

External Evaluation of the Pilot of “MaterialWise”, an Initiative Funded by C&A Foundation

Submitted to C&A Foundation

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Forward

This evaluation was carried out at a relatively early moment within the overall trajectory of MaterialWise, which is an evolving project within a dynamic landscape. The evaluation was bounded in time, spanning the period of pilot funding, from December 2017 to August 2019. Data and perspectives included in this evaluation were limited to 30 September 2019.

Executive Summary

Introduction

The MaterialWise initiative, which got its start as a Cradle to Cradle Products Innovation Institute (C2CPPI) project to bolster quality assurance and lower the cost of chemical hazard assessments (CHAs), gained momentum from late 2017 with funding from C&A Foundation, Target Foundation and Google. Through three pilots launched in 2019, it aimed to seed a globally-harmonised database of CHAs that would enable brands, manufacturers, and their suppliers to make informed data-driven decisions about chemicals early in the design process so that their choices would result in safer end products. MaterialWise's value proposition is anchored in substantiation, granularity, underlying data, database management, 3rd-party verification, and an external challenge process. Reliable, affordable data, information and knowledge regarding the composition of materials have been identified as key to shifting and accelerating industry towards safer products, which can also function as positive inputs for a circular economy.

This evaluation was designed for the purpose of learning, informing decisions, and improving performance. In this light, the initiative's design, implementation, results thus far, missed opportunities, and potential for building upon the pilot were reviewed. This generated a set of recommendations to enhance learning and to inform funding decisions and actions of similar projects.

Methodology

Guided by Terms of Reference (ToR) provided by C&A Foundation, which mandated and resourced this assessment, dimensions related to MaterialWise's relevance, effectiveness, efficiency, and sustainability were examined. The evaluation team adopted a Utilisation-Focused Evaluation (UFE) approach, which prioritises the usefulness of the evaluation to its intended users with the aim of increasing the relevance and uptake of recommendations. The evaluation provides an assessment of progress, thus far, while also offering insights to enable the initiative to move beyond its pilot phase.

The team developed and used an Evaluation Matrix to guide the inquiry. It laid out key and subsidiary questions linked with primary and secondary data sources and referred to indicators and methods seen to facilitate assessment of the requested dimensions. Given its pilot stage, there was a relatively small pool of people who had direct knowledge of the initiative during the evaluation period. Data collection was undertaken through semi-structured interviews with 30 informants who were identified through a consensus-based approach with the MaterialWise leadership team and C&A Foundation's Effective Philanthropy (EP) team. Document review predominantly relied on grant agreements, financial and narrative reports, stakeholder presentations, and landscape documents on safer chemistry provided by MaterialWise and C&A Foundation, as well as a relevant external documents.

Relevance

The relevance of MaterialWise was examined in relation to C&A Foundation's overall Theory of Change (TOC), the strategy of its Circular Fashion programme, the global fashion industry, and other selected

sectors where the MaterialWise team has pursued partnerships. MaterialWise’s potential for scaling and contributing to wider system shifts and industry-related transformation was of particular interest, given the foundation’s vision and purpose to transform the fashion industry into a “force for good”. MaterialWise was deemed to be “mostly relevant”, which reflects a judgement that the initiative’s objectives are well-designed and well-aligned with the priorities of C&A Foundation, co-design partners, and other stakeholders. In addition, the approach to executing the initiative was seen as mostly reflecting the values, vision and mission of C&A Foundation.

While recent developments related to apparel brand-led momentum around scored chemistry and its stewardship by the Zero Disposal of Hazardous Chemicals (ZDHC) coalition seemed to have tempered enthusiasm for the MaterialWise offer, the relevance of its value proposition to apparel brands and other sectors could be expected to increase in the future with growing interest in its ability to provide alternative assessments for chemicals of concern. Co-design partners in electronics, retail and personal care involved in MaterialWise pilots have expressed their interest in using the initiative as a resource to move beyond Restricted Substances Lists (RSLs) and toward safer chemistry.

Effectiveness and Results

The evaluation of effectiveness was principally based on the likelihood, at present, that targeted results have been or are expected to be achieved, compared with the expectations that had been set for the C&A Foundation-funded pilot period. The extent to which such actions have brought about, generated evidence to bring about change, or contain system change potential was also examined, together with the way in which the MaterialWise team interacted with relevant stakeholders and leveraged other initiatives. At the time of this evaluation, which was arguably premature, the results of the pilot period were not available. This led to the assignment of a rating (“somewhat ineffective”) that reflects a situation where MaterialWise’s performance was judged likely to meet outcome targets in a few areas, where there was little evidence of systems change to date with some concerns about positioning for systems change, and where MaterialWise achieved uneven engagement with stakeholders and other relevant initiatives.

Apart from the delay in launch, the MaterialWise team did successfully run its first pilot (Alternatives to Ortho-Phthalates Plasticisers), although the publication of the resulting alternative assessment portfolio was still pending at the time of the evaluation. Its publication promised a vital opportunity to gain feedback from actual users regarding the relevance and use of MaterialWise’s offering. In view of the attrition of participating chemical suppliers, the second pilot (PFAS-free and ZDHC MRSL compliant Durable Water Repellents) generated a lower portfolio volume than planned; it was not yet available at the time of the evaluation. It was premature to judge the potential of the third pilot (Alternatives to the use of Dimethyl Formamide in the manufacture of synthetic leather). Discussions with the MaterialWise team revealed that they drew important lessons from the development and piloting experience, pinpointed the sources of key challenges, and were regularly adapting to the changing conditions and environment.

Efficiency

MaterialWise has been judged to perform in an efficient manner, taking account of its current situation within a broader trajectory. The assessment of efficiency was based on two factors: the initiative’s cost-efficiency and its timely delivery of outputs. On the one hand, MaterialWise was deemed to have used its funds judiciously and remained within its budget, while also employing efficiency-increasing strategies (e.g. most of the funds received were invested in building the initiative’s infrastructure, which is expected to

increase cost-efficiency in the future). On the other hand, the bulk of MaterialWise’s programmed activities and outputs were not fully completed on time, as discussed in the assessment of the initiative’s effectiveness.

Sustainability

The evaluation team felt that it was not appropriate to assign a rating to this dimension, given that the grant was allocated to an initiative in pilot phase. In reviewing the initiative’s reliance on philanthropic funding, it was determined that further support would be needed to assure continued benefits beyond the lifetime of the C&A Foundation grant. At the time of the evaluation, there was not yet evidence that MaterialWise’s business model would lead to financial independence. The evaluation team was optimistic that the full set of results from the pilots would provide insights into this question, provided that the initiative can move into market-validation.

Recommendations

In light of this evaluation’s purpose to promote learning, inform decisions, and improve performance, a focused set of recommendations has been provided:

- Recommendation 1:** MaterialWise should clarify and socialise its value-proposition and business model to both increase interest and uptake.
- Recommendation 2:** MaterialWise should develop general criteria that can be used to identify pilots that require more extensive due diligence, before an initial investment.
- Recommendation 3:** MaterialWise should accelerate the pace at which its envisaged database is populated. This will likely entail reconsidering the orientation of the pilots and increasing the size of the team.
- Recommendation 4:** MaterialWise should review its engagement strategy with priority stakeholders in order to fully understand and meet their needs, as well as adequately communicate the initiative’s value proposition to these stakeholders.
- Recommendation 5:** MaterialWise should enlarge its geographic focus and go beyond the networks associated with team members’ direct connections. New European ties could open doors into uncharted territory, including discussions with key global actors that could help to position the initiative and leverage the IP that has been generated into an international standard for harmonised CHA.
- Recommendation 6:** In order for its MEL processes to be more structured and more credible, MaterialWise should rely on its logical framework as a foundation for its MEL.
- Recommendation 7:** MaterialWise should clarify its legal status and the ownership of IP.

Acronyms

C2C	Cradle to Cradle (certification)
C2CPII	Cradle to Cradle Product Innovation Institute
CEO	Chief Executive Officer
CEPN	Clean Electronics Production Network
CHA	Chemical Hazard Assessment
CSO	Civil Society Organisation
DMF	Dimethyl Formamide
DWR	Durable Water Repellents
EC	European Commission
EDF	Environmental Defense Fund
EP	Effective Philanthropy
EPA	United States Environmental Protection Agency
EU	European Union
GC3	Green Chemistry and Commerce Council
GHG	Greenhouse Gas Emission
GHS	Globally Harmonised System
HBN	Healthy Building Network
IP	Intellectual Property
IR	Inception Report
KPI	Key Performance Indicator
MRSL, RSL	Manufacturer's Restricted Substance List, Restricted Substance List
NDA	Non-Disclosure Agreement
NGO	Non-Governmental Organisation
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical Substances (EU)
RFP	Request for Proposal
SDGs	Sustainable Development Goals
SOP	Standard Operating Procedure
TOC	Theory of Change
ToR	Terms of Reference
UFE	Utilisation-Focused Evaluation
UNEP	United Nations Environment Programme
ZDHC	Zero Disposal of Hazardous Waste

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1 Introduction

Universalialia is pleased to submit this external Evaluation Report of the “MaterialWise” pilot to C&A Foundation. Through its Circular Fashion Programme, C&A Foundation provided a grant to the Cradle to Cradle Product Innovation Institute (C2CPII), which channelled that support to the MaterialWise initiative through its fiscal sponsor, the Healthy Building Network (HBN). This support was provided to advance the foundation’s strategic commitment to increasing the accessibility of high-quality, actionable data about chemicals, to enable positive decision-making early in product design processes. This is part of a wider effort aimed at shifting the fashion industry towards using and reusing safe materials. In this light, C&A Foundation provided €400K towards proof of concept, deployed from December 2017 through August 2019. A further €90K was authorised in March 2019 for project and reporting activities, extending the timeline to December 2019.

In its grant proposal, MaterialWise was described as an “industry engagement initiative” to create a database of verified chemical hazard profiles, based on a harmonised standard for chemical assessment. It aimed to enable brands, manufacturers and their suppliers to make informed data-driven decisions about chemicals early in the design process so that their choices would result in safer end products. Reliable, affordable data, information and knowledge regarding the composition of materials are key to shifting and accelerating the industry towards safer products, which can also function as positive inputs for a circular economy.

This evaluation assesses the extent to which the pilot of MaterialWise has met its stated goals and is relevant to the fashion industry, and potentially beyond to other sectors. It also provides a focused set of recommendations and lessons to enhance learning and inform actions of similar projects and funding decisions. The evaluation focuses on the initiative’s design, implementation, results thus far, missed opportunities, and potential for building upon the pilot.

The scope of the evaluation was set according to the following dimensions:

- Focus on MaterialWise as a whole, not restricted in any way by the fact that C&A Foundation provided approximately 1/3 of the pilot funding;
- Examine results achieved thus far with respect to the three “use cases” launched by MaterialWise during the pilot funding period; and
- Consider MaterialWise’s progress in the context of the fashion industry and, to the extent possible, other sectors where MaterialWise has pursued partnerships.

This report provides insights under the following chapters and evaluation criteria:

- Chapter 2: Methodology
- Chapter 3: Relevance
- Chapter 4: Effectiveness and Results
- Chapter 5: Efficiency
- Chapter 6: Sustainability
- Chapter 7: Conclusions and Recommendations

2 Methodology

This chapter summarises the evaluation methodology. It reiterates objectives of the evaluation’s Terms of Reference (ToR); highlights the scope and design; outlines tasks associated with data collection, analysis, and reporting; and elaborates limitations faced in carrying out this study. See [Appendix III](#) for the evaluation design.

2.1 Objectives

Informed by the ToR (see [Appendix XIV](#)) and discussions with MaterialWise as well as C&A Foundation staff, the evaluation’s objectives were to:

- 1) Review the **approach** and **design** implemented by MaterialWise in achieving and/or progressing towards scalable and viable outcomes;
- 2) Assess **factors** (in **design** and **implementation**) that have contributed to, or impeded the achievement of outputs and likelihood of outcomes;
- 3) Examine the **relevance, efficiency, effectiveness and results**, and **sustainability** of the initiative and its constituent components; and
- 4) Distil actionable, **strategic recommendations** and **lessons** for the future development of the MaterialWise initiative.

2.2 Design

Lines of inquiry in this evaluation were organised around five dimensions of the Organisation for Economic Co-operation and Development’s Development Assistance Committee (OECD-DAC) evaluation criteria, as follows:

- *Relevance* — MaterialWise’s ability to situate itself within, and adapt to, changing conditions and its environment;
- *Effectiveness* — mission fulfilment, including likely progress towards results and impact;
- *Efficiency* — ability to perform functions cost-effectively and productively with appropriate levels of inputs;
- *Accountability and learning* — monitoring and measuring results (positive & negative) and sharing results both internally and externally with others; and
- *Sustainability* — the likelihood that MaterialWise’s results will continue after C&A Foundation funding has been withdrawn.

The team developed an Evaluation Matrix ([Appendix IV](#)) to frame and operationalise the inquiry, anchored in these criteria and based on key questions set out in the ToR ([Appendix XIV](#)). This Matrix elaborated key questions and subsidiary questions, linked these with data sources (primary and secondary), and referred to indicators and methods seen to facilitate assessment.

In carrying out its task, the evaluation team drew on the following forms of inquiry: **theory based** – an examination of the causality that links activities and results, including a review of MaterialWise’s Theory of Change (TOC); **business model analysis** – a framework to understand MaterialWise’s offering as well as its

impacts for other eco-system actors; **3 sphere analysis** – a reflection with the team regarding dimensions of actionability of the chemical hazard profiles proposed to be managed and provided to the intended users; and **Institutional and Organisational Analysis** (IOA) – examining management dimensions of MaterialWise with its performance in delivering scalable and viable outcomes.

2.3 Data Collection

Data collection was undertaken through a document review and semi-structured interviews. Documents consisted of grant agreement files, financial and narrative reports, presentations to various stakeholders and landscape documents on safer chemistry. See [Appendix VI](#) for a list of resources consulted.

Semi-structured Interviews were conducted during July-September 2019 with 30 informants selected through a consensus-based consultation with MaterialWise and C&A Foundation staff ([Appendix V](#)). Informants have been categorised and consulted as follows:

- 4 C&A Foundation staff and other funders
- 5 MaterialWise Staff and Advisory Board
- 9 Co-Design and Pilot Partners, Potential User
- 2 Data Partners
- 10 Other Resource Persons

2.4 Analysis and Reporting

The team used the qualitative data management and analysis platform [Dedoose](#) to organise the collected data according to categories elaborated in the Evaluation Matrix. This facilitated triangulation of data sources by key question. With this analysis, the team prepared an in-situ workshop with MaterialWise staff to share and validate the preliminary findings, engage in a process of making sense of these external perspectives, and identify gaps where further input was required. The evaluation team advanced a set of findings, conclusions and recommendations in the form of a draft report. The current final report integrates all feedback from diverse sources.

2.5 Limitations

Four factors have been identified which constrained the team, to varying extents, in addressing aspects of the evaluation ToR, as described and discussed below.

Firstly, as a start-up, MaterialWise was experienced as a fast-moving initiative that adapted and changed even during the course of the evaluation itself. It is situated in a landscape where many “undercurrents” were at play, and where the need for MaterialWise to protect its position and strategy was perceived as high. MaterialWise is in the process of developing proof for a concept anticipated to disrupt the field. Therefore, a consensus-based approach was used with the MaterialWise leadership team and C&A Foundation’s Effective Philanthropy (EP) team to identify respondents who could inform the evaluation. This list was agreed amongst the parties. It was acknowledged that this approach resulted in a small group of informants, which also reflects the relatively small pool of people who had direct knowledge of the initiative, given its pilot stage.

Secondly, while informants felt confident in sharing their perspectives, they naturally did not have in-depth knowledge of MaterialWise’s actual operations and achievements. The evaluation team gathered their

impressions and hunches into a collection of perspectives; however, this had relatively limited prospects for extensive triangulation of the MaterialWise team’s self-reporting and self-perception on matters of effectiveness, results, efficiency and sustainability. On relevance, a larger pool of external perspectives was available from informants, which triangulated well with industry literature.

Thirdly, of the informants who were directly interviewed, only three of these were drawn from the apparel industry. The extent to which these views are fully representative of the global fashion industry regarding the question of the relevance of MaterialWise for this sector is indicative but not conclusive.

Fourthly, the evaluation was time-bounded, with data up to 30 September 2019 having been included. Given the pilot setting, and the fact that the evaluation took place in a moment before the MaterialWise offering was available in the marketplace, not all aspects could be triangulated (e.g. compensation model for assessors, etc.). When the evaluation was planned, it was envisaged that three “use cases” would be underway during the inquiry and that the evaluation team would plan for a progressive data collection to allow the fullest possibility for gathering meaningful data. Due to unanticipated delays in getting all the elements and agreements in place with the contributing actors, only the first pilot was fully undertaken during the evaluation timeframe, although the publication of its results were still pending at the time that this report was drafted. During the analysis phase, the two other pilots were put on hold in conjunction with the MaterialWise team’s consideration of options to assure the generation of alternative assessments by year-end. As there was not an opportunity during the time-bounded period of the evaluation for the alternative assessments generated out of the first pilot to be put at the avail of users, there was limited concrete, external evidence of proof of concept at the time of the evaluation. Furthermore, the pricing model could not be tested, which therefore limited the possibility of its assessment as part of this evaluation. The Evaluation Team has consequently offered a theorised view based on the MaterialWise team’s argumentation. In the absence of an operationalised system being solicited by users who were actually paying for the provided data and using it for the intended purposes, it was not possible to assess the extent to which the offering is likely to meet its claims.

3 Relevance

This chapter looks at the extent to which the objectives and strategies of MaterialWise are aligned with the overall vision and mission of C&A Foundation, and the ways in which it was envisaged that this initiative would support the foundation’s Circular Fashion programme and its underpinning TOC. Insights are offered regarding the relevance of the MaterialWise offering for the global fashion industry and other sectors.

3.1 Relevance to C&A Foundation Vision and Purpose

Finding 1: Aiming to facilitate informed decisions about chemicals and a shift towards safer products (using ‘greener’ chemistry) through the publication of disaggregated, standardised, 3rd-party verified information, MaterialWise is aligned with C&A Foundation’s vision and purpose to transform the fashion industry into a “force for good”. It is also aligned with the foundation’s commitment to transparency.

In 2014, C&A Foundation was launched as a corporate foundation of the apparel retailer C&A, positioning itself as working to transform the fashion industry into a “force for good”. The foundation’s overall ToC set its goal as achieving a fashion industry that enables people to thrive by “inspiring people, networks, and organisations to play their part in creating change”. With a vision and purpose that are clearly transformative in nature, through its grant-making activities, the foundation has sought to support initiatives that challenge the root causes of the fashion industry’s problems, contribute to C&A Foundation’s push for the whole industry to think much more systemically, and generate practical avenues for ‘how’ to bring about change.

In this light, MaterialWise is aligned with and supports C&A Foundation’s vision and purpose to transform the fashion industry. MaterialWise involved the creation of a database of verified chemical hazard profiles that could be used by brands, manufacturers, and their suppliers in the fashion industry, and beyond, to gain in-depth information about chemicals and ‘greener’ alternatives. It would begin with a set of profiles seen as having significant potential for switching and thus triggering awareness and movement towards green chemistry. The granularity of information in this database was planned to be higher than what was currently available, which would allow users to make informed choices about chemicals, enabling higher levels of use, reuse, and recycling compatible with a circular economy. Ellen MacArthur Foundation’s 2017 report asserted that the rapid elimination of chemicals from textile production is needed to “capture the full value of a closed-loop system” and “is required to enable healthy flows of materials in a circular system”.¹ The MaterialWise offer corresponds to the latter, which has been identified as key to shifting and accelerating industry towards safer products, which can also function as positive inputs for a circular economy. C&A Foundation has embraced a concept of circularity that goes beyond recycling contents, and refers to continuous reuse within a system. In this light, MaterialWise’s ambition to develop alternative assessments has contributed to the actualization of C&A Foundation’s vision of the fashion industry evolving towards offering a net positive benefit.

An apparel sector informant portrayed MaterialWise as “an asset that C&A Foundation could use to push and drive those changes throughout the industry”. Together with its promise to reduce the cost and complexity of chemical hazard assessment, the dimension of transparency that MaterialWise engendered

¹ Ellen MacArthur Foundation. (2017). *A New Textiles Economy: Redesigning Fashion’s Future*, p53-55

in helping companies make better choices resonated with a wider theme embraced by the foundation. C&A Foundation had identified transparency as a strategic lever/ approach, to increase accountability and to motivate action.² In aiming to publish disaggregated information in a standardised and comparable manner that included mechanisms to check the accuracy of the data (through 3rd party verification), with feedback loops to accommodate a challenge process, and presenting information in an accessible format, MaterialWise offered valuable elements that were well-aligned with the foundation’s transparency commitment. Furthermore, the co-design, user-centered approach adopted by MaterialWise reflects and is well-aligned with the spirit of partnership that C&A Foundation has endeavoured to bring out across its work with implementing partners (both grantees and non-grantees).

3.2 Relevance to C&A Foundation Circular Fashion Programme

Finding 2: MaterialWise is highly aligned with the Circular Fashion programme’s strategic objective to promote and enable implementation of ‘safe and circular’ thinking based on having access to actionable, open data sources that promote accountability and facilitate informed choices.

The C&A Foundation Circular Fashion programme’s TOC was anchored around promoting a rethinking of current, predominantly linear business models. It aimed to not only shift, but also accelerate and scale-up adoption throughout the fashion industry of ‘safe and circular’ thinking that “uses and reuses safe materials; restores and regenerates ecosystems and provides dignified work for people making products that are ‘made to be made again’”.³ Accordingly, the programme sought partners that had the potential to address systemic barriers to change and/or who could bring best practices to the fashion industry in the long term. Together with its focus on the textile industry as well as safe chemistry, which the Circular Fashion team indicated were fully aligned with the foundation’s interest, MaterialWise directly contributed to one of the Programme’s four key strategic objectives, which was to “build availability and access to data and methodologies enabling implementation of circular business models”, and matched a Key Performance Indicator (KPI) to assure “actionable, open access data sources”.

