

SUPPORTING THE CIRCULAR ECONOMY TRANSITION

THE ROLE OF THE FINANCIAL SECTOR IN THE NETHERLANDS

ACKNOWLEDGMENTS

This report has benefited from the analysis, insights and ideas of many individuals with a keen interest in the circular economy. The team from Oliver Wyman is grateful to all who contributed their time and effort to provide guidance and support in the writing of this report. We particularly would like to thank our interview partners, survey respondents and the ABN AMRO team. The illustration was contributed by INK Strategy.

EXECUTIVE SUMMARY

A growing and wealthier global population is straining the biocapacity of our planet. In the densely populated and prosperous Netherlands, we consume more than three times what the Dutch ecosystem can produce, while globally we consume 1.7 times what the Earth can produce. The current rate of resource consumption is unsustainable, both for society and for the businesses that now depend on natural resource consumption.

A sustainable level of resource consumption can be achieved by moving away from the linear, “take-make-dispose” economic model and towards a circular economy based on the principle of “reduce-reuse-recycle.” Underpinned by a move to renewable energy, the circular economy relies on products and services that minimise waste and, therefore, environmental damage and resource depletion¹. More concretely, circular businesses are “closing the loop” in supply chains by reusing end-of-lifecycle products as raw materials, sharing idle resources, using renewable resources, or extending the product lifecycle.

The Netherlands is fertile ground for circular growth. Circular innovations and business models are beginning to emerge and thrive in an urbanised and environmentally conscious environment. Estimates of economic contributions of the circular economy vary significantly, but all point to substantial change by 2030: a contribution of €6 billion to €30 billion to Dutch GDP, and the creation of 15,000 to 80,000 new jobs². Changes on this scale will create many winners and losers in established industries.

Aside from moral arguments, there is a strategic and economic case for providing access to finance to innovative circular startups and small and medium-size enterprises (SMEs) as a growing segment of the Dutch

economy. However, benefiting from this opportunity will require substantial change on the part of most stakeholders and participants in the financial sector.

Financial sector support for circularity creates a virtuous circle. Financial institutions can hedge the risks stemming from their portfolio of linear businesses while capturing part of the upside potential generated by a circular economy. Better access to funding accelerates the growth of the circular economy, and improves the economic equation of circular businesses. This, in turn, alleviates investment and credit risks and provides more sustainable returns.

Providing access to finance, especially for innovative circular startups and SMEs, is crucial to the innovation ecosystem. Drawing on a survey of 50 circular companies and interviews with 30 stakeholders across the Dutch circular economy ecosystem, this report recommends concrete measures that can be taken by corporates, institutional investors, banks, insurers, and the government to capture value and expedite the flow of capital into the circular economy, in order to create a viable ecosystem.

Circular startups will require an estimated €400–500 million in risk capital over the next five years. At the moment there are a few hundred circular Dutch businesses, most of which are in the pioneering phase. Startups in particular are hindered by a lack of reasonably priced risk capital (such as equity). Only a part of this demand is expected to be covered by traditional risk-capital providers.

Circularity is a CEO agenda topic. To drive circular innovation, circular startups require additional risk capital and business support. Corporates stand to benefit significantly from providing a “path to

profitability” for early-stage companies, for example by offering venture capital. To reduce linear risks and create a sustainable business model, circularity should be part of the corporate strategy.

The government can facilitate access to risk capital funds by increasing market transparency and offering additional incentives to funding providers. Both the EU and the Dutch Government have identified the circular economy as an important growth area with high societal impact. Significant EU grants and subsidies have been allocated to circular initiatives. New institutions such as a Nederlandse Financieringsinstelling voor Economische Ontwikkeling (NFEO) should have a mandate to address the equity funding gap for startups as a relevant part of its wider mission.

Banks should build expertise in circular business models and develop innovative ways of mitigating their risks to make them “bankable.” As startups become SMEs, they normally begin to access bank lending. As is the case in other innovation markets with a large technology component, bank funding for the circular economy is more complex. The cost of assessing creditworthiness through established procedures is out of proportion with the relatively small size and significant risk of the loans.

Given the likely growth of circular business models, however, banks should see this effort as a strategic investment that can generate top-line growth and attractive economics. Examples could include obtaining guarantees or insurance for cash flows and supply-chain risks or reviewing collateral eligibility criteria to include circular technology. In addition, banks are ideally positioned to introduce circular businesses to their clients and third-party investors (and government

financial support) in the early stages of financing when loans are simply the wrong funding instrument.

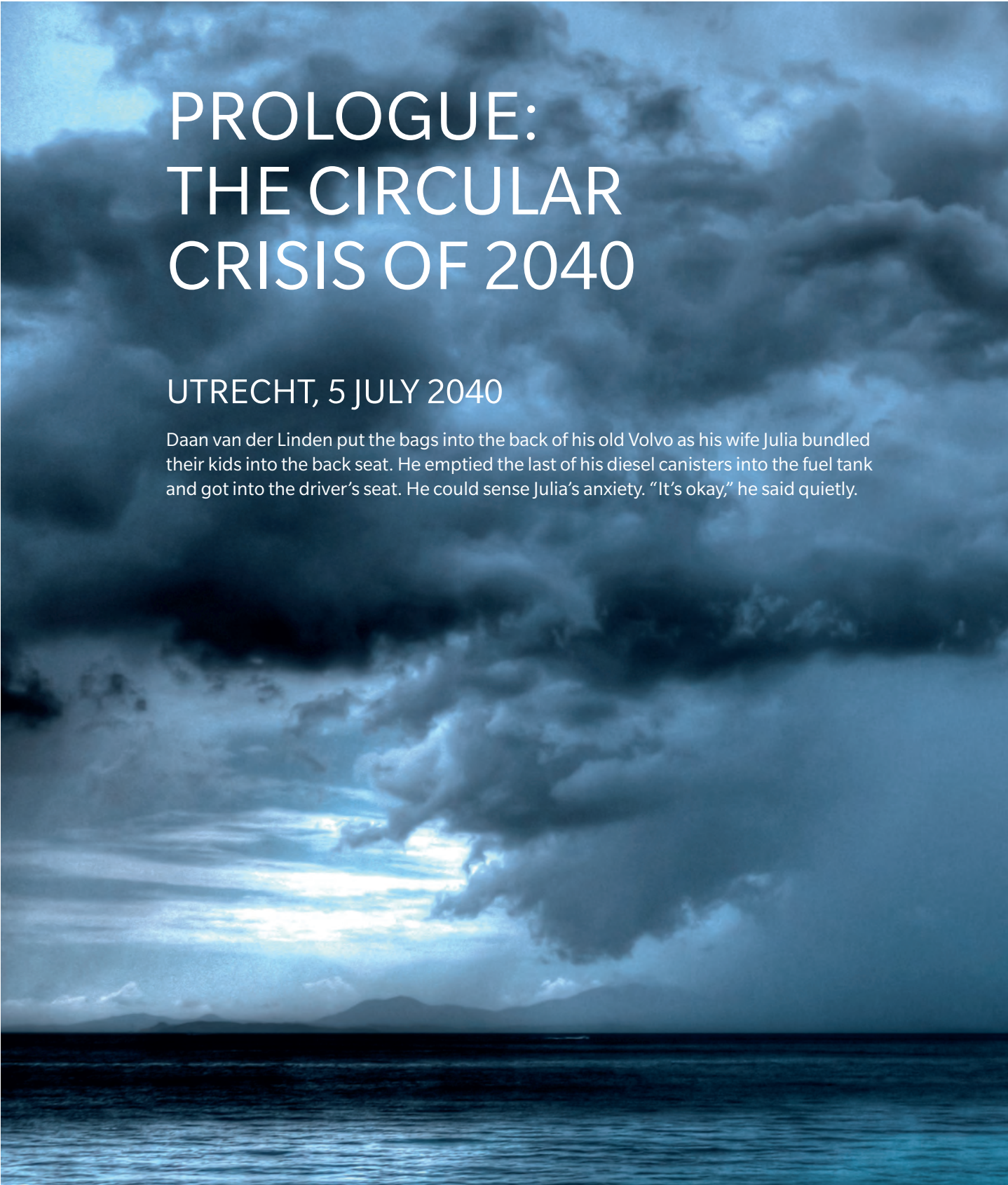
Moreover, the emerging risks of the circular economy will provide insurers with the opportunity to develop new products both for circular businesses and consumers (such as insurance products for individuals using sharing platforms, or new insurance models for products consumed as a service).

Institutional investors should make circularity a priority in their impact investing agenda: Fully circular corporates have yet to emerge, but a corporate trend towards diversifying away from linear businesses is beginning to appear in the Netherlands. Corporates stand to benefit most from an early move to circularity but transition costs are complex to determine. As responsible shareholders of corporates with long-term liabilities, institutional investors should build expertise, and help corporates further their circular strategies. Circularity should not be seen as a separate effort and can be built into the existing Sustainable Development Goals investment strategy of most institutional investors, in particular Goal 12. Additionally, institutional investors can stimulate innovation by increasing the allocation to venture-capital funds with a sustainable investment mandate.

This report discusses what different stakeholders, including financial institutions, corporates, and the government can reasonably do within the current commercial market setting; for instance changes in the tax or subsidy schemes are not covered. The main report is flanked by fictional stories in the prologue and epilogue to stimulate thought.

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PROLOGUE: THE CIRCULAR CRISIS OF 2040

UTRECHT, 5 JULY 2040

Daan van der Linden put the bags into the back of his old Volvo as his wife Julia bundled their kids into the back seat. He emptied the last of his diesel canisters into the fuel tank and got into the driver's seat. He could sense Julia's anxiety. "It's okay," he said quietly.



“But what if we’re caught?” she said. “The fine for driving a diesel car is €20,000. We should have handed it in.”

“It doesn’t matter. We’re leaving. We’ll dump it at the airport.”

Daan drove even slower than usually. It wasn’t just that the pot holes were getting worse. The trip felt like a funeral procession, except the corpse wasn’t in the back of the car; they were driving through it.

No one spoke. Julia and the children stared out the windows at the world they were leaving. It was astonishing how quickly things had fallen apart. With so much government spending going into lifting the dykes against rising sea levels, everything else was neglected. The Netherlands was starting to look like a third-world country. And it was not only the roads and public buildings. The private homes they drove by were also dilapidated.

As the cost of oil and, hence, of international trade had begun to escalate dramatically in the late 2020s, small trading nations such as the Netherlands had been particularly hard hit. The derelict tankers, now makeshift flood defences outside Rotterdam harbour, were a stark visual reminder of the “end of trade.” The emergency 300 percent tax on electricity introduced in 2035, and never lifted, had been the final straw. Wages had fallen 50 percent in the last five years. “Better poor than dead” was the governing party’s re-election campaign slogan. Daan had once agreed. Now he wasn’t so sure.

The direct route to Schiphol airport would have taken them through Maarssenbroek. But Daan took a route around it, joining the A2 several kilometres to the north. He wanted to avoid the Maarssenbroek tent city. It had been safe enough when occupied only by “water refugees.” But since destitute Dutch natives had started moving in, ethnic conflicts had made the place dangerously violent. Road blocks and car jackings were not uncommon.

Five kilometres from Schiphol, they drove past Trashboarding World. That was something Daan would miss. Snow skiing had ended in 2031 with the final melting of Europe’s snow caps. But the 2028 international treaty banning the export of waste meant that great mountains of it were building up in the Netherlands, mainly on what were once dairy farms. It didn’t take long for frustrated snowboarders to pounce on the opportunity and Daan was the over-40s Dutch champion.

It was dark by the time they arrived at Schiphol. Daan turned off the headlights and drove slowly down a slip road that ran behind a large windowless refugee processing centre. They parked and removed their luggage. Daan left the keys in the ignition as a gesture of goodwill to whomever had the job of destroying his car.

It was only a two hundred metre walk to the terminal but they were soaked in sweat when they arrived. Though 10:15 p.m., it was still 28 degrees Celsius.

“Where are you travelling to this evening?” asked the automated check-in kiosk.

“Stuart Island, New Zealand,” Julia replied. They had been accepted under New Zealand’s immigration points system, which favours young families with highly educated parents. They had considered the new colony on Antarctica but there were stories of lawlessness, and the economy was almost entirely agricultural, which was of no use to a pair of research scientists. At latitude 47 south, Stuart Island would be fine for a few decades at least.

As required, they had arrived eight hours before their flight. The physical examinations and security interviews went quickly, leaving them with three hours in the departure lounge. They sat in a row of chairs near to the Green Bank bureau de change. Its shutters were down because the bank had gone into receivership in May, another victim of the widespread business loan defaults.

Daan could not help but feel some satisfaction from it. After finishing his PhD in chemical engineering in 2023, he had started a business making small power generators for homes. The technology, which linked solar and waste energy, was revolutionary. He had used a loan from his parents to get started. But when he needed funding to begin manufacturing on a commercial scale, he couldn’t find it. With energy prices still low, no one had seen the value in businesses based on efficient resource use. Green Bank had been the last to reject him, though it was then called the Commercial Bank of the Netherlands. Its recent rebranding had apparently done the bank no more good than it had done the environment.

The sun was rising, which meant it was time to board. As the family approached the gate they paused for a moment to look out the window. Huge zeppelins hovered over what was previously a runway, 200-metre-long cigar shaped balloons with 50-metre passenger cabins hanging below. Fuel costs and CO₂ emission charges had bankrupted the last European airline in 2030 and two years later the Dutch electorate had voted to ban all airplane travel.

“How long will the trip take, Mummy?”

“It all depends on the winds, darling. A week or two, probably.”

They walked down the stairs from the terminal, across the tarmac and up the stairs into the cabin of their Air New Zealand zeppelin. From his seat Daan looked back at the terminal. “We missed our chance,” he muttered, as the zeppelin was untethered. When they began to float away, he started imagining how it all could have turned out so very differently.

UTRECHT, 5 JULY 2040

Daan was waiting outside when the driverless electric van arrived. He loaded a large rolled carpet into the back as a couple stepped out of the front doors. They looked bewildered.

To be continued...





