A practical guide to the Circular Risk Scorecard

Guidance on the origin, goal and use of the Circular Risk Scorecard

Kopgroep Circulair Financieren

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Content

1. The Circular Risk Scorecard: a tool to assess risks through a circular lens

The most important reason that **circular businesses struggle to attract bank financing**, compared to linear businesses, is that circular businesses generally attain poor credit scores. This means that these businesses are deemed more likely to not repay their loans, which is a major risk for banks. In other words, t**hey are perceived as risky customers**. Even if a bank provides a loan to a circular business, it **charges a high interest rate**.

Why are circular businesses perceived as being more risky than linear businesses, while circular businesses are more capable of mitigating business risks? (for example related to price volatility and supply chain disruptions) How can we ensure that risks of circular businesses are estimated more accurate and realistic, allowing financing to be adapted to support the transition towards a circular economy rather than obstruct it? These are the questions we have been seeking to answer by developing the Circular Risk Scorecard (CRS). This **guidance document** helps you to **understand how and why the CRS was developed**, and **how to use it**.

Team: The Kopgroep Circulair Financieren

The Kopgroep Circulair Financieren (Kopgroep) connects progressive **Dutch financial institutions** towards a common goal: **circular financing becoming the norm in 2030**. The Kopgroep developed a path towards 2030: the **Circular Finance Roadmap 2030**[1]. It was published in February 2022, and defines four action lines:

1. *Risk:* Create an integral assessment of linear and circular risks;
2. *Metrics:* Take circular metrics into consideration in financing circularity;
3. *Fit-for-Circular-Finance:* Gain experience by closing deals with circular businesses;
4. *Instruments:* Optimise the circular finance instruments.

This practical guide was developed as part of the **Risk action line**.

Goal: assessing risks through a circular lens

We identified **two main reasons** why circular businesses are being perceived as **more risky** than linear ones:

1. Firstly, **current financing** depends largely on a **linear perspectives on risks**. For example, from a linear perspective, resources such as critical raw materials are assumed to be infinitely available, and therefore their use does not impose any risk. As these so-called linear risks (see box) are not explicitly taken into account, the opportunities that circular companies offer are overlooked. A circular business, which loops materials back into the value chain, has the same risk profile as a linear business. The risk might even be deemed higher, as the efforts undertaken to loop the materials back, deviate from normal, linear practice. We believe the current risk models do not adequately assess the real risks.

> ***Linear risk[1] is the risk that companies, households and governments are exposed to by remaining to operate in a linear (wasteful) manner. In other words, operating under the false assumption of infinite availability and affordability of raw materials, which threatens future resilience of businesses and economies.***
>
> *- Circular Finance Roadmap 2030, Kopgroep Circulair Financieren –*

2. Secondly, the **risk** arising from the **circular (innovative) nature of the company**, requires a **totally different way of operating**. To control and preserve goods and materials, parties within supply chains need to cooperate and incentives are shifted from one to all parties involved. This results in a mismatch between the long-term vision of circular business models and the short term of risk assessment. Security to mitigate

[1] *Roadmap Circulair Financieren 2030: de financiële sector als aanjager van de circulaire transitie* (2022), DNB Platform voor Duurzame Financiering)

risks is sought in assets, while the value of circular projects is usually contained in (a combination of) assets, services, supply chain cooperation, contracts and future cash flows."

Circular risk[1] is the risk arising from the circular (new) nature of the company, which requires a totally different way of operating. To control and preserve goods and materials, parties within supply chains need to work together and incentives are shifted from one to all parties involved.

- Circular Finance Roadmap 2030, Kopgroep Circulair Financieren –

To reflect risk more adequately, the combination of these two (assessing linear risks and the mismatch between the long-term vision of circular business models versus the short term of risk assessment) should be incorporated in the process of risk assessment. This is what we call: **applying a circular lens to financing**.

"Our existing risk models do not interpret the risks (and opportunities) of circularity in a correct way. The CRS will help us to alter our risk perception to the 'correct' risk perception."

- Marcel van Breemen, member of Risk project group, Risk Manager, Rabobank –

Solution (step 1): creating an open-source Circular Risk Scorecard

The **main risk** for banks is the risk of a **borrower not repaying the loan**, so-called credit risk. Credit risk models calculate this risk, i.e. the likelihood of a borrower to default on a loan and how much the bank would lose from the outstanding amount (i.e. expected loss). To ensure risks are managed properly, the Basel IV set of rules for banks requires them to determine the Expected Loss (EL) on their loans. This EL is calculated by the formula:

Exposure at default (EAD) x Probability of Default (PD) x Loss Given Default (LGD).