The enormous issues of pollution and biodiversity degradation related to the fashion industry were seen as needing direct attention by the Circular Fashion programme’s leadership team. In illuminating alternative chemistry, MaterialWise had a role to play in this respect. At the same time, it was viewed as “quite an entrepreneurial step for getting better chemistry into circulation” and consequently, was awarded with C&A Foundation funding to gauge its ability to become a trusted approach for making data available to actors along the value chain to enable informed choices. A MaterialWise staff member contended, “We’re very aligned with C&A Foundation’s Circular Fashion goals. We see safer chemistry as an essential first step in circular materials. You can’t have circular without safe. We are a fundamental building block of safe and circular.” In zeroing in on the notion that ‘safe’ has not yet been fully integrated into the discussion about ‘circular’, as highlighted by a number of key informants, this provides evidence of the wider need for intensified efforts and infrastructure to support this transition, which enhances the relevance of MaterialWise for C&A Foundation’s Circular Fashion programme.

² C&A’s commitment to transparency: C&A Foundation. (s.d.). *C&A Foundation’s commitment to transparency*. Available at: www.candafoundation.org/global/impact/ca-foundationtransparencycommitment.pdf

³ See the Circular Fashion programme’s webpage, which elaborates the Circular Fashion programme’s purpose. C&A Foundation. (2018). *Circular fashion*. Available at: <https://www.candafoundation.org/impact/circular-fashion>

3.3 Relevance to the Global Fashion Industry

Finding 3 Initially conceived as a mechanism to boost scalability of the Cradle to Cradle (C2C) certification, MaterialWise evolved into being seen as potentially filling a gap in identifying and generating assessments of chemicals, in a context where chemical management and optimisation was directly linked to sustainable development.

Within the global pursuit of sustainable development, chemical management and optimisation were linked to achieving the United Nation’s Sustainable Development Goals (12 and 17). United Nations Environment Programme (UNEP) indicated that most companies face barriers to access cost-effective, trusted data on chemical hazards and safer alternatives and called for bold action,

“...to fill global data and knowledge gaps, and enhance international collaboration to advance chemical hazard assessments, classifications and communication by... sharing existing hazard data and assessments... and developing a global database of assessed and classified chemicals for information sharing and promoting harmonization of classifications...”⁴

MaterialWise could be seen as a response to this call. It got its start as a C2CPII project to bolster quality assurance and lower the cost of assessments to boost scalability of its certification programme.⁵ MaterialWise entered an evolving landscape of tools to evaluate chemicals and alternatives, each with its own orientation, capabilities, and limitations (Appendix VII). MaterialWise could eliminate Chemical Hazard Assessment (CHA) duplication, widely seen as diverting scarce resources, and generate alternative assessments. The team looked to philanthropy to fund the initial population of a harmonised database, which was envisaged to be accessible to all industry sectors.

Years earlier, Zero Discharge of Hazardous Chemicals (ZDHC), initiated as a coalition of six brands, had begun aligning the apparel/ footwear/ leather industries around a common vision to eliminate hazardous chemicals from the supply chain. A CA& Foundation staff person conveyed a shared view that while ZDHC’s Manufacturing Restricted Substances List (MRSL) was focused on managing input chemistry, ZDHC was not working to identify alternatives to restricted chemicals. MaterialWise was perceived to be filling this gap. Following up on its 2016 consultation with 48 key stakeholders, the MaterialWise team developed an approach that met all of the elements that had been identified through these discussions, which included: direct access to deep data about the materials and chemicals in their products; a faster and less expensive way to conduct assessments; harmonisation across standards and the tools that support them in a format that could be sliced-and-diced for multiple certifications, labels, inquiries and needs; and positive material libraries. All of this was to be implemented in a way that inspired confidence in the resulting assessments as “consistent, credible, and verified”.⁶ MaterialWise gained momentum from late 2017 with funding from C&A Foundation, Target Foundation, and Google to seed the envisaged database through three pilots.

⁴ United Nations Environment Programme. (2019). *Global Chemicals Outlook II: From Legacies to Innovative Solutions*, Synthesis Report. Available at:

https://wedocs.unep.org/bitstream/handle/20.500.11822/27651/GCOII_synth.pdf?sequence=1&isAllowed=y, p.81

⁵ MaterialWise presentation to co-design partners, 6 May 2019

⁶ Outcome of needs analysis reported in C2CPII Material Health Database Phase One: Research + Strategy, September 2016

Finding 4 In view of recent developments related to brand-led scored chemistry, the interest of apparel brands in MaterialWise seems to have waned. MaterialWise’s value propositions linked to substantiation, granularity, underlying data, and database management appear less necessary to meet their current needs.

While MaterialWise set about identifying and engaging co-design partners to get its pilots off the ground, two transformative changes⁷ that were already underway in the apparel industry took stronger hold:

- Increasing use of MRSLs in place of restricted substance lists (RSLs), which shifted decisions about chemicals to the input stage, replacing the focus of chemicals restricted on finished products; and
- More chemical disclosure of textile formulations was occurring at the request of brands who wanted more information about the hazards associated with chemical formulations to assist them in making informed decisions.

These two movements affected key parts of MaterialWise’s value proposition, arguably putting its overall offering into question, at least for the apparel sector. This was triangulated with views from apparel sector informants who expressed uncertainty about the niche of MaterialWise in view of these developments. Statement included: “not sure how MaterialWise fits in”; “can’t say what is the place for MaterialWise”; “there is potential for stakeholders to get on board; will it happen? I don’t know”. Apparel sector information also pointed to the “good work that ZDHC has done in bringing together brands and chemical suppliers in MRSL compliant chemistry” and “the track record that they have in being able to work together for more sustainable chemistry”.

Another key factor also came into play in that brand-led scored chemistry (favouring the use of safer chemistry versus compliance) had particularly accelerated over the past two years and been credited with both advancing chemical management systems and helping apparel companies achieve their chemical management goals. To avert growing fragmentation driven by individual brands moving more strongly in this direction, in 2018, Levi’s and Nike proactively shared their respective efforts with ZDHC, which took up the initiative to develop an aligned protocol, known as the Chemical Formulation Hazard Scoring Tool. In taking this forward, together with its other tools, ZDHC is widely seen as the best-placed group to engage apparel brands in collective action to transform “the textile industry in a proactive and systemic way”.⁸ An informant reduced it to the simplest level, “the textile industry does not really see the value [of MaterialWise]”. The evidence gathered through this evaluation from apparel sector informants, which must be acknowledged as limited and indicative, more than conclusive, suggests that, at present, a high-level view of hazard, as would be offered by ZDHC, was generally seen as sufficient to make informed decisions, and that slightly different interpretations and inconsistencies in CHA data were not perceived to matter a great deal for the bulk of the apparel industry.

Finding 5 While not appearing to be in the forefront of apparel company concerns, the MaterialWise team’s capacity to, and interest in generating alternative assessments that build positive material libraries represents an area of potential, as yet untapped, relevance.

The alignment around scored chemistry was expected to rapidly transform the supply chain. However, this still depended on engagement from the entire ecosystem (chemical suppliers, formulators, brands,

⁷ Cattermole Consulting. (2018). *Landscape Analysis of Scored Chemistry Framework*.

⁸ Zero Discharge of Hazardous Chemicals. (2019). *Zero Discharge of Hazardous Chemicals (ZDHC): How collective action is transforming the textile industry in a proactive and systemic way*. Available at: www.saicm.org/Portals/12/Documents/meetings/OEWG3/inf/OEWG3-INF-34-ZDHC-.pdf

manufacturers, assessors, and the NGO community). As far as the aligned protocol for scored chemistry was concerned, an involved informant admitted, “one of the difficulties is that the group working on scored chemistry is not sure where we are going and how that fits into ZDHC”. Input across stakeholders pointed to the safety assessment of chemicals being part science, part art with the resulting situation that two well-trained toxicologists could disagree on whether they think that a substance is safe or not, based on having the same data. Discerning ‘almost safe’ and ‘almost hazardous’ was still problematic, as an expert explained:

“Scored chemistry outputs need to provide a level of meaningful differentiation between chemical hazards, especially when the results are not clearly safe or clearly hazardous... there [is] a need for a finer scale to aid in decision-making; e.g. if using a scale of red, yellow, and green – does yellow indicate that it is almost safe or almost hazardous?”

An apparel sector informant noted that the paucity of alternative assessments was still a gap and that industry was still a long way from having safer options for all priority chemicals. Generating alternative assessments is an aspect of MaterialWise’s value proposition that appears relevant; however, only one of three apparel sector informants mentioned this aspect and suggested a need to cooperate to find best alternatives. A personal care sector informant drew attention to an aspect that has a bearing on the apparel sector, mentioning a hierarchy of concerns: “what is in me, on me, and around me”. This stakeholder indicated that, at present, people are most concerned about what they put in their bodies but the next big wave relates to “what is on me”. This is where the fashion industry will be significantly implicated.

3.4 Relevance to Other Industry Sectors

Finding 6 In addition to apparel, MaterialWise may be of increasing relevance to other industry sectors (e.g. electronics, retail, personal care) that have already, or are planning to adopt restrictions in the pursuit of safer chemistry and are seeking positive alternatives.

Through its 2016 Research & Design Phase, MaterialWise had engaged with numerous stakeholders spanning apparel, electronics, chemical suppliers, retailers, assessors, and technology providers to identify their biggest pain points.⁹ The team further developed these high-level contacts into co-design partners on its three pilots. An involved stakeholder envisaged a highly credible role that MaterialWise could play as an independent presenter showcasing work being done in the apparel industry as a model for what could be done in other sectors vis-à-vis sustainability and circular economy.

These co-design partners and other actors mentioned that they had witnessed some steps in the direction of industry-wide structures being formed with a specific aim of pursuing safer chemistry. For instance, in the electronics sector, the Clean Electronics Production Network (CEPN) was established in 2016 with a goal of moving toward zero exposure of workers to toxic chemicals in electronics manufacturing processes.¹⁰ A CEPN member had engaged in discussions with MaterialWise in 2018 around the idea of using it as a preferred purchasing platform that would “enable the sector to enlarge its pre-competitive space”; this was described as an avenue for the sector to accelerate towards greener chemistry in a more meaningful manner.

In the retail sector, key actors had prioritised green chemistry since 2013. For instance, Walmart published its sustainable chemistry policy and committed to reducing, restricting, and eliminating ten chemical

⁹ C2CPII Material Health Database Phase One: Research + Strategy, The Headlines, September 2016

¹⁰ Green America Center for Sustainability Solutions. (s.d.). *Clean Electronics for Safer Manufacturing*. Available at: <http://www.centerforsustainabilitysolutions.org/clean-electronics>

ingredients. Target unveiled its Sustainable Product Standards. Procter & Gamble promptly responded with its own initiative around restricting key chemicals. Together, these triggered sector-wide efforts to evaluate chemical profiles, and resulted in lists of chemicals to avoid that has grown in momentum to this day. In this light, MaterialWise can offer highly relevant support. A retail sector informant explained, “We’re doing restricted substance lists. We only put a chemical on this list if we believe there are safer alternatives. MaterialWise will be a good tool in future for our designers to help know what are the safest chemicals.”

In the personal care sector, California was seen as leading the way with its 2017 Cleaning Product Right to Know Act that requires cleaning products and fragrances to disclose ingredients on their labels and online, particularly chemicals of concern. An informant mentioned that the Personal Care Council could be a candidate for driving forward industry-wide effort vis-à-vis safer chemistry, along the lines of what ZDHC is currently stewarding in the apparel sector. While such movement appears to have stalled at present, in the face of growing consumer demand to “know more about what we being exposed to, bringing into our homes, or putting into or on our bodies”¹¹ and corresponding transparency legislation, the relevance of MaterialWise could grow. It appears well-situated to address these concerns by providing granular, disaggregated information about chemicals, which is 3rd party verified. This sectoral stakeholder observed, “We live in a context where tools like MaterialWise will be more necessary and valuable in the future”, referring to its use as a resource to move beyond RSLs and toward safer chemistry.

¹¹ Kar, A. (2017). *New CA Law Requires Cleaning Products Disclose Ingredients*, Expert Blog. Available at: www.nrdc.org/experts/avinash-kar/transparency-fundamental-protection-against-toxic-chemicals

4 Effectiveness and Results

This chapter looks at how well MaterialWise has done in terms of achieving its intended objectives to date, and gauges the approach and design used in doing so. The results of the pilots that were undertaken to develop aspects of its offering have been examined. Internal and external factors of effectiveness have also been identified and reviewed, together with the engagement and satisfaction of potential user groups.

4.1 Achievement of Outputs and Objectives

Finding 7 MaterialWise has successfully developed the underpinning elements of its new model for a harmonised input approach for generating CHA profiles. However, aspects related to actual users of its infrastructure and the accompanying pricing model have yet to be market-validated.

According to the TOC reconstructed for MaterialWise ([Appendix VIII](#)), its long-term impact relates to enabling products that are safe for people and the planet, and compatible with the notion of circular economy, which is still evolving. The main objective of the C&A Foundation-funded period pertains to the development of a new model for accessing material health information, constituted by a set of outputs that have been understood to form a roadmap for elaborating MaterialWise’s key offering (Figure 4.1).

Figure 4.1: Roadmap for Delivering MaterialWise’s Global Harmonised Positive Chemistry Repository



Source: MaterialWise Scalability Plan 2020-2022

To date, according to the MaterialWise team’s monitoring and reporting documentation, four of the five envisaged outputs have been completed. The remaining aspect related to the pricing model has not been confirmed and its viability has not been tested in the marketplace with actual users, as indicated in [Table 4.1](#).

Table 4.1: Achievement of Outputs Underpinning the MaterialWise Offering, September 2019

OUTPUT	STATUS
Cloud-based platform	A first version prototype that allows for assessor input and visual output for users was available, which facilitates live demonstration. Improved functionality was underway.
Harmonised input methodology with multiple outputs	A “universal output” based on the Globally Harmonised System of Classification and Labeling (GHS) that enables harmonised input and portable data (multiple outputs, with roll-up scores for chemical formulations) has been developed and works in a test environment. A template has been created for use by data suppliers (assessors). It was reported by the MaterialWise team that aspects related to actionability of the data exceeded the original design and that more decision-making tools (e.g. colour-coding) will be conceived as the platform moves into an operational model.
Verification and peer review process	A 3 rd -party verification process was established and had been tested. A process to facilitate external challenges had been designed and documented.
Engagement of data suppliers	Assessors and verifiers have been identified, recruited, and engaged through agreed fees, contracts, and licensing arrangements. Guidance for assessors and verifiers has been developed, documented, and supported their induction process. Cost-sharing licensing agreement was in the process of being tested with two assessors.
Pricing model	A pricing arrangement for assessors, users, and MaterialWise had been decided. Two assessors were under contract based on this model with respect to the first pilot which was underway. A subscription model for making the results of this pilot available to end users had been discussed but had not yet been tested in the marketplace with actual users.

Source: Compiled for this evaluation on the basis of MaterialWise’s monitoring reports, quarterly perspectives to stakeholders

Views solicited from a range of stakeholders provided context for the magnitude of this endeavour, overall and with respect to the pricing model in particular. This step remains vitally important. An informant familiar with the pricing model discussion was able to contextualise the challenge of engaging data suppliers, reiterating the need for all parties to experience benefits:

“MaterialWise is about changing behaviour. It has done things a different way. The team has to convince assessors that they won’t lose their knowledge and they’ll get paid. They’ve found a win-win-win where we believe the assessors’ data will be seen by more people.”

4.2 Approach and Design to Achieve Intended Objectives

Finding 8 MaterialWise’s user-centred design approach fed the initiative with much needed input from the market. The co-design group was managed in an adaptive manner and has functioned effectively, although its efficiency could not be assessed based on available information.

In its proposal to C&A Foundation, MaterialWise stated that “we want to make high-quality, actionable data more accessible for brands, manufacturers and their suppliers”. The benefit of this endeavour was characterised as “empower[ing] positive, data-driven decisions earlier in the design process and accelerat[ing] the development of products that are trusted to be healthier and safer”. This hinged on developing “a new model for accessing material health information”, which was anticipated to be the central output of this initiative. Accordingly, C&A Foundation’s €400K grant was to be used to “address the

business requirements for success,” which included mobilising manufacturers from across industry sectors to drive change in the current processes and business models surrounding data assessment. Practically speaking, this is referred to in the grant proposal as recruiting a pilot group in 2017, engaging in pilots in 2018 (delayed to 2019), and preparing to scale in 2019 (delayed to 2020). The manufacturers that figured amongst co-design partners included: H&M, Levi’s, Gap, Nike, Method, Steelcase, Target, and Google.¹²

In implementing its envisaged user-centred design, MaterialWise recruited a spectrum of co-design partners from 36 potential users on the basis of their interest in leveraging its value proposition. In addition to civil society and philanthropy actors, these partners represent various sectors: apparel (brands), electronics, retail, cleaning, and furniture. Co-design partners were engaged in an initial Research & Design phase and regularly since, through design workshops and as advisors on specific matters. Professionally facilitated and relying on clear, precise, operational questions, these workshops were used as a way for the co-design partners to collectively reflect, innovate and inform MaterialWise’s direction. The initiative also reached out to partners individually, based on their profile and skillset, in a timely manner to address different opportunities and roadblocks. As a MaterialWise staff member said, “We call on co-design partners for different reasons. Each assessor is doing things that we can learn from.” The co-design partners consulted for this evaluation expressed satisfaction about the process, stating that their time and expertise had been valued and used in an optimal manner.

The user-centred design has led to positive results: first and foremost, it has provided MaterialWise with insider input, orienting the initiative towards actual market needs, for instance in terms of alternative chemicals. As co-design partners represented various sectors, the needs and their perception of MaterialWise’s added value differed: this variety has been deemed conducive to both knowledge sharing and systems thinking. Co-design partners were also asked to contribute to iterative technology development, providing feedback on low-fidelity prototypes. These key contributions stemming from user-centred design increased both the initiative’s effectiveness and efficiency. Another benefit of the approach pointed out by external stakeholders has been to enhance MaterialWise’s credibility in the eyes of the green chemistry community, as stakeholders associated the initiative with high-level partners linked with systems change. Finally, the user-centred design also affected the co-design partners themselves: it gathered a group of innovators and generated excitement around the initiative, thus convening a “coalition of the willing”, as described in MaterialWise’s Scalability Plan. Almost all co-design partners reported that they deepened their understanding, and half expressed having developed a sense of ownership over the novel idea implicit in MaterialWise.

Although co-design partners were overall highly satisfied with their experience, involving high-level professionals who are volunteering time out of interest lends a certain fragility to such an endeavour. The MaterialWise team has been careful not to overstep the relationship; however, a few co-design partners reported a lack of clarity regarding expectations. Three co-design partners wondered if they were expected to be advocates, and two stated that they would not be able to “support, endorse, promote” the initiative without having full clarity on the business model.

“

We were co-designing on what it could look like, what sorts of information was needed. It was incredibly positive. I learned a ton. I felt the group help shape a lot of what would be going forward...I was able to provide good conversation. My feedback was well-received. I came back geeked about the concept.

- Co-Design Partner

”

¹² MaterialWise presentation to CSW and NCAC-SOT Joint Symposium, 30 April 2019

Finally, assessing the user-centered design entails comparing the savings of the approach, as discussed above, with the expenses that it entailed. From 2016 to October 2019, MaterialWise spent approximately US\$318K on its user-centered design.¹³ Putting this amount in context, this represented 19.3% of the funds that MaterialWise received during the same period. Given the key advantages of the user-centered design (having market insights and a core base of supporters) in setting the stage for MaterialWise to scale, the investment in user-centered design is deemed good value for money (see [Chapter 5 on Efficiency](#)).

4.3 Results of the Pilots

Finding 9 **The three pilots fell short of their envisaged results for a variety of reasons. However, they provided a vital opportunity to test the processes and infrastructure underpinning the MaterialWise offering and offered fertile ground for reflection about the sources of key challenges.**

Aligned with its planning, albeit with a delayed launch, three pilots were conceived to test and refine the five outputs (found in [Table 4.1](#)) underpinning the MaterialWise offer. As of late September 2019, the pilots had not delivered the anticipated results (see [Table 4.2](#)). Apart from the delayed launch, the first pilot appears to have run relatively smoothly, bearing in mind that the alternative assessments generated from the results had not yet been published at the time of the evaluation. In view of the attrition of participating chemical suppliers, the second pilot was disappointing in that a lower portfolio volume than planned could be generated; these were not yet available at the time of the evaluation. It was premature to judge the potential of the third pilot during the evaluation period, as it was ongoing and results were not yet available at the time of the evaluation. What was evident from discussions with the MaterialWise team was that they had drawn important lessons from the development and piloting experience, pinpointed the sources of key challenges, and were regularly adapting to the changing conditions and environment.

According to MaterialWise, the pilots were “meant to allow time to create the fundamental building blocks not necessarily to prove them”. Summing up the achievements of these pilots, a universal methodology had been developed and tested; four assessors had been recruited and supported by an input application launched, tested, and refined during the pilot period; two independent toxicologists had been recruited and engaged in verification using the guidance that had been developed. Internally, one of the key lessons learned was that “there’s more research involved” than was realised at the outset. The intended result of enabling harmonisation of the different assessment tools currently in use was heralded as a great achievement. A stakeholder, who was aware of the resistance of incumbents that would need to be overcome to facilitate this, remarked, “It would be great for the marketplace to have a harmonised tool. I don’t know if it is likely. People like their own brand”.

¹³ According to MaterialWise, expenses per year have been the following: 2016: \$107K; 2017: \$67K; 2018: 119K; 2019: \$25L (as of October) as well as part of the Technical Director’s salary – to be determined. Also, note that C&A Foundation reports in Euro whereas MaterialWise reports in US dollars, hence the variation in currencies.