1. FROM LINEAR TO CIRCULAR ECONOMY

A circular economy is an industrial system that is restorative or regenerative by intention and design. The economic benefit of transitioning to this new business model is estimated to be worth more than \$1 trillion in material savings by 2030³

Ellen MacArthur Foundation

Waste equals food. Products can be designed from the outset so that, after their useful lives, they will provide nourishment for something new

William McDonough and Michael Braungart, Cradle to Cradle: Remaking the Way We Make Things

In a business-as-usual scenario, the ocean is expected to contain one tonne of plastic for every three tonnes of fish by 2025, and by 2050, more plastics than fish (by weight)⁴

Ellen MacArthur Foundation

The circular economy discussion is progressing much faster than the first dialogues around sustainability 20 years ago. It is a topic that combines sustainability, innovation and business sense and gets people excited

Head of Sustainability, Dutch bank

The circular economy can be an important export product for the Netherlands for the next ten years

Circular economy expert, Dutch bank

This chapter explains

- 1. The background and foundation for the circular economy*
- 2. Economic benefits of the transition from linear to circular*

1.1. THE DANGER OF CONTINUING THE SAME PATH

As population grows and becomes more affluent, its consumption of scarce resources increases. This idea is not new. In 1798, the British economist Thomas Malthus contrasted population growth with the ability of the earth to sustain it. In the early 1970s, the IPAT equation was developed by a group of American scientists⁵ in an attempt to describe the environmental impact as a function of population, affluence and technology.

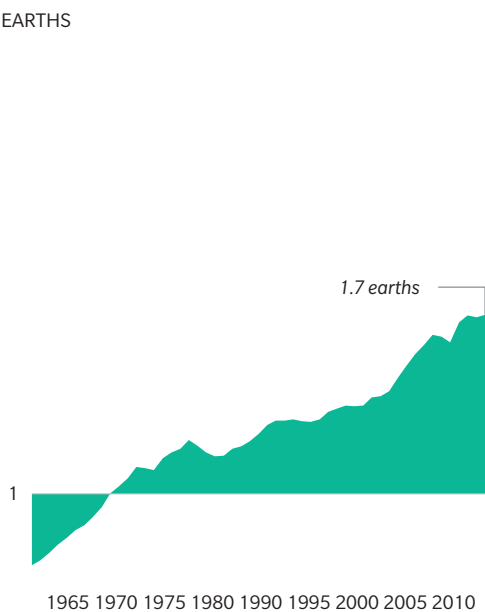
$$\text{Environmental impact} = \text{population size} \times \text{consumption/person} \times \text{damage/unit of production}$$

The environmental impact can take a variety of forms, such as resource depletion or air pollution. Currently, five trillion pieces of plastic, weighing more than 250,000 tons, are floating in the sea⁶, and 79 percent of plastic is discarded. By 2015, we, humans, had created a cumulative 4.9 billion tons of plastic waste⁷.

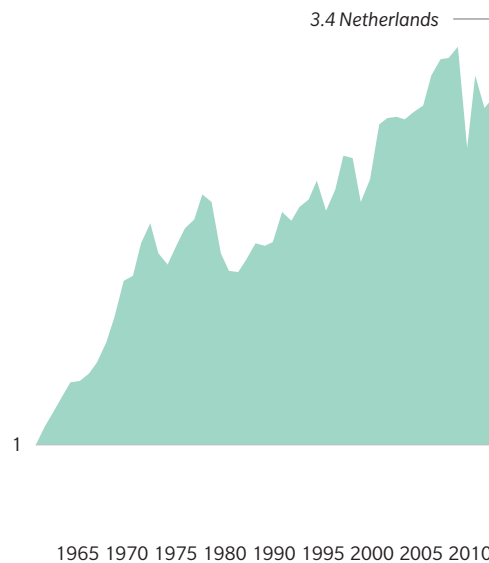
Exhibit 1: Yearly net resource consumption (measured in number of earths/Netherlands; 1961–2013)

ECOLOGICAL FOOTPRINT VS. BIOCAPACITY

EARTHS



NETHERLANDS



The increasing environmental impact of a growing population that has become more affluent can also be illustrated by the concept of Earth Overshoot Day. (See Exhibit 1.) It marks the day that annual resource consumption exceeds the Earth’s capacity to regenerate those resources. In 1970, annual consumption roughly equalled regenerated resources, meaning Earth Overshoot Day fell in the month of December. In 2013, consumption exceeded regeneration by 1.7 times⁸, meaning that Earth Overshoot Day fell in the month of August. As a highly developed and densely populated country with few natural resources, the balance for the Netherlands is significantly worse than the global average.

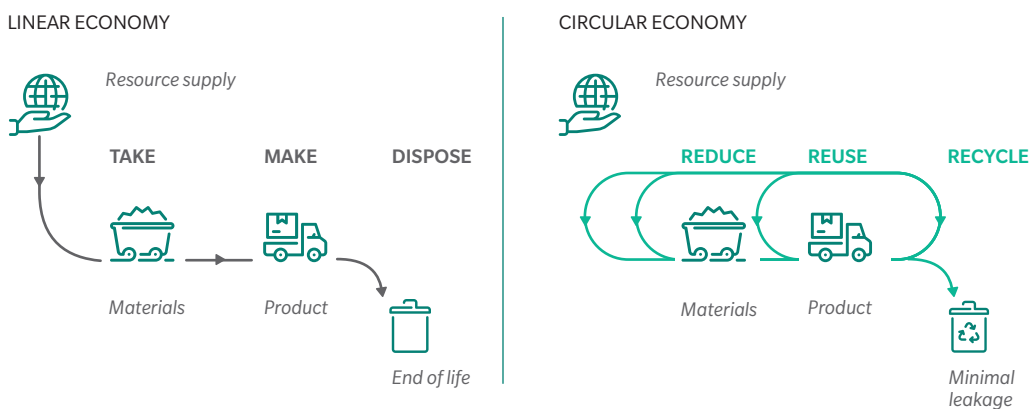
Using current predictions, the global consumption of natural resources is expected to triple by 2050⁹. This is driven by a growing global population (expected to reach 8.5 billion by 2030¹⁰) and increasing affluence levels¹¹.

From these predictions and the IPAT equation, it follows that the only remaining factor to balance the environmental impact of a growing and more affluent population is technology, which is one of the main drivers of the environmental damage per unit of production. The circular economy can be a driver of the technological change required.

1.2. DEFINITION OF THE CIRCULAR ECONOMY

The circular economy is sometimes called the “reduce-reuse-recycle” model to contrast it with the current, linear “take-make-dispose” model. Current production and consumption processes use raw materials as inputs, produce goods, and then dispose of waste. The linear economy thus relies on a continuous supply of resources. The circular economy is instead a continuous development cycle that preserves natural resources and energy while optimising outputs and reducing the creation of irreversible waste.

Exhibit 2: From a linear economy to a circular economy



The most widely known definition of the circular economy is from the Ellen MacArthur Foundation:

“Looking beyond the current “take-make-dispose” extractive industrial model, the circular economy is restorative and regenerative by design. Relying on system-wide innovation, it aims to redefine products and services to design waste out, while minimising negative impacts. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital”¹².

The Dutch government, in publishing its circularity objectives for the Netherlands, defines the concept this way:

“We are talking about an economy that provides for people’s needs without placing an unacceptable burden on the environment and without exhausting natural resources”¹³.

For the purpose of this report, we equate the circular economy with the five generally accepted types of circular business models¹⁴:

- **Circular supplies**¹⁵: Provide renewable energy, bio-based, or fully recyclable input material to replace single-lifecycle inputs into production processes
- **Resource recovery**: Recover useful resources or energy from disposed products or by-products
- **Product life extension**: Extend the working lifecycle of products and components by repairing, upgrading, and reselling
- **Sharing platforms**: Increase the utilisation of products by making their shared use or ownership possible
- **Product as a service**: Offer product access and retain ownership to optimise benefits of circular resource productivity

The reduce, reuse, and recycle elements that underpin the concept of circularity are intertwined across the five circular business models defined above.

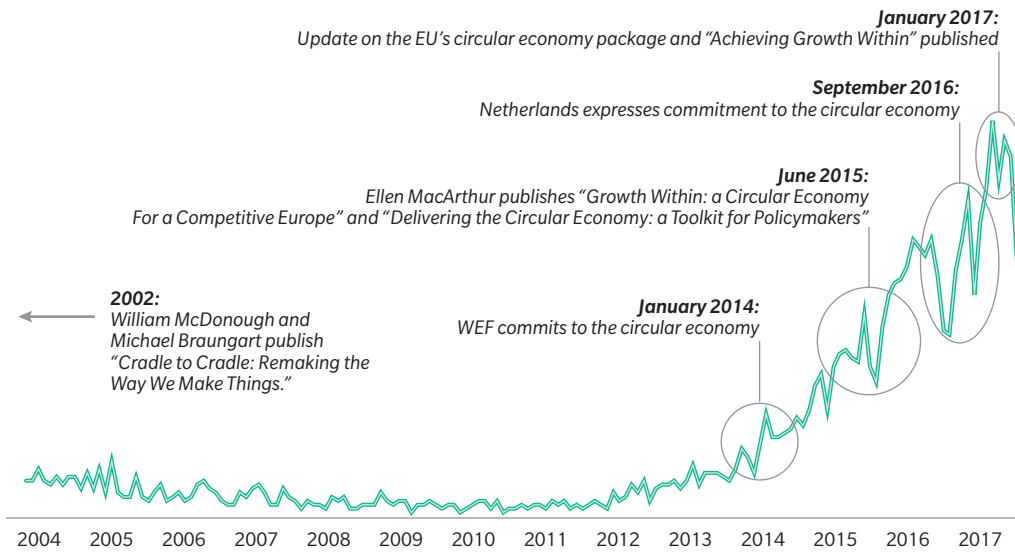
1.3. EMERGENCE OF THE CONCEPT

Following the 2014 World Economic Forum (WEF) Annual Meeting and accompanying publications¹⁶, the concept of a circular economy has gained considerable momentum.

Many elements of the circular economy concept have already been articulated over recent decades as part of broader political and societal programmes.

The 1992 Rio Declaration, which serves as the standard by which UN member countries create environmental policies, calls on member states to “reduce and eliminate unsustainable patterns of production and consumption”¹⁷. The UN’s Millennium Goals expand on this by adding the goals of reducing greenhouse gas emissions and retaining a planet whose resources are sufficient for the following generations¹⁸. More concretely, the currently articulated Sustainability Development Goals call for increased resource efficiency in consumption and production, sustainable management of natural resources, and substantially reduced waste generation through prevention, reduction, recycling, and reuse¹⁹.

Exhibit 3: Number of hits for “Circular Economy” on Google



The 2014 WEF meeting generated momentum for ideas around sustainable design and business models with a positive impact. These ideas date back decades. The first articles of McDonough and Braungart from 1992 described the concept for products used as services in a circular economy. Based on the five criteria of the Cradle to Cradle framework, McDonough recently presented the concept of 'The Five Goods' as an easy way for companies to use sustainable design principles to create 'less bads and more goods'²⁰:

1. **Good materials:** exclusion of harmful inputs in the production process
2. **Good economy:** reduction of waste by reusing resources at the end of the product life
3. **Good energy:** reliance on sustainable energy generation
4. **Good water:** protection of water supplies by developing production processes, creating water supplies of good quality
5. **Good lives:** promotion of human dignity, safe working conditions and accommodation of the family living circumstances

1.4. ECONOMIC GAINS FROM A CIRCULAR ECONOMY

The economic and environmental benefits of the circular economy are closely intertwined. Several analyses have attempted to quantify the effect of a transition to a circular economy on GDP and job growth in the Netherlands. They estimate that by 2030, GDP attributable to the circular economy would be in the range of €5.7 billion to €31 billion, creating between 14,000 and 83,000 new jobs²¹. Industrial sectors are

expected to account for nearly 75 percent of this growth²², even though they currently account for only 18 percent of GDP²³.

These projections take account of first-order effects created by a broad shift from higher value new goods to lower value second-hand and recycled goods that a circular economy would entail and which would reduce GDP. However, analysts expect that second-order effects produced by consumer savings and subsequent spending on other products will outweigh this negative effect on GDP.

Long-term economic growth will also be helped by reduced exposure to resource supply shocks and resource price volatility. Commodity prices are already subject to speculation and volatility, which are only likely to increase as resources become scarcer, placing considerable strain on traditional linear business models. An early investment in circular businesses will diversify the Netherlands' linear business portfolio, by offering added protection against downside linear risk while capturing the upside potential of circular businesses.

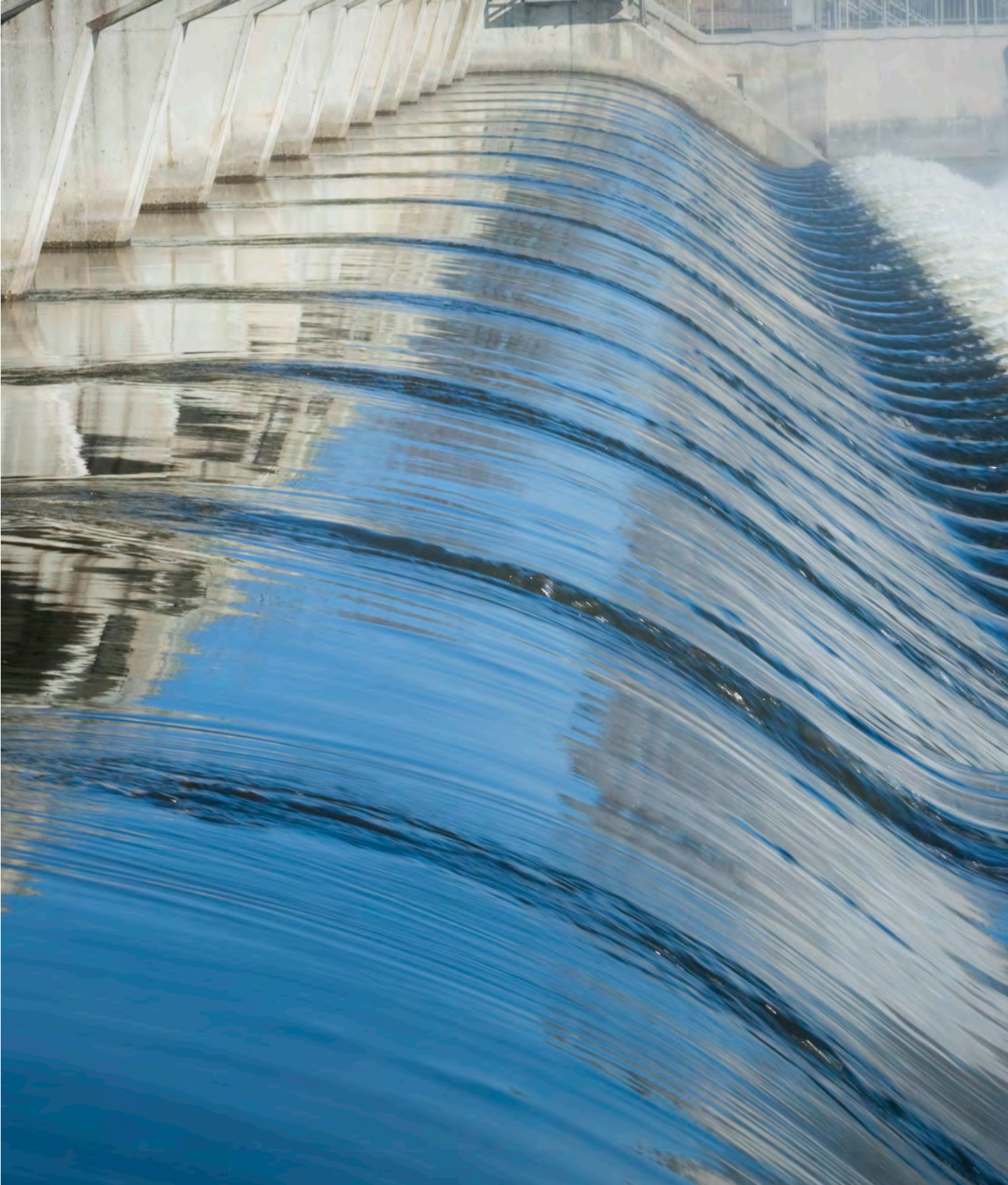
The transition to a circular economy will create a higher risk, higher reward environment for the economic actors that drive it forward. Early involvement by banks can lock in expertise in financing circular business models and in making technological assessments. This provides a platform for future growth, as circular businesses become mainstream, and a way of diversifying risks that arise from lending to linear companies. The inherent riskiness of new business models still limits circular businesses' access to traditional financing such as bank lending. However, as explained in Chapter 4, banks have several levers by which they can de-risk SMEs.