We decided to start with applying our circular lens to the Probably of Default (PD): the likelihood that over a specified period, usually one year, a borrower (the bank's customer) will not be able to make their scheduled repayments on their loan.

The initial idea was to build a new 'circular PD-model'. However, during our initial discussions, we encountered that building a PD-model is heavily regulated, requires a minimum of **5 to 7 years of default data (which is not available at the moment)** and requires managing several **compliance issues**. Our solution was *not* to build a new circular PD-risk model, but a Circular Risk Scorecard (CRS). The CRS does not replace the PD model, but rather supports the existing PD-risk models in applying the circular lens, and re-assesses the risk perception on circularity. In other words: **the CRS is an add-on to the existing PD-models**.

"The Circular Risk Scorecard will help us gain more insights into the risks of circular Product-as-a-Service businesses."

- Rob van Willigen, member of Risk project group, PaaS Business Developer, ABN AMRO -

Result (step 2): collecting data of circular businesses

The CRS was developed as a short-term solution to be able to amend the linear risk profile of circular businesses. However, our next envisioned, medium to long-term step is to integrate circularity into all existing risk models. To do so, 5 to 7 years of (default) data is needed, which is not available at the moment. **The CRS was developed to generate this (default) data on circular businesses.**

"To integrate circularity into the existing risk models, 5 to 7 years of (default) data of circular businesses is needed."

- Halldora Thorsdottir, member of Risk project group, Risk Model Validator, ABN AMRO –

Ultimate Goal (step 3): circular financing becoming the standard in 2030

We acknowledge that our short- and medium term solutions (the CRS and integrate circularity into existing risk models) are incremental transitions *within* the current financial system. To reach our **long term**, ultimate goal (circular financing becoming the standard in 2030), it might be needed to discuss more **fundamental changes to the financial system**, such as a tax shift from labour to materials (e.g. Ex'Tax), governance (e.g. fraud, tax evasion) or including environmental and social value in the risk assessment (e.g. True Price).

We encourage this debate, while at the same time acknowledge that the influence of the CRS lies purely on the short to medium term transition. The usage of the CRS intends to enlarge the access of circular businesses to financing immediately, which we deem a vital, first step (see figure 1).

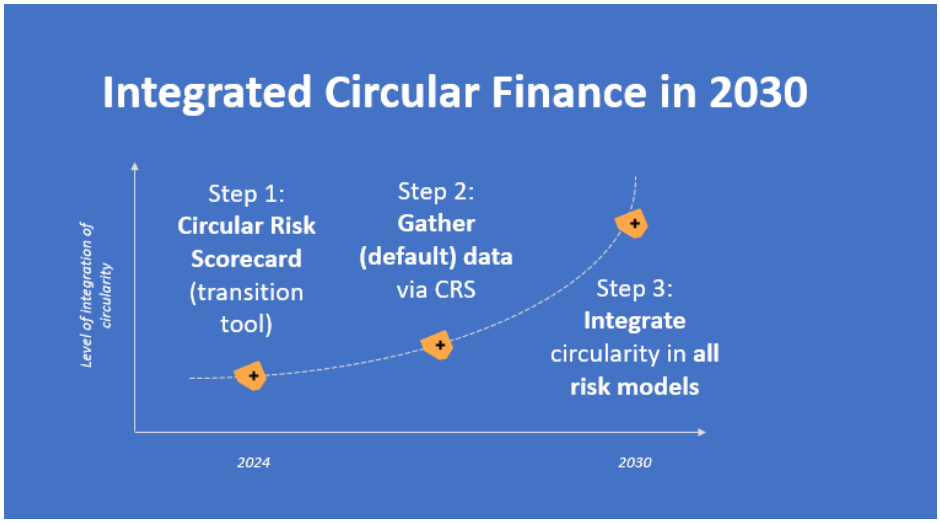


Figure 1 | The transition towards integrating circularity into all risk models in 2030

Origin: a unique group of financial and risk experts

The CRS was developed by a project group within the Risk action line (the Risk project group). The Risk project group has unique elements, such as being a **non-competitive cooperation** of Dutch financial institutions in the risk domain between **ABN AMRO, Rabobank, Invest-NL, ING and Triodos**, which takes into account the *Chinese walls* between the institutions. We refer to the Colophon for an overview of all involved.