Table 4.2 Status of MaterialWise Pilots, September 2019

PILOT	STATUS
Pilot 1: Alternatives to Ortho- Phthalates (Phthalates) Plasticisers	<p>By July 2019, 10 alternative assessments had been generated, which had been fully verified by an independent toxicologist. As of the submission of the Evaluation Report, they had not yet been published, at the decision of the MaterialWise team.</p> <ul style="list-style-type: none"> ■ Incomplete
Pilot 2: PFAS-free and ZDHC MRSL compliant Durable Water Repellents (DWR)	<p>Of 20+ chemical suppliers approached at the recommendation of co-design partners to facilitate testing of MaterialWise’s processes and its platform’s ability to intake formulation information, protect intellectual property (IP), and display formulation results in multiple formats, four chemical suppliers had agreed to participate with eight products; four assessors agreed to participate. This set the stage to deliver a much lower portfolio volume than the original aim of 30-40 CHAs and was judged viable to continue.</p> <p>In September 2019, two participating chemical suppliers dropped out, reportedly drawn towards alternative engagement in the ZDHC Chemical Supplier Leader Programme. The MaterialWise team was now weighing up the benefits of continuing with this pilot in view of the significantly reduced portfolio volume that would ultimately be generated, due to the corresponding undermining in relation to the affordability criteria of the eventual CHAs.</p> <ul style="list-style-type: none"> ■ Incomplete
Pilot 3: Alternatives to the use of Dimethyl Formamide (DMF) in the manufacture of synthetic leather	<p>Building on the work of ZDHC’s DMF-alternatives working group, this pilot secured the agreement of five (of six) ZDHC-recruited suppliers, including three based in China and two multinationals, to identify and evaluate DMF alternatives. To date. The team had developed formal guidance for polymeric materials and substances, although this was still subject to review. An RFP issued to assessors in early June 2019 resulted in a July 2019 award of the work, followed by an August 2019 kick-off with the involved suppliers.</p> <p>As of late September 2019, no disclosures had been reported and the pilot was ongoing but reportedly slow. An informed stakeholder observed that the pilot was good, as was the involvement of the assessor, but felt that “apart from project management, there was no specific add-on or added value that MaterialWise put on the table”.</p> <ul style="list-style-type: none"> ■ Incomplete

Source: Compiled on the basis of MaterialWise’s monitoring reports, quarterly perspectives to stakeholders

In a period of six months, one of the pilots had fully run from its inception to near-conclusion; the publication of its portfolio was pending. The results of the two remaining pilots fell short of what had been anticipated in terms of engaging the key partners and generating the targeted volume of alternative assessments, and were themselves incomplete. The MaterialWise team attributed this to several factors: extended time and effort to recruit suppliers (almost two months); difficulty in engaging suppliers after kick-off (over two months); limited volume of alternative assessments generated for the envisaged portfolios, which fell short of supporting the value proposition in terms of affordability; and the challenges associated with achieving roll-up scores for GHS and C2C to ensure actionability of the CHAs.

These challenges were ultimately overcome but had utilised more resources than anticipated. While MaterialWise had secured partners and funding and built infrastructure, the lack of published results meant that there had not been an opportunity to test the ability to realise its business model and generate revenue. Although no progress on the side of users and market validation had been achieved, a user application that displays alternative portfolios and hazard tables for multiple methodologies (GHS, C2C) had been developed in anticipation of moving into an operational mode, pending finalisation of MaterialWise’s exit from C2CPII.

External actors interviewed as part of this evaluation were not surprised by the degree of challenges encountered, as illustrated by this feedback:

“Getting stakeholders to participate is a challenge when it is not only about chemicals but also formulations. The owners of those formulations are important stakeholders to get on board. The manufacturers need to get a better understanding of what goes into the ‘sausage’ that the assessors currently own. What do the users of the data need beyond the high level roll up that they currently get? What information can be actionable for them? They are not necessarily clear on that. Sufficient value needs to be offered to the assessors to make their lives easier, showing from a financial perspective how they can not lose out. They are very protective.”

Towards the end of this evaluation process, the MaterialWise team appeared to have reached an inflection point. They were weighing up the benefits of persisting with the DMF and DWR pilots or changing direction. Having gained confidence about the “benefit-to-cost”, “simplicity”, and “compatibility” aspects of the MaterialWise offer through the first pilot (phthalate), which was near completion, there was a recognition during discussions in the Validation/ Sense-making Workshop convened with the team (18 September 2019 in Durham, USA) that an enhanced focus on ‘trialability’ and ‘observability’ could deliver the pivotal evidence to secure the vital elements to ensure the initial adoption of its innovation.¹⁴

In this light, at the time of writing, the MaterialWise team was considering deploying the \$140K in remaining resources reserved for data and verification on single chemical alternative portfolios, which would not require supplier buy-in and could generate two-to-four additional portfolios to seed the envisaged database by the end of 2019. Together with this change in direction, the team was intent on strengthening discussions with sector leaders in electronics and personal care to “identify and activate pull-through levers that will make the product portfolios successful”, thereby dramatically accelerating the needed proof-of-concept which the pilots had been unable to fully deliver at this stage.

In terms of lessons learned from the pilots, the team highlighted its realisation that alternative portfolios for a product (versus a single chemical) were highly time-consuming due to recruitment and disclosure processes. Furthermore, the team realised that its pitch to chemical suppliers on lowering the cost of assessment was significantly less valuable to them than the prospect of (secured) user-demand for chemical hazard disclosure.

The evidence gathered thus far suggests that MaterialWise’s claims (harmonised input methodology, actionable CHAs available at a lower price, 3rd party verification) were of value but had not yet been delivered through the pilots. A philanthropy informant confirmed, “Those three aspects are what we want to achieve; this is the promise of MaterialWise... still waiting to see it materialise”. The evaluation team considers this as important confirmation of the perceived value of the MaterialWise offer. It is evidence that the MaterialWise team learned important lessons, and that its shifts in direction were informed by, and in reaction to insights gained along the way.

¹⁴ Professor Everett Rogers, ‘the father of innovation’, popularised these notions through his 1962 seminal work, *Diffusion of Innovations*. IMD’s Professor of Innovation Bill Fischer (2011) adapted these five aspects identified by Rogers into a framework to analyse and predict innovation success in *The Idea Hunter: How to Find the Best Ideas and Make them Happen*

4.4 Unintended Results

Finding 10 Designed from the outset to disrupt the incumbent system, MaterialWise’s presence on the landscape has had intended as well as unintended results. MaterialWise’s pursuit of granularity has not been welcome by all landscape actors. Nevertheless, MaterialWise has contributed to more collaboration between assessors, which is conducive for arriving at a unified CHA profile.

MaterialWise has had a few unintended results right from the start. This stems from the fact that its offering was designed to be disruptive, thus having the potential to upset incumbent players’ ways of working and their associated business models. Initially, MaterialWise was “meant to be a shared hazard assessment repository where assessors would remain the owners, thereby eliminating duplication of CHAs”. In bringing together actors from across industry sectors during the Research & Design phase, it was reported that “the alternative assessment piece was illuminated”. This insight that “there was a bigger problem at industry level that could be tackled” led to the unexpected result of MaterialWise redefining its offering.

Flowing from that, an informant indicated that MaterialWise’s existence has generated multiple and diverse conversations in the field that appeared to agitate some actors. In one case, MaterialWise was portrayed as a “threat”, perceived as enabling brands to pursue their own individual initiatives related to scored chemistry. As explained by one informant, “as long as brands do this as an isolated approach, MaterialWise is not supporting convergence”. The MaterialWise team is clearly aware that transformation towards green chemistry would not happen effectively if pursued brand-by-brand. The evaluation team gleaned that MaterialWise was therefore intent on enabling industry initiatives already in play, fostering informed choices towards safer chemistry, and believed that its value for the apparel sector would be most effectively realised through its embedding within the ZDHC framework. According to the MaterialWise team, “as we look at each sector, we look at who are the players and how can we support them. I’ve been talking about MaterialWise as a support initiative, because people get nervous; they don’t know how MaterialWise fits”.

Another unintended effect relates to MaterialWise’s push for more granularity and ramping up deep data CHA. While chemical suppliers were not an intended beneficiary of the MaterialWise offer, the initiative appears to have created pressure on chemical suppliers. A stakeholder close to the sector reported that the nature of chemical assessment being proposed by MaterialWise was perceived by the chemical industry “as an extra cost, with no benefit”. Nevertheless, an interviewee reported that chemical suppliers were already striving to meet registration requirements for the REACH database, which was designed to help consumers make informed choices for safer products and orient substitution of substances of concern.

A further landscape effect that has emerged seems conducive to advancing alignment on scored chemistry. An informed stakeholder reported,

“I see that ToxServices and SciVera, who are usually not getting along, seem to be agreeing... we’ve already had such a horribly long struggle to push for these methods to be used; I don’t think that we have the energy to also fight the assessors”.

Given that MaterialWise set out to disrupt the landscape, this could be seen as a positive development. The extent to which this effect could be attributed to MaterialWise’s presence and/or the parallel push for scored chemistry that had emerged from the apparel sector itself could not be gauged conclusively. This stakeholder urged all actors to focus on the bigger picture: “The most important thing is that we [apparel brands] can find a good method that we can scale to make sure that the chemicals used in our industry are safe from a circular perspective”.

4.5 Internal Factors on Effectiveness

Finding 11 Factors seen as positively influencing MaterialWise’s effectiveness include its embedding within the Healthy Building Network and the potential for synergies linked to compatibility of goals and a shared ethos regarding partnership and system change. Other influential internal factors were found in the competence, conduct and reputation of the core team.

Having a home within HBN, together with its role as fiscal sponsor, was described by stakeholders as “a good idea”, a “positive connection”, “an influencer” that “checks the transparency box”. The synergy between these two entities has been identified as a positive element supporting MaterialWise’s effectiveness, based on collaboratively working to address their shared question of “how to grow and get information out there”. Both parties appeared to share the same ethos of “doing it through partnership, expansion, and changing some of the work that we’re doing, now that the ecosystem is growing”. HBN stakeholders indicated their interest in working with partners like MaterialWise, which they described as “doing some of the most important work to get us some green chemistry answers”.

Another major asset that has positively influenced MaterialWise’s effectiveness lays in the competence, strength and reputation of the team. Informants vigorously verified that the sum is larger than its individual parts, mentioning “I believe in their capabilities”; “They have a strong technical grasp”; “They’ve got the horsepower and the right approach”. There was also feedback that contract resources had been used as a successful complement to the core team. MaterialWise’s overall presentation stood it in good stead for achieving its intended objective. An NGO informant remarked: “As an entity and as a package, it brings a level of sophistication and business knowledge that is unparalleled in the non-profit world”. MaterialWise’s agility and its demonstrated ability to pivot were also identified as positive factors on its effectiveness.

Finding 12 Some internal aspects were drawbacks on the effectiveness of MaterialWise, which included unresolved organisational arrangements, and pivots that had led to confusion.

Hindering factors were also identified, with one key aspect related to the uncompleted separation of MaterialWise from C2CPII. This aspect was identified by stakeholders as slowing down the initial development of MaterialWise by upwards of a year, ramping down its activities in May 2018, and affecting the initiative’s potential to raise further philanthropic funding. While MaterialWise was able to ramp up again in October 2018, under the HBN umbrella, delays on launching the pilots and publishing their results impeded the team in delivering key aspects for its proof of concept, particularly around gauging demand from users, assuring technical functionality in a real-time environment, and testing out its pricing model.

Another complicating dimension is that while the overarching goal of building a globally-harmonised repository of CHAs with a single 3rd-part verified CHA per chemical and generating alternative assessment portfolios based on CHAs had remained the same, the means to fill out the database had evolved over time. In adapting to changes in the environment and insights gained through the pilots, notions shifted from purchasing CHAs in bulk from assessors, to doing pilots, to hiring assessors to populate the database. While demonstrating adaptive management and recognising that the ability to pivot is a highly prized dimension for an entrepreneur in start-up mode, the shifting of implementation mechanisms has led to a certain level of confusion. Lack of clarity on the value proposition and pricing model was reported by many stakeholders.

4.6 External Factors on Effectiveness

Finding 13 MaterialWise has taken advantage of multiple opportunities to build awareness around its activities. Still, a relatively small number of actors have so far been exposed to MaterialWise. The MaterialWise team has not yet built solid relationships with the assessors, the chemical suppliers, and the green chemistry community. This has led to confusion amongst such stakeholders and reluctance to collaborate.

MaterialWise has taken advantage of multiple opportunities to build awareness around its activities: in addition to the user-centered design approach, staff members have notably participated in and presented at events, led webinars, and held discussions with varied stakeholders (assessors, manufacturers, networks, etc.). While it remains a work in progress, these relationship-building efforts have borne fruit with certain types of stakeholders, who now have a better understanding of MaterialWise’s offer and support it. These stakeholders are the co-design partners, the Advisory Board, and philanthropic funders. In interviews, they concurred that MaterialWise is constituted of dedicated professionals with complementary skillsets, who are very collaborative and continually seek feedback.

Still, this represents a fairly tight inner circle of actors involved in the piloting stage. About this inner circle, an informant remarked, “They understand but that is different than advocating and promoting it. People are still on the fence about whether it is good or not. It is not there yet; it’s still in a hypothetical mode.” While the pilot may have been about proof of concept and not related to scaling the innovation in the eyes of the MaterialWise team, according to the input of stakeholders, they did not necessarily make this distinction nor were they fully aligned in their perceptions about the offer. The downside of piloting with a small group of actors appears to be a relatively small basis for advocacy, which is a key force for the diffusion of innovation.¹⁵ The MaterialWise team reported that more companies had been briefed on the project and that there was a core of active advisors/ observers/ friends who could presumably act as ambassadors and promoters; however, such potential could not be triangulated given the small pool of informants.

At the same time, stakeholders pointed to three categories of actors for whom MaterialWise should reflect on its engagement strategy: the assessors, the chemical suppliers, and the green chemistry community.

Regarding the first, MaterialWise has engaged with assessors at some key moments (design phase, briefing based on business case, regular updates for interested assessors, etc.). This is consistent with the initiative’s identification of assessors as crucial stakeholders for its success and stated objective to “change their behaviour”. Out of the eleven informants who addressed the initiative’s way of engaging with assessors, two expressed the opinion that MaterialWise had done everything it could to involve assessors and one said that the “tide [was] starting to turn” with assessors, meaning that the relationship between the initiative and the assessors was taking a new and positive turn.

“
It should be providing opportunities
for others, leveraging the community
much better. MaterialWise will need
to socialise and make people
comfortable and show that the value
is there.

- External Stakeholder

¹⁵ Rogers, E. (2003). *Diffusion of Innovations*, 5th edition. New York: Free Press

However, eight of the eleven interviewees explained that while the collaboration of a renowned assessor company with MaterialWise was a positive sign, the initiative’s capacity to get the assessors’ buy-in remained to be proven. Indeed, and almost all respondents stressed this point, assessors are reluctant to embrace a new system where they believe their income could be compromised. At the time of writing, in addition to the renowned assessor mentioned above, three further assessors had been recruited. Nonetheless, it is still too early to tell if the assessors will return to the initiative for further work, especially at a larger scale. MaterialWise is confident that an upcoming “large business opportunity” will rally the assessors beyond the early adopters. Until this opportunity arises, there is a need for MaterialWise to reflect on its engagement strategy with assessors in order to ensure that it can best tap into said opportunity.

Regarding the second category, MaterialWise has struggled with the engagement of chemical suppliers, which was a key aspect for the pilots. Despite multiple contacts and pitches, these stakeholders have not shown, and acted upon, the expected interest in the initiative. According to MaterialWise staff members, the initiative had previously reflected on a value proposition for chemical suppliers and hoped that they would get sufficiently interested to “input their materials [CHAs] into the database”. Yet, recruiting and retaining suppliers was an important obstacle faced during the first and second pilots, despite continued efforts to encourage their participation.¹⁶ A factor explaining this difficulty rests in the fact that MaterialWise had originally posited that the main barrier for chemical suppliers to adhere to safer chemistry was the cost of the assessments, as the Pilot Project Update (September 2019) states. Indeed, a co-design partner mentioned that “the pressure among chemical manufacturers to reduce costs for assessments and not have inefficiencies is very strong”.

However, as described in the same Pilot Project Update, the pilot process revealed that the main factor affecting the chemical suppliers’ interest in MaterialWise was their customers’ (the brands) requirement that they justify their choices of chemicals, rather than the opportunity to lower their costs. In addition, the Pilot Project Update reports that the chemical suppliers’ participation in the pilots was probably affected by “the emergence of the ZDHC Chemical Leaders Program and scored chemistry initiative [which have] created distraction in the system since the pilot project inception”. Because of the challenges in recruiting and retaining chemical suppliers for the pilots, at the time of writing, MaterialWise was considering modifying the piloting process in order to run “pilots that don’t depend on getting disclosure from chemical suppliers”. As the 2017 Project Proposal states, “This initiative will only succeed if it makes business sense for the brands, manufacturers, and suppliers that use it.” It appears that MaterialWise does not yet sufficiently “make business sense” for the chemical suppliers, and consequently is in need of a renewed positioning in a market with emerging opportunities and challenges.

Regarding the third category, MaterialWise has focused on developing relationships with key organisations within the small green chemistry community¹⁷, yet there are networks, civil society organisations (CSOs) and academic actors with whom the initiative has not yet deeply engaged. Representatives of these external stakeholders reported not having fully understood MaterialWise’s value add. While certain ecosystem actors fully support the initiative, there have been reports of confusion and perceived competition amongst other actors. While MaterialWise has made efforts to engage with the green chemistry community, in line with its strategic prioritisation of stakeholders, internal and external informants agree that clarifying and socialising the initiative’s value proposition and value add will help MaterialWise find its place on the

¹⁶ The process to identify and recruit chemical suppliers for the first pilot lasted eight weeks and resulted in the commitment of four chemical suppliers. Retention then proved challenging, as two chemical suppliers abandoned the process, leaving only two.

¹⁷ For instance, MaterialWise offers 1:1 updates each quarter and attempts to identify synergies, signed an MoU with ZDHC, developed a partnership with Healthy Building Network, obtained a speaking engagement at the Innovators Roundtable and pilot with GC3, etc.

landscape, defuse potentially detrimental perceptions, and join forces with existing actors and initiatives towards their common goal of minimising chemical toxicity.

Finally, opportunities for MaterialWise to build connections with European and Asian stakeholders and systems have, thus far, been tapped to a limited extent. To date, the initiative has been highly focused on actors based in the United States. As mentioned above, the green chemistry community in this country is known for being small. The limited extent of reach beyond the North American continent is seen as limiting the initiative’s potential achievements and scale: indeed, reaching “markets beyond Europe [and] US” is a strategy for scale and is presented as such in the grant proposal under “Planning for Scale”.

5 Efficiency

This chapter assesses the extent to which the MaterialWise initiative has been executed in an efficient manner, with realistic targets, given its scale of operations. Aspects related to cost-efficiency have been reviewed as well as the extent to which monitoring systems have been used to systematically track outputs and outcomes. The mechanisms put in place to facilitate adaptive management through the capture and use of results, experience, and lessons learned have also been examined.

5.1 Cost-Efficiency and Achievement of Milestones

Finding 14 MaterialWise has made a judicious use of funds: it has improved the realism of its forecasting throughout the grant and has remained within budget. The initiative relied on incurring limited fixed costs, using nimble project management, and having a fiscal sponsor, which provided certain services. Overall, these aspects increased its cost-efficiency.

The grant proposal to C&A Foundation included a 3-year budget: 2016 (actual), 2017 and 2018 (projected). **Table 5.1** provides a comparison of the revenue and expenses from the 2017 proposal with actual budgets

	Total Projected	Total Actual
Revenue	\$1,590,000	\$1,107,000
Expenses	\$1,555,000	\$1,105,000

throughout the grant’s duration. As can be seen, in the proposal to C&A Foundation, MaterialWise overestimated the amount it would gain in revenue and the amount it would spend. However, year-on-year budgets demonstrate that MaterialWise successfully adapted its projections and remained within budget. The current year (2019) represents good budget management: the initiative had funds of

\$947K; of this, \$538K was spent during January to end of August. Remaining funds are deemed to suffice to close the year. The initiative has also set aside funds for the remainder of the pilots and data purchase, and while the specifics were not available to the evaluation team, a MaterialWise staff member stated that funding commitments had been made for 2020.

All in all, MaterialWise has spent \$1.6 million between January 2016 and September 2019. The initiative has primarily used these funds to set up its infrastructure and needed processes, and begin purchasing data to populate the database. With initial learning in place and a system that is now functional (albeit, still needing market-validation), it can be expected that future work will be more cost-efficient, barring currently unforeseen obstacles.

To stay within budget, the MaterialWise team has remained very lean: with only three full-time staff and the support of contracted consultants as necessary. This has served to keep its fixed costs to a minimum. However, several interviewed stakeholders mentioned that the small (and at times downwardly changing) size of the team had also contributed, among other factors, to the slower than anticipated pace at which the pilots have been unfolding, as MaterialWise has been short on manpower. Increasing the size of the team would also serve the purpose of anchoring the “scientific foundation” of MaterialWise, as a co-design partner explained, thus further enhancing its credibility. This is consistent with the initiative’s Scalability Plan, which specifies that MaterialWise plans on “[seeking] capacity-building grants to continue to fund critical positions and add new ones”.

The main strategy pursued for maintaining and increasing efficiency has been through the adoption of nimble project management in conjunction with a user-centred approach. This allowed for frequent, strategic and nimble pivots rooted in evidence, as provided by co-design partners, and in response to emergent challenges. It also guided MaterialWise in its allocation of resources, developing only processes and prototypes that were of actual interest to market actors. As a MaterialWise staff member said, “we only spend money on the features that [co-design partners] really want”. Relying on the services of a fiscal sponsor has also proved to be an appropriate and efficient strategy. As a result, MaterialWise has not needed to invest resources in developing and executing functions related to accounting, human resources, legal matters, etc., particularly as it has worked to prove a concept.

Finding 15 **MaterialWise has not met most of its milestones on time. While MaterialWise has benefitted from two grant extensions and additional funds from C&A Foundation, it has not yet delivered proof of concept and does not seem close to what the initiative had planned in terms of preparing for scaling. Such delays have mostly been due to the process of spinning out of its parent organisation.**

According to the initial 2017 grant proposal to C&A Foundation, the initiative planned to reach certain milestones; for instance, being prepared to purchase the first round of data by 30 May 2018 and publishing pilot results by 31 January 2019. These milestones, as well as almost all others, were not met on time.

Based on updated and now current planning, originally anticipated results will most likely be reached up to a year later than originally anticipated. The targets, as they were initially set, were ambitious: they did not leave much latitude for unforeseen circumstances; and particularly for the process that MaterialWise encountered in spinning out of its original home in C2CPII. This process extended over a much longer period of time than MaterialWise and C&A Foundation had foreseen and led to a significant slowing down of the initiative’s evolution. During this spin out, MaterialWise limited its expenses to the bare minimum and successfully raised funds, which provided financial stability while also causing setbacks in reaching milestones in a timely manner, accounting for the delays described above. In addition to the delays due to the spin out process, the pilots experienced different challenges which affected their timeline. Main challenges have been recruitment of suppliers, disclosure from said suppliers, representations of formulations using roll-up scores and lack of buyer pull-through.

Initially, the C&A Foundation grant of €400K was planned to last from December 2017 until January 2019. C&A Foundation then agreed to a no-cost extension until 30 March 2019, and later granted the initiative an extension until 15 August 2019, together with €90K in additional funds to purchase data. Thus, the C&A Foundation grant has spanned 20 months and has been worth €490K in total.