The prolonged low-interest-rate environment has reduced the returns of pension fund managers and insurers, forcing them to "re-risk" their balance sheets. Additionally, the long-term liability structure of these institutional investors has created a concern over the enduring sustainability of businesses in their portfolios. In this context, the transition to a circular economy provides institutional investors with an opportunity to address both their sustainability and return imperatives.

The linear companies of today can become the circular pioneers of tomorrow. By pushing circular models, they can shift customer demand to ensure mainstream uptake of circular concepts. In a market where business sustainability and climate resilience have become top of mind for consumers, the early movers to circularity will find themselves in a strong competitive position.

As sustainability replaces globalisation as the key driver of the economy, a reversal from global to local supply chains is expected. Given the Netherlands is well placed to be an early mover in this space, the accrued benefits of the circular economy would be amplified by exporting circular technology and processes²⁴.







2. THE NETHERLANDS AS A LEADER IN THE CIRCULAR ECONOMY

If we would turn our business model completely circular (that is, implementing all principles), the price of our goods would become too high to create a demand

Entrepreneur

The circular economy requires at least a European-wide strategy, not only a local Dutch strategy. The largest gains for the circular economy are global gains

Hans Stegeman, Triodos Bank

A corporate will never be truly circular if it doesn't influence the total value chain, even the part that is indirect

Aniruddha Kusurkar, FrieslandCampina

A lot of people think technology is the main problem preventing reuse of resources, but many resource recovery technologies exist already. What is missing is sufficient scale and a dependable source of resource streams to work with

Ruud Sondag

This chapter explains that

- 1. The Dutch Government has committed to becoming fully circular by 2050 and to halve the use of raw materials by 2030*
- 2. Cities will drive circular uptake as they benefit from key circular enablers: high population density, compact infrastructure, and autonomy over local budgets*
- 3. Circular startups will drive innovation, while SMEs and corporates will have a critical role in growing the circular ecosystem*

2.1. THE EU'S CIRCULAR ECONOMY PACKAGE

The EU's 2015 circular economy package launched initiatives covering legislation, funding, and measures to boost knowledge sharing.

Most of the laws and regulations governing consumption of goods in member states are set at EU level. Three notable initiatives include:

- In 2016, the European Parliament recommended the Commission and member states take measures to promote durable goods that can be repaired and upgraded²⁵
- In 2016, the European Commission proposed a regulation aimed at creating a single market for fertilisers made from secondary raw materials²⁶
- In 2015, the European Commission proposed revisions to the existing EU Directive on Waste. The proposal includes a target of recycling 65 percent of municipal waste and 75 percent of packaging waste by 2030²⁷

The EU stimulates activity in strategic economic sectors such as the circular economy by providing financing²⁸. These investments are often leveraged with money from national governments, regional development agencies, and the private sector (see Zero Waste Scotland case study). The most relevant initiatives to the circular economy are:

- Horizon 2020 is the EU's largest research and innovation programme. It has a budget of almost €80 billion to be invested from 2014 to 2020, of which €650 million is earmarked for the circular economy²⁹
- The European Structural and Investment Fund (ESIF) consists of five funds including the European Regional Development Fund and the European Social Fund. It aims to stimulate job creation by investing in infrastructure and renewable energy and other resource efficiency projects. The ESIF budget includes €5.5 billion for waste management projects across Europe³⁰
- The EU's LIFE programme supports environmental and nature conservation and climate action projects. It has a budget of €3.4 billion for the period 2014 to 2020³¹

Lastly, the EU aims to contribute to knowledge creation and sharing. Initiatives include stakeholder platforms for financing the circular economy and reducing food waste, conferences on reducing the use of plastic, and bringing stakeholders together in innovation deals.

CASE STUDY – ZERO WASTE SCOTLAND

The circular economy is about innovation, and quite a lot of small and medium-sized businesses struggle to do that by themselves

Louise McGregor, Zero Waste Scotland

Small businesses don't just need money, they need support with business planning, modelling, and creating a supportive ecosystem

Stuart Ferguson, LWARB

Zero Waste Scotland (ZWS) is a fund which exclusively supports circular SMEs.

ZWS is funded by the Scottish Government to support the delivery of its circular economy strategy. Additionally, the European Regional Development Fund (ERDF) contributed a total of £73 million until December 2018 for the Resource Efficient Circular Economy Accelerator, a sum that is being matched by the Scottish Government.

In April 2016, Zero Waste Scotland launched a £18 million fund of grants for circular SMEs, as part of the ERDF Strategic Intervention. Until year-end 2018, the fund will disseminate grants to Scottish SMEs with a maximum of £1 million. This initial government funding is intended to de-risk circular businesses and, hence, encourage funding from private investors.

By providing grants, ZWS aims to showcase the benefits that circular SMEs bring to society and support healthy and sustainable financing in the long term. Besides financing, the fund informs policy, motivates behavioural change, and provides business support, advice, and training via its Circular Economy Business Support Service.

Another well-established initiative supported by the EU is the London Waste and Recycling Board (LWARB). After shifting its focus to the circular economy three years ago, it is supporting young circular businesses with financing and advice.

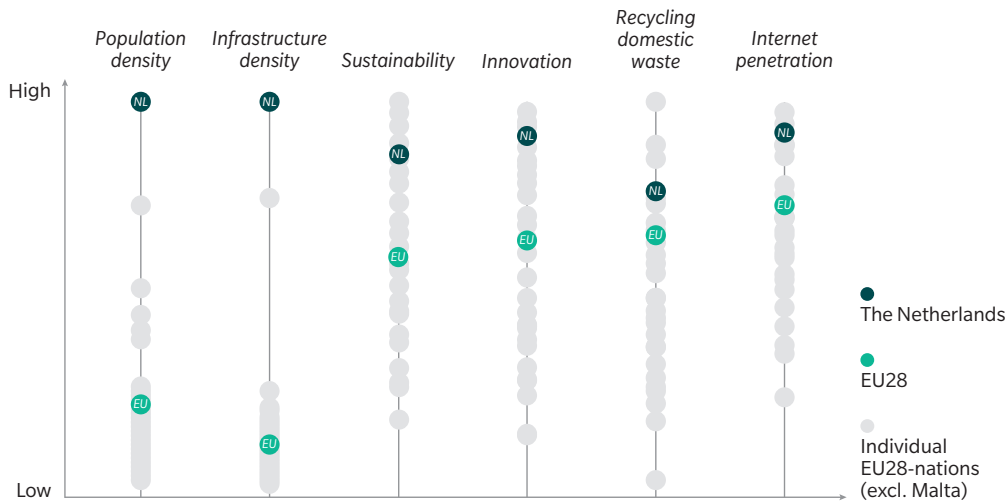
A progress report of the circular economy package was published in January 2017³² and followed by a pledge to extend financial support of the circular and bio-economy³³.

2.2. THE CIRCULAR AMBITION OF THE NETHERLANDS

As an affluent Western European country with few natural resources, the ecological footprint of the Netherlands is worse than the European average^{34,35}. For example, per capita CO₂ emissions surpass the EU average of 6.7 metric tons by 50 percent³⁶.

That said, the Netherlands was one of the key supporters of the action package adopted by the EU and scores well on many dimensions generally thought to favour adoption of circular economy principles. (See Exhibit 4.)

Exhibit 4: Relative positioning on dimensions supportive to the circular transition

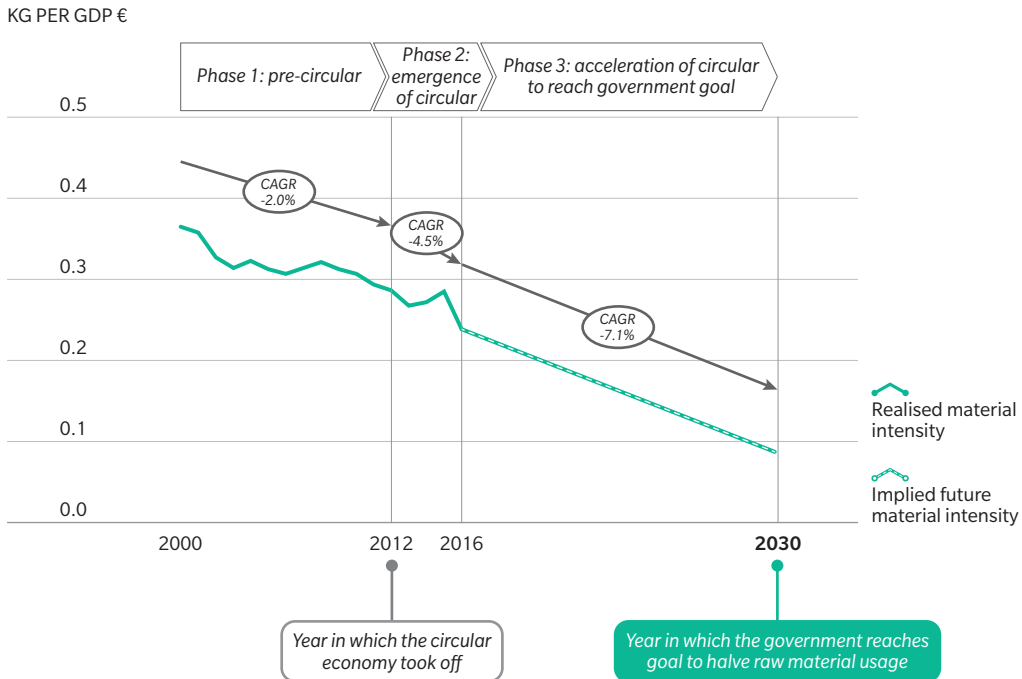


Source: Eurostat, OECD, PBL, RobecoSAM, European Innovation Scoreboard 2017

In its Rijksbreed Programma Circulaire Economie (2016), the Dutch Government committed to becoming fully circular by 2050 and to halve the use of primary raw materials (minerals, fossils, and metals) by 2030³⁷.

One way of putting the government's 2030 objective into context is the impact on the material density of GDP: the kilograms of raw materials used per euro of GDP. (See Exhibit 5.) The government aims to halve total use of fossil energy carriers, biomass and other raw materials such as metals. If this is to be achieved while keeping GDP on its expected trend, material density needs to fall 7 percent each year until 2030³⁸. This seems possible given past trends and bearing in mind that renewable energy can go a long way towards reducing the use of fossil raw materials, which today account for 51 percent of raw materials consumed³⁹.

Exhibit 5: Material intensity in the Netherlands (historical and implied)



Source: Eurostat, CBS and OECD

The Rijksbreed Programma Circulaire Economie identifies biomass and food, plastics, manufacturing, construction, and consumer goods as circular priorities. Next to a 2050 vision and strategic goals, the report outlines the policy toolkit which is expected to be deployed:

1. Legislation and regulation: such as on the definition of waste
2. Intelligent market incentives: such as in government procurement policies
3. Financing: such as facilitating initiatives of the financial sector
4. Knowledge and innovation: such as understanding labour market factors
5. International cooperation: especially at EU level

The government's official commitment has developed alongside a significant number of not-for-profit initiatives led by universities and NGOs. TU Delft is considered to be one of the seven Pioneer Universities by Ellen MacArthur and is part of the CE100. Utrecht University established the Sustainable Finance Lab in 2011. Other notable initiatives include Circle Economy, Nederland Circulair!, and Het Groene Brein.

2.3. THE IMPORTANCE OF LOCAL AUTHORITIES FOR CIRCULAR ECOSYSTEMS

In 2014, 54 percent of the world's population and 90 percent of the Dutch population lived in urban areas. By 2050, this ratio is expected to stand at 66 percent and 96 percent, respectively⁴⁰. City municipalities thus have a critical role to play in enabling and encouraging circular behaviour from residents and businesses.

Cities are innovation hubs because of key enablers such as population density and highly educated citizens, the ease of sharing ideas, and proximity of potential consumers. For the circular economy, concentrated waste streams can make it easier to close resource loops. Finally, the principle of subsidiarity in the EU stipulates that powers are exercised as close to the citizen as possible. Many strategic support schemes, hence, are available to or disbursed through local authorities.

Actions taken by municipalities to create circular ecosystems typically fall into one of four categories:

- **Supply-side levers:** such as supporting circular businesses with funding and/or advice
- **Demand-side levers:** such as changing procurement policies
- **Regulatory levers:** such as charging consumers for waste
- **Infrastructure levers:** such as creating physical and virtual marketplaces

Exhibit 6 provides an overview of how local authorities across the world and municipalities in the Netherlands are supporting the circular transition.