Process: the road to the top 6 risk drivers

The CRS was developed by the Risk project group. Initially, we started by defining a **longlist of 40 risk drivers**, which are of importance to the risk profile of circular businesses (see Appendix III). Through various iterations of experts, we selected a **shortlist of the top 6 risk drivers**. Of these six, three risk drivers are already present in the existing risk models. However, we apply a circular lens on them:

1. **Ability of Management Team;**
2. **Robustness of contracts;**
3. **Market competitiveness.**

We also selected three risk drivers which are typical for circular businesses that are not accounted for in existing risk models:

4. **Security of resources;**
5. **Circularity of the product;**
6. **Suitability for circular proposition.**

For more information on risk drivers and associated variables, please refer to Appendix II.

Scope: Circular businesses

Our initial scope was on a type of circular business which is, given its characteristics, one of the most difficult to finance: Product-as-a-Service. Examples are wash-as-a-service (Bundles), flowers-as-a-services (Reflower) and kitchen-as-a-service (Chainable). However, during the development of the CRS, we discovered that the risk drivers are also applicable for other circular businesses. Therefore, we included other circular business models into the CRS as well:

- ***Resource recovery (material sales model):*** businesses that sell circular materials (non-virgin and/or bio-based). An example is SusPhos that upcycles phosphate-rich waste streams to generate high-quality bio-based materials, as an alternative for fossil-based materials.
- ***Circular supplies (product sales model):*** products made from either bio-based materials or non-virgin materials. An example is BE O lifestyle, that produces products such as reusable cups from bio-based materials (plants), which are fabricated by people with an occupational disability.
- ***Product life-time extension (service sales model):*** services to extend the life-time of a product (e.g. repairing, refurbishing), which are paid for in one go. An example is bicycle repair shops.
- ***Product-as-a-Service:*** see above. The main difference between PLTE and PaaS is the way that revenues are earned: via a fixed fee or pay-per-use revenue model (PaaS), or via a one-off sale (PLTE).
- ***Sharing Platforms:*** a platform to share products between multiple users. An example is MyWheels, which shares electrical cars.

2. Four ways of using the Circular Risk Scorecard

Target groups: financial institutions and circular businesses

Our initial target group was **banks**. However, as a result of various discussions, we discovered that (parts of) the CRS could also be used by other **financial institutions** such as for instance investors, pension funds and insurance companies. For these institutions, the CRS can be applied to complement their standard risk assessment process. Alongside financial institutions, we believe that the CRS can be beneficial for **circular businesses**.

Use: four ways of using the CRS

In total, we found that the CRS can be applied in four different ways. The first three are applications for financial institutions, the fourth for circular businesses.

I. Underpin manual override of traditional risk assessment

When a (circular) business applies for a bank loan, a bank's financial specialist generates the existing risk model with data on their (potential) client. This creates a risk profile of the borrower of the loan. As stated before, we believe that this generated risk profile does not take into account the risks of pursuing a linear business model. The CRS can be used to **apply the circular lens and 'correct' the existing, linear risk profile of the client**. The finance specialist using the CRS can apply a so called 'manual override' on the existing risk model, in which the risk profile which is generated by the standard risk models is adjusted. The CRS outcome (a score between 0-100) can be used to underpin the height of the manual override.

II. Circular deal selection

A second way to use the CRS is to **select circular deals**. In some cases, financial institutions consider creating a specific loan book and/or fund for circular businesses. These funds are *only* available for businesses with a certain circular (risk) profile. The CRS outcome can determine whether a specific circular business crosses the 'tipping point' (e.g. only circular businesses with a CRS-score below a certain circular risk score) and be eligible for the special type of financing.

III. Educate financial experts

In the daily financing practice, questions regarding circularity of businesses and products are not regularly being asked. We believe that using and implementing the CRS can be a way to **educate financial experts on circularity**. By using the CRS, knowledge of circular businesses of employees of financial institutions can be developed and the circular lens can be applied to the common, linear risk perception.

IV. Educate circular businesses

In the pilot testing phase of our project, we encountered that not only financial institutions, but also circular businesses themselves can benefit from using the CRS. The CRS **educates circular businesses**, as they gain a better understanding of how financial institutions value or assess their business, and are better able to effectively respond to this. As such, they will be better prepared for questions in for instance a round of funding.

"Working through the Circular Risk Scorecard has provided me with insights which will come in handy in my current funding round."

- Spencer Schols, Co-founder, Circ Energy –

3. Practical guidance on using the Circular Risk Scorecard

Tool: accessing the CRS

The CRS can be accessed via a landing page at De Nederlandse Bank: link.