Proposal to C&A Foundation (2017):

We are optimistic that our pilot program will not only scale up significantly in 2019, but also the models we develop can be replicated and activate others to address their own challenges with chemical data.

Despite these extensions and additional funds, at the time of evaluation there was no external evidence of the pilots having delivered proof of concept. There was also no indication that within the upcoming months, MaterialWise will radically accelerate its preparation for scaling and catch up with its milestones, even giving the initiative the benefit of an additional year lost due to the unresolved organisational arrangements. This is a matter of concern, especially as certain external stakeholders and even co-design partners are beginning to show signs of impatience with the flow pace at which MaterialWise is populating the envisaged database, despite their belief in the initiative’s potential to scale up.

5.2 Monitoring, Evaluation and Learning (MEL)

Finding 16 MaterialWise’s monitoring did not rely on the logical framework that was developed, thereby lowering the quality and credibility of its MEL efforts. Nevertheless, the reporting to both co-design partners and C&A Foundation was frequent and at an adequate level.

In terms of monitoring, according to the grant agreement, MaterialWise and C&A Foundation agreed that the initiative would rely on a logical framework and would provide a mid-year report as well as an end-of-project self-evaluation. The self-evaluation was later replaced with the current external evaluation.

The logical framework was tailored to the grant and adequately reflected the work that both parties agreed MaterialWise would perform. It included six workstreams, each of which was associated with an output and associated assumptions, risks, indicators, targets, means of verification, etc. In March 2019, this framework was updated, with a 67% expansion of outputs (increased from 6 to 10). Despite having built and updated this tool for grant management, and despite the C&A Foundation requirement that partners “report against indicators and targets stated in their log-frames or theories of change”¹⁸, the evaluation team found no evidence that MaterialWise actually reported against it. The team instead used the MaterialWise software platform for its monitoring; it did not, however, account for all the workstreams contained in the logframe. This was a missed opportunity because logframes provide at-a-glance monitoring information that can easily not only be comprehended and interpreted, but also compared over time.

In terms of reports, MaterialWise submitted a brief yet insightful mid-year monitoring report. Its format was consistent with the status of MaterialWise as a pilot. In its recent Scalability Plan 2020-2022, MaterialWise defined a series of updated milestones that indicate tipping points in each of the initiative’s five core strategies. The milestones are accompanied by 28 metrics all in all; yet, no timeline has been defined, thus limiting the potential for accountability-based monitoring.

Regarding reporting, as set out in the “Tracking & Reporting” workstream of the initial logical framework, MaterialWise sent out quarterly retrospectives and previews to its co-design partners and C&A Foundation.

“
MaterialWise is very good at sending out emails about what they are doing, and there is a lot for me to learn from that: make sure that your funders are happy with you.

- External Stakeholder

These were brief summaries that included highlights of progress, pilot updates, and short descriptions of activities previewed for the following quarter. MaterialWise staff also undertook frequent, although mostly informal, reporting to co-design partners and C&A Foundation. Both categories of stakeholders expressed satisfaction towards the frequency and the contents of the reporting done by MaterialWise.

In sum, given MaterialWise’s status as a pilot, grant monitoring was adequate and its reporting was good. However, using the logical framework as a basis for monitoring would have made the MEL process more structured, and ultimately more credible.

¹⁸ C&A Foundation. (2017). *Assignment of grant agreement*. See Annex F: C&A Foundation Reporting Guidelines.

Finding 17 **MaterialWise has implemented organisational learning mechanisms, particularly through its user-centred approach and adaptive management. It can be considered a learning initiative.**

MaterialWise is known amongst interviewed stakeholders for continually seeking feedback, particularly from co-design partners and also from other actors. The successes, challenges, and lessons learned have all been discussed with co-design partners, either as a group or individually based on partners' profiles and skillsets. MaterialWise staff also reached out to external stakeholders, at times, to inform specific issues and concerns. Co-design partners and Advisory Board members expressed high appreciation for the way in which the team has valued their feedback.

MaterialWise has also embraced a management style that favours integrating feedback. The inputs gathered from stakeholders have been quickly processed and incorporated, resulting in multiple, successive iterations. “Agile development with closed loops”, as worded by an Advisory Board member, is part of the initiative's core characteristics, leading to the co-design partners' perception that their inputs have effectively contributed to shaping MaterialWise.

As a result of these two mechanisms, the initiative has increased both its effectiveness and its efficiency. Moreover, it successfully embedded learning into most of its activities and further, into the way the team thinks. Thus, MaterialWise can be considered a learning initiative.

“

They learn from their mistakes. MaterialWise has done an incredible job adapting to the market, to the constraints. I have always found them to be ones who want to know what the flaws are, what to improve.

- Co-design Partner

”

6 Sustainability

This chapter assesses the extent to which MaterialWise can be scaled as well as replicated. The likelihood that the initiative will become financially sustainable in the future is also discussed, together with factors that may promote or inhibit the initiative’s sustainability.

6.1 Scalability

Finding 18 As a pilot initiative, MaterialWise has been designed to eventually effect systemic change. The initiative has set up the systems and processes that would be necessary to effectively take advantage of any “breakthrough opportunities” that might dramatically increase its scale and value to users.

MaterialWise remains in its piloting stage. Stakeholders close to the initiative deeply believe in its potential to take off, scale up, and transform the way in which chemicals are chosen, used and substituted. Indeed, it appears that MaterialWise, once at full scale, could affect the landscape of green chemistry and become a highly useful tool for actors ready to embrace safer chemistry.

Throughout its existence, MaterialWise has developed systems and processes, and successfully set up the infrastructure for a globally harmonised repository of CHAs. While much of the groundwork has been done, as presented in [Table 4.1](#), the extent to which the intended users of MaterialWise’s services will pay for those services, based on which pricing arrangement, and the extent to which they will use the purchased information to inform their chemistry choices have not yet been market-validated (a pre-cursor for the envisaged scaling) and needs finalisation. The initiative is now looking for “breakthrough opportunities to scale”, as a MaterialWise staff member asserted. There was a hope that this might occur in the apparel sector, but as already described, interest has been diverted towards the alternative approach of scored chemistry. MaterialWise has been exploring notions in other sectors that could support its scalability.

For instance, if a large organisation or network were to enter into partnership with the initiative, the repository could be populated much faster than the current trajectory has been facilitating, on an alternative assessment portfolio-by-portfolio basis. This type of large business opportunity for MaterialWise would, in turn, render access to the envisaged repository more attractive for users. Scaling the dataset would also allow for a decrease in user fees, thereby widening the clientele from innovators to early majority and building momentum for more extensive adoption. This breakthrough opportunity has not happened yet for MaterialWise, mostly as the business model is yet to be finalised and the database populated (see [Factors of Sustainability](#)). However, such a scenario is increasingly likely, as sustainability and circularity are progressively becoming a higher concern for customers and manufacturers alike. For MaterialWise, such scaling is key to its financial sustainability.

“

We would like to have all [our] chemicals in MaterialWise and require everyone to use it. Then the goal would have been accomplished. But that is tens of thousands of chemicals. At some point, MaterialWise needs to grow its database exponentially. There needs to be a large increase in scale.

- Co-design Partner

”

There is also a possibility that MaterialWise could be replicated; however, given the initiative’s ambition to provide a global sector-agnostic repository with accessible, harmonised, portable data, any replication would effectively constitute duplication.

6.2 Financial Sustainability

Finding 19 MaterialWise has been very successful at raising philanthropic funding, but a depletion or interruption of such funding would compromise the sustainability of the results achieved thus far. Currently, there is no evidence that MaterialWise’s business model will lead to financial independence in the near future.

MaterialWise has, so far, been very effective in securing funding from philanthropic actors. As each has come on board, this has been perceived by others as important validators and has served to enhance the overall credibility of the initiative. Philanthropic funding has been the initiative’s main source of financial resources and is expected to remain an important source of support, at least until the end of 2021, when it is projected to represent just 26% of revenue.¹⁹ If such funding were to deplete or cease before self-generated revenues constitute the large majority of income, or before MaterialWise has identified a breakthrough opportunity to scale, the sustainability of the results accomplished thus far would be seriously compromised. The team would need to reduce its size and its pace of work, which would, in turn, limit its ambition and hinder its self-sustaining income generation potential.

Scalability Plan 2020-2022 (August 2019):

We believe MaterialWise will eventually sustain itself on revenue from participating organizations. Our goal is that revenue will support ongoing operations by 2023. Philanthropic funds provide an essential runway to ensure this transformation has time to take hold.

Based on the 5-year projections presented in MaterialWise’s Scalability Plan 2020-2022, the initiative plans on being independent from philanthropic funding as well as reaching a positive fund balance by 2023. However, the evaluation team has only encountered assumptions but not found evidence that

“
MaterialWise needs a pool of hungry clients – and hungry assessors. It is a classic dilemma of the chicken or the egg. If you build it, they will come.

- Co-design Partner

MaterialWise’s business model will lead to financial independence in the projected period. MaterialWise is in a situation where its eventual independence is based on its ability to convince users (brands and chemical suppliers) of their need for deep data CHA portfolios and that brands should request of their chemical suppliers that they submit their chemicals into the MaterialWise repository. Its financial independence is also based on MaterialWise’s ability to convince chemical suppliers to do so. Both types of stakeholders would also need to agree to pay for the service, and assessors would have to perceive a business opportunity attractive enough for them to abide by a new and/or complementary system for income generation.

¹⁹ As per MaterialWise’s Scalability Plan 2020-2022 (August 2019). According to these five-year projections, in 2022 philanthropic funding would represent only 10% of income. The initiative would earn \$1,875,000 in data sponsorships and \$2,295,000 in user subscriptions for the year 2022.

So far, pilot results and stakeholder interviews have not provided compelling evidence that brands and chemical suppliers would demand and pay for the service that the initiative would like to offer. This assertion must also be put in context of the limited range of stakeholders that were consulted for this evaluation. In this light, the evaluation team was not able to gather evidence, so far, that the volume of assessments to be performed and the planned compensation scheme would attract assessors for repeat business, beyond the pilots. As can be seen, the path towards financial independence relies on multiple assumptions, which are serious in nature. Ideas are currently being explored in order to reduce the reliance on supplier buy-in. The closure of the pilots will provide an important opportunity for MaterialWise to reflect with the co-design partners and the Advisory Board around the business model and stakeholder collaboration. While it is finalising those elements, MaterialWise can continue to rely on philanthropic funding as a runway until the initiative takes off.

6.3 Factors of Sustainability

A set of enabling and inhibiting factors have been identified that are deemed likely to affect the sustainability of MaterialWise’s results as well as of the initiative itself.

Finding 20 **Enabling factors of sustainability for MaterialWise include: the user-centred approach; the MaterialWise team; strong relationships with supportive stakeholders; the process for continual update of the repository; the future-orientated nature of the initiative’s work; and the progressive development of regulation around chemicals.**

Three elements that increase effectiveness discussed earlier in this report are also factors of sustainability: the use of a *user-centered approach*, the *strong assets of the MaterialWise team*, and the *strong relationship with supportive stakeholders*. All three elements increase the potential sustainability of the initiative and of its results. See **Effectiveness and Results**, and especially Sections 4.5 and 4.6 for a discussion of these points.

Other factors that favour sustainability include:

- **Process for updating the CHAs:** A process was defined to ensure that CHAs in the repository would be updated by the assessors who create them, based on a system of expiry dates. The license agreement between MaterialWise and the assessors stipulates that assessors assess a chemical and that the CHA itself has a certain shelf life. Assessors have been granted the freedom to re-assess chemicals multiple times outside of MaterialWise, as long as they update their assessment within the repository, within the licensed timeframe. Doing so would prolong the usability of a CHA held in the repository and extend the period during which assessors receive compensation for each use of a CHA. For MaterialWise, this ensures that data is regularly updated, at no additional cost beyond the license agreement fee.
- **Future-orientation:** The acceleration of circular economy thinking and the increasing preoccupation of customers regarding safer chemicals underpin a discernable momentum for safer chemistry. UNEP also spoke to the future-orientation of safer chemistry in its Global Chemicals Outlook II, in which it described the substitution of chemicals with safer alternatives as “becoming a driver for solutions and innovations”.²⁰ In addition, it is worth highlighting that this field is entirely new – a co-design partner described it as a “completely untapped world”. This means that there is a lot of

²⁰ United Nations Environment Programme. (2019). *Global Chemicals Outlook II: From Legacies to Innovative Solutions*, Synthesis Report. Available at:

https://wedocs.unep.org/bitstream/handle/20.500.11822/27651/GCOII_synth.pdf?sequence=1&isAllowed=y, p.56

space for MaterialWise to develop and occupy into the longer term. The future orientation of the initiative’s work is a factor that favours its sustainability.

- **Chemical Regulation:** Another factor that favours MaterialWise’s sustainability is the gradual creation and implementation of new regulation around hazardous chemicals.²¹ For instance, in 2016 the United States updated the Toxic Substances Control Act in order to require risk-based chemical assessments and increase public transparency for chemical information.²² The European Union (EU), in October 2018, adopted a new restriction under the Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals, limiting the use of hazardous chemicals in clothing, textiles and footwear.²³ As mentioned by UNEP, certain landmark regulations and policies, for instance in the EU, include provisions for substitution and these examples could be replicated. The report also specifies that “some multilateral treaties (such as the Montreal Protocol and the Stockholm Convention) have played a critical role in driving substitution for selected chemicals of concern.”²⁴ Such developments have the potential to enhance the relevance of MaterialWise, across all industry sectors.

Finding 21 Inhibiting factors of sustainability include the unfinished and untested business model, the slow population of the repository, the lack of convergence with other actors, as well as relatively weak relationships with certain key stakeholders groups.

Despite its efforts, MaterialWise has not yet built solid, lasting relationships with certain stakeholder groups, particularly the assessors, the chemical suppliers, and parts of the green chemistry community, as discussed earlier in this report. While a factor that limits effectiveness, it also potentially affects the initiative’s sustainability.

Other factors that hinder sustainability include:

- **Business model:** Elements of MaterialWise’s business model have been constantly evolving since its inception, with very few stakeholders confirming that they understand its ins and outs. There has been a persistent confusion regarding the MaterialWise offering, notably amongst assessors and green chemistry community stakeholders. Even co-design partners are not all equally familiar with it, expressing a desire for greater clarity. Such a lack of clarity around the business model remains a hindering factor regarding its sustainability, moving forward.

²¹ At international level, chemicals are regulated by a series of initiatives and conventions: Montreal Protocol (1987), Basel Convention (1992), Globally Harmonized System of Classification and Labelling of Chemicals (2002), Rotterdam Convention (2004), Strategic Approach to International Chemicals Management (2006), Stockholm Convention (2009). At European level, chemicals are managed by the Registration, Evaluation and Authorization and Restriction of Chemicals (REACH) and Classification, Labelling and Packaging regulations for specific families of products. The United States Environmental Protection Agency (EPA) strengthened the country’s legislation in 2009. https://en.wikipedia.org/wiki/Regulation_of_chemicals Recent developments in the area of hazardous chemicals have built on this foundation. The European Commission organised a high-level conference in November 2019 to review a comprehensive European Union Framework on Endocrine Disruptors, which could have far-reaching effects in boosting the value of MaterialWise’s proposition: https://ec.europa.eu/environment/chemicals/reach/events_en.htm Since 2017, the Swedish Chemicals Agency has been stepping up its efforts in restricting chemicals, with 39 chemical substances identified that have subsequently been restricted in the EU’s chemicals regulations: www.kemi.se/en/news-from-the-swedish-chemicals-agency/2017/swedish-initiatives-have-led-to-the-regulation-of-close-to-40-hazardous-chemicals-within-the-eu/

²² United States Environmental Protection Agency. (2019). *The Frank R. Lautenberg Chemical Safety for the 21st Century Act*. Accessible at: <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/frank-r-lautenberg-chemical-safety-21st-century-act>

²³ European Commission. (2019). *REACH Restrictions*. Accessible at: https://ec.europa.eu/growth/sectors/chemicals/reach/restrictions_en

²⁴ United Nations Environment Programme. (2019). *Global Chemicals Outlook II: From Legacies to Innovative Solutions, Synthesis Report*. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/27651/GCOII_synth.pdf?sequence=1&isAllowed=y, p.56.

- **Populating the repository:** Filling the repository has progressed at a slower pace than was envisaged. As discussed earlier, this is a crucial step for MaterialWise towards scalability and sustainability, as it would truly make the repository “the place where everyone goes to get their CHAs”, a future that a co-design partner (among others) envisages. For the time being, the slow pace at which this is progressing is hindering the initiative’s sustainability.
- **Lack of convergence with other actors:** MaterialWise has not yet found its place in the landscape of green and safer chemistry and has not yet had a breakthrough opportunity to partner with a large organisation or network. As a result, external stakeholders are confused and reluctant to commit to the initiative. For instance, a MaterialWise staff member explained that certain chemical suppliers disengaged from one of the initiative’s pilots because they wanted to wait and see what ZDHC’s Chemical Leader Programme would do. This lack of convergence with other organisations and networks challenges MaterialWise’s relevance, creating uncertainty and confusion. This in turn risks negatively affecting both the durability of its results over time and the likelihood of its financial sustainability.

Given the pilot stage of MaterialWise, it is important to consider these reflections and concerns accordingly.

7 Conclusion

Given the learning orientation of this evaluation, the concluding thoughts shared below are designed to accomplish two aims. The first is to recap the evaluation’s key insights, with a retrospective eye, including drivers (both positive and negative) that influenced the achievement of the piloted activities. The second is to offer recommendations to MaterialWise to enhance learning and inform future actions.

7.1 Recap of Evaluation Results

Conclusions contained herein are referenced to the evaluation rubric set out in [Appendix IX](#). The following Exhibit 7.1 summarises the project’s ratings along its 5-point scale.

Exhibit 7.1 Evaluation of the Project as per the Rubric

RELEVANCE	EFFECTIVENESS AND RESULTS	EFFICIENCY	SUSTAINABILITY
Mostly Relevant (4)	Somewhat Ineffective (2)	Efficient (3)	Not applicable

A concluding discussion of each is provided below.

7.1.1 On Relevance...

The evaluation team was asked to assess the relevance of MaterialWise to C&A Foundation’s current vision and purpose, which have been cascaded down through its Circular Fashion programme, as well as the relevance of the initiative to the global fashion sector, and beyond. The rating of “mostly relevant” reflects a judgement that the initiative’s objectives are well-designed and well-aligned with the priorities of C&A Foundation, co-design partners and other stakeholders. In addition, the approach to executing the initiative was deemed to mostly reflect the values, vision and mission of C&A Foundation.

At the time that funds were granted, MaterialWise was perceived as filling a gap in identifying and generating assessments of chemicals with high potential for transforming the global fashion sector, fitting precisely into, and supporting the foundation’s transformational vision. The initiative mapped directly to the Circular Fashion programme’s strategic objectives and TOC. The co-design, user-centered approach adopted by MaterialWise reflected the foundation’s partnership approach

Recent developments on the landscape vis-à-vis apparel brand-led momentum around scored chemistry and the convergence being brought to this approach at the mandate of these brands under the framework of an industry-wide coalition seem to have tempered enthusiasm for the MaterialWise offer. Its value proposition, which is anchored in substantiation, granularity, underlying data, and database management, is currently perceived as less pertinent than it once was by apparel brands.

While there is growing scepticism around the capacity of the apparel industry’s coalition to deliver the promised infrastructure to enable meaningful movement towards safe chemistry, the extent to, and moment at which MaterialWise’ relevance for the fashion sector will reappear is not clear. Growing consumer demands and accompanying legislative pressure for granularity and transparency are seen as

factors that would enhance its relevance, together with the emergence of major deficiencies in the scored chemistry approach currently being promoted within the apparel sector, should that situation arise.

While MaterialWise’s relevance for the apparel sector may not be fully recognised at present, its potential relevance for sectors beyond apparel was communicated by informants from these sectors. The team’s outreach to electronics, retail, personal care through its co-design groups has sparked their interest. Informants suggested that MaterialWise could have a highly credible role in showcasing the apparel sector’s leadership in eliminating hazardous chemicals and promoting circular economy. Such a role would be consistent with the transformational objectives of C&A Foundation and its Circular Fashion programme.

7.1.2 On Effectiveness and Results...

The evaluation of effectiveness was principally based on the likelihood, at present, that targeted results have been or are expected to be achieved, compared with the expectations that had been set for the pilot period. The effectiveness criterion also involved gauging the extent to which such actions have functioned to bring about change or contain systems change potential. The way in which MaterialWise has gone about interacting with relevant actors and leveraging other initiatives was also considered.

The MaterialWise team’s approach in engaging with co-design partners was managed adaptively, functioned efficiently, and delivered valuable market-based insights in terms of identifying relevant substances and engaging corresponding chemical suppliers, assessors and verifiers in the collective endeavour of generating trusted, unified alternative assessments. Those involved expressed satisfaction with their engagement and the way this was handled and leveraged. Through the pilot period, MaterialWise reported that it had been able to successfully develop the key elements underpinning its material health assessment model, which represents a substantial advance in harmonisation, in a landscape where assessors have been pitted against such a development, in view of the disruption to their own business models and revenue streams.

The MaterialWise team did run its first pilot successfully, from inception through to near-conclusion, given that publication of the resulting alternative assessment portfolio was still pending at the time of the evaluation. Their publication promised a vital opportunity to gain feedback from actual users regarding the relevance and use of its offering. In assessing the effectiveness, overall, the assigned rating reflected the situation that all three pilots fell short of their envisaged results with respect to enabling MaterialWise to validate its infrastructure and pricing model in the market. This left the initiative in a situation of being based primarily on hypotheses and assumptions at the time of the evaluation, leading to the assignment of a rating that reflects a situation where MaterialWise’s performance was judged likely to meet outcome targets in a few areas, through reasonable engagement with stakeholders, and communication with other relevant initiatives.

7.1.3 On Efficiency...

The assessment of the grant’s efficiency has been based on two factors: the initiative’s cost-efficiency and its delivery of outputs in a timely manner. On the one hand, MaterialWise has made judicious use of funds and remained within budget, while also employing efficiency-increasing strategies. The investment of most of the funds received in building the initiative’s infrastructure is expected to increase cost-efficiency in the future. On the other hand, the bulk of MaterialWise’s programmed activities and outputs were not fully completed on time: it did not meet its milestones by 10 to 12 months, noting that its targets were very ambitious. The process of spinning out of the initiative’s original home has taken much longer than expected

and is still not completed. In addition, there is no indication that, within the next half-year, MaterialWise will exponentially accelerate its preparation to scale up and catch up with its milestones.