2.4. NEW BUSINESS MODELS ARE BEING TESTED

In the private sector, corporates, SMEs and startups⁴¹ are pioneering or experimenting with new business models and finding ways to overcome barriers to the circular transition. (See Exhibit 7.)

2.4.1. CORPORATES AND THE INTRICACIES OF GLOBAL SUPPLY CHAINS

The Sustainable Growth Coalition, which brings together eight Dutch multinationals, strongly supports circular economy initiatives, and Dutch corporates are often quoted as successful circular pioneers. A well-known example is Philips' "Light as a Service" model for Schiphol Airport. Desso is offering the use rather than the purchase of flooring. Schiphol, BAM, and Desso are among the seven Dutch corporates in the CE100 of the Ellen MacArthur Foundation.

Exhibit 6: International and Dutch examples of municipality initiatives to increase circularity

ACTIVITY	INTERNATIONAL EXAMPLES	DUTCH EXAMPLES
Stimulating circular innovation	Phoenix: Innovation incubator connects businesses with each other and circular centres of expertise	Rotterdam: New Circularity Centre founded by Rotterdam port and businesses
Providing advice	London: London Waste and Recycling Board runs knowledge-sharing hubs and accelerators	The Hague and Amsterdam: Fund “Startup in Residence,” a social/circular impact accelerator
Providing funding	Glasgow: Zero Waste Scotland funds SMEs using EU and national funds	Venlo: Awards public grants to startups focusing on Cradle to Cradle principles
Changing the consumer mindset	Paris: White paper proposes raising awareness in schools about renewable energy and food waste	Amsterdam: Introduced circularity in schools’ syllabus
Changing procurement policies	Copenhagen: Procurement policies feature green goals (such as durability or recyclability)	Amsterdam, Rotterdam and Utrecht: Form part of Green Deal Circulair Inkopen encouraging circular procurement
Setting targets for resource consumption	Glasgow: City Council aims to reduce food waste by 33 percent and landfill waste by 5 percent	N/A
Initiating own circular business	Baltimore City: Wood waste of municipalities is collected and offered to businesses	N/A
Internalising linear risks in tax system	Taipei: Charges households for number of bins of waste (“pay as you throw”)	Sittard: Bills households by weight of non-recyclable waste, pushing general waste down 41 percent
Creating behavioural incentives	London: Return schemes to incentivise reuse and repair of clothes	The Hague: Built a collection point for raw materials that can be reused
Changing urban design	Paris: “Reinventing Paris” calls for circular urban projects to redevelop 23 Parisian sites	Rotterdam: A recovered swimming pool is turned into BlueCity, a hub for circular enterprises
Creating marketplaces	Austin: Materials Marketplace fosters closed-loop systems where a firm’s waste is used by another party	Amsterdam: Plans to create an online marketplace to encourage trade and reuse in the construction sector
Facilitating sharing platforms	London: Library of Things enables sharing of infrequently used goods (DIY tools, camping)	Utrecht: Supports De Deelkelder, a “tool library” gives people access to things rarely needed

Nevertheless, corporates face significant obstacles to adopting circular business models. The introduction of more repairable or durable products threatens to “cannibalise” their current product offering, and reduces the value of their linear business assets. However, the greatest challenge for corporations trying to become circular lies in the readiness of other parties in their supply chains (something also flagged in Oliver Wyman’s survey of small circular businesses).

The Ellen MacArthur Foundation identified supply chains as “the key unit of action” and noted that “the challenge of closing materials loops and regenerating natural assets is an exponential function of product complexity and supply-chain length”⁴². The interlinked global supply chains behind the product offering of corporates are typically not set up in line with circular principles. Re-designing them to ensure that the end products and their packaging are recyclable or repairable is a challenge.

Corporates hold the key to bringing supply chains into the circular age. Their purchasing volumes often dominate supply chains, and corporates may work with their suppliers to simplify and purify production inputs to enhance the recyclability of the end product. For example, the Cradle to Cradle certified T-Shirts of C&A are fully compostable and were designed in close collaboration with the company’s suppliers in India⁴³.

In some instances, action by the legislator or regulator is needed to enable circular supply loops. Stringent regulation around, for instance, the repurposing of waste might prevent circular businesses from minimising materials leakage.






2.4.2. SMEs AND CONSUMER PREFERENCES

Ninety-nine percent of Dutch companies conform to the EU definition of an SMEs. Together they produce 63 percent of Dutch GDP and account for 67 percent of jobs⁴⁴. Correcting for sole traders (ZZP’ers), the Chamber of Commerce counts approximately 420,000 SMEs⁴⁵. However, the number of SMEs whose main business model is circular is negligible. One of the most comprehensive surveys on circular businesses in the Netherlands identified 100 companies as examples of circular business models and concluded that “the understanding of the circular economy is far ahead of organisational practice”⁴⁶.

Nederland Circulair! puts the number of circular SMEs operating in the Netherlands today even lower, at about 70⁴⁷. One example of a successful circular pioneer is Desko, which extends the life of office furniture by promoting its reuse. Another example is GRO, which cooperates with LaPlace and uses coffee grounds as nutrients for growing mushrooms.

Many SMEs are grappling with a lack of scale for their circular operations. Especially for resource recovery models, the landscape of existing businesses that recycle paper or glass is fragmented. This hinders the introduction of new and more efficient technologies and processes for the up-cycling of materials.

Exhibit 7: Circular Business Models⁴⁸

	DESCRIPTION	EXAMPLES OF ADOPTERS
<p>CIRCULAR SUPPLIES</p> 	<ul style="list-style-type: none"> • Provide renewable energy, bio-based or fully recyclable input material to replace single-lifecycle inputs into production process • Suitable area for innovation by corporates given scale, knowledge of technology, and R&D resources • Difficult for small challengers given required capital investment and risks around R&D • Main drawback: technology risk 	<p>G-Star Raw C&A Desso Onora Reflow Filament Mush Bin</p>
<p>RESOURCE RECOVERY</p> 	<ul style="list-style-type: none"> • Recover useful resources or energy from disposed products or by-products • Contains technological and supply-chain components (to collect inputs for process) • Suitable area for public private partnerships, because waste collection is organised by local authorities • Difficult for small challengers given capital investment for R&D, factories, and complex supply chains • Main drawback: long time to recover capital investment 	<p>Attero Vlaxglas Recycling Black Bear The Waste Transformers GRO Waste-to-Chemicals Avantium</p>
<p>PRODUCT LIFE EXTENSION</p> 	<ul style="list-style-type: none"> • Extend working lifecycle of products and components by repairing, upgrading, and reselling • Suitable area for innovation by large corporates producing goods (see circular supplies) • Suitable model for small challengers providing repair or upgrade services for local community • Labour intensity of repair or upgrade services and local delivery reduce scalability for small challengers • Main drawback: consumer preferences for new and most recent products need to be overcome 	<p>Marktplaats TechnoGym Desko Van der Kallen Recover-e</p>
<p>SHARING PLATFORMS</p> 	<ul style="list-style-type: none"> • Enable increased utilisation rate of products by making shared use and ownership possible • Proven business model with several well-publicised success stories makes it attractive for investors • Suitable for small challengers given scalable technology, network effects, and limited initial capital investment • Main drawback: investment needed to gain market share and brand awareness 	<p>Airbnb OV Fiets Mobypark ParkFlyRent Rewear</p>
<p>PRODUCT AS A SERVICE</p> 	<ul style="list-style-type: none"> • Offer product access and retain ownership to optimise benefits of circular resource productivity • Allows corporates to develop new sales model, strengthen customer relationships and recover end-of-use assets • Suitable especially for B2B transactions • Difficult for small challengers given the need to finance assets up front while user fees accrue over time • Main drawback: shift in consumer behaviour needed for concept to gain traction 	<p>Philips Michelin Logge Bundles</p>

A circular economy implies more decentralised production processes as materials are reused and recycled locally. Given their proximity to end consumers, SMEs may be well placed to advance such circular business models. Promising examples are repair and upgrade services to extend product lifetimes or collecting and re-purposing materials within a given municipality.

That said, it is unlikely that many SMEs will be among the circular pioneers. With retail consumer demand relatively untested and infrastructure, supply chains, and circular ecosystems still under development, the circular transition involves risks which SMEs may be reluctant or unable to take. Lack of demand for circular products came third in a non-representative ranking of barriers to circularity conducted by Oliver Wyman.

The obstacle looms largest in the B2C sector. As yet, there is limited consumer awareness of the circular economy, and many consumers attach value to owning the latest or most fashionable items, for example, in electronics. Building consumer awareness is an important step to changing attitudes over time. Promoting circular brands and certifications, such as “Cradle to Cradle certified,” can be a first step.

In the meantime, the government, financial institutions and corporates can play an important role in creating lasting demand for circular products and services through their procurement and facilities policies. Many are already doing so, especially with respect to furnishing and reducing the CO₂ impact of their buildings. With the government by far the largest single purchaser⁴⁹, its impact could be significant.

An indirect but potentially powerful lever for the government to stimulate demand is the differentiated taxation of inputs used for circular and linear products. For example, the environmental costs of producing and disposing of linear products could be further reflected in taxes levied. Similarly, labour is now subject to relatively higher taxes than the use of raw materials, making labour-intensive business models, such as product life extension, less competitive. Recognising this, Sweden has decreased VAT on labour for repairs and allows consumers to deduct 50 percent of repair expenses from income tax.

2.4.3. THE ROLE OF STARTUPS AND MAIN BARRIERS THEY FACE

Startups can drive disruptive innovation and challenge incumbents to rethink the status quo. This is expected to be an important impulse for the circular transition⁵⁰, but as with SMEs, the number of actual businesses is small. One example is Reflow Filament, which develops a technology using plastic waste as 3D printing input. Another well-known example is Bundles, which offers washing machines, dryers, and dish washers on pay-per-use services.

The number one obstacle identified by Dutch circular businesses in a recent, non-representative survey is the difficulty in accessing finance. Given the importance of the financial sector in lowering this barrier, the rest of the report looks at the current state of funding for Dutch circular businesses (Chapter 3) and presents options for improving the financing landscape (Chapter 4).







3. FINANCING THE CIRCULAR TRANSITION

“Our experience is that it is difficult to obtain a subsidy without the help of a specialised agency

Willem Haase, WEBO

On seed and venture-capital financing, the Netherlands is so far behind it does not even show up on the radar

Reshma Sohoni, Seedcamp

One of the interesting things about the circular economy as an opportunity for investors is that unlike “clean tech”, this is not about having to select a specific technology front runner. Rather, it is about investing in a range of business models which inherently capture more value

Founder, Private Equity fund

We get a lot of financing requests from smaller businesses. Not all of them are suitable credit risk exposures for the bank. If that is the case, we try to pair them up with Wealth clients looking for investments

Circular economy expert, Dutch bank

“In crowdfunding, the ideal loan maturity for the crowd is three to five years. Quite often an entrepreneur is looking for more than seven years maturity; this is a problem that could be solved by making the loans tradable

Laura Rooseboom, StartGreen Capital

This chapter explains

- 1. The types of funding needed to drive the circular transition*
- 2. Why there is a risk capital funding gap for Dutch circular startups and how big it is*
- 3. What banks and institutional investors can do to support the circular transition*

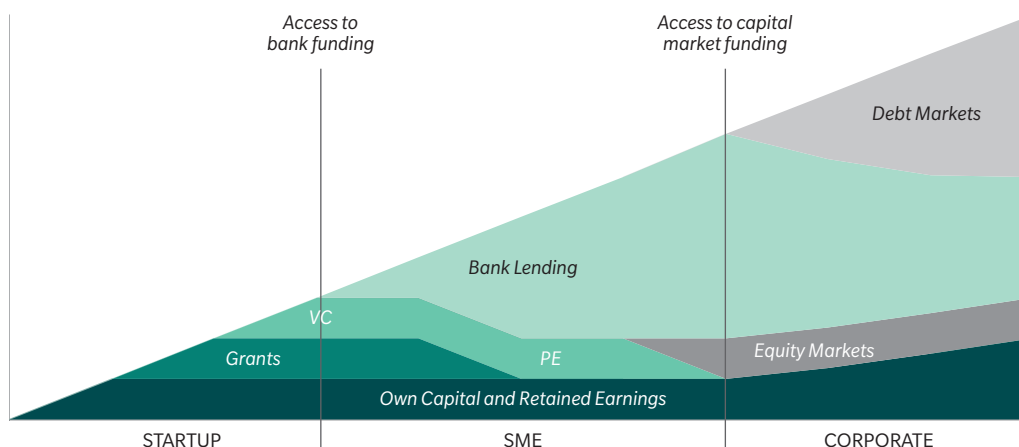
3.1. TYPES OF FUNDING REQUIRED ACROSS BUSINESS LIFECYCLE

Startups, SMEs, and corporates have different risk profiles. Startups rarely generate stable cash flows, have a high probability of failure but, if successful, can expand rapidly. These characteristics call for risk-bearing capital to be the primary type of funding. Bank lending becomes a significant source of funds once startups mature into SMEs with a business history, predictable cash flows, and (fixed) assets which can be understood to serve as collateral. Unlike startups and SMEs, corporates have access to the capital markets, larger cash reserves, and a well-established bank financing arrangement.

The liability structure changes over the lifecycle of a business. (See Exhibit 8.) It does not correspond to the current situation in the Netherlands, but shows the stylised target state of a mature and innovation-friendly financing landscape.

Exhibit 8: Stylised liability structure over the business lifecycle⁵¹

FUNDING



The rest of this chapter looks at the availability of funding from different types of providers at each of the three stages of business maturity: startups, SMEs, and corporates. Given the role of Dutch startups in driving the innovation necessary for the circular transition, their financing will be addressed in more detail.

3.2. STARTUPS: FINANCING IS THE NUMBER ONE CONCERN

Startups often drive disruptive innovation. While the investment needs of startups are usually small, great uncertainty about the success of new business models means few funding sources are available to them: capital raised from friends and family, government grants dedicated to new businesses in strategic sectors, and specialist professional investors such as venture-capital funds.

