheel in isolation.



ACCOUNTANTS

Through both adopting practical solutions and raising awareness of its importance, accountants can push for integrating non-financial information into financial reporting. Accountants can experiment with integrating non-financial information in their reporting, opening up the way for adopting new accounting practices (such as Integrated Profit and Loss Statements), which can help capture the value of circular business models, allowing them to become more competitive. From 2023 onwards, the new CSRD obliges businesses to report on circularity. Mandatory indicators will urge accountants to engage with circularity (and its effects) in businesses for the purpose of corporate disclosure. This way, accountants will ensure that not only the positive but also the negative impacts are reported in a properly integrated way. Last but not least, accountants can play an advisory role in the establishment and further development of the reporting guidelines and can see to it these guidelines become better equipped to measure and report on impact.



FINANCIERS

Smart capital allocation requires that financiers and investors have an understanding of the level of circularity of the companies in their portfolios. Circular businesses are likely to be safer and more profitable in the long run, but this is often overlooked in financiers' present approach to risk. Hence, there is a need to develop risk models that take into account the value of circular business. Moreover, they can leverage their position to pressure companies to measure and share impact information and ask auditors for reliable integrated information.



REGULATORS

Currently, accounting for circular businesses can amount to trying to fit square pegs into round holes, as the present regulatory standards continue to be ill-equipped to serve non-linear models. Legislative bodies need to catch up with organisations leading the way in the circular transition. By removing legislative obstacles to circular business, legislators can enable circular companies to become more competitive. Financial sector regulators should stimulate financiers to rethink risk in the context of the circular transition and incentivise linear businesses to move away from their present unsustainable practices. Specifically, regulators can track and support impact reporting, and stimulate and demand submission of circular impact data in financial reporting. Governmental regulation should rethink tax schemes that incentivise depreciation and excessive resource use. Such laws and other regulatory incentives can level the playing field; existing circular businesses will grow and other companies are encouraged to adopt circular business models.

5 - CONCLUSION

This paper concludes a two-year trajectory by the Coalition Circular Accounting (CCA), which explored the accounting-related challenges to the transition to the circular economy, and sought to devise practical solutions. Current accounting practices are limiting for circular businesses and can create obstacles for companies wishing to implement circular solutions. For instance, the present approach to depreciation, whereby assets are depreciated to zero, goes fundamentally against the principles of a circular economy, where resources are used in ongoing cycles. **Circular accounting can become not just as an enabler, but a driver of the circular transition.**

Circular accounting and reporting will put circularity on the minds of company executives, and enable investors to demand better performance on circularity—and higher quality data to accurately quantify and credibly represent such performance. Executives will see circularity not just as a side issue, but as material to the company's success. Investors will be able to move capital away from unsustainable projects, towards circular businesses. Customers will also be empowered to make more sustainable choices, picking circular options. What is more, circular accounting can help adequately reflect the value of sustainable businesses which are at the forefront of the circular transition and remove some of the obstacles they currently face, thereby making them more competitive. **Circular accounting and reporting are key for making the circular economy a reality.**

However, the shift to a circular economy requires complex changes to our present ways of doing business. In order to push forward the circular transition—and to be able to unlock business opportunities under the new circular economy—we must redefine how we presently approach value, impact, and risk.

- **Value.** We must learn to appreciate and quantify the value generated with circular business models. This includes reassessing what we call 'waste' and introducing concepts such as residual value. We should also move away from the existing approach whereby value is considered primarily in the short-term—products being purchased and then disposed of—to one where materials are kept in use for as long as possible. New circular business models enable optimising and extending the lifespan of products and materials and are characterised by increased collaboration within supply chains. Accountants can help devise and promote accounting solutions which can adequately reflect these new forms of value in a circular economy.

- **Impact.** Impact must be understood (and measured) to capture the long-term social, environmental and economic impacts organisations have on their stakeholders. Non-financial impacts should be listed on companies' income statements and balance sheets alongside financial factors.

- **Risk.** A new approach to risk is needed to steer capital away from non-circular (therefore in the long run often more risky) businesses, and towards ones which promise long-term, stable value creation and positive impact. Financiers should develop risk assessments which take into account not only financial returns, but also pre-financial information and companies' total long-term impact and interrelationship with society and the natural environment.

While we identify accounting as an important driver of the circular transition, we recognise that the complexity and multi-level nature of the systemic change that it asks for requires that all relevant stakeholders take action and move away from linear take-make-waste practices. Cross-sector collaboration and a global mindset change are key to enable a timely and systemic shift to a circular economy. We call on businesses, accountants, regulators and financiers to act now and take responsibility and play a part in the circular transition.

COLOPHON

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