The effect of not managing to deliver the results of the pilots during the period of evaluation has been adequately reflected in the assessment of the initiative’s effectiveness. Considering the extent to which results have been delivered with the least costly resources available using efficient and timely processes, MaterialWise has been judged to perform in an efficient manner, taking account of its current situation within a broader trajectory.

7.1.4 On Sustainability...

The evaluation team deemed it inappropriate to assign a rating to this criteria, given its pilot stage. Still, sustainability-related comments can be made on a few issues.

In terms of scalability, MaterialWise is looking for a transformational business opportunity that would allow the initiative to dramatically increase its scale. It has set up the infrastructure required to take advantage of such an opportunity, which could effect systemic change, but to date, the results of the pilot have not enabled it to scale.

Regarding financial sustainability, MaterialWise has been highly successful at securing philanthropic funding. However, as of now, it is not likely that the initiative’s results would be sustained over time in the absence of such funding. Philanthropic funding will be necessary at least until a breakthrough is realised, as mentioned above. It was not possible to triangulate the extent to which MaterialWise’s business model will lead to financial independence, as it was not yet operational in the market. The full set of results from the pilots might provide insights into this question, provided that the initiative can move into market-validation. For the time being, further support would be needed to ensure continued benefits beyond the lifetime of the C&A Foundation grant.

7.2 Recommendations

The following recommendations are aimed at MaterialWise, in support of its ongoing work into the future:

- Recommendation 1** MaterialWise should clarify and socialise its value-proposition and business model in order to both increase interest and uptake.
- Recommendation 2** MaterialWise should develop general criteria that can be used to identify pilots that require more extensive due diligence, before an initial investment.
- Recommendation 3** MaterialWise should accelerate the pace at which the database is populated. This will likely entail reconsidering the orientation of the pilots and increasing the size of the team.
- Recommendation 4** MaterialWise should review its engagement strategy with priority stakeholders in order to fully understand and meet their needs, as well as adequately communicate the initiative’s value proposition to these stakeholders.
- Recommendation 5** MaterialWise should enlarge its geographic focus and go beyond the networks associated with team members’ direct connections. New European ties could open doors into uncharted territory, including discussions with key global actors

that could help to position the initiative and leverage the IP that has been generated, into an international standard for harmonised CHA.

Recommendation 6 In order for its MEL processes to be more structured and more credible, MaterialWise should rely on its logical framework as a foundation for its MEL.

Recommendation 7 MaterialWise should clarify its legal status and the ownership of the IP.

Appendix I List of Findings

- Finding 1** Aiming to facilitate informed decisions about chemicals and a shift towards safer products (using ‘greener’ chemistry) through the publication of disaggregated, standardised, 3rd-party verified information, MaterialWise is aligned with C&A Foundation’s vision and purpose to transform the fashion industry into a “force for good”. It is also aligned with the foundation’s commitment to transparency.
- Finding 2** MaterialWise is highly aligned with the Circular Fashion programme’s strategic objective to promote and enable implementation of ‘safe and circular’ thinking based on having access to actionable, open data sources that promote accountability and facilitate informed choices.
- Finding 3** Initially conceived as a mechanism to boost scalability of the Cradle to Cradle (C2C) certification, MaterialWise evolved into being seen as potentially filling a gap in identifying and generating assessments of chemicals, in a context where chemical management and optimisation was directly linked to sustainable development.
- Finding 4** In view of recent developments related to brand-led scored chemistry, the interest of apparel brands in MaterialWise seems to have waned. MaterialWise’s value propositions linked to substantiation, granularity, underlying data, and database management appear less necessary to meet their current needs.
- Finding 5** While not appearing to be in the forefront of apparel company concerns, the MaterialWise team’s capacity to, and interest in generating alternative assessments that build positive material libraries represents an area of potential, as yet untapped, relevance.
- Finding 6** In addition to apparel, MaterialWise may be of increasing relevance to other industry sectors (e.g. electronics, retail, personal care) that have already, or are planning to adopt restrictions in the pursuit of safer chemistry and are seeking positive alternatives.
- Finding 7** MaterialWise has successfully developed the underpinning elements of its new model for a harmonised input approach for generating CHA profiles. However, aspects related to actual users of its infrastructure and the accompanying pricing model have yet to be market-validated.
- Finding 8** MaterialWise’s user-centred design approach fed the initiative with much needed input from the market. The co-design group was managed in an adaptive manner and has functioned effectively, although its efficiency could not be assessed based on available information.
- Finding 9** The three pilots fell short of their envisaged results for a variety of reasons. However, they provided a vital opportunity to test the processes and infrastructure underpinning the MaterialWise offering and offered fertile ground for reflection about the sources of key challenges.
- Finding 10** Designed from the outset to disrupt the incumbent system, MaterialWise’s presence on the landscape has had intended as well as unintended results. MaterialWise’s pursuit of granularity has not been welcome by all landscape actors. Nevertheless, MaterialWise has contributed to more collaboration between assessors, which is conducive for arriving at a unified CHA profile.
- Finding 11** Factors seen as positively influencing MaterialWise’s effectiveness include its embedding within the Healthy Building Network and the potential for synergies linked to compatibility of

- goals and a shared ethos regarding partnership and system change. Other influential internal factors were found in the competence, conduct and reputation of the core team.
- Finding 12** Some internal aspects were drawbacks on the effectiveness of MaterialWise, which included unresolved organisational arrangements, and pivots that had led to confusion.
- Finding 13** MaterialWise has taken advantage of multiple opportunities to build awareness around its activities. Still, a relatively small number of actors have so far been exposed to MaterialWise. The MaterialWise team has not yet built solid relationships with the assessors, the chemical suppliers, and the green chemistry community. This has led to confusion amongst such stakeholders and reluctance to collaborate.
- Finding 14** MaterialWise has made a judicious use of funds: it has improved the realism of its forecasting throughout the grant and has remained within budget. The initiative relied on incurring limited fixed costs, using nimble project management, and having a fiscal sponsor, which provided certain services. Overall, these aspects increased its cost-efficiency.
- Finding 15** MaterialWise has not met most of its milestones on time. While MaterialWise has benefitted from two grant extensions and additional funds from C&A Foundation, it has not yet delivered proof of concept and does not seem close to what the initiative had planned in terms of preparing for scaling. Such delays have mostly been due to the process of spinning out of its parent organisation.
- Finding 16** MaterialWise’s monitoring did not rely on the logical framework that was developed, thereby lowering the quality and credibility of its MEL efforts. Nevertheless, the reporting to both co-design partners and C&A Foundation was frequent and at an adequate level.
- Finding 17** MaterialWise has implemented organisational learning mechanisms, particularly through its user-centred approach and adaptive management. It can be considered a learning initiative.
- Finding 18** As a pilot initiative, MaterialWise has been designed to eventually effect systemic change. The initiative has set up the systems and processes that would be necessary to effectively take advantage of any “breakthrough opportunities” that might dramatically increase its scale and value to users.
- Finding 19** MaterialWise has been very successful at raising philanthropic funding, but a depletion or interruption of such funding would compromise the sustainability of the results achieved thus far. Currently, there is no evidence that MaterialWise’s business model will lead to financial independence in the near future.
- Finding 20** Enabling factors of sustainability for MaterialWise include: the user-centred approach; the MaterialWise team; strong relationships with supportive stakeholders; the process for continual update of the repository; the future-orientated nature of the initiative’s work; and the progressive development of regulation around chemicals.
- Finding 21** Inhibiting factors of sustainability include the unfinished and untested business model, the slow population of the repository, the lack of convergence with other actors, as well as relatively weak relationships with certain key stakeholders groups.

Appendix II List of Recommendations

- Recommendation 1:** MaterialWise should clarify and socialise its value-proposition and business model in order to both increase interest and uptake.
- Recommendation 2:** MaterialWise should develop general criteria that can be used to identify pilots that require more extensive due diligence, before an initial investment.
- Recommendation 3:** MaterialWise should accelerate the pace at which the database is populated. This will likely entail reconsidering the orientation of the pilots and increasing the size of the team.
- Recommendation 4:** MaterialWise should review its engagement strategy with priority stakeholders in order to fully understand and meet their needs, as well as adequately communicate the initiative’s value proposition to these stakeholders.
- Recommendation 5:** MaterialWise should enlarge its geographic focus and go beyond the networks associated with team members’ direct connections. New European ties could open doors into uncharted territory, including discussions with key global actors that could help to position the initiative and leverage the IP that has been generated, into an international standard for harmonised CHA.
- Recommendation 6:** In order for its MEL processes to be more structured and more credible, MaterialWise should rely on its logical framework as a foundation for its MEL.
- Recommendation 7:** MaterialWise should clarify its legal status and the ownership of the IP.

Appendix III Methodology

Utilisation-Focused and Participatory Evaluation

For this mandate, Universalialia adopted a Utilisation-Focused Evaluation (UFE).²⁵ This approach prioritises the usefulness of the evaluation to its intended users, which reflects the Evaluation ToR’s requirements in terms of generating learning, informing decisions, and improving performance. This is a well-tested evaluation approach that increases the relevance and utility of recommendations and their uptake. Tailored participatory and iterative processes with key stakeholders are vital ingredients of UFE and match our approach. Combined with a theory-based and learning-oriented framework, the evaluation team worked to enhance the involvement of key stakeholders throughout the evaluation through their participation in data collection, discussion of emerging findings, and commenting on deliverables. These contributions have served to enhance the quality of each evaluation step, leading to relevant and useful recommendations.

Parallel Studies

Universalialia’s evaluation team has simultaneously undertaken three additional studies for C&A Foundation; namely:

- Overall Effectiveness Evaluation of the C&A Foundation;
- Mid-Point Evaluation of the CanopyStyle initiative;
- Independent Evaluation of “Accelerating Better Cotton Initiative to Mainstream Sustainable Cotton Production & Uptake”

Insights, findings and recommendations from the MaterialWise evaluation have been and will be used, where relevant, to inform these analyses and the overall work of the evaluation team.

Methodology

Assessing Organisational Performance

This mandate represents a formative evaluation in the overall trajectory of MaterialWise. As proposed by C&A Foundation, this evaluation assessed dimensions related to MaterialWise’s relevance, efficiency, effectiveness, results, and sustainability. It has sought to provide an assessment of progress, thus far, while also offering insights to enable the initiative to move beyond its pilot.

This multi-faceted study considered the current status and trajectory of the initiative and its strategic positioning and approach. The relevance of MaterialWise to multiple actors was investigated, specifically C&A Foundation and its signature programme in Circular Fashion; suppliers to the envisaged database (assessors, verifiers); design and implementation partners; and potential users in the fashion industry, and to a limited extent, other selected sectors where the MaterialWise team has pursued partnerships.

Accordingly, the relevance of MaterialWise was examined in relation to C&A Foundation’s overall TOC as well as the strategy of its Circular Fashion Programme. In this light, MaterialWise’s potential for scaling and contributing to wider system shifts and industry-related transformation was reviewed.

²⁵ Patton, M. Q. (2008). *Utilization-Focused Evaluation: 4th edition*. Thousand Oaks, Ca: Sage Publications

The evaluation also included a cost-effectiveness dimension, assessing whether and to what extent the resources provided in support of the pilot were used wisely towards providing proof of concept.

While still early in the MaterialWise trajectory, the evaluation assessed results generated thus far from the three “use cases” that were designed and launched during the pilot funding period. The assessment focused on the creation and population of a third party-verified database, the sustainability of MaterialWise’s business model, and the likelihood of resulting improvements in the quality of available data and potential effects in terms of improved decision-making by users (outcomes). The following Business Model Canvas was used as a framework to guide reflection and discussion with the MaterialWise team about its offering.

Figure III. i: Business Model Canvas

The Business Model Canvas

Designed for: _____ Designed by: _____ Date: _____

Key Partners (Icon: Two hands shaking)

Why are we key partners?
Who are our key partners?
What key resources do we acquire from partners?
What key activities do partners perform?
What key channels do partners control?
What key customer segments do partners serve?
What key revenue streams do partners generate?

Key Activities (Icon: Person running)

What key activities do our Value Propositions require?
Do Distribution Channels?
Customer Relationships?
Revenue Streams?

Key Resources (Icon: Person sitting at a desk)

What key resources do our Value Propositions require?
Do Distribution Channels? Customer Relationships?
Revenue Streams?

Value Propositions (Icon: Briefcase)

What value do we deliver to the customer?
What value do our customers' problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?
How are we creating value?
How are we capturing value?

Customer Relationships (Icon: Heart)

What type of relationship does each of our Customer Segments expect as the solution and what are we offering?
How are we creating value?
How are we capturing value?
How are we integrating with the rest of our business model?
How do we integrate with the rest of our business model?

Customer Segments (Icon: Person standing)

For which are we creating value?
Who are our most important customers?
What are their needs?
What are their pain points?
What are their goals?

Channels (Icon: Truck)

Through which Channels do our Customer Segments want to be reached?
How are we reaching them?
How are we capturing value?
How are we integrating with the rest of our business model?
How are we capturing value?
How are we capturing value?

Cost Structure (Icon: Document with dollar sign)

What are the most important costs inherent in our business model?
What key resources are most expensive?
What key activities are most expensive?
What key channels are most expensive?
What key customer segments are most expensive?
What key revenue streams are most expensive?

Revenue Streams (Icon: Money bag)

For what value are our customers really willing to pay?
Do we have a pricing strategy?
How are they currently paying?
How much are they willing to pay?
How much are they willing to pay?
How much are they willing to pay?

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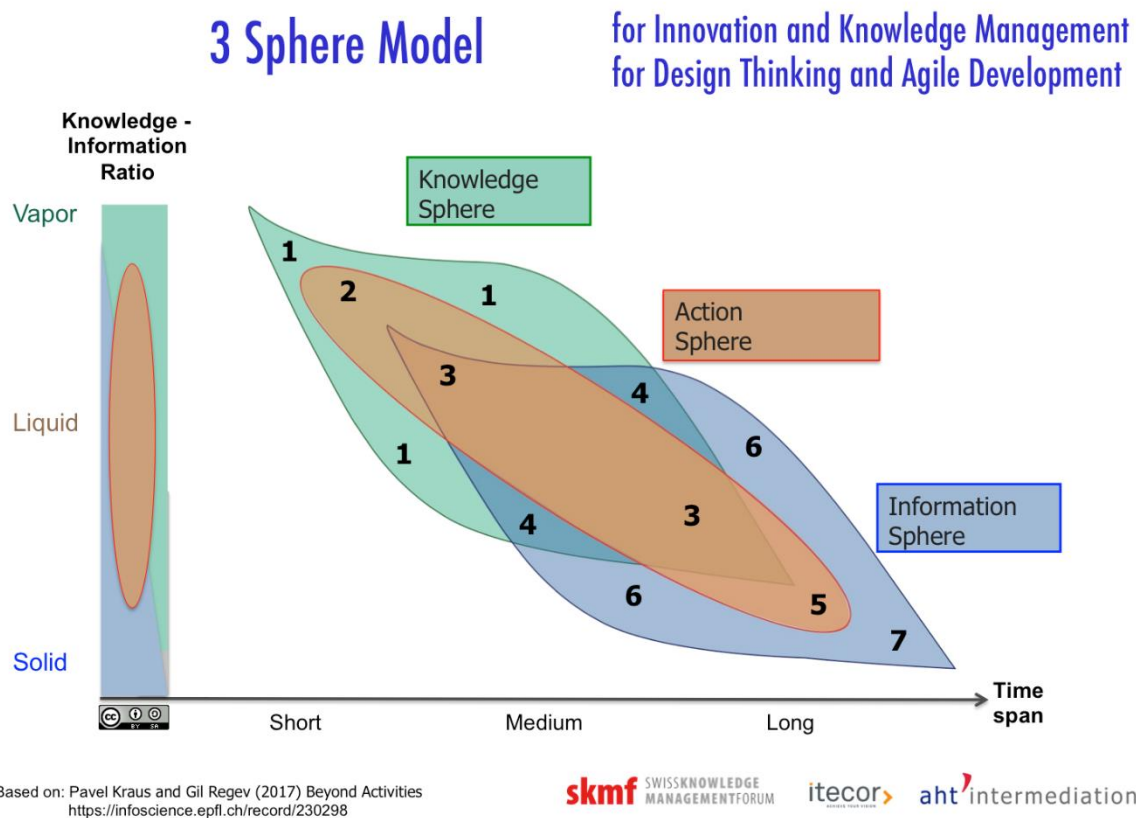
Osterwalder, A. and Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*.²⁶

The 3 Sphere Model was used to prompt discussion regarding the actionability of the information and knowledge being generated by MaterialWise and stored in its database (i.e. chemical hazard profiles). MaterialWise has been described as “building a repository of cost-effective, verified, chemical hazard assessments” where there is a belief that “organizing, validating, and scaling this dataset is key to proactive decision making in industry and will rapidly lead to better products for consumers”.²⁷ The 3 Sphere Model provided insights into these claims.

²⁶ This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/3.0/>

²⁷ Ellen McArthur Foundation, Google. (2018). *The Role of Safe Chemistry and Healthy Materials in Unlocking the Circular Economy*.

Figure III. ii: 3 Sphere Model



Swiss Knowledge Management Forum. (2017). *Introducing the 3 Sphere Model*.

The 3 Sphere Model visualises overlapping domains related to information, action, and knowledge. The “Y” axis depicts a continuum of information to knowledge, where the lowest value is pure information and the highest value is pure knowledge. In this model, pure information is qualified as being “solid”. Pure knowledge is “vapour”. An intermediate state is “liquid”. The “X” axis depicts the duration of the lifecycle and the validity of the knowledge or information.

Regarding the Knowledge Sphere: knowledge is developed subjectively within an individual and is processed internally by that individual until a hunch or intuition (i.e. “pure vapour”) becomes certain knowledge.

Regarding the Action Sphere: when the individual has achieved certainty of the knowledge, s/he may choose to test it, share it with others, externalise it. This is where the model’s Action Sphere begins (i.e. where the knowledge is used and applied). Based on the application and usage, the knowledge is then confirmed by a wider community. It may then be deemed appropriate to record more formally. This is done in many ways and the knowledge then moves into the Information Sphere.

Regarding the Information Sphere: content in the information sphere is likely to endure much longer than when it is in the Knowledge Sphere because it has been documented, formalised, archived, and is no longer subject to testing, experimentation, and interpretation. This condition is exacerbated by a human tendency to accept what is formally documented rather than to challenge it.

When an individual accesses this information and tries to apply it in the real world, this information is being “actioned” (i.e. returned to the Action Sphere). The more it is applied and used, back into the Action Sphere, the more it develops a new version of itself, which may even be a confirmation of its continuing validity; nevertheless, it is separate from the originally-accessed information and is now again subjective knowledge held by the individual. And so a cycle may begin again.

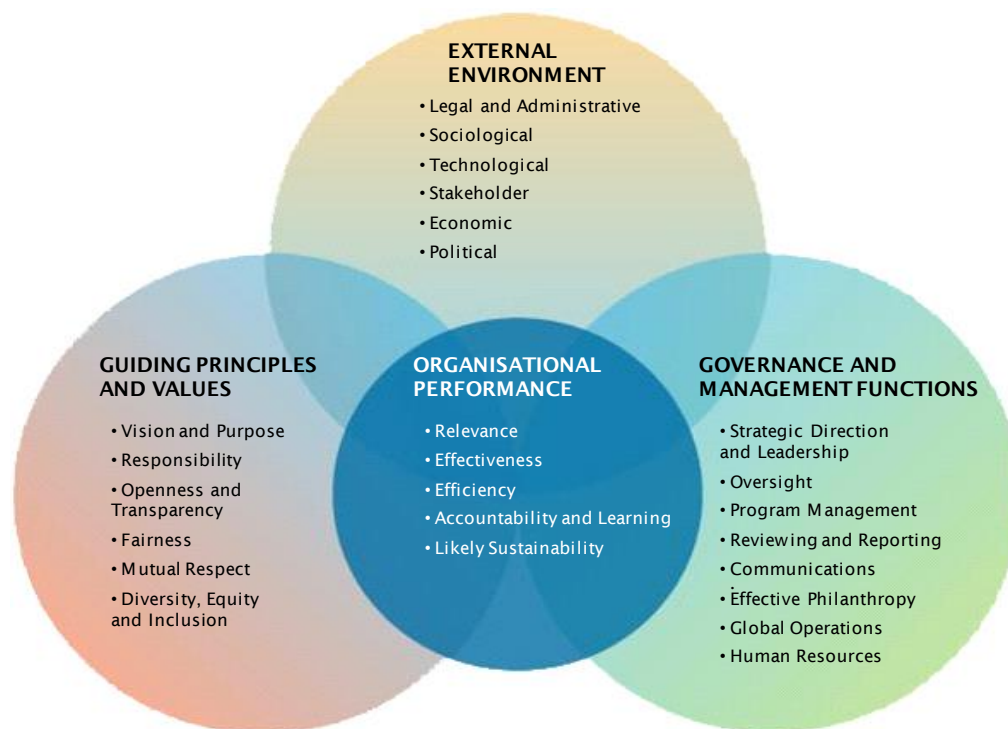
One of the risks observed in Knowledge Management is that once knowledge has been formalised, documented, and transformed into information, it loses its actionability. It would be irresponsible to act on information because humans require knowledge and wisdom in order to appropriately use information. The fact that arsenic is poisonous to humans is information; being able to contextualise this information enters the realm of knowledge (e.g. arsenic is no threat to human health and the planet if it is hermetically sealed in a glass jar).

The whole point is the actionability: the 3 Sphere model suggests that pure hunch or intuition is unlikely to trigger action because there has not yet been adequate processing or testing. Equally, information that is at the lowest, most “solid” level has questionable validity in a given context. The applicability of the 3 Sphere model with regarding to MaterialWise’s value proposition was to assess the extent to which the content that is being managed is being regularly trialled, tested, applied, updated, rather than just sitting in a repository with no regular review processes.

Finally, this evaluation assesses MaterialWise’s engagement and management of partners and other stakeholders and considers management and governance dimensions of MaterialWise, and its operational performance in achieving and/or the likelihood of making meaningful progress towards delivering scalable and viable outcomes. For this task, the evaluation team utilised Universal’s Institutional and Organisational Assessment (IOA) framework, which was developed together with Canada’s International Development Research Centre (IDRC) and the Inter-American Development Bank.