Underlying this report are the findings from 20 interviews with Dutch circular businesses and the results of a survey of another 30 businesses conducted in June – July 2017. The sizing of the equity funding gap further relied on industry databases and benchmarks. The gap is forward-looking, as it projects future startup demand for financing and compares it against funding sources available.

3.2.1. OVERVIEW OF FINDINGS

Exhibit 9: 65 percent of startups surveyed find financing difficult or very difficult to secure

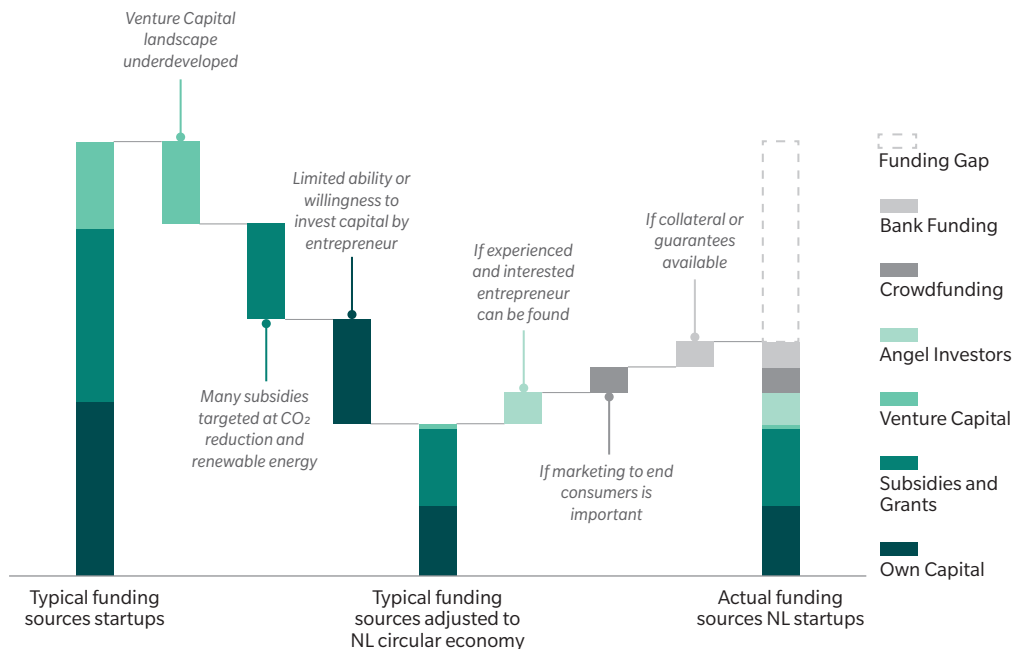


The research suggests that demand from circular businesses for government grants and venture capital exceeds the supply of funds allocated to the circular economy or similar investment mandates. (See Exhibit 10.) Businesses are exploring alternative sources of finance, such as bank lending and crowdfunding. But these sources of capital cannot fill the equity funding gap: Bank lending requires collateral, and crowdfunding is a recent concept that raises limited sums for relatively short durations. The actual liability structure of circular Dutch startups differs from the expected liability structure for a new business. (See Exhibit 10.)

This comparison of demand and supply suggests an equity funding gap of approximately €150–200 million over the next five years. While this amount is negligible in comparison to the assets managed by Dutch institutional investors (an estimated €1.6 trillion assets under management⁵²), filling it is vital for the circular transition. An example for what this can look like is INKEF Capital, a VC fund set up by ABP with a mandate to invest €500 million into Dutch start-ups. Without new companies to introduce disruptive ideas, the pace of circular innovation will slow. Not only does this put the government’s 2050 circularity goal into jeopardy, it could also mean that the Netherlands misses the opportunity to become a circular innovation leader.

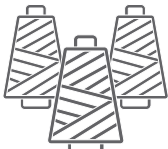




The scarcity of risk capital affects some circular business models more than others. Exhibit 10 illustrates the specific difficulties entrepreneurs encounter on the basis of their business model and maturity. Common challenges to raising finance include the use of new technology or unproven business models, dependence on third parties in the value chain and above-average time to recover investments. In particular, the development of new technology required in the circular supplies and resource recovery business models poses a high risk of failure, which discourages investors. Product life extension business models tend to create lower returns and growth rates, which result in investors diverging to higher growth concepts. Sharing platforms struggle to obtain funding due to the absence of collateral. The new product-as-a-service sales model remains unproven; hence the currently emerging demand poses a risk that is difficult for investors to accept. If funding remains a challenge, it is expected to hamper the transition to the circular economy. (See Exhibit 11.)

Exhibit 10: The liability structure of startups: from expected to actual



The rest of this section provides more detail on the supply of and demand for risk-bearing capital for circular startups.

Exhibit 11: Funding situation analysis circular economy startups

	IDEA	SEED	FIRST ROUND OF FINANCING	FUNDING GAP % – next five years
FUNDING GAP % – next five years	21%	31%	42%	37%
CIRCULAR SUPPLIES 	“Due to the novelty of the technology, investors are cautious”	“It is difficult to conduct a small scale pilot as the equipment is expensive”	“To scale up, we need the buy-in from several parties in the value chain, this is a risk for investors in case a party drops out”	54%
RESOURCE RECOVERY 	“The research to develop a new technology is expensive”	“We build our own machines, hence banks struggle to estimate the value”	“Investors expect returns after a few years in operation while scaling up takes more time”	44%
PRODUCT LIFE EXTENSION 	“The business was set up by investing our working hours”	“Fortunately only limited funding is required, especially as investors are not interested due to the low returns”	“Funding is not our biggest obstacle. Finding the required demand is more challenging”	7%
SHARING PLATFORMS 	“Banks won’t fund an algorithm. Hence, self-funding and crowdfunding were explored”	“The sharing of resources resonates well in the current economic climate”	“Going mainstream requires large investments in marketing. However, once you survive the pilot, funding tends to become easier”	6%
PRODUCT AS A SERVICE 	“Developing the business model and conducting the pilot only requires limited funding”	“Operating a leasing model means all sales will have to be prefunded”	“Banks are worried about the creditworthiness of our customers and their ability to meet the monthly payments”	25%
	No funding gap	Limited funding gap	Significant funding gap	

3.2.2. SIZING THE RISK CAPITAL SUPPLY FOR CIRCULAR STARTUPS

New circular businesses in the Netherlands obtain the vast majority of their financing from five sources. (See Exhibit 12 for the findings underlying the funding gap estimates.) In this chapter, we elaborate on the potential availability of capital for circular startups.

Exhibit 12: Estimated supply of risk capital for circular businesses

PHASE	ESTIMATED SUPPLY OVER NEXT FIVE YEARS	BREAKDOWN	FUNDING PROVIDERS
Idea	€25–30 million	80%	Own Capital
		20%	Subsidies and Grants
Seed	€75–100 million	20%	Subsidies and Grants
		60%	Venture Capital ⁵³
		10%	Angel Investors
		10%	Crowdfunding (equity)
First round of financing	€150–175 million	20%	Subsidies and Grants
		60%	Venture Capital ⁵⁴
		20%	Crowdfunding (debt)

Own Capital

Own capital includes savings from the entrepreneur and family and friends to fund the first steps of a business. Some entrepreneurs who are able to invest a significant amount of their own capital have often sold a successful business or use profits of an established business to fund a new venture. Other entrepreneurs can struggle to raise even relatively small amounts.

Many of the interviews and survey responses indicated an inability or reluctance to invest significant amounts of own capital. A possible explanation for this is that circularity has emerged as a concept relatively recently and, hence, circular businesses are often founded by young entrepreneurs.

To estimate own capital, this report assumes that each circular entrepreneur is able to raise €20,000 in financing privately, either through savings or from family and friends.

Subsidies and Grants

The Dutch Government and the EU offer a wide array of grants and subsidies, tailored to a variety of goals, sectors and company sizes, including dedicated programmes to support innovation and entrepreneurship.

Grants and subsidies are an important funding source for start-ups and were explored by many interviewees and survey respondents. However, only a minority were successful whilst others were discouraged from applying. In the case of Dutch government funds, circular startups struggle to find funds for which they meet the eligibility criteria. EU-wide funds were seen as involving an overly burdensome application process given the low probability of success.

The EU has earmarked €6.2 billion for the circular economy until 2020 (see Chapter 2.1). An allocation of 4 percent in line with the Dutch share of EU GDP results in funds of around €250 million for the entire period, or €60 million per year available for the Netherlands. Assigning 10 percent of this funding to circular startups corresponds to a supply of a mere €30 million of financing for five years.

There is no large scheme dedicated to the circular economy in the Netherlands. However, some broader Dutch schemes incentivising innovation or sustainability are accessible to circular businesses. Most of the Dutch funds available are distributed in the form of subsidies and tax credits rather than direct grants. Examples are WBSO, MIA, VAMIL and Innovatiebox. For longer-term loans – for example, to develop a new technology – Dutch firms can apply for the Innovatiekrediet.

This analysis assumes that circular startups will receive financial support between €20 million and €30 million over the next five years from the Dutch programmes.

Venture Capital

Venture capital is generally characterised by investment horizons of three to five years and several rounds of funding, injected at different stages of company maturity. Venture-capital funds take a significant equity stake and provide advice and network access to support the company on its growth path.

Relative to GDP, more venture capital is invested in the Netherlands than in the EU on average. Nevertheless, Dutch venture-capital funding as a share of GDP (0.033 percent) is nine times lower than in the US (0.28 percent) and three times lower than in Denmark (0.109 percent). Government investment accounts for approximately a third of all venture-capital assets in the Netherlands⁵⁵. The EU, operating through the European Investment Fund (EIF), is one of the largest contributors. In the US, venture-capital funds have a broader investor base, including university endowments, corporate investors, and pension funds.

The Dutch government has recently announced the launch of Invest-NL, a €2.5 billion government investment fund dedicated to supporting innovative startups from January 2018⁵⁶. From the information made public so far, many circular business models are likely to be within the investment mandate of the fund, potentially representing a significant increase in the amount of early-stage risk capital available.

This report assumes that 7 percent of venture-capital funds raised in the Netherlands are available to circular businesses, resulting in a supply of €150 million to €170 million over five years. Historically, this is likely to overestimate the share of the circular economy: from 2011 to 2016, 7 percent of Dutch venture capital funds were invested in the energy and environment sector, which also includes renewable energy assets. The supply of risk capital for circular projects is hence likely to be below this number. However, in light of the expected increase of available risk capital through Invest-NL (which is not separately accounted for), this calibration was maintained.

Angel Investors

Angel investors are usually successful entrepreneurs who agree to invest several hundred thousand euros in a new business through some form of risk-bearing capital.

Importantly, they have hands-on experience with starting a business and can also provide the startup with advice and access to their networks.

There are no reporting requirements for angel investments and granular public data on angel investment in the Netherlands is limited. According to AFME, 3,200 angel investors are registered in the Netherlands, and €34 million has been invested in 118 reported transactions⁵⁷. In 2011, the Association for Business Angel Networks in the Netherlands estimated that angel investors had invested between €1.5 billion and €2 billion⁵⁸.

If 10 percent to 20 percent of small circular businesses can secure the support of an angel investor over the next five years and an average of €290,000 is invested, the total supply of funding from angel investors will be within the range of €10 million and €15 million.

Crowdfunding

Crowdfunding can create publicity which is helpful for B2C businesses. Few of the startups interviewed or surveyed for this report explored crowdfunding. However, most of the businesses that did, eventually raised money. Next to the administrative effort involved, obtaining crowdfunding with maturities above six to seven years is expensive, and founders' ability to regain control after raising equity from a large crowd is limited.

In 2012, €14 million of crowdfunding was raised in the Netherlands. In 2016 there were at least 10 crowdfunding platforms in the Netherlands raising a total of €170 million at interest rates between 4.4 percent and 9 percent. €17 million of the capital raised had risk-bearing characteristics⁵⁹.

By comparison, in the UK £332 million of risk-bearing capital was raised through crowdfunding platforms. The rapid growth from £28 million in 2013 was encouraged by the Seed Enterprise Investment Scheme⁶⁰. There is currently no indication of a similar programme in the Netherlands. Rather, the Authority for the Financial Markets (AFM) intends to tighten regulatory and reporting requirements for crowdfunding platforms⁶¹.

If 10 percent of the equity and 5 percent of the debt raised through crowdfunding platforms is made available to new circular businesses, this would result in a financing supply of €40 million to €50 million over the next five years.

Bank Funding

Banks provide debt, not equity capital. This creates a mismatch between the needs of a start-up and the financing banks provide. Nevertheless, the shortage of accessible alternatives means that bank lending was the external source of funding most commonly explored by the businesses interviewed or surveyed. Few start-ups were bankable enough to obtain bank loans. Those that did could pledge eligible collateral or were supported by a larger business partner.

Banks are making efforts to help new businesses which might become bankable in the future. All Dutch banks interviewed have internal mechanisms for matching non-bankable start-ups with Wealth investors, referring them to incubator programmes or investing small amounts of seed capital into a handful of businesses. These mechanisms only work for a small number of companies however.

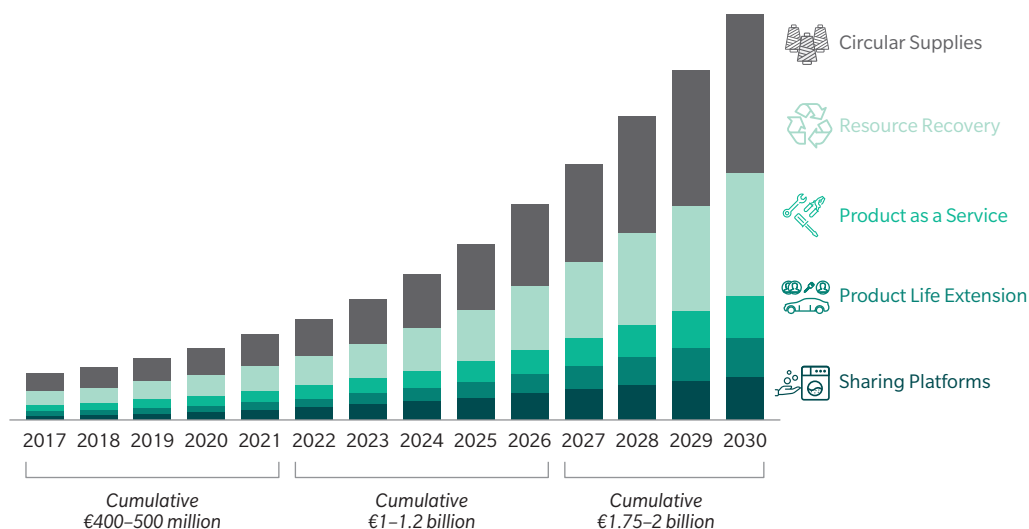
Because banks do not provide risk-bearing capital, and funding from internal referrals or provision of seed money is available only on an ad-hoc basis, the funding available to circular startups contains no contribution from banks.