CRS output: a circular risk score between 0-100

The CRS was developed to determine a 'circular risk score'. This is a score between 0-100 (see Figure 2). This score determines the level of circular risk whereby **a low score is indicative for a low risk**. See Appendix I for the methodology behind the circular risk score.

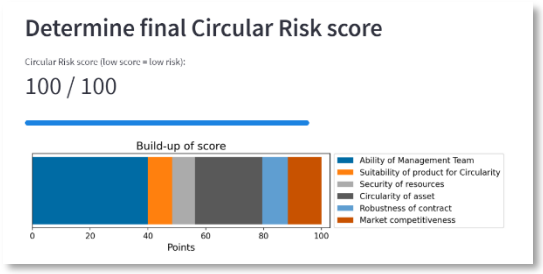


Figure 2 | Screenshot of the Circular Risk score

Figure 2 reflects the contribution to the circular risk score per risk driver. For instance, ability of management team and circularity of the asset weight more heavily than other risk drivers. By providing an answer to **18 questions**, the circular risk score is **automatically calculated**. In order to determine a circular risk score, please follow the step-by-step approach, as stated below.

Step 1: provide a name or code

When opening the CRS, you are requested to provide a name or code (depends on what you prefer) of the financial institution or other company which is performing the assessment. Next, you need to fill in the name or code of the circular business which is assessed.

Step 2: provide an answer to 18 questions

The CRS consists of six risk drivers, each derived from multiple variables. The scores of these six risk drivers will be calculated from the answers to 18 questions. The CRS will guide you through answering these questions. If you need assistance, place your mouse on the question mark icon for an explanation on the response categories.

Step 3: override risk driver outcomes when deemed necessary

If the outcome of the risk driver is not perceived to correctly fit your imagined risk profile, it is possible to override the risk driver score. This override replaces the risk driver score determined by the associated variables. When you perform an override, it is required to specify why you deem the override to be necessary. Through this specification, other actors in the financing process (e.g. the credit approvals department) can determine whether they agree with your override.

Step 4: download scorecard in PDF-format (optional)

The final circular risk score and the answers to the 18 variables can be downloaded into a pdf version of the inputs and outputs. This allows you to save the data locally and, for instance, add this to the credit application. It is not possible to retrieve the data entries in the browser application once the page is closed or reloaded.

Step 5: submit answers to database, to collect data on circular businesses

The final step is to click on the 'submit' button, which saves the inputs to the CRS database. We encourage you to submit, as this is the way we gather the (anonymised) data and are able to perform portfolio analyses on circular risks.

Step 6: collect your data (optional)

Users of the CRS can collect the data they provided (if labelled properly by a code or name). Please send an email to circularriskscorecard@outlook.com.

Details: tabs provide additional information

Finally, the different tabs at the top of the page refer to information regarding how to use the dashboard, the required data input and background information about some of the risk drivers. Notably, the tab 'peak extraction years' refers to question 3.1 on 'dependency on (critical raw) materials'.

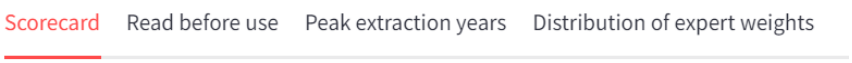


Figure 3 | Screenshot of the tabs in the CRS

Security: data privacy by independent parties

All data submitted through the CRS will be collected in a database. This CRS database will be managed by two **independent parties**, being **RiskQuest and Copper8**. The data will be sorted in two ways:

- ***Individual user data:*** financial institutions, or other companies using CRS, can collect their own provided data to run queries on. The database manager will provide their individual dataset upon request.
- ***Aggregated data:*** all provided data will be aggregated to a portfolio level on an anonymous, no-name base, so that no outcome can be traced back to an individual assessment.

Technically, when a user clicks on the 'submit' button, an email will be sent to the independent parties, which will run a script to collect data from the mailbox. In this way, the database will be created and expanded.

Appendix I: Methodology behind the CRS

First step: defining the most important risk drivers

Initially, we started by defining a **longlist of 40 risk drivers** which are of importance to the risk profile of circular businesses (see Appendix III). Through various iterations, a shortlist was made. The next step was to determine the ingredients of information that is needed to proxy the risk driver and create "answer options" that circular businesses could fill in.

For example, circularity of the product consists of (i) design and upgradability, (ii), circular material use in the product, (iii) durability of the product and (iv) ease of repair. We formulated answer options, ideally 3-4 per risk driver, that provide information on for instance the percentage of non-virgin or bio-based materials[2]. Four answer options were created, to increase the discriminatory value of the outcome and to prevent user from too easily choosing the middle option.