The IOA framework was used to structure understanding of the workings of MaterialWise’s management, processes, functions, and governance arrangements; ii) review adherence to the organisation’s values and guiding principles in the conduct of its operations; iii) set this within the larger context through a brief landscape analysis covering elements that have a bearing on the use and utility of the MaterialWise offering.

Figure III. iii: Institutional and Organisational Assessment Framework



While the evaluation makes recommendations to improve the overall performance management of MaterialWise, it does not assess the individual performance of any MaterialWise managers or staff. (This exercise should not be a substitute for, nor be used for individual performance management by or within MaterialWise.)

Following the IOA framework, progress on overall organisational performance was assessed against the following evaluative criteria:

- *Relevance* — MaterialWise’s ability to situate itself within, and adapt to changing conditions and its environment
- *Effectiveness* — mission fulfilment, including likely progress towards results and impact
- *Efficiency* — the ability to perform functions cost-effectively and productively with appropriate levels of inputs
- *Likely sustainability* — the ability of MaterialWise to achieve its objectives and fulfill its mission in a sustainable way
- *Accountability and learning* — monitoring and measuring results (positive & negative) and sharing results both internally and externally with others

The evaluation used mixed methods to address these issues and derived findings by triangulating the evidence collected from different sources, as described in greater detail elsewhere in this report.

The Rating System

See [Appendix IX](#) for details on the rubric system.

Appendix IV Evaluation Matrix

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
Relevance	1.1 To what extent are the initiative's strategies and objectives aligned to C&A Foundation's current vision and mission as well as the Circular Fashion programme's TOC?		<p>Alignment / coherence of MaterialWise's vision, mission, and strategy</p> <p>Evolution / refinement / calibration of vision, purpose and strategy to respond to emergent dimensions</p> <p>Evidence of external recognition of MaterialWise's contribution to system-wide change towards circular economy</p> <p>Evidence of potential user satisfaction</p>	<p>Documents</p> <p>Evaluations</p> <p>Interviews</p> <p>Advisory Board</p> <p>Meeting notes</p>	<p>TOC</p> <p>Portfolio review</p> <p>Landscape analysis</p> <p>Participant observation</p> <p>Sense-making</p>

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
	1.2 What specific, existing gaps were filled by the initiative in enabling a circular economy approach, particularly in the apparel/fashion industry?	<p>1.2.1 What role does chemical hazard data play in supporting:</p> <ul style="list-style-type: none"> ■ Circular economy ■ ZDHC ■ Fashion industry <p>1.2.1 To what extent does the MaterialWise value proposition fill data gaps in terms of:</p> <ul style="list-style-type: none"> ■ Being a trusted source of data ■ Promoting a universal, harmonised input ■ Offering 3rd party-verified profiles that are valued by prospective users ■ Cost-effective chemical hazard assessments ■ Cost-effective portfolios of safer alternatives 	<p>Evidence of agreement on gaps addressed</p> <p>Evidence of inputs to circular economy approach (particularly in fashion industry)</p> <p>Evidence of potential user satisfaction: chemical suppliers, assessors, manufacturers (e.g. via testing of problem and solution statements)</p>	<p>Documents (including original R&D interviews and summary deck) Evaluations Interviews</p> <p>UNEP reports</p> <p>Ellen MacArthur Foundation / Google White Paper on need for better data: https://www.ellenmacarthurfoundation.org/assets/downloads/The-Role-of-Safe-Chemistry-and-Healthy-Materials-in-Unlocking-the-Circular-Economy.pdf</p>	<p>TOC</p> <p>Portfolio review</p> <p>Landscape analysis</p> <p>Participant observation</p> <p>Sense-making</p>

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
	1.3 To what extent was the user-centered design approach deployed by the initiative relevant and appropriate in achieving the intended objectives?	<p>1.3.1 To what extent have co-design partners participated in co-design workshops, feedback sessions or served as an advisor?</p> <p>1.3.2 To what extent have these efforts shaped a market-validated solution?</p>	<p>Evidence of strategic participation in appropriate networks to contribute to systems change</p> <p>Evidence of engagement of co-design partners in co-design workshops, feedback sessions</p> <p>Evidence of mechanisms used by co-designers to provide guidance</p> <p>Evidence of adaptive management</p> <p>Co-designer satisfaction</p> <p>Evidence of disparities between co-design partners in meeting inclusion priorities</p>	<p>Documents</p> <p>Evaluations</p> <p>Interviews with co-design partners</p>	<p>TOC</p> <p>Portfolio review</p> <p>Landscape analysis</p> <p>Participant observation</p> <p>Sense-making</p>
Efficiency	2.1 To what extent has the approach been executed in an efficient manner? Were the targets set by the initiative achieved on time? Were the targets realistic given the scale of operations?	2.1.1 What are areas for improvement?	<p>Evidence of timely disbursements</p> <p>Evidence of satisfaction of co-design partners</p>	<p>Documents</p> <p>Monitoring report</p> <p>Interviews</p>	<p>Portfolio review</p> <p>Landscape analysis</p> <p>Participant observation</p> <p>Sense-making</p>

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
	2.2 To what extent has the initiative been cost-effective?	2.2.1 Are there any cases of inefficient or wasted resources?	<p>Evidence of timely disbursements</p> <p>Evidence of satisfaction of potential users</p> <p>Evidence of appropriate human resources</p>	<p>Documents</p> <p>Evaluations</p> <p>Interviews (particularly with MaterialWise Staff, C&A Foundation Programme Management)</p>	<p>Portfolio review</p> <p>Landscape analysis</p> <p>Participant observation</p> <p>Sense-making</p>
	2.3 Did the initiative use monitoring systems to track outputs and outcomes in a credible, systematic manner? If yes, how?		<p>Evidence of M&E system in place</p> <p>Evidence of regular reporting</p> <p>Evidence of partner satisfaction with reporting (process and substance)</p>	<p>Documents</p> <p>Evaluations</p> <p>Interviews with MaterialWise staff and contractors</p> <p>Steering Committee minutes (?)</p> <p>Trello boards</p> <p>Quarterly retrospectives</p> <p>Grant report</p>	<p>Portfolio review</p> <p>Landscape analysis</p> <p>Participant observation</p> <p>Sense-making</p>

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
	2.4 Which mechanisms (formal or informal) were put into practice to capture and use results, experiences and lessons (allowing for adaptive management) for internal learning?		Evidence of processes established to crystallise key learning Evidence of application of learning from use cases	Documents Evaluations Interviews R&D Findings Co-design workshops PowerPoint presentations & roadmaps Quarterly retrospectives Planning summaries	Portfolio review Participant observation Sense-making
Effectiveness and Results	3.1 What are the pilot's likely results? To what extent did the initiative meet its targets? What is the evidence of MaterialWise's likely overall effectiveness?		Positive evaluation of potential users and other key ecosystem stakeholders (e.g. advocates) Value-for-money programming Robust business model with high likeliness of financial sustainability	Documents Evaluations Interviews Examination of two “use cases” Testimonials	Portfolio review Participant observation Sense-making
	3.2 To what extent did the pilot demonstrate MaterialWise's potential to	3.2.1 ...their access of actionable chemical hazard profiles at lower cost?	Evidence of satisfaction of actual/potential users	Documents Evaluations	Portfolio review

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
	facilitate brands, manufacturers, and their suppliers to enhance (the various matters raised in the sub-questions):	3.2.2 ...the quality of chemical hazard data available to these actors through harmonisation of input methodology and 3 rd party verification?	Evidence of actual/potential ambassadorship by key ecosystem actors Evidence of perceived value of harmonisation	Interviews Examination of two “use cases” Testimonials	Participant observation Sense-making
		3.2.3 ...their decision making on chemical choices at an early stage in the design process, to allow for the creation of safer products (based on extrapolation from the “use cases” during the pilot funding period)?	Evidence of acceptance of proposed 3 rd party verification		
	3.3 Did the initiative sufficiently engage and manage relevant actors and stakeholders? If so, how?	3.3.1 How effectively does MaterialWise complement and leverage other existing industry initiatives and solutions (in apparel and other industries)?	Evidence of complementarity and/or leverage Evidence of satisfaction of partners	Documents Evaluations Interviews Testimonials	Portfolio review Landscape analysis Participant observation Sense-making
		3.3.2 What has been the effectiveness of engagement with partners in achieving the initiative’s results?	Evidence of alternatives to MaterialWise Evidence of shared purpose and/or priorities and/or activities among partners		
		3.3.3 Which stakeholder groups are likely to threaten the scaling-up of MaterialWise?	Evidence that partnerships have been managed in an		

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
		3.3.4 To what extent have the partnerships facilitated by MaterialWise (design group and externally) functioned effectively and efficiently?	adaptive and responsive manner		
	3.4 What evidence is there of MaterialWise, if scaled, being able to contribute to wider system shifts and industry transformation for enabling use of safer chemistry in the apparel industry?	3.4.1 Which of the strategies should be replicated?	<p>Identification of appropriate leverage points/nodes in the system to get multiplier effects</p> <p>Identification of appropriate stakeholders in the system as potential users of MaterialWise</p> <p>Evidence of coherent and strategic guidance to potential users that favour multiplier effects at several scales and levels</p> <p>Evidence of satisfaction of potential future users</p> <p>Identification of current or potential elements that might block the multiplier effect/systems change</p>	<p>Documents</p> <p>Evaluations</p> <p>Interviews</p> <p>Conference Insights</p>	<p>TOC</p> <p>Landscape analysis</p> <p>Portfolio review</p> <p>Participant observation</p> <p>Sense-making</p>
	3.5 What unintended results (positive or negative) did the processes employed by MaterialWise produce?		Evidence of continued benefits (or other effects) beyond the life of C&A Foundation pilot funding	<p>Documents</p> <p>Evaluations</p> <p>Interviews</p>	<p>Portfolio review</p> <p>Participant observation</p> <p>Sense-making</p>

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
	3.6 What external and internal factors, challenges, and risks influenced the initiative's implementation, successes and failures?	3.6.1 What drivers (positive and negative) influenced the achievement or failure of the workstreams? And why?	<p>Evidence of positive drivers</p> <p>Evidence of blind spots</p> <p>Evidence of risks</p> <p>Evidence of enabling or hindering factors (including blocks to multiplier effect and/or systems change) at the following levels:</p> <ul style="list-style-type: none"> • Institutional - internal • Strategic: Focus on fashion versus other industry sectors • Relational/ Reputational • Political • Economic • Cultural • Ideological 	<p>Documents</p> <p>Evaluations</p> <p>Interviews</p> <p>Conference Insights</p>	<p>Portfolio review</p> <p>Participant observation</p> <p>Sense-making</p>
	3.7 What are the main lessons learned from the initiative?	3.7.1 What were the missed opportunities?		<p>Documents</p> <p>Evaluations</p> <p>Interviews</p>	<p>Portfolio review</p> <p>Participant observation</p> <p>Sense-making</p>

CRITERIA	KEY QUESTIONS	SUB-QUESTIONS	INDICATORS	DATA SOURCES	DATA COLLECTION METHODS
Likely Sustainability	4. What are the main factors that promote or reduce the sustainability and results of the initiative?	4.1 What evidence is there that MaterialWise’s harmonised input verification process model for cost-sharing/subscription (or planned adaptations following the pilot) will lead to financial sustainability?	Robust business model with high likeliness of financial sustainability	Documents	Portfolio review
		4.2 To what extent is there evidence that users will demand and pay for the service (now and into the future)?	Evidence of C&A Foundation exit strategy	Evaluations Interviews	Participant observation
		4.3 To what extent are the results as a whole, likely to continue if philanthropic funding depletes or ceases altogether?	Evidence of continued support beyond the life of C&A Foundation pilot funding	Conference Insights	Sense-making
		4.4 To what extent can the initiative be scaled and / or replicated?	Evidence of satisfaction of potential future users		
		4.5 What, if any, competition exists to the services (or could exist in the near future)?			

Appendix V Stakeholders Consulted

C&A Foundation Staff

NAME	ORGANISATION	TITLE / POSITION
Joustra, Douwe Jan	C&A Foundation	Head of Circular Fashion Programme
Vuddamalay, Ilan	C&A Foundation	Programme Manager, Circular Fashion Programme

MaterialWise Staff and Advisory Board

NAME	ORGANISATION	TITLE / POSITION
Ciganik, Gina	Healthy Business Network (HBN)	Executive Director
Glass, Stacy	MaterialWise	Executive Director
Heine, Lauren	MaterialWise	Director of Safer Materials and Data Integrity
Perkins, Lewis	Apparel Impact Institute	President and Member of MaterialWise Advisory Board
Vogel, Sarah	Environmental Defense Fund (EDF)	Vice President of Health and Member of MaterialWise Advisory Board

Co-Design and Pilot Partners

NAME	ORGANISATION	TITLE / POSITION
Becker, Monica	Green Chemistry and Commerce Council (GC3), Plasticiser Working Group	Director of Collaborative Innovation
Flicker, Tom	Target	Director of Sustainable Product Development
Gallegos, Linda	Levi Strauss & Co.	Senior Design Innovation Lead
Hackenmiller-Paradis, Renée	Nike	Senior Chemist, Chemistry Centre of Excellence
Kausch, Matteo	Cradle2Cradle Products Innovation Institute	Director of Technical Development
McPartland, Jennifer	Environmental Defense Fund (EDF)	Senior Scientist, Health Programme
Michel, Frank	Zero Discharge of Hazardous Waste (ZDHC)	Executive Director

NAME	ORGANISATION	TITLE / POSITION
Raab, Christina	Zero Discharge of Hazardous Waste (ZDHC)	Implementation Director, Strategic Partnerships
Weissbach, Ylva	H&M	Sustainability Business Expert
Werner, Mike	Google	Lead of Circular Economy and Safer Chemistry

Data Partners

NAME	ORGANISATION	TITLE / POSITION
Bull, Sarah	Toxicology and Risk Assessment (TARA) Consulting	Principal Toxicologist
Whittaker, Margaret (Meg)	ToxServices LLC	Managing Director and Chief Toxicologist

Other Resource People

NAME	ORGANISATION	TITLE / POSITION
Cattermole, Amanda	Cattermole Consulting	Consultant to C&A Foundation
Hannak, Juergen	Adelphi Consultants	Senior Project Manager
Hearne, Shelley	Forsythia Foundation	Executive Director
Kopac, Matt	Burt's Bees	Manager, Sustainable Business & Innovation
Kraus, Pavel	Swiss Knowledge Management Forum	President, Knowledge Management Expert
McGrath, Teresa	Healthy Building Network (HBN)	Chief Research Officer
Mohan, Kate	Target Foundation	Corporate Social Responsibility Senior Manager
Regev, Gil	Ecole Polytechnique Fédérale de Lausanne (EPFL)	Professor, Business Modelling and Systems Thinking
Sweet, Lauren	US Environmental Protection Agency	Toxicologist, Safer Choice Programme
Templeton, Peter	Cradle to Cradle Products Innovation Institute (C2CPII)	CEO
Tickner, Joel	Green Chemistry and Commerce Council (GC3)	Director

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Appendix VII Selected Existing Chemical Evaluation Tools

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SINIMILARITY	UL THE WERCS™
Summary	Screening tool that consolidates global regulatory and authoritative lists to enable users to quickly identify and eliminate known chemicals of high concern from the beginning of the design process.	Tool for industry to identify alternative substances. Allows for comparison on chemicals/ substances or materials/mixtures based on 6 hazard endpoints. Endpoints are compared individually and collectively. User makes the final evaluation.	Tool to support transition to safer chemicals and inform decisions on use of chemicals in products and processes. Provides a rigorous comparative hazard assessment for evaluating alternatives to chemicals of concern based on 18 hazard endpoints.	Tool to assist users in finding mixtures of solvents with specific properties that have reduced environmental impacts. Designed to encourage technicians, engineers, and consultants to add more benign solvents to harmful ones to reduce overall environmental impact without need for equipment updates.	Developed for secure supplier product chemical data collection and comprehensive product evaluation. Provides automated restricted substance list (RSL) review, hazard evaluation, exposure assessment (human health, environment) and risk assessment over product's lifecycle. As a tool for an alternative assessment, user can process potential substitutes through the RSL, hazard, exposure, and risk steps to identify preferred alternatives.	An NGO list suggesting substances fulfilling REACH criteria for being “Substances of Very High Concern”. Consists of some 800 CAS numbers in 31 groups. For every substance in the SIN List database, there is information on its hazardous properties, EU regulatory status, producing companies, production volume. When applicable, it also links to substitution case stories. SINimilarity is available through the SIN List database and can identify substances structurally similar to SIN List substances. The tool indicates whether the searched substance contains the same group-specific structural elements as SIN List substances and/or if it has	A screening tool for product evaluation. The evaluation can be as complex as user desires as the user selects the type and number of hazard endpoints/ impacts to be evaluated. Multiple products can be compared graphically. The tool evaluates products based on presence of “chemicals of concern” in the product. The basis of chemicals of concern are “authoritative lists” or restricted substance lists

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SINIMILARITY	UL THE WERCS™
						structural similarity to any SIN List substances. SINimilarity includes a reference database of 80,000 substances that pre-registered under REACH.	developed by industry.
Developer	Cradle to Cradle Product Innovation Institute (C2CPII)	Germany's Social Accident Insurance Institute for Occupational Safety and Health	Clean Production Action (CPA)	United States Environmental Protection Agency (US EPA)	SCIVERA LLC	ChemSec	The WerCS
Designed for	Designed to be used along the supply chain	German companies, although it has been adapted for the Globally Harmonized System (GHS)	Businesses, governments, and individuals concerned about chemical risks	Solvent technicians, engineers, environmental consultants	Designed to be used along the supply chain: for product stewardship, raw materials sourcing, product development, product integrity, regulatory compliance support, product design and evaluation	Downstream users of chemicals, authorities, NGOs, financial investors, procurement staff	Product design and evaluations
Capabilities	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Identifies chemicals of high concern before inclusion in design 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Prioritises substances for alternatives assessment based on attributes of interest 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Identifies completed alternatives assessments, case studies, examples of successful substitutions 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Prioritises substances for alternatives assessment based on attributes of interest Compares alternatives based on one or more attributes 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Prioritises substances for alternatives assessment based on attributes of interest Compares alternatives based on 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Compares alternatives based on one or more attributes Identifies completed alternatives assessments, case studies, examples of successful substitutions 	<ul style="list-style-type: none"> Identifies intrinsic characteristics such as known human health hazards associated with a chemical Prioritises substances for alternatives assessment based on

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SIMILARITY	UL THE WERCS™
	or to prioritise for elimination	<ul style="list-style-type: none"> Compares alternatives based on one or more attributes 	<ul style="list-style-type: none"> Compares alternatives based on one or more attributes Ranks alternatives based on user-chosen attributes 		one or more attributes		attributes of interest <ul style="list-style-type: none"> Compares alternatives based on one or more attributes
Applica- bility	Designed to help users identify that chemicals/substances to not use. Points to alternative portfolios to guide towards what to use instead	For chemical/substance and material/mixture substitutions Can be used to assess alternative chemicals/substances or materials/mixtures and minor process changes. Not intended for robust process change evaluations.	For chemical/substance substitutions. Can be used to compare organic, inorganic, polymeric chemicals/substances and materials/mixtures. Is only intended for chemical hazard assessments.	For chemical/substance, material/mixture, and product/article substitutions and process modifications	For chemical/substance, material, and product substitutions and process modifications	For chemical/substance substitutions	For chemical, material, and product substitutions
Hazard Endpoints		Evaluates the following under GHS guidelines: <ul style="list-style-type: none"> Human Health Hazards Exposure potential Acute health hazards Chronic health hazards 	Human Health Hazards <ul style="list-style-type: none"> Human health group 1 (carcinogenicity, developmental toxicity, endocrine activity, mutagenicity and genotoxicity, reproductive toxicity) Human health 	<ul style="list-style-type: none"> Human toxicity potential (ingestion) Human toxicity potential (inhalation) Human toxicity potential (dermal) Exposure aquatic toxicity potential Global warming potential Ozone depletion potential Photochemical oxidation potential Acid rain potential 	15 human health endpoints and 6 environmental endpoints	<ul style="list-style-type: none"> Endocrine disruption Equivalent level of concern Carcinogenicity Mutagenicity Reproductive toxicity PBT/vPvB Additional information on EU risk/hazard phrases 	GreenScreen Endpoints form the basis of this tool. Existing internal databases include: toxicological, environmental, physio-chemical properties,

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SINIMILARITY	UL THE WERCS™
		Environmental Hazards Chemical/Physical Properties <ul style="list-style-type: none"> • Physicochemical hazards • Process-related hazards 	group 2 (acute mammalian toxicity, systemic toxicity and organ effects, eye irritation, neurotoxicity, respiratory sensitisation, skin irritation, skin sensitisation) Environmental Hazards <ul style="list-style-type: none"> • Acute aquatic toxicity • Chronic aquatic toxicity Environmental Fate <ul style="list-style-type: none"> • Bioaccumulation • Persistence Chemical/Physical Properties <ul style="list-style-type: none"> • Flammability • Reactivity 	Also contains life cycle analysis components			technical feasibility.
Other Evaluations		Exposure		Life-cycle impacts Materials management Technical feasibility	Exposure Life-cycle impacts Materials management	Exposure	Exposure Cost/benefits and availability Materials management Technical feasibility
Data input		Users must consult external data sources (e.g. safety	Users compile hazard data on components of	Users select chemical(s) and processing conditions	User or supplier enters bill of substances (complete	Chemical/CAS name, health and environmental	User enters product formulation or

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SIMILARITY	UL THE WERCS™
		data sheets) and compare against the Column Model's internal standards databases. Users can assess the significance of each potential hazard (qualitative weighting factor) for each situation.	interests using external sources. GreenScreen® contains guidance and refers to resources, including databases that can search for data or chemicals on specified hazard lists.		material and chemical usage). RSLs can be configured by users. Hazard assessment framework (GHS, GreenScreen®, US EPA Safer Choice, etc.) can be selected by users. Users can select exposure scenarios for product types or life cycle stages (product use, occupational, etc.) to refine risk assessment step.	concerns, production volume, use, SIN group, REACH status, appearance on SIN List.	bill of substances and selects hazard endpoints (from internal or external sources). Users define scoring system.
Data output		This tool is a manual method for alternative assessments	This tool is a manual method for alternative assessments	Potential environmental impact scores for current formulation, physical properties, infinite dilution activity coefficients, and ranking of potential alternative solvents	This tool outputs reports detailing the RSL review, hazard evaluation, exposure assessment, risk assessment, and life-cycle evaluation.	Colour-coded rankings for each chemical with a description of similar structures on the SIN List, and also includes chemical hazard information, chemical's use, SIN List group, production volume, producers and a chemical's REACH Status	Graphs and reports
Limitations		Data found in a safety data sheet may be insufficient for a complete evaluation, requiring external data sources	Training and expertise in chemistry and toxicology is required		Although system can protect supplier proprietary ingredient information, it requires supplier to participate in ingredient disclosure to SciVera if manufacturer does		

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SINIMILARITY	UL THE WERCS™
					not know product chemical ingredients.		
User Friendliness	Automated Contains user guidance Available in English only	Contains user guidance Available in multiple languages (English, German, Spanish)	Contains user guidance Provides user training Available in English only	Automated Contains user guidance Available in English only	Automated Provides user training Available in Chinese (Mandarin), English, and other languages upon request	Automated Contains user guidance Provides user training Available in English only	Automated Provides user training Available in Chinese, English, French, German, Italian, Japanese, Portuguese, Russian, Spanish
User Expertise	No special expertise is required to use this tool	Designed for users with scientific or engineering background. Data interpretation requires scientific or engineering background. Knowledge of the manufacturing process is recommended.	Designed for users with scientific or engineering background. Training is needed to use this tool; a strong science background is recommended as a training prerequisite. The tool was developed so that little expertise is needed for data interpretation, although toxicological expertise may be necessary in some instances.	Designed for professionals with an advanced degree in a related field. Some computer experience is required to install and use the tool.	No expertise is required to use the database.	To use results from a SINimilarity search in product development would need further expertise.	Designed for professionals with an advanced degree in a related field.