3.2.3. THE AMOUNT OF RISK CAPITAL NEEDED BY CIRCULAR STARTUPS

The supply of risk capital for new circular businesses in the Netherlands was compared to the estimated financing needs of these ventures. This estimate is based on a breakdown of circular startups in the Netherlands currently, a projection of how this number will evolve based on growth benchmarks in comparable industries⁶², and average financing needs for the first five years of operation. Subsequent financing needs, such as the bank lending which a company would require in its sixth year of existence, are not included in this estimate.

According to the projection, risk bearing capital in the range of €400–500 million is needed to finance new circular companies until 2021. (See Exhibit 13.) This increases to €1.75–2 billion needed by approximately 1,500 circular startups in 2030. Note that if the first rounds of investment go to circular companies that become successful businesses, re-invested funds can meet part of later financing needs.

Exhibit 13: Projected funding demand



It is important to note that this projection equates to 7–10 percent of the expected GDP contribution of the circular economy will be accounted for by companies that are currently either startups or have not yet been founded. Rabobank recently estimated⁶³ that in a high growth scenario for the circular economy, €31 billion of value will be created by circular businesses in 2030, the equivalent of 5.1 percent of the Dutch GDP. The revenues from new circular companies, including those that move through the innovation funnel into the SME and corporate stage by 2030, are an estimated €2.7 billion.

3.3. THE CRUCIAL ROLE OF THE BANKING SECTOR IN SUPPORTING SMEs WITH CIRCULAR AMBITIONS

There are few fully circular SMEs in the Netherlands today. More often, SMEs experiment with circular business models alongside their normal activities. Hence, this subchapter describes the general financing conditions for Dutch SMEs and explores the situation for circular SMEs in a case study.

The EU has monitored the financing conditions for SMEs since 2009 in its Survey on the Access to Funding for Enterprises (SAFE). The results show that the relative importance of risk-bearing capital decreases rapidly after startups become bankable. The three most important sources of financing for SMEs in the Netherlands are credit lines (relevant for 60 percent of SMEs), bank loans (45 percent) and leasing (41 percent)⁶⁴. Equity capital is only the sixth most relevant funding source (28 percent).

The Netherlands is second among EU countries for the availability of financial services and first for competitiveness of the economy⁶⁵. Despite a generally favourable background, the indicators tracking financing conditions for Dutch SMEs show comparatively low, although improving, scores. (See Exhibits 14 and 15.)

SMEs perceive that it is overall more difficult to obtain financing in the Netherlands than in other EU countries⁶⁶. The prospects of obtaining equity funding, trade credit, and leasing consistently reach robust levels, but bank funding drives the composite ease of obtaining financing down. This is in part due to the Netherlands having the highest outright rejection rate for bank loans in Europe. (See Exhibit 15.) Moreover, only 50 percent of SMEs received the full sum requested in a recent SAFE survey, placing the Netherlands in the bottom three EU countries, above Greece and Ireland⁶⁷. These conditions have resulted in some SMEs being discouraged from approaching banks for loans⁶⁸.

To lower the risk profile of loans to SMEs, the Dutch government introduced “Borgstelling MKB Kredieten,” under which the government acts as loan guarantor to SMEs. The European Investment Bank guarantees part of Dutch banks’ lending to SMEs through a range of funding schemes^{69,70}. Nevertheless, state support for SMEs remains below that of other EU countries. As highlighted in a recent report⁷¹, the Netherlands is one of the few EU countries without a public development bank. And, relative to the GDP, the Netherlands is ineffective in gaining guarantees for SMEs from the European EFSI funds. This topic featured prominently in political parties’ 2017 election programmes.

3.4. CORPORATES: THE FINANCIAL SECTOR AS A PARTNER

Corporates can play many roles in the transition to circularity: as suppliers of circular products, as consumers of circular goods, as investors in circular innovation, and as circular demand trendsetters.

Exhibit 14: Ease of obtaining financing (aggregate across funding methods including loans, equity, trade credit, leasing) (2013–2016)⁷²

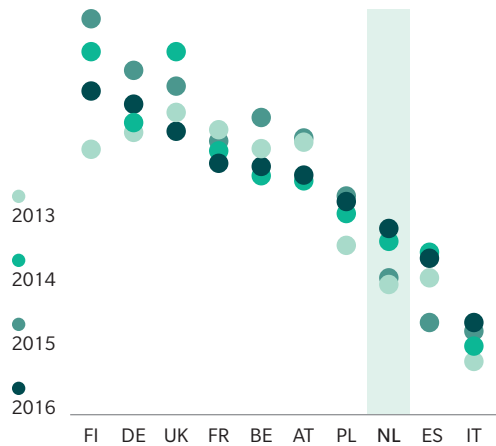
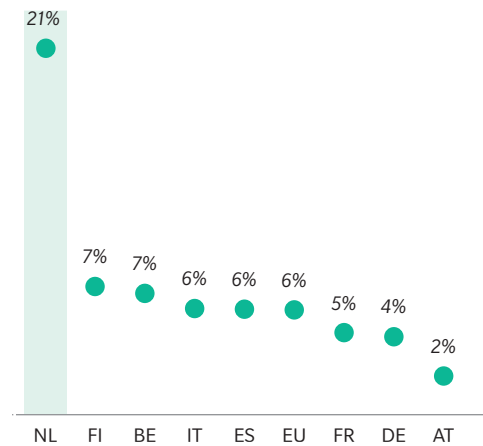


Exhibit 15: Bank loan rejection rates for SMEs across euro area countries (June–Dec 2016; outright rejection rate (% of SMEs that applied))⁷³



Corporates face a challenging journey from their current linearity to circularity. Funding will not be the largest obstacle, since corporates have internal R&D budgets and are highly bankable. Of more consequence will be their willingness to start the circular journey in the absence of immediate economic imperatives created by innovation, environmental regulation, and consumer demand.

To nudge them in this direction, institutional investors, such as pension funds and asset managers, can open a dialogue with corporates about the long-term viability of their business. As responsible shareholders, institutional investors have a responsibility to focus on the long-term value creation of the companies in their portfolios, as emphasized in the 2016 Dutch Corporate Governance Code.

To some extent, this is already taking place. For example, institutional investors often incorporate sustainability KPIs into the criteria by which they make investment decisions, and set sustainability targets for the firms they invest in, when linear risks are considered financially material. Institutional investors’ ability to raise awareness of emerging linear risks at the highest levels of the organisation means they have an important role to play in the drive to circularity.

The role of banks in supporting the journey to circularity of corporates can also take a different shape: Banks can bring different parties in the circular supply chain together. An example of this is presented in the case study below, where the move by corporates to circular procurement has been facilitated by the bank offering an innovative funding solution to a circular startup. However, this type of project finance solution is costly for the bank, and hence only commercially viable for large-scale projects.

CASE STUDY – BLACK BEAR

Black Bear Carbon BV is the first Cradle to Cradle certified carbon black business. Black Bear's circular economy process uses end-of-life tires as a feedstock to produce consistent, high-quality carbon blacks. As a joint venture with KARGRO, which supplies end-of-life tyres, Black Bear Carbon recently opened a first of its kind carbon-black recycling plant in Nederweert (NL) and is in the process of expanding.

Can you talk us through your funding journey?

We went through three stages. It took five years to develop the technology and a viable product. This stage was funded from founders' money and subsidies. It then took three years and €10 million of capital expenditure to develop and build a commercial scale installation. This was funded by bank loans, regional investment funds, subsidies, and equity of the partners. We are now in the process of scaling up, which requires larger amounts of capital. These green infrastructure investments are interesting for commercial banks, EIB, and private equity players focused on infrastructure.

How difficult was it to obtain a bank loan?

It was difficult. For a banker, risk levels need to be acceptable across four risks: technology, management, supply chain, and demand risk. To assess the technology risk, the bank hired an engineering firm to do a technical due diligence. This external validation was quite powerful. It presented a balanced view and translated the technology into terms which the bankers could understand.

How long did it take to obtain a bank loan and what lessons were learned?

It took us a year in total. The first meeting was in March; we got the offer letter in December and completed the paperwork in March the following year. Many bank departments (local, head office, sustainability, technology) and external parties were involved. It is important to make sure that all parties and their internal departments are aligned. A process where everyone can voice their concerns at an early stage is essential.

What could circular businesses do better when looking for funding?

Circularity in itself is not a benefit. You have to specify which societal problem you are trying to solve and quantify your impact, even if it is challenging. All circular businesses should try to translate their impact into, for instance, CO₂ savings, as it will act as a type of currency. This can help you quantify the business idea and better link it to governmental targets and subsidies. Secondly, circular businesses should focus on proving that they provide financial returns while achieving impact. Sometimes the perception is too much that of being a charity industry.

What can banks do to support circular businesses better?

Banks could be more experimental. For example, they could carve out €100 million and lend this to a number of circular firms to learn about circular business models. Some things will go wrong, but these loans can be monitored on an individual basis. This will provide a better learning platform, both for banks and circular businesses.

What should the role of the government be?

The government should identify areas where the Netherlands can be the market leader and aggressively fund those. I think that Europe is a global leader in the circular economy, so the government should take this opportunity. In addition, a transition to the circular economy can have a large positive impact on the COP21 Paris goals for CO₂ reduction. Regulations, taxes, or subsidies will get the circular transition going. When the economics are favourable, other problems will disappear.

Martijn Lopes Cardozo, CEO of Black Bear Carbon BV

CASE STUDY – LEASE YOUR LIGHT

Through smart financing and cooperation with other financial parties inside and outside ABN AMRO, we realised a form of financing that would not be possible based on traditional principles

Richard Verhagen, ABN AMRO

ABN AMRO and LEDsEnable implemented a “light as a service” scheme for the Chemelot industrial park, comprising several large chemical plants run by 12 manufacturers (including DSM). Tube luminescent (TL) lighting is replaced with smart LEDs, which delivers light only when needed. Clients rent the lamps and pay for usage. Companies can transition to sustainable and cost-effective lighting, while LEDsEnable finances the purchase, installation, and maintenance of the LED lights. The light installation can be controlled wirelessly, and the smart LEDs turn themselves off automatically once it is bright enough, resulting in a CO₂ reduction of 80 percent to 90 percent compared to traditional lighting systems.

ABN AMRO supported this initiative by providing funding in the form of a 12-year financial lease of €6 million. The novelty of the “product as a service” business model required ABN AMRO to construct a unique financing model that breaks with tradition in several ways: a longer than usual loan duration (12 years vs. the traditional three to four years), acceptance of non-traditional forms of collateral (intellectual property in the form of software programs vs. tangible assets such as buildings), and the requirement that insurance be taken against all operational risks of LEDsEnable.

On the bank’s side, experts within the Risk, Lease, Project Finance, Legal and Insurance departments were consulted to ensure the contractual terms of the financial lease were within the risk appetite of the bank. On the LEDsEnable side, the involvement of end customers and suppliers (and suppliers of suppliers) was key to de-risking the loan. End consumers provided assurance over long-term “light as a service” demand, while suppliers provided guarantees for the lifespan of the hardware components of the lighting installations.





4. CALL FOR ACTION: FINANCING THE CIRCULAR ECONOMY

If you have just started on sustainability, the circular economy is a bridge too far. We can discuss this topic with maybe 10 percent to 20 percent of corporates right now

Peter van der Werf, Robeco

Securing access to financing for new circular entrepreneurs, now a significant bottleneck, is crucial. We have to act swiftly if we want to realise our dream of the Netherlands as a Circular Hotspot

Freek van Eijk, Acceleratio

The Netherlands has a strong entrepreneurship culture and it's surprising that startups don't find it easier to access finance. Other European countries are further in providing funding options or setting up associations to help startups

Jasper Middendorp, Reflow Filament

I wanted to expand my business and therefore approached the bank. The bank only offered me funding if I used my house as collateral

Hugo van der Kallen, van der Kallen

Even if we cannot provide funding at an early stage, it is beneficial to involve the bank. We can introduce circular businesses to other funding sources and can revisit bank funding at a later stage

Circular economy expert, Dutch bank

This chapter explains

- 1. Corporates, institutional investors, banks, and the government all have a role to play in supporting the circular transition*
- 2. Government and corporates are well suited for supporting small circular businesses with financing in the short term*
- 3. Banks and institutional investors need to build knowledge and expertise on the circular economy to engage with SMEs and corporates, respectively*

4.1. A JOINT EFFORT TO FACILITATE ACCESS TO FINANCE

The previous chapter focused on the funding situation faced by circular startups, SMEs, and large corporations. This chapter explores potential funding solutions. This complements the set of broader actions to stimulate the circular economy discussed in Chapter 2.4., including circular procurement.

Improving the circular funding climate in the Netherlands without creating any market distortions requires a concerted public-private response whereby financial institutions, the government, and corporates reinforce each other's efforts. To remove the funding hurdles, we recommend a set of actions that different stakeholders could take based on their capabilities:

- Corporates: drive circular innovation, partly by supporting small innovative companies
- Institutional investors: leverage position as responsible shareholder to make circular strategy a priority
- Banks: engage with SMEs to overcome the knowledge gap on circular business models and risks
- Government: stimulate an innovation-friendly and transparent financing landscape for young businesses

Once market frictions have been reduced and the circular economy gains momentum, increased interest from foreign investors is expected to have a knock-on effect on the funding supply in the Netherlands, further increasing access to finance.

4.2. CORPORATES: DRIVE CIRCULAR INNOVATION, INCLUDING BY SUPPORTING SMALL INNOVATIVE COMPANIES

Corporates may look to invest in many different business development topics. The circular economy will emerge as a topic of critical relevance in the long term, once key raw materials become scarce and traditional supply chains begin to de-stabilize. While this may not happen for several years, building a stable circular supply chains takes time.

It requires coordination among many different parties, changes to core operational processes, and sometimes even the creation of new markets. Given this lead time, circularity needs to become part of the CEO story in the short to medium term.