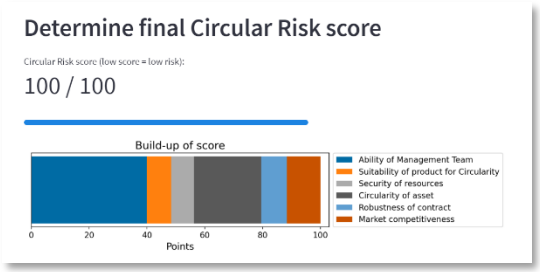
Definitions: conforming to open source, multi-stakeholder initiatives

There has been a lot of debate on definitions of circularity, circular economy, circular businesses, etc. We base our understanding and definitions on two, publicly available and multi-stakeholder initiatives:

1. The already mentioned **Circular Finance Roadmap 2030** of the Kopgroep Circulair Financieren;
2. The **Circular Transition Indicators (CTI) framework**[2] of the World Business Council for Sustainable Development (WBCSD). The CTI-framework, now in its fourth edition, is an open source, objective and quantitative framework that can be applied to businesses of all industries, sizes, value chain positions and geographies. In the CRS tool, we refer to the CTI, for instance in the definition of *non-virgin* or *renewable materials*. For more information and definitions, we refer to the latest CTI release.

Methodology: a circular risk score between 0-100

The Circular Risk Score reflects the **calculated level of circular risk of the circular and linear business**. Businesses are scored on a level between 0-100, with low score = low risk (see screenshot below). Depending on the specifics of the business, first test results indicate that circular businesses have a lower score (=lower risk profile) than linear businesses.



The circular risk score is determined by the following formula:

- ***18 variable scores:*** the score of a particular risk driver is being determined by two or more variables. For instance, the score of risk driver 'security of resources' is determined by three variables: dependency on critical raw materials, ownership/control over resources and type of relationship with value chain. By providing answers to the variable questions, the score for a certain risk driver is determined (e.g.

[2] *Circular Transition Indicators v4.0* (2023), World Business Council for Sustainable Development (link)

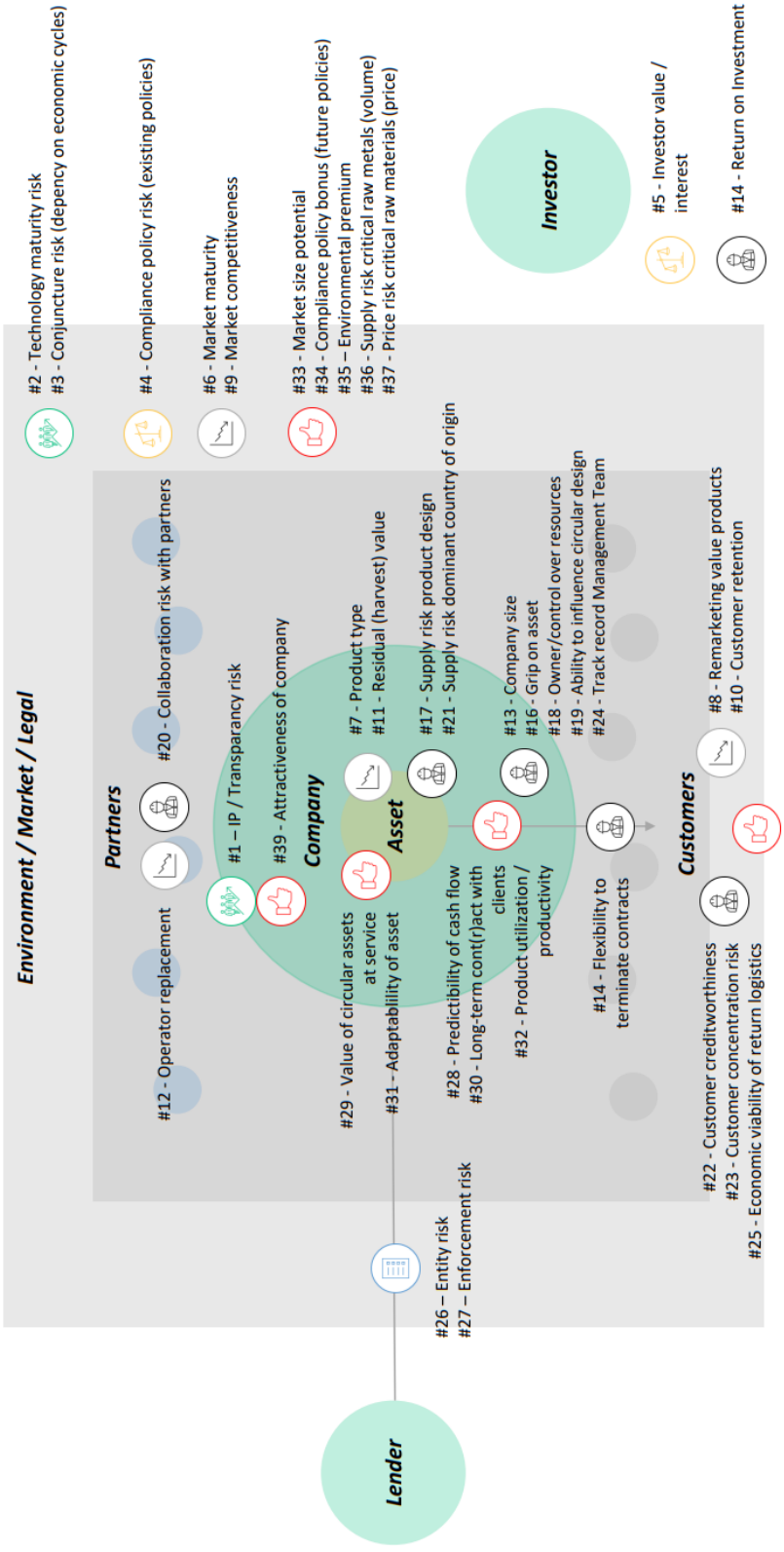
hardly secure, little secure, largely secure or very secure). In total 18 variable questions have to be answered.