	MATERIALWISE	COLUMN MODEL	GREENSCREEN® FOR SAFER CHEMICALS	PROGRAM FOR ASSISTING THE REPLACEMENT OF INDUSTRIAL SOLVENTS (PARIS III)	SCIVERA LENS CHEMICAL SAFETY ASSESSMENT SYSTEM	SIN LIST AND SINIMILARITY	UL THE WERCS™
Availability	Under development, for release in 2019	Released in 2006 (the GHS version was released in 2011) and is frequently updated	Released in 2007 and is frequently updated	To be determined	Released in 2010 and is frequently updated. Details of methodology and modelling are explained; weighting factors are built in.	SIN List was released in 2008 and updated in 2009, 2011, 2013, 2014. SINimilarity tool was released October 2014.	Released in 2008 and is frequently updated
Fees	Over USD 1000 to access to alternative assessments	Free of charge	Free of charge	Free of charge	Less than USD 1000	Free of charge	Over USD 1000

Source: Organisation for Economic Co-operation and Development. (s.d.) *Substitution and Alternatives Assessment Tool Selector*. Available at: <http://www.oecdsaatoolbox.org/Home/Tools>; MaterialWise. (s.d.). *How it Works*. Available at: www.materialwise.org

Appendix VIII Theory of Change

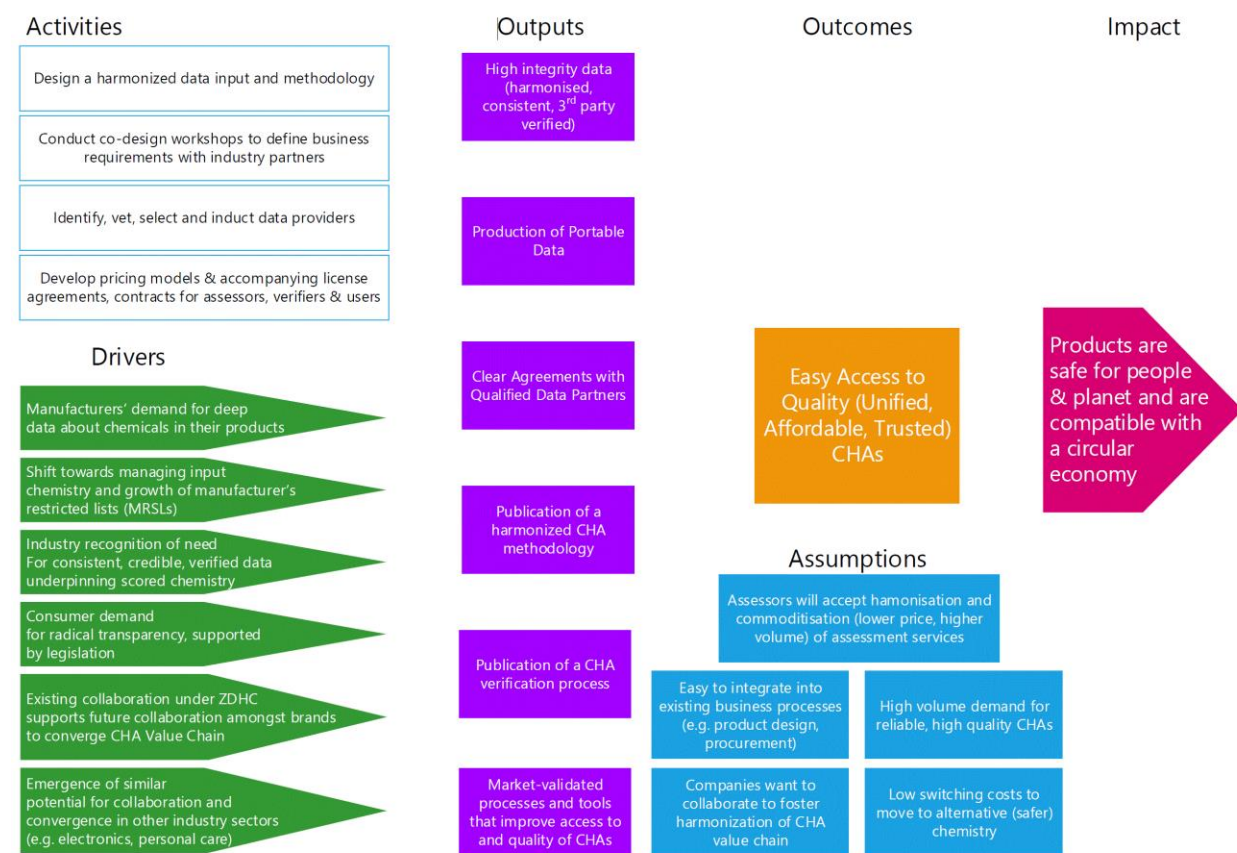
Reconstructed Theory of Change of MaterialWise

The long-term impact of MaterialWise relates to enabling products that are safe for humans, the environment, and is compatible with the notions of circular economy.

The assumptions and drivers underpinning this Theory of Change (TOC) have been identified.

MaterialWise’s envisaged outcome of easy access to high quality chemical hazard assessments (CHAs) will be facilitated by the development of its central output, which is a new approach to material health assessment (which subsumes the six constituent elements listed below).

High quality is defined by the dimensions of being unified (i.e. harmonised across existing assessment systems like C2C, GHS, GreenScreen and allowing for a single agreed assessment on the part of toxicologists/assessors) and trusted (i.e. the underlying constituting data has been prepared by trusted assessors and verified by a qualified third party). Regarding affordability: the pricing model has been theorised to promote high volume usage. While not part of a standard TOC presentation, the activities underpinning the outputs have been mentioned to provide even further clarity regarding the aspects undertaken to build the outputs, which are central to gauging the initiative’s effectiveness thus far.



Appendix IX Evaluation Rubric

The evaluation team used rubrics that reflected the requirements of C&A Foundation’s ToR, together with a 5-level performance scale which deepened C&A Foundation’s Good/Adequate/Poor rating system to allow for further delineation of performance. The system was deployed based on four main criteria. This examination uncovered key insights into MaterialWise’s work and operations, and is in line with the IOA framework presented above.

Five varying levels of performance were identified with descriptions according to each criterion. The assessment of the grant as per the rubric is presented in [Exhibit 7.1](#).

CRITERION / DEFINITION	LEVEL	DESCRIPTION OF PERFORMANCE
Relevance Extent to which the pilot is aligned with the priorities of C&A Foundation, Advisory Board, Co-Design Partners, industry actors, NGOs and business actors; extent to which the pilot filled specific, existing gaps in enabling a circular economy in fashion industry and also other industries; appropriateness of user-centered design.	Fully Relevant (5)	All of the initiative’s objectives are exceptionally well-designed and fully aligned with the priorities of C&A Foundation, co-design partners, and other stakeholders.
	Mostly Relevant (4)	All of the initiative’s objectives are well-designed and well-aligned with the priorities of C&A Foundation, co-design partners, and other stakeholders. In addition, the approach to executing the initiative mostly reflects the values, vision, and mission of C&A Foundation.
	Adequately Relevant (3)	The majority of the initiative’s objectives are adequately designed and aligned with the priorities of C&A Foundation, co-design partners, and other stakeholders. In addition, the approach to executing the initiative adequately reflects the values, vision, and mission of C&A Foundation.
	Partially Relevant (2)	Some of the initiative’s objectives are aligned with the priorities of C&A Foundation, co-design partners, and other stakeholders, but much of the design of the initiative seems to favour other priorities (<i>which can happen when working in partnerships</i>).
	Completely Irrelevant (1)	None of the initiative’s objectives have been specifically designed or aligned to address the priorities of C&A Foundation, co-design partners, and other stakeholders.

CRITERION / DEFINITION	LEVEL	DESCRIPTION OF PERFORMANCE
Effectiveness and Results Likelihood that/ extent to which: results compare with targets; actions bring system change or create its potential; there is consistent, quality engagement with relevant actors; MaterialWise builds upon/leverages other initiatives.	Highly Effective (5)	Performance (likely to) vastly exceed outcomes targets with strong evidence of systems change and potential, robust engagement with stakeholders, and synergy with other relevant initiatives.
	Quite Effective (4)	Performance (likely to) exceed outcomes targets at least in some areas, evidence of systems change and change potential, constructive engagement with stakeholders, and synergy with other relevant initiatives.
	Effective (3)	Performance (likely to) meet outcomes targets in most areas, evidence of systems change and potential, constructive engagement with actors and stakeholders, and cooperation with other relevant initiatives.
	Somewhat Ineffective (2)	Performance (likely to) meet outcomes targets in a few areas, little evidence of systems change and potential to date, reasonable engagement with stakeholders, and communication with other relevant initiatives.
	Completely Ineffective (1)	Performance (likely to be) well short of outcomes targets, no evidence of systems potential, poor engagement with stakeholders, and little communication with other relevant initiatives.
Efficiency Extent to which activities and outputs have been carried out with the appropriate human resources, in a timely and cost-effective manner; extent to which targets were realistically set, given scale of operations; appropriateness of monitoring systems to track outputs and outcomes credibly and systematically	Highly Efficient (5)	Full completion of all programmed activities and delivery of all envisaged outputs significantly ahead of plan, using the appropriate human resources and exceeding value-for-money.
	Quite Efficient (4)	All programmed activities and outputs have been delivered ahead of plan, using the appropriate human resources, with some achieving significant value-for-money.
	Efficient (3)	Programmed activities and outputs have been delivered according to plan, using the appropriate human resources and delivering the anticipated value-for-money.
	Moderately Inefficient (2)	Most of the programmed activities and outputs have not been fully completed, using less than optimal human resource allocation, without delivering the anticipated value-for-money.
	Completely Inefficient (1)	Only a few or none of the programmed activities and outputs have been fully completed, with a seriously inadequate human resource allocation, without delivering value-for-money at all.
Sustainability Extent to which a financially sustainable business and transaction model has been created; extent to which	Exceeds Expectations (5)	Benefits generated by the post-pilot initiative organisations and processes have been, or will likely be, significantly scaled up in terms of geography and/or the addition of further aspects, compared with those achieved during the lifetime of the initiative.
	Mostly Satisfactory (4)	Most of the initiative’s ongoing benefits have persisted, or are likely to persist, beyond the pilot at comparable levels to those achieved during the lifetime of the initiative.

CRITERION / DEFINITION	LEVEL	DESCRIPTION OF PERFORMANCE
results are likely to continue were philanthropic funding to cease (i.e. have in place an exit strategy).	Sustainable (3)	Evidence of continued benefits, or likely continued benefits, beyond the lifetime of the pilot. Planned exit strategies have been implemented or are likely to be implemented.
	Possibly Sustainable (2)	Further support would be needed to assure continued benefits beyond the lifetime of the pilot.
	Not Sustainable (1)	No evidence that benefits are continuing or are likely to continue beyond the lifetime of the pilot initiative and/or the intended benefits are now obsolete and/or intended benefits have been outweighed by subsequent negative impact.

Appendix X Additional Information – Relevance

Figure X.i: C&A Foundation Overall Theory of Change

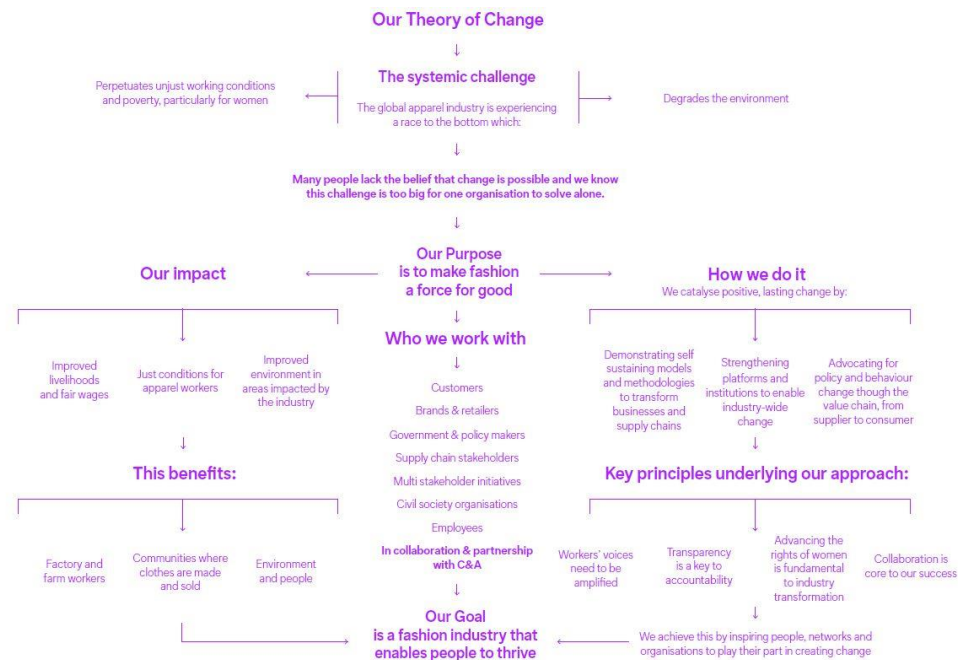


Figure X.ii: Theory of Change of C&A Foundation's Circular Fashion Programme

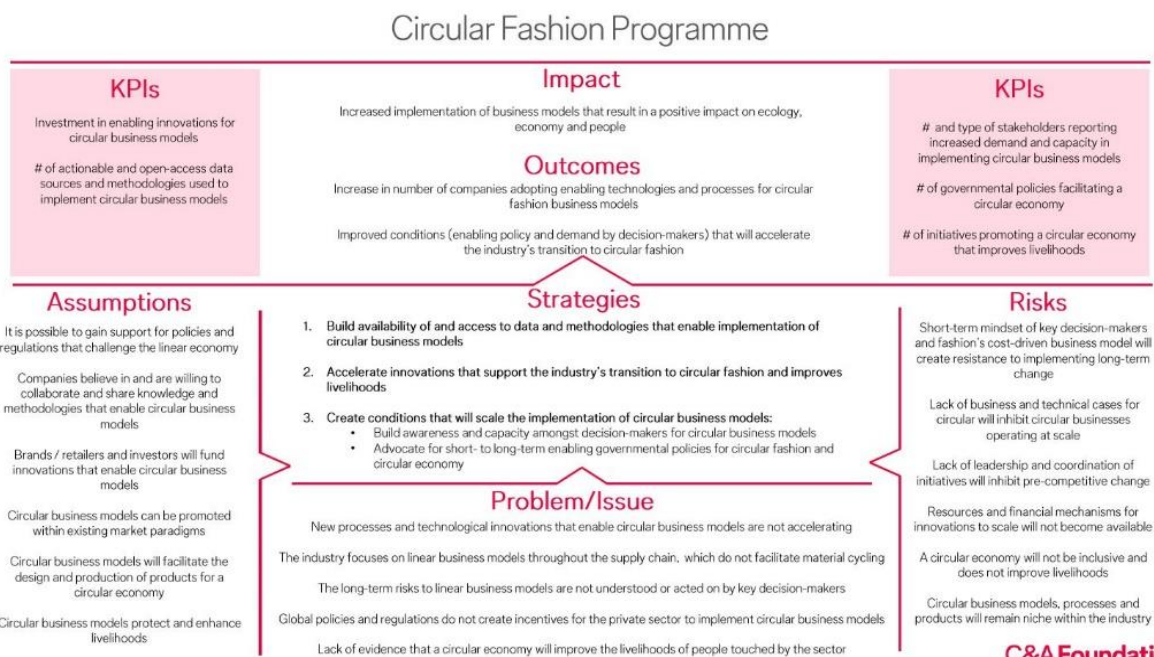


Figure X.iii: Initiatives Funded under C&A Foundation’s Circular Fashion Programme Mapped by the Evaluation Team according to its Strategic Objectives

Actors for change / selected KPIs	SO1: Accelerate innovations that enable implementation of circular business models in fashion supply chain	SO2: Build availability of and access to data/methodologies that enable implementation of circular business models	SO3: Build awareness, demand, and capacity among decision-makers for circular business models	SO4: Advocate for short- to long-term enabling governmental policies for circular economy and fashion	Other mechanisms (including research)
Suppliers Investment in enabling innovations for circular business models # of actionable, open-access data sources/methodologies used to implement circular business models		  			
Brands / retailers # of actionable, open-access data sources/methodologies used to implement circular business models		 A pathway to better chemistry. 	 		 
Institutional Investors # of actionable, open-access data sources/methodologies used to implement circular business models					
Government # of policies facilitating a circular economy				 	
Consumers					

Illustrative Quotes

Relevance of MaterialWise to C&A Foundation Vision, Mission, and Circular Foundation Programme

“MaterialWise could be a huge step forward in reducing the cost and complexity of chemical hazard assessment. [...] It is a huge enabler. Making the whole process efficient. It is a key element if we want this thing to scale. If it comes together, it could be an incredibly important key enabler.”

- Advisory Board Member

“MaterialWise is based on the premise that only safe chemicals can be part of a circular system, and that you need data for that.”

- MaterialWise Staff Member

“Without question, MaterialWise could be that concerted element to make sure that as you circulate, that you’re moving towards less toxic materials.”

- Philanthropic Funder

“We’re very aligned with their Circular Fashion goals. We see safer chemistry as an essential first step in circular materials. You can’t have circular without safe. To get people the information they need, to not re-tox, they need this. We are a fundamental building block of safe and circular. We’re not the only building block. We’re part of a system of transparency and compliance. We’re an excellent complement to the ZDHC in the safe space: getting the data more readily available. Other pillars are 1) designing for circularity; 2) Identifying and testing business models for circularity; 3) circular materials...C&A Foundation [sees] the bigger picture that will be solved for the whole industry when the MaterialWise dataset is scaling.”

- MaterialWise Staff Member

“For us, the focus on the textile industry was important as well as the focus on safe chemistry. While it is not explicitly featured in our TOC, [safe chemistry] is fundamental to circularity; it is in the access to data. You could also consider it as something that supports circular business models and provides information for decision-makers...”

- C&F Circular Fashion Team Member

Relevance of MaterialWise to the Global Apparel Industry

“Similar scores for a chemical formulation are ‘good enough’.”

- Apparel Sector Co-Design Partner

“With our alignment around ZDHC and MRSLs, we are pretty aligned on reducing our use of hazardous chemicals as an industry.”

- Apparel Sector Co-Design Partner

“In the fashion field, brands pretty much use a red/yellow/green approach and tell their suppliers not to use such and such...if it is something that is easily replaceable, fine. If it is red, then tell me what to use instead.”

- Apparel Sector Co-Design Partner

“Right now, we’re pretty limited in what we can tell people.”

- Apparel Sector Co-Design Partner

“Most companies are trying to figure out how to be aligned with regulation with their restricted substances list; they are not thinking much beyond compliance.”

- Apparel Sector Co-Design Partner

“You don’t move towards good chemistry and circular economy only by eliminating bad chemistry.”

- Advisory Board Member

“ZDHC has gotten everyone ripe for better chemistry but it is hard to know if it will take us in this direction.”

- Apparel Sector Co-Design Partner

“The situation is evolving... ZDHC is not yet in the safer chemistry space. Explorations started in 2018, based on the interest of member apparel brands and retailers. Five of them are using their own scored methodologies. They wanted to have something harmonised in safer chemistry assessment; best practice. Screened chemistry has been around for a long time. ZDHC is slowly moving into this area.”

- Apparel Sector Co-Design Partner

“It’s a changing landscape. Recently, ZDHC took screened chemistry under their wing and created a taskforce for safer chemistry. I can’t say what is the place for MaterialWise there, but there is a place. They have a lot of competence. It is good to have second opinions. MaterialWise can help out”.

- Apparel Sector Co-Design Partner

“There are some companies that are more progressive. These are the bigger brands: Nike, Levi’s, and a bit lower: Inditex, H&M, C&A – they have the potential to use the information from MaterialWise. It is a small part of what they need. I don’t know if all companies will be using MaterialWise.”

- Apparel Sector Co-Design Partner

“This is a complex topic, with many different opinions that make it hard to determine what is right for better chemistry, ZDHC, and the textile industry.”

- Apparel Sector Co-Design Partner

“We must radically enable and then accelerate safer material innovation if we want to realise a future where materials cycle perpetually in closed loop systems without toxifying people and the planet... Unlocking and accelerating the realisation of a circular economy requires that we create safe materials and build the systems, infrastructure and technology to keep safe molecules flowing endlessly. Achieving this requires that we leverage chemical hazard evaluation tools to assess and then optimise material chemistry for human and environmental health so that better decisions can be made in the design phase. It also requires collaboration across industries to send demand signals for providing materials and products that are both high performing and optimised to flow through commerce safely. We also need a revolution in recycling technologies to enable circular flow of materials. This kind of systems-level change is only possible when a consortium of like-minded individuals and companies band together and use the power of their collective intelligence and resources to solve the complex problems ahead of us.”