Investment in circularity might be seen as similar to hedging through an option: the cost of developing a circular strategy and starting to experiment are relatively small. There is a risk that the circular economy takes off slowly, meaning the comparative edge gained through investing now is limited. If however, risks of the linear economy materialise quickly, such as through resource price shocks or legislator action, the payoff will far outweigh the initial investment.

As part of their circular innovation strategy, corporates will determine the mix between buy and build approaches. Unless corporates have started on this path, developing the capabilities internally will take a long time. To expedite circular innovation, corporates can consider a spectrum of buy options – indirectly, via incubators and accelerators or directly, through partnering with circular startups.

Incubators and accelerators will create mutually beneficial arrangements where startups can test their ideas with experienced entrepreneurs and corporates can learn about the latest innovations. While incubators create an environment suitable for the sharing of innovative ideas (such as a co-working space), accelerators offer structured mentoring programmes to more established businesses.

Partnership options with new companies can vary from teaming up with a startup as a customer, acquirer, investor, or strategic partner. Corporate VC funds with a circular innovation component are beginning to emerge. However, they are still in their infancy in the Netherlands.

In a young innovation market such as the circular economy, corporate VC funds provide distinct benefits. Corporates gain market knowledge, anticipate market movements, and test circular concepts in a contained environment. Startups can use the extensive experience, brand and global distribution network of the corporates to accelerate their growth. There are various VC fund setups, a few of which are described below:

Corporate investment funds are internally run funds that promote investments closely related to corporate divisions and work well in the advanced stages of innovation and in highly technical fields, such as BP's Venture fund, which supports low-carbon energy innovations.

Internal dedicated funds are held at arm's length, and innovators can take advantage of the parent corporation's infrastructure. In the Netherlands, both Unilever and DSM have set up their own funds to invest in (circular) innovations:

Unilever Ventures is the venture capital and private-equity arm of Unilever. Funding comes from the parent corporation, and investments are made in Personal Care and Digital Transformation innovations. Startups, gain access to Unilever's global ecosystem, assets and expertise, and many of the startups eventually become strategically relevant to Unilever and help their sustainability mission.

DSM Venturing invests in innovative companies that are strategically relevant to DSM, with a focus on nutritional health and flavours, solar energy, and biomedicine. The fund is managed by the vice president of DSM Innovation Centre and intends to create mutual benefits beyond funding, as the innovators can tap into DSM's vast resources and DSM can create strategic options and value for their ecosystem.

External VC funds: corporates invest in an externally handled VC fund, which makes investment decisions based on the parameters set by the investing corporates. PhysiC Ventures, backed by Humana and Pepsi, promotes innovation in health and sustainability and encourages corporates to forge commercial relationships with portfolio companies.

4.3. INSTITUTIONAL INVESTORS: LEVERAGE POSITION AS RESPONSIBLE SHAREHOLDER TO MAKE CIRCULAR STRATEGY A PRIORITY

Institutional investors, such as pension funds, insurers, and asset managers, can use their role as shareholders of corporates to put the circular economy transition higher on the list of priorities for portfolio companies. To do so, they will need to invest in building knowledge and expertise on the topic themselves. At the moment, institutional investors looking for sustainable investments prefer to focus on investments in renewable energy assets, which have bigger ticket sizes and proven business models. As a second priority, institutional investors could consider increasing their portfolio allocation to venture-capital or private-equity funds with a sustainability mandate.

Make circular strategy a C-Suite priority

As responsible shareholders, institutional investors should encourage corporates to think about their long-term business risks, including linear risks. This is an emerging practice for large pension funds and asset managers, currently part of their wider sustainability agenda which is organised along the UN's Sustainable Development Goals. However, an intensification of this investor pressure is required to initiate company-wide conversations regarding the management and mitigation of linear risks. In time, this concern should translate into measures for stimulating circular innovation. Institutional investors can shift investment in this direction by developing and incorporating circularity indicators into their investment criteria and reporting on them.

Increase venture capital and private equity allocation

Institutional investors have long investment horizons and large portfolios which need to be diversified. They are hence well positioned to invest in venture-capital and private-equity funds. Currently, Dutch institutional investors allocate a relatively small share of their assets to these investment classes. Given the size of asset portfolios, even a small increase in the allocation would considerably increase supply of risk capital for young businesses.

A step further in this direction would be for institutional investors to create or invest in a (cross-industry) venture-capital fund with a circular mandate. While this would easily close the funding gap, it would require setting up an appropriate funding vehicle. In a first phase, institutional investors would likely need to build up their own circular investment capabilities and knowledge, as currently, there are few asset managers with the expertise to execute a circular economy mandate. The governance structure of the fund, sourcing the right investment team, and minimum investment thresholds have been cited as obstacles to implementation. However, these are not insurmountable difficulties, as evidenced by Aviva, which operates in-house venture capital funds in Singapore and London aiming to invest £100 million in the Internet of Things, data and analytics, innovative customer experiences, and distribution platforms. Similar initiatives might be set up for circular ventures.

4.4. BANKS: ENGAGE WITH SMEs TO OVERCOME KNOWLEDGE GAP ON CIRCULAR BUSINESS MODELS AND RISKS

The high uncertainty around the viability and risks of circular SMEs means bank lending can be challenging to obtain. However, banks can reduce the downside risk of these businesses by drawing in other economic actors that can contribute to stabilising cash flows or guaranteeing loans. Moreover, for businesses that are not bankable currently, banks can provide advice on alternative sources of funding and support in challenging business models and technological risks.

Remove risks to cash flows

Banks deem businesses more risky when they operate in intricate and lengthy supply chains, as in the case for of resource recovery models. If one party in the supply chain is unable to fulfil their commitment, such as to supply recyclable materials, the circular business may be unable to operate. To mitigate this risk, banks can involve insurers who can provide products protecting banks from high-risk segments of the supply chain (for an example, see the LEDsEnable case study in Chapter 3). In addition, banks can encourage entering long-term contracts with launching customers to stabilise cash flows.

In line with an observed trend for wholesale banks to move to a sector focus, banks can offer supply-chain financing to reduce liquidity risks whereby startups sell their receivables to third parties based on the creditworthiness of their clients (B2B). And banks can develop facilities to support large companies' use of supply-chain financing for circular companies. This would take advantage of the better creditworthiness of large companies to increase the supply of working capital and lending to circular businesses, while mitigating risks for the larger company. This form of financing is particularly valuable when circular companies have developed cash flows and client relationships but have not yet become sufficiently profitable or predictable to service loans.

Seek guarantees against borrower default

The provision of guarantees to reduce the riskiness of SME loans is a well-established mechanism to encourage bank lending and one of the main tools used by the EIB. Compared to subsidies, guarantees have significant benefits, as capital can be leveraged several times and there are more checks and balances from financial parties (such as banks, corporates). The guarantees can also be tied to lending criteria, allowing the guarantor to encourage lending in certain sectors or to certain types of borrowers.

National governments and the EU are providing guarantees to stimulate innovation and entrepreneurship, such as the Borgstelling MKB Kredieten (NL) and InnovFin SME Guarantee (EU).

Other actors, such as corporates or insurers, can also act as guarantors. For insurers, this could be turned into a product with an insurance premium. Corporates might benefit from circular innovations within their supply chain, such as cheaper services due to technological advances.

Alternatively, cooperative funding facilities can provide access to finance in supply chains where several parties rely on one central actor. Municipalities occupy a central position in these supply chains and thus may be the central party to distribute funding. The EIB and ABN AMRO successfully collaborate to facilitate funding to SMEs in cooperation with FrieslandCampina. Through the dairy corporate, the money is accessible to dairy farmers seeking to invest in a manure fermentation plant.

Widen definition of eligible collateral

To mitigate the credit risk of young companies, banks require loans to be collateralised. Traditionally, a bank considers collateral eligible if it is marketable and liquid. Oftentimes, circular businesses have assets that are not eligible as collateral, such as a form of technology-driven intellectual property (IP) or consumer products rented as services.

Technological IP does not meet the collateral eligibility standards due to the difficulty in valuing it, its illiquidity as well as its high correlation with borrower default. As will be discussed in Chapter 4.5, however, if these obstacles are overcome, banks may regard it as collateral for loans to small, asset-light circular startups (see the LEDsEnable case study).

In the product as a service business model, the valuation techniques for depreciating assets oftentimes do not properly account for their residual value. This is due to stringent accounting rules, and the lack of liquid secondary markets, and banks' inability to process non-traditional types of collateral – traditional collateral being mainly real estate, vehicles, and financial instruments. As circular business models increase in uptake, this limitation will need to be addressed.

Refer non-bankable businesses to appropriate funding sources

In the UK, the government has taken the step to introduce a mandatory bank referral scheme^{74,75}, whereby banks which reject an SME loan application are required to refer them to more suitable sources of funding, such as alternative funding providers. This is an example of a type of measure that strives to provide additional transparency to opaque funding landscapes. In a similar fashion, Dutch banks could provide rejected circular SMEs with advice on alternative sources of funding and access to their network of funders, such as High Net Worth Individuals. On a small scale, this is already an emerging practice for the largest Dutch banks. As the circular economy and supporting financing landscape matures, the need for this referral activity will diminish.

4.5. GOVERNMENT: STIMULATE AN INNOVATION-FRIENDLY AND TRANSPARENT FINANCING LANDSCAPE FOR NEW BUSINESSES

The role of the government in improving the funding landscape for circular businesses should centre on correcting market failures either directly or by incentivising private actors. In the context of the circular economy funding issues identified in Chapter 3, the government should intervene with two main goals: to improve market transparency regarding the availability of funding, and to increase the supply of funding.

Improve market transparency

Generally, there is little transparency regarding the availability of public and private sources of funding for young companies in the Netherlands. Our survey found that 48 percent of circular startups and SMEs⁷⁶ fail to secure government funding, typically due to an inability to locate funds and the administrative burden involved. For private funding, anecdotal evidence from interviews with circular businesses suggests that a scarcity of information about the availability and suitability of sources creates delays and complexity. An aggregator website, where all sources of funding available to circular startups and SMEs are listed and categorised in terms of suitability would provide businesses with a one-stop shop for understanding their funding options.

Private actors lack economic incentives to provide such a public good and the government could be best positioned to fulfill the role of funding aggregator. In other countries, this setup already exists – Better Business Finance in the UK being an example. There are currently several public websites that partially fulfil this role (such as the Rijksdienst voor Ondernemend Nederland (RVO)) which could be enhanced with private sector opportunities. If these resources were to be consolidated into a broad spectrum financing vehicle as discussed in the 2016 NFE0 report⁷⁷, the aggregator website could fit well under the broader mandate of a Dutch public bank devoted to economic development.

Another roadblock to obtaining funding is the lack of transparency surrounding circular business risks, especially technology risk. The new technology or production process is often the main asset of early-stage circular companies. However, in a technology-intensive innovation market such as the circular economy, the cost of technology assessments might be prohibitive for investors or lenders, given the degree of specialisation required and the lack of scale.

The government can provide two solutions: it can either set up an institution that acts as the central technology assessor, or it can subsidise third-party technology assessments. Including the valuation of intellectual property as part of the former would reduce uncertainty, providing potential investors with an independent data point of its value and the likelihood of monetisation.

Increase the supply of capital via direct and indirect measures

The market failures in the circular economy chain of financing can be addressed by stimulating public and private risk capital providers. The government can step in to ensure the availability of financing across all stages of the life cycle of innovative companies.

The government is already one of the largest providers of risk capital for small circular businesses (see Chapter 2.4.2). Further building out this role could involve increasing the size of existing financing schemes such as sustainability-focused venture-capital funds sponsored by a province. Another option is to address the circular startup equity financing gap via a new institution such as an NFEO or Invest-NL, which can have a mandate to address this gap as a relevant part of its wider mission. This can take the form of conditional grants, such as those set up by the Israel Innovation Authority for projects that reduce greenhouse gas emissions.

Creating incentives for private investors to fund circular initiatives is a potential indirect measure the government can take. The current scheme used by the Dutch government is the SEED Capital-regeling⁷⁸, which increases security for investors. In the UK, the government has gone further with the Seed Enterprise Investment Scheme, which boosts investments in early-stage companies by offering tax breaks on shares bought through crowdfunding platforms⁷⁹.



EPILOGUE: CIRCULAR VICTORIOUS

UTRECHT, 5 JULY 2040

Daan was waiting outside when the driverless electric van arrived. He loaded a large rolled carpet into the back as a couple stepped out of the front doors. They looked bewildered...





“Can I help?” Daan asked.

“We’re here for an Airbnb,” the woman said. “But the sign on the door says Tulip Enterprises. Are we in the wrong place?”

“No, no, that’s just the first two floors,” Daan explained. “All the rest have switched into apartments. You must be the people staying at our place.”

Since the late-2020s most commercial property developers had followed Google’s lead and designed their buildings so that they needed little more than the insertion of a kitchen to be turned into residential apartments. It had turned out to be a wise strategy. With so many people now working from home and cafes, office occupancy had halved since 2020. And with all that space being converted to residential property, new construction had all but ended.

Julia and the kids appeared, flustered and pulling the luggage behind them.

“These are the Maes’s from Antwerp.” said Daan, introducing them to Julia.

“Sorry we’re late leaving,” Julia panted. “I couldn’t find my cup.”

“Never leave home without your cup!” declared Mr. Maes, quoting the old anti-disposable cup campaign. It had been part of movement triggered by a 2023 BBC documentary series hammering home the damage being done by solid waste and, especially, by plastic. Public sentiment had turned violently against plastic and many governments imposed taxes on goods made of plastic. By 2030, alternatives to plastic and to throwing it away had proliferated to the point where plastic waste had reduced by 80 percent.

Julia gave Mr. Maes a half-hearted smile as she stepped into the van. Once the rest of the family were in, she told the van to take them to Return and Repair.

The eight kilometer trip took only six minutes. Driverless technology had reduced the number of cars by 70 percent. With cars no longer parking except overnight, most roads were effectively two meters wider. And traffic lights had been eliminated by the “hive” technology that coordinated the movements of cars coming into each other’s proximity. The van had not stopped once on the way to Return and Repair.

Daan told the van to wait, and the kids to stay inside. Julia and he lugged the carpet inside and placed it on the counter.

“Return or repair?” the receptionist asked.

“Repair,” said Daan. “This carpet has been part of the family for 20 years. We’ll collect it when we get back from holiday.”