- ***6 risk driver scores**:* the answers to the variable questions will be aggregated per risk driver, on an equal basis.
- ***6 expert weights scores**:* the 6 risk drivers are not all equally important. We've asked 31 experts, from Financiers, to Investors, to Risk Managers, to Business Developers, to divide 100 points between these 6 risk drivers. This exercise provides the expert weight scores to all risk drivers.

Appendix II: Overview of the Risk Drivers and Variables of the CRS

Risk Driver	Variable
Risk Driver 1: Ability of Management Team	1.1 Experience Management Team with innovative / circular businesses
	1.2 Diversity of Management Team
Risk Driver 2: Suitability for circular proposition	2.1 Suitability of product for circular proposition
	2.2 Incentives to optimise use of products
Risk Driver 3: Security of resources	3.1 Dependency on and availability of (critical raw) materials
	3.2 Ownership/control over resources (natural hedge)
	3.3 Type of relationship with value chain
Risk Driver 4: Circularity of asset	4.1 Design & Upgradability
	4.2 Circular material use product
	4.3 Durability
	4.4 Ease of repair
Risk Driver 5: Robustness of contract	5.1 Contract length of portfolio
	5.2 Contract term flexibility (portfolio average)
	5.3 Incentives for contract renewal
Risk Driver 6: Market competitiveness	6.1 Access to market (entry barriers)
	6.2 Level of competition / substition
	6.3 Circular market share
	6.4 Compliance to (future) green policies

Appendix III: 40 initial risk drivers



Colophon

The team: members of the Risk project group

The Risk project group consist of:

- ***Experts from Dutch financial institutions:*** Marcel van Breemen, Tessa Eerenberg, Twan Geurts (Rabobank), Rob van Willigen, Sander van Wijk, Halldora Thorsdottir, Mukul Tyagi (ABN Amro), Mireille Ruberg, Maud Hartstra, Lucas Lemmens (Invest-NL), Martijn Wiegman (ING), Marco Zwijnenburg (Triodos)
- ***Policy expert:*** Mark Overman (Dutch Ministry of Infrastructure and Water Management)
- ***CRS model builders:*** Rick Stuhmer, Diederik Hemmens (RiskQuest)
- ***Quality Assurance:*** Elisa Achterberg (Circular Finance Lab)
- ***Program leads:*** Jeroen van Muiswinkel (Copper8, jeroen@copper8.com), Manon van Ginkel (Copper8)

The additional experts: input from outside the financial sector

Next to the experts from the Risk project group, we've received input from the following experts/groups:

- ***Blue City*** - Funding the future event (2022);
- ***Circl*** - Lanceringsevent Kopgroep Circulair Financieren (2023);
- ***Springtij*** - Circular Risk model sessions (2022 & 2023).

Credits for the photo on the front page go to Photographer Sammie Chaffin.