- “The Role of Safe Chemistry and Healthy Materials in Unlocking the Circular Economy, Research Paper published by Google and Ellen MacArthur Foundation, April 2018

Relevance of MaterialWise to Other Industry Sectors

“MaterialWise is interesting to us because it has the ambition to work across sectors. Not only apparel. But also packaging, formulated consumer goods, etc.”

- Philanthropic Funder

“The co-design team is a testament to private players being interested. It shows that there is demand and that MaterialWise is attractive for these companies. They are big and they represent different sectors. It is not only appealing to one sector.”

- Advisory Board Member

“It felt like a super good fit for the broader gap around safety data and chemistry hazard profiles.”

- Philanthropic Funder

“Now that safe chemistry is getting integrated in circular economy language, MaterialWise is entering at the right time. With an acceleration in the population of the database, you would see a spike in its use. This would untie and unlock all the existing intellectual property (IP) around CHAs; there would be a domino effect. A core piece of my strategy for the future is to tell my suppliers to go download the CHA reports, assess them, come to me and show me that you have an optimised a chemical formulation.”

- Electronics Sector Co-Design Partner

“I want to have a fully populated database of assessments so I can tell my team: go find the information in MaterialWise.”

- Electronics Sector Co-Design Partner

“With ZDHC, we are tied to the apparel brands. But if we could link neighbouring supply chains in automotive, tanneries, homeware interiors, building industry, furniture, building materials...the bridge to textile industry is narrow.”

- Co-Design Partner

“Subject to their acceptance in other industries, e.g. the building industry, electronics; this engagement could be a strength to bring zero disposal of hazardous chemicals into those other industries.”

- Co-Design Partner

“We are concerned about exposure levels, both in a single product and aggregate across multiple products. There aren’t solid tools to be able to give that evaluation. MaterialWise will help companies like ours and others to do a more rigorous assessment, especially on aggregate exposure...If MaterialWise can truly fill that gap, it would be a value add. In our industry, there’s a lot of discussion about what is the proper evaluation. Maybe MaterialWise could provide good evidence about which chemicals we should care about and not others. The advantage of lists is that you can see what is on or off. But those same lists can muddy the waters on what really matters and create confusion for what really matters Could MaterialWise be a tool to cut through the noise?”

- Personal Care Sector Informant

“There’s an interesting phenomenon where organisations working in this space set up these initiatives, but they don’t do a lot of follow-through.”

- Personal Care Sector Informant

Appendix XI Additional Information – Effectiveness

Illustrative Quotes

Assessment of Effectiveness

“Right now, were pretty limited in what we can tell people “The pilots are an interesting way of getting at least a few profiles in, but they are not enough to make MaterialWise the place where everyone goes to get their CHAs...and [would be] required to use it. Then the goal would have been accomplished. But that is tens of thousands of chemicals. There needs to be a large increase in scale... At the moment, we don’t have anything else. It is like the cure for cancer. As long as I feel there is no alternative...We don’t care about who solves the problem as long as it gets solved. Many have tried but have failed. And I don’t know of anyone else who is close to solving it.”

- Personal Care Sector Informant

“It is going a lot slower than I would like. It has not been a function of motivation and ambition, but of herding cats, getting the relationships established, funding – the size of her team.”

- Co-design Partner

“MaterialWise gave me a presentation a few weeks ago, it was the clearest version yet. It changed my idea a bit; it made me believe that they are clearer on what they want to do. They build the plane as they fly it; not necessarily the best idea.”

- Co-design Partner

-

Factors on Effectiveness

“MaterialWise has the potential to scale. The biggest retailers are looking for a way forward...Google tried to do it. Even the biggest companies in the world cannot do it on themselves. MaterialWise has its job cut out. It possibly can’t bring everybody along. But they certainly need the brands articulating their desire for something like MaterialWise.”

- Co-design Partner

“Assessors and the current players in the space are scared because this will significantly disturb their model, but their model is not scaling. This disturbance threatens their revenue stream. So it is political, because it is not a global market where you have anonymity. It is a closed environment with individuals; people are protective. Getting Lauren on board was a very good step in dealing with that, she is trustworthy, her approach, her relationships with folks in the industry, etc.”

- Co-design Partner

“What’s missing? They need people who have more expertise in standardisation. If they’re going to make this a big programme, there has to be policies, SOPs, an organisational structure, etc.”

- Assessor

“Not everything has run smoothly, we have encountered some unexpected turns...We have worked methodically with lawyers, leadership, and board committee members toward resolution and have agreed on a fiscal sponsor model to proceed. This resolution would not have been possible without the support, alignment and collaboration of our funders...We recognised the need to start with demand side priorities and to leverage their supply chain for the pilots. As a result, we are spending more time with retailers, brands, and NGOs to shore up the demand side before we have the right access to pilot participants...”

- MaterialWise Staff Member

“Scaling assessment data for the next wave of (less-technical, less-resourced) adopters will require us to tackle formulations and the challenges that come along (e.g. disclosure, IP protection and roll-up methodology for multiple chemicals, etc.). It’s thorny, but it’s a critical challenge that needs to be solved to bridge from single CAS# data to actionable interpretations for the majority of users. Our design activities in the fall will focus on unravelling this challenge. Our commitment to agile, use-centered design and our management teams experience with start-ups helps us handle bumps in the road and make a better product/offering as a result.”

- MaterialWise Mid-Year Report 2018

Appendix XII Additional Information – Efficiency

Illustrative Quotes

Cost-efficiency

“It’s going too slow: the pilots were supposed to start earlier. For me, this has to do with resources. With one [chemist], you can only do that much.”

- Co-design Partner

“They have made significant progress in this last year, they really need to be a position where they scale in the next 6-12 months. Crisp the value proposition, finalise business model. These are all things that if they are not resolved in the next 6-12 months, they will never be resolved. It is top priority.”

- Co-design Partner

“It seems all very slow to me, I would have liked to see more speed. I don’t know what they’ve done in the past 2 years. It seems like they keep refining their pitch.”

- External Stakeholder

“We make sure that we’re profiling the right stuff. Before sending the developers off to code it. Only spend money on the features that they really want.”

- MaterialWise Staff Member

MEL

“MaterialWise does a good job of informing us about its quarterly targets and how it’s meeting quarterly targets.”

- Co-design Partner

“We’re more providing MaterialWise with information as opposed to getting information back; that is natural and acceptable.”

- Co-design Partner

“MaterialWise has done a good job at listening to our feedback, moving and modifying when it was required. They are learning, adapting.”

- Co-design Partner

“MaterialWise has done more reports and updating than most organisations. We receive quarterly reports by email and in between we’ve had regular calls. The quality of the reporting, the monitoring is good.”

- External Stakeholder

Appendix XIII Additional Information – Sustainability

Illustrative Quotes

“MaterialWise has the potential to scale. But it certainly needs the brands articulating their desire for something like MaterialWise.”

- Advisory Board Member

“Once the financial piece is figured out, it should take off. If there is demand, it should absolutely follow on the business model side. They are working on it.”

- Advisory Board Member

“MaterialWise is still looking for its place. Once MaterialWise has found that place, they should be more self-sufficient and find [funding] in other ways.”

- Co-design Partner

“[How is your patience level vis-à-vis MaterialWise?]”

We don’t have anything else! It is like the cure for cancer. As long as I feel there is no alternative...”

- Co-design Partner

“You need assessors to commit to populating the database: you need seed funding to get that going faster.”

- Co-design Partner

“I would hope that MaterialWise stays around in the long term, and I would hope that it would be able to expand into other sectors, not just apparel. CHAs are trendy now, they are needed to make chemical decisions. It is the new way to think about the design, from construction as well as end of life. CHAs are critical for closed loop and recyclability. I wouldn’t say that MaterialWise is critical to circularity but that CHAs are, and how MaterialWise supports that is key.”

- Co-design Partner

“Now, despite the expertise that is being brought into MaterialWise, they still need to bring in assessors. It is a new business model for the assessors. They need to participate, create the profiles, populate the database. They are currently doing that privately for money. Those very same assessments.”

- External Stakeholder

“There is a lot of chemicals out there, there might be a need to evolve the business model over time. I don’t know what are their projections. I can see it being able to continue for at least a decade, but they might have to evolve the business model. It is an evolving field.”

- External Stakeholder

Appendix XIV Terms of Reference

C&A Foundation

Terms of Reference

External Evaluation of the pilot of “MaterialWise” an initiative funded by C&A Foundation

C&A Foundation seeks an Evaluation Team for undertaking an external evaluation of the pilot of MaterialWise (a database that contains third party verified chemical profiles, based on a harmonised standard for chemical assessment, and its associated transaction model) implemented by Cradle2Cradle Product Innovation Institute and Healthy Building Network and funded by C&A Foundation. More details are given below in the terms of reference.

I. Introduction

C&A Foundation is a corporate foundation here to transform the fashion industry. The foundation work with change-makers all over the world, offering financial support, expertise and networks to make the industry work better for every person it touches. The foundation collaborates with a variety of stakeholders, including NGOs and industry partners, and works closely with smallholder farmers and garment workers. Currently, they are concentrating their current efforts in five key areas: accelerating sustainable cotton, improving working conditions for garment workers, eliminating forced and child labour from the apparel supply chain, fostering a transition to circular fashion, and the strengthening communities where they work. In every programme a specific emphasis is placed on the issues facing women and girls as they are disproportionately affected by the challenges of the apparel industry. C&A Foundation is driven by the belief that despite the vast and complex challenges, collaborative action can make fashion a force for good.

C&A Foundation is commissioning the evaluation of the MaterialWise pilot, implemented under the Healthy Building Network, to arrive at an objective assessment of the extent to which MaterialWise met its goals, is relevant to the apparel industry and recommendations and lessons that will enhance learning and inform actions and funding the initiative in the future. MaterialWise aims to house and provide 3rd party verified toxicological data, presented in a consistent way. This can be used to help stakeholders make informed decisions about chemicals so that their choices result in safer products.

The terms of reference present a brief description of the initiative; scope; objectives and key questions; evaluation methodology; stakeholder involvement; roles and responsibilities; evaluation process; deliverables; audience and dissemination; consultant qualifications and projected level of effort.

The evaluation is required to be completed and submitted to C&A Foundation by 22nd July 2019.

1| External Evaluation of MaterialWise Pilot

C&A Foundation

II. The Initiative

MaterialWise is an initiative conceived to address the challenges faced by companies who need reliable, verified information to inform better decision making about the chemicals used to make their products. The aim of the pilot was to a) collaboratively design a searchable database of verified hazard assessments of chemicals that can be compared as part of an alternative assessments and b) assess the financial business model.

MaterialWise's value proposition and core service offering that it is aiming to develop through its pilot:

- **Better chemistry** – a repository of 3rd party verified chemical hazard profiles for alternatives that have been identified for elimination.
- **Aggregating demand, reducing cost** – a transaction model that reduces the cost of assessments by aggregating demand and providing equitable compensation to assessors
- **Harmonized and portable data** – a harmonised input with multiple outputs that support industry standards and creates portable data
- **Transparency** – from methodology and verification to a chemical hazard summary table to support search chemical profile
- **IP Protection** – encouraging maximum disclosure while allowing IP protection of critical formulation-level information
- **Actionable information** – interpretation backed by high quality, current, verified data

The initiative has been funded from December 2017 for 1 year and 4 months with EUR 490,000 in total. Additional grant related details will be provided to the evaluation team by MaterialWise and C&A Foundation.

III. Scope

The independent evaluation should assess the extent to which the pilot achieved the intended objectives and document significant learning from the pilot. The evaluation must assess the extent to which the initiative's design and implementation contributed to its ability to realise intended outcomes. It must identify missed opportunities and potential for building upon the pilot, as required.

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IV. Objectives and Questions

The Evaluation Objectives are to:

1. Review the approach and design implemented by MaterialWise in achieving and / or progress towards scaleable and viable outcomes
2. Assess factors (in design and implementation) that have contributed to or impeded achievement of outcomes
3. Examine the relevance, efficiency, effectiveness and results and sustainability of the initiative and its varied components, thereof
4. Distil actionable and strategic recommendations and lessons from the pilot for future development of MaterialWise

Evaluation Questions: The specific evaluation questions will include, but are not limited to the following:

Relevance:

- To what extent are the initiative strategies and objectives aligned to the C&A Foundation's current vision and mission as well as the Circular Fashion programme's theory of change?
- What specific, existing gaps were filled by the initiative in enabling a circular economy, particularly in the apparel industry?
- To what extent was the user centered design approach employed by the initiative relevant and appropriate in achieving the intended objectives?

Efficiency:

- To what extent has the approach been executed in an efficient manner? Were the targets set by the initiative achieved on time? Were the targets realistic given the scale of operations?
- To what extent has the initiative been cost-effective?
- Did the initiative employ monitoring systems to track outputs and outcomes in a credible, systematic manner? If yes, how?
- What mechanisms (formal or informal) had been put into practice to capture and use results, experiences and lessons (allowing for adaptive management) for internal learning?

Effectiveness and Results:

- What were the results of the MaterialWise pilot? To what extent did the initiative meet its targets? What is the evidence of MaterialWise's overall effectiveness?
- To what extent does the pilot demonstrate MaterialWise's potential to:
 - Increase access, and lower the cost of access, to actionable chemical hazard information to enable brands and manufacturers to create safer products?

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- Increase the quality of the chemical hazard data available to brands and manufacturers through harmonisation of input methodology and 3rd party verification?
- Improve decision making on chemical choices at the pilot companies?
- Create a financially sustainable business and transaction model for MaterialWise?
- Did the initiative sufficiently engage and manage relevant actors and stakeholders? If so, how?
 - How effectively does MaterialWise complement and leverage other existing industry initiatives and solutions? (in apparel and other industries)
 - What has been the effectiveness of engagement with partners in achieving the programme results?
 - Which stakeholder groups are likely to threaten the scaling of MaterialWise?
 - To what extent have the partnerships facilitated by MaterialWise (design group and externally) functioned effectively and efficiently?
- What evidence is there of MaterialWise, if scaled, being able to contribute to wider system shifts and industry transformation for enabling use of safer chemistry in the apparel industry? Which of the strategies should be replicated?
- What unintended results (positive or negative) did the processes employed by MaterialWise produce?
- What external and internal factors as well as challenges and risks have influenced the implementation, successes and failures? And why?
- What are the main lessons learned from the initiative? What are the drivers (both positive and negative) that influenced the achievement or failure of the workstreams?

Sustainability:

- What are the main factors that promote or reduce the sustainability and results of the initiative?
 - What evidence is there that MaterialWise's business and transaction model (or planned adaptations following the pilot) will lead to financial sustainability?
 - To what extent are the results as a whole likely to continue if philanthropic funding depletes?
 - To what extent can the initiative be scaled and / or replicated?
 - What were the missed opportunities?

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V. Methodology

The evaluation of initiative will be theory-based and be undertaken primarily through a qualitative methods, drawing as necessary on available documentary and interview data. It will involve reconstruction / construction of the initiative theory of change.

Documentary review will be conducted based on all existing documents and data held by MaterialWise. The review (alongside initial interviews) will be conducted first.

Semi-structured Interviews will be conducted with informants including:

- MaterialWise staff
- Partner agencies (Government / other NGOs / International agencies), as appropriate
- C&A Foundation staff
- Industry level actors (business, supply chain actors, etc.), as appropriate

Rating system: In addition to this, the evaluation team will employ a rating system (Good, Adequate, Poor) that rates the initiative's overall performance. The rating will be developed in consultation with the Effective Philanthropy team at the foundation.

Stakeholder Involvement is critical to the successful execution of the evaluation. The evaluation is expected to employ a participatory approach providing for meaningful involvement of partners engaged in the initiative.

VI. Stakeholder Involvement

Stakeholder involvement is critical to the successful execution of the evaluation. The evaluation consultancy is expected to retain independence in coming to judgments about the initiative but employ participatory and collaborative approach providing for meaningful involvement of C&A Foundation and MaterialWise management and staff, and actors (government, NGOs, business actors, etc.) involved in the partnership.

The key stakeholders are:

- MaterialWise, Healthy Building Network and C2CPII staff
- Key staff at C&A foundation involved with this initiative
- Relevant staff at industry actors
- Partners
- NGOs and business actors involved

The draft report will be discussed in a meeting and also circulated to relevant MaterialWise, Healthy Building Network staff and C&A Foundation staff and management for review and comments prior to finalisation.

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VII. Roles and Responsibilities

The Head of Effective Philanthropy¹ (the Evaluation Manager) is responsible for:

- Overall responsibility and accountability for management and delivery of the evaluation up to and including approval of the final report;
- Technical guidance for the evaluation consultants throughout the implementation of the evaluation up to and including participation / observation of field visits.
- Leadership of the evaluation draft report review process including collating comments and facilitating discussion and management responses.
- In all of these roles, necessary support will be provided by other members of the C&A Foundation Effective Philanthropy Team – specifically the Evaluation Specialist located in India.

The Programme Manager at C&A Foundation is responsible for:

- Facilitation on the evaluation including access to initiative related data, all documents, and access to stakeholders (internal and external);
- Reviewing and commenting on drafts of the inception and evaluation report;
- Preparing a management response, as and when necessary.

The Manager at MaterialWise is responsible for:

- Facilitation and day-to-day assistance to the evaluation consultants including access to initiative data, all documents, and access to stakeholders;
- Reviewing and commenting on drafts of the inception and evaluation report;
- Preparing a management response, as and when necessary.

The evaluation consultants are responsible for:

- Conducting all necessary qualitative and quantitative assessments and fieldwork;
- Day-to-day management of the evaluation;
- Regular formal and informal reporting to the Evaluation Manager;
- Participation in key evaluation related meetings (kick off meeting, inception report meeting and draft findings meeting etc.)
- Production of deliverables (inception report and evaluation report) in accordance with the Terms of Reference and contractual arrangements.

¹ Head of Effective Philanthropy and the Evaluation Specialist is not involved in the management of the initiative or the day to day operations.

C&A Foundation

The evaluation consultants will report to the Lee Alexander Risby – Head of Effective Philanthropy, C&A Foundation on all issues related to the evaluation, contracts, fees and expenses, and deliverables and commenting / responses processes.

VIII. Evaluation Process

The evaluation will be carried out in conformity with the principles and standards set out in C&A Foundation [minimum requirements](#) and [policy](#) for Monitoring and Evaluation.

The consultants will prepare a succinct evaluation **inception report and work-plan** that will operationalise the Terms of Reference. The inception report will be based on initial documentary review and preliminary interviews with different actors including farmers.

The inception report and work-plan will address the following elements: expectations of the evaluation; roles and responsibilities within the evaluation consulting team; elaboration of the initiative theory of change, as appropriate; any refinements and elaboration to evaluation questions; methods – qualitative and quantitative and data collection, including possible constraints; outline of the final evaluation report and an evaluation matrix linking questions – methods – data sources and indicators.

The inception report and work-plan will be approved by the Head of Effective Philanthropy and act as an agreement between the consultants and the C&A Foundation on how the evaluation is to be conducted.

The consultants will prepare the **draft and final evaluation reports** that describe the evaluation methodology, findings, recommendations and key lessons.

If significant differences arise regarding the interpretation of evidence between C&A Foundation and MaterialWise programme management on the external evaluation report, an opportunity will be provided to formulate a management response to the findings and recommendations. This will be published with the final report.

The main activities and evaluation timetable for this consultancy is set out below:

Evaluation Process	Deadline	Responsibility
Inception report preparation	26 April 2019	Consultant Team
Completion of documentary review / interviews and fieldwork	1 June 2019	Consultant Team
Draft report for comment	26 June 2019	Consultant Team / Head of Effective Philanthropy (facilitator)

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Final report	22 July 2019	Consultant Team
Preparation and copy-editing of report	30 July 2019	C&A Foundation (Effective Philanthropy Team)
Dissemination of the evaluation	30 September 2019	C&A Foundation (Effective Philanthropy Team)

IX. Deliverables

The evaluation requires the consultant to submit the following deliverables:

- Inception report
- End of Data Collection – initial findings workshop or a virtual call to C&A Foundation and MaterialWise / Healthy Building Network staff
- Draft evaluation report
- Findings Meeting (in person meeting with relevant C&A Foundation and MaterialWise staff)
- Final evaluation report, not to exceed 30 pages, with a two page executive summary

X. Audience and Dissemination

Main audiences for the evaluation will be: C&A Foundation, MaterialWise and the Healthy Building Network. The final evaluation report will be published by C&A Foundation and disseminated through websites and social media.

Learning products including a lessons notes will be developed after the completion of the evaluation.

XI. Consultant Requirements and Level of Effort

Applicants may be individual consultant, a group of individual consultants with a designated team lead, or consulting companies with relevant evaluation expertise. Applicants must have at a minimum the following qualifications:

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- Substantial experience in conducting evaluations of a high standard with experience in supply chains, chemicals and/or initiative promoting collaboration;
- Programmatic / strategic evaluation experience to inform further development of operations related to field building;
- Additional experience is expected in:
 - Methods for evaluating collaborative initiatives;
 - Theory-based evaluation designs;
 - Qualitative methods;
- Knowledge of chemical hazard assessment processes
- Strong facilitation skills and proven ability to lead participatory processes;
- Fluency in English (spoken and written) is essential; and
- No conflict of interest with C&A foundation and MaterialWise or Healthy Building Network

The expected level of effort for the evaluation is approximately 25 working days. This is an estimate – the level of effort proposed must be aligned with the proposed methodology.

A. Technical Proposal

- A narrative proposal (no more than 5 - 6 pages excluding annexes) and including the following sections:
 - a) Evaluation Methodology: Describe your overall approach and evaluation methodology including, and not limited to, evaluation questions, evaluation design and methodology.
 - b) Relevant Experience: Provide details of projects of similar scope, complexity and nature you have worked on previously. Please include any experience with partnerships and system change initiatives. Include also any experience with summative evaluations in chemicals.
 - c) Specific Expertise: Describe your level of knowledge and expertise conducting partnerships and systems change initiative evaluations.
 - d) Key Personnel and Staffing: Describe the key personnel. Include CVs (no more than 2 pages each and attached as annex) of key personnel who would be part of the proposed plan.
 - e) Timeline: Include a detailed timeline of key activities.
 - f) Sample reports: Two sample evaluation reports authored by the team lead (will be treated as confidential and used for purposes of selection)

B. Financial proposal

- The financial proposal should include a line-item budget and a budget narrative. The cost estimates used to prepare the budget should be presented in Euros.