Julia placed her mobile phone on the counter and said, “This one’s a return, if you know what I mean.”

“You want the latest one?” the reception asked.

When Julia nodded, he dropped her phone into the slot on the countertop box labelled “phone upgrade” and tapped the Q-fone 17 icon on its display screen. The machine extracted the €50 upgrade fee from Julia’s phone wallet as it loaded the latest software.

Julia had gone from the Q-fone 8 to the 17 without buying a new device since 2031. The skyrocketing price of the gold, copper and platinum that went into making them had made new phones prohibitively expensive. With people wanting to hang on to phones for as long as possible, the phone companies had devised this new way of selling upgrades.

Daan and Julia returned to the van and told it to go to Schiphol Airport. Though it was a Monday morning, the terminal was not busy. Business travel had declined steadily over recent decades, partly because people had become increasingly comfortable with teleconferencing but also because of consumer activism. Since the de Frees carbon credits scandal, Dutch companies had been required to report on their resource use, and cutting business travel was a simple way to improve a company’s score.

As the plane took off and looped around to head south, Daan got a clear view of Rotterdam harbour. Half the ships were being loaded or unloaded with cargo. The rest were being dismantled by gigantic machines. As a result of product and resource innovations 80 percent of production was now local-for-local and global trade had halved.

The flight to Bamako was surprisingly pleasant. Business class was offering the new meats grown by Protein Orchards. Julia tried the “chuck,” a cross between chicken and duck. Daan had lamb. He had no problem with lab meats but he always stuck to meats that you used to get from four-legged animals. He watched *Star Wars* episode 22, *The Wookie Strikes Back*, before nodding off.

None of them had been to Africa before and they were excited on arrival at Bamako-Senou airport. They walked out of the air-conditioned terminal into the 30 degree heat of Mali in July. “Feel that solar power!” said Daan. The children groaned. “Hey, it’s my job. It’s what feeds this family.”

Once the luggage was packed into the taxi, Julia and the children got in the back seat and Daan sat up front next to the driver. The children were astonished to see a person driving a car. “Do you kids not study any history at school?” Julia asked. “Or watch old movies?”

The highway into the city took them past great fields of solar panels, elevated two meters above the ground, with each panel tilted to face the sun. In the shade beneath the panels, the normal sundried earth of Mali was replaced by a verdant green, on which a scattering of goats grazed.

“Those are mine! Ours, I mean” Daan shouted. “Look everyone, those are Linden Suntrackers!” Even the kids seemed genuinely excited and proud at the sight of their father’s design in this far off place. Without sarcasm for once, Julia recited the company slogan: “We ask how much we can give, not get.”

APPENDIX A.

INTERVIEWS

CIRCULAR BUSINESSES

- Black Bear, Martijn Lopes Cardozo
- Bundles, Rogier de Jonge
- cirQlight, Emma Fromberg
- Desko, Michael Kuiper
- DutchSpirit, Erik Toenhake
- FrieslandCampina, Aniruddha Kusurkar
- GRO, Jan Willem Bosman Jansen
- Herso, Rik Ruigrok
- van der Kallen, Hugo van der Kallen
- Logge, Jaap Logge
- Mobypark, Manuel Cayre
- Recover-E, Jan-Paul Kimmel
- Reflow Filament, Jasper Middendorp and Ronan Hayes
- Ruud Sondag
- Spaak, Livio Bod
- Tarkett, Rudi Daelmans
- The Waste Transformers, Lara van Druten
- Tshared, Jeroen van der Heide
- Vlakglas Recycling Nederland, Cor Wittekoek
- WEBO, Willem Haase and Bart Voortman

FINANCIAL SERVICES INDUSTRY

- ABN AMRO, Richard Kooloos, Richard Verhagen, Hein Brekelmans, Nadia Menkveld and Jan Raes
- AEGON, Marjolein Breed and Peter Lugtigheid
- APG, Marta Jankovic
- Caroline Escott
- Catena Investments, Reinoud Lyppens
- Circularity Capital, Jamie Butterworth
- CrowdfundingHub, Ronald Kleverlaan
- De Brabantse Ontwikkelings Maatschappij, Bert de Haas
- ING, Armand Ferreira and Gerald Naber
- Nederlandse Vereniging van Participatiemaatschappijen, Felix Zwart

- PGGM, Frido Kraanen
- Prime Ventures, Joost Holleman
- Rabobank, Alain Cracau
- Robeco, Masja Zandbergen-Albers and Peter van der Werf
- Seedcamp, Reshma Sohoni
- SFRE, Jim Prouty
- StartGreen Capital, Laura Rooseboom
- Stichting DOEN, Wouter van Westenbrugge
- Triodos Bank, Hans Stegeman
- Various Oliver Wyman and MMC colleagues

THOUGHT LEADERS AND INITIATIVES

- Acceleratio, Freek van Eijk
- Circle Economy, Marc de Wit and Shyaam Ramkumar
- Circular Valley, Guido Braam
- City of Amsterdam, Sladjana Mijatovic
- Green Alliance, Dustin Benton
- Jenny Elissen
- London Waste and Recycling Board, Stuart Ferguson
- Ministerie van Economische Zaken, Jasper Wesseling
- RSM Erasmus University, Dirk Schoenmaker
- Sustainable Finance Lab, Elisa Achterberg
- TNO, Elmer Rietveld
- VNO-NCW: Sustainable Growth Coalition, Frits de Groot, Tessa van Soest and Willem Henk Streekstra
William McDonough
- Zero Waste Scotland, Louise McGregor

APPENDIX B.

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APPENDIX C. RESULTS OF SURVEY OF CIRCULAR BUSINESSES

For this report, an online survey was conducted in June and July 2017. It was distributed by Nederland Circulair! and Het Groene Brein. Additionally, Oliver Wyman reached out to circular businesses. In total, more than 50 responses were recorded; in-depth interviews were conducted with 20 respondents.

The survey results were one of the factors informing the analysis of the circular financing landscape in Chapter 3.

SEGMENTATION OF RESPONDENTS

Exhibit 1: Survey respondents segmented by revenue
(% of total respondents, €)

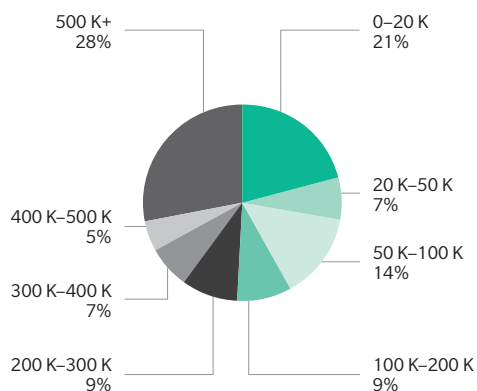
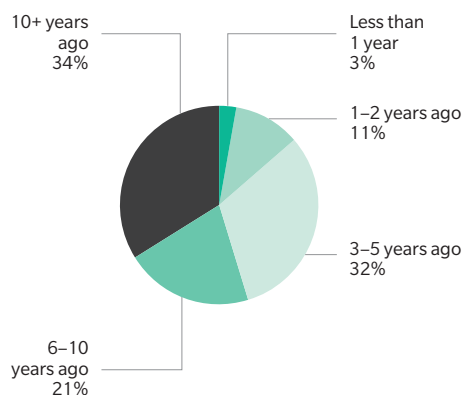


Exhibit 2: Survey respondents segmented by years in existence
(% of total respondents)



RESULTS

Exhibit 3: Obstacles experienced by survey respondents (number of respondents)



Exhibit 4: Difficulty in obtaining funding (number of respondents)

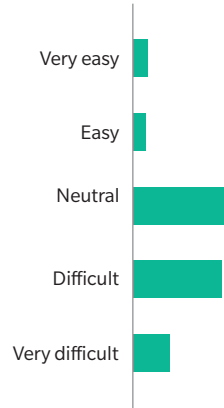


Exhibit 5: Desired and actual funding sources for start-ups (number of respondents)

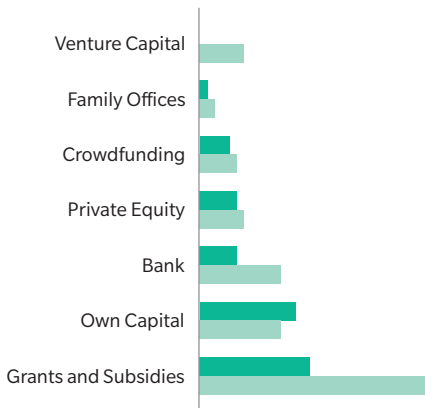


Exhibit 6: Desired and actual funding sources for incumbents (number of respondents)

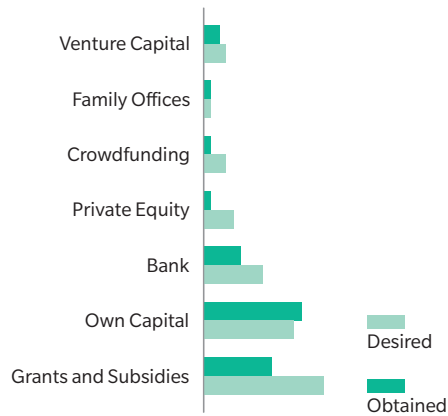


Exhibit 7: Reasons for inability to obtain bank funding (number of respondents)

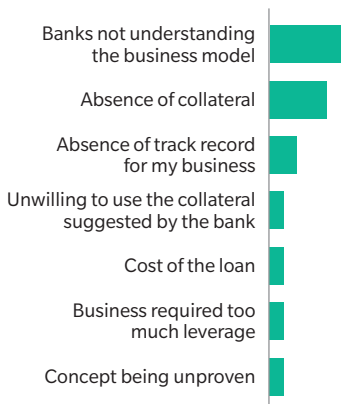


Exhibit 8: Reasons for inability to obtain subsidies and grants (number of respondents)

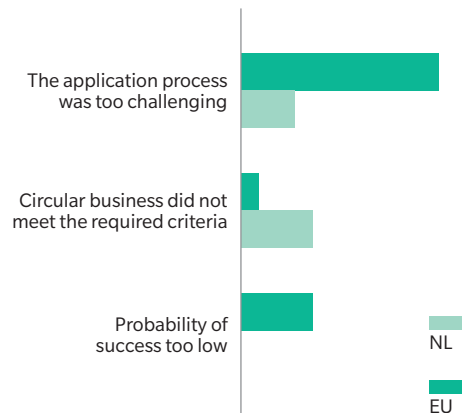
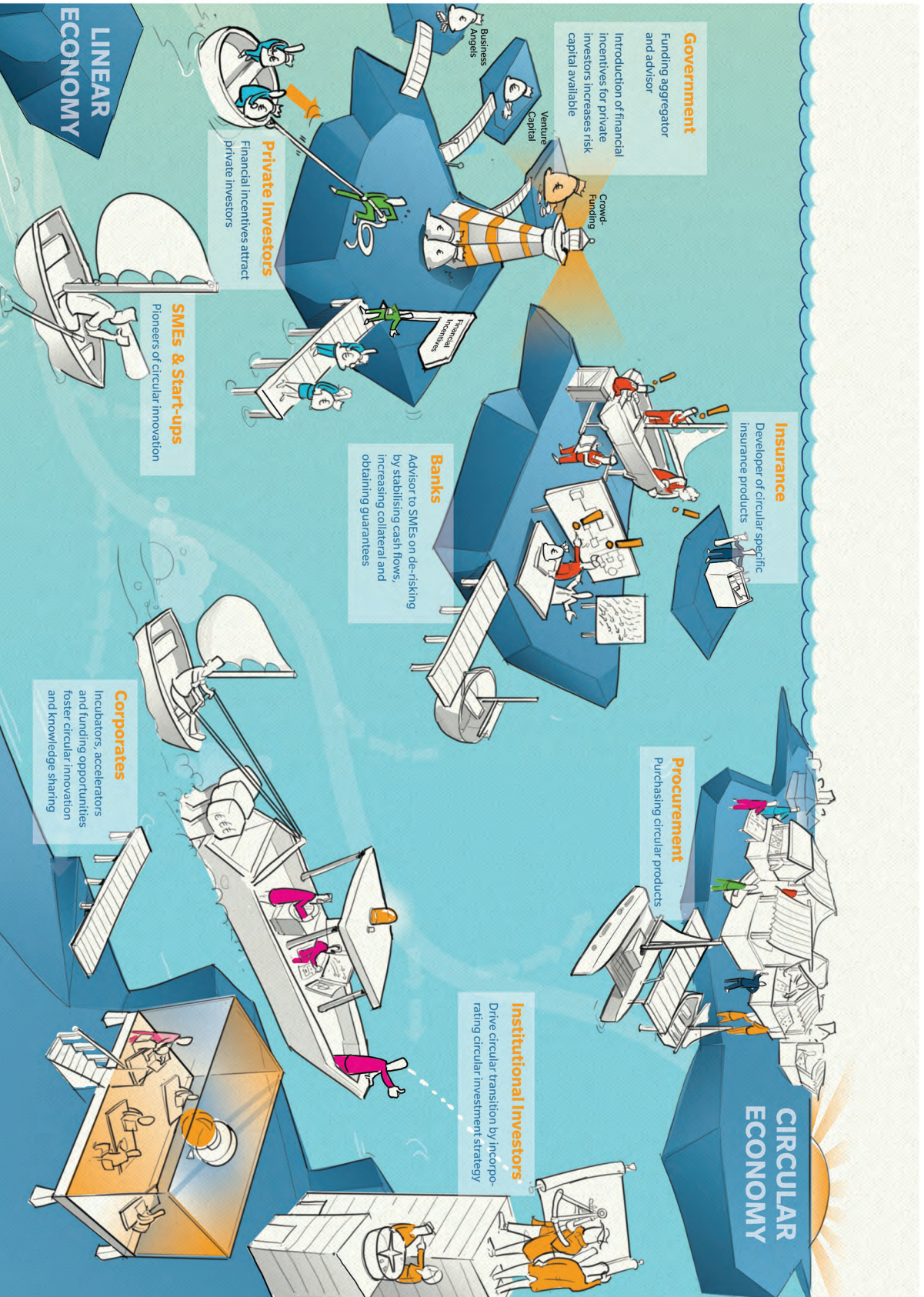


Exhibit 9: Two minute update: An illustration of the role of the financial sector in supporting the circular economy transition
 This illustration was contributed by INK Strategy



Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation.

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