

First year report project

circular 

September 2021

Nancy Bocken
Ankita Das
Marc Dijk
Deanna Han
Jan Konietzko
Laura Niessen

OVERVIEW

The circular economy seeks to narrow, slow, close and regenerate resource flows (Figure 1). Circular business models are about creating significant positive, and significantly reduced negative impacts for the environment and society, focused on resource-preserving activities like reuse, refurbishment, remanufacturing, recycling, and regeneration (Boons & Lüdeke-Freund, 2013; Bocken & Geradts, 2020; Lüdeke-Freund et al., 2019). This is achieved through changes in how an organization and its ecosystem create, deliver, and capture value.

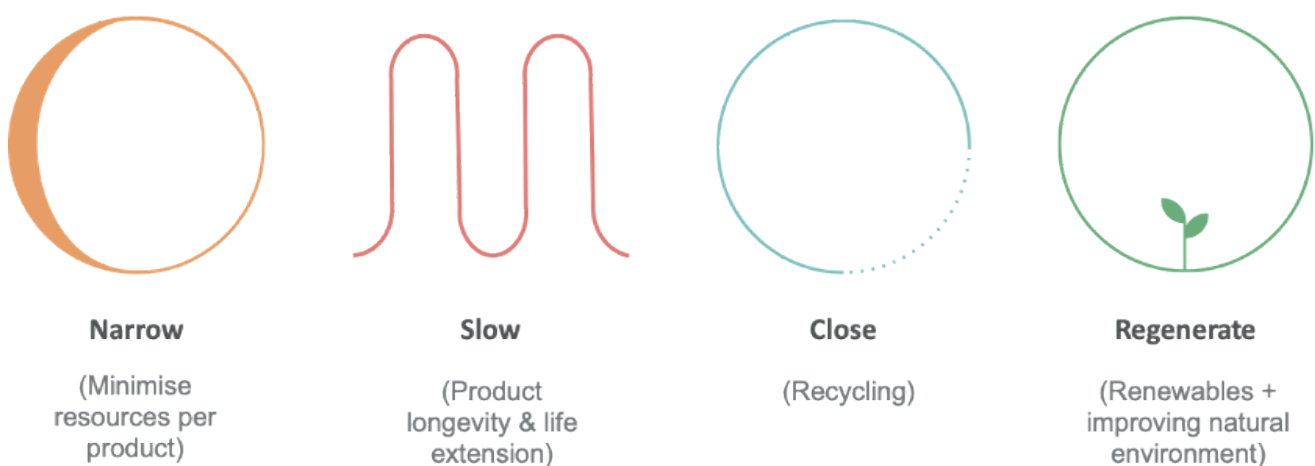


Figure 1. Circular strategies. Based on Bocken et al. [2016] and Konietzko et al. [2020]

The transition to a circular economy requires more services to maintain and repair, refurbish, remanufacture and recycle products. Already today we see a shift towards more service-oriented business models, like mobility as a service or pay-per-use models for washing machines. Product based companies have started to experiment with these models, to increase the resource efficiency of their offerings, build closer customer relationships, and to generate recurring revenue.



However, circular service business models (CSBMs) are far from mainstream, and research focused on experimentation – the process of change towards new service business models – is little understood.

Project [Circular X](#) is a 5-year project running from mid-2020 till 2025 at Maastricht Sustainability Institute, funded by the [European Research Council \(ERC\)](#). It has four key objectives:

- 1. Advancing understanding of CSBMs; their emergence and impacts*
- 2. Advancing knowledge on CSBM experimentation*
- 3. Developing CSBM experimentation tools*
- 4. Designing and deploying CSBM experimentation labs*

This report summarizes the outcomes of the first year into the project. It details the project timeline and progress, coverage in the media, launched tools for companies, publications and established partnerships.

In sum, after the first year, project Circular X has been covered in multiple media outlets, reached over 2000 people through public speaking engagements, gained over 200 followers on Twitter, and over 600 on LinkedIn, and produced 2 business tools and 15 publications.



Some key research findings and highlights from the Circular X project after the first year include:

1. Circular Business Model Experimentation is found to be an iterative approach to develop and test circular value propositions in a real-life context with customers and stakeholders, starting with a shared goal.

The new field of Circular Business Model Experimentation emerges from 4 dominant streams of research - business, transitions, engineering and design. Recently the field has become more interdisciplinary and more tools and methods have been created. More can be read in the [joint paper](#).

2. Seven years after the original sustainable business model archetypes paper published in Journal of Cleaner Production, we launched a follow-up [joint study](#) about unsustainable business models. We found that global sectors such as food, clothing and finance still suffer from institutionalised unsustainable business models. Awareness of such unsustainable business models can help break these down at a sector level. Several unsustainable business model types were identified:

- 1) Environmental resource exploitation and waste
- 2) Human resource exploitation and waste
- 3) Economic exploitation
- 4) Unhealthy or unsustainable offering
- 5) Quantity over quality and value
- 6) Addictive consumption pattern
- 7) Complex opaque global value chain
- 8) Short-term shareholder – not stakeholder value
- 9) Financing and supporting unsustainable practices.

More on sustainable solutions can be found in this [joint paper](#).

3. Laura Niessen's first PhD paper with Nancy Bocken found that an increasing number of businesses want to drive sufficient consumption through their business strategies. While they face barriers such as the financial viability of sufficiency strategies, they all see it as a business responsibility and the way forward in the future. The new [Business for Sufficiency framework](#) can help business map their current strategies and find potential gaps.

4. The New Business Models (NBM) 2021 conference paper led by Ankita Das found that CSBMs are often developed without forecasting their environmental impact. This is important as well-intentioned circular solutions can have unintended rebound effects. In addition, most organisations currently measure environmental impacts using rules of thumb, followed by LCA/LCA-based methods and the GHG protocol. Many practitioners feel that current methods of environmental impact measurement are time-consuming and complicated to use, and therefore not fit for the rapid business experimentation process. Current impact measurement methods are not made to forecast impacts and are thus not fit for an innovation context of high uncertainty. The findings were based on 29 interviews and 39 survey responses with business developers and managers and are being used as an input for future tool development.

5. The NBM conference paper led by Deanna Han found that companies strategically introduce different circular business models in different countries. Her work investigated the rationale of such circular business model introductions and found that factors such as cultural norms, but also the saturation of the market and regulation matter for variations in circular business model introductions.

6. The Circularity Card Deck and circular business model experimentation workshops by Jan Konietzko and Nancy Bocken helped innovators, entrepreneurs and designers from various businesses (e.g., Swapfiets, Polestar, HEMA) become more aware of their current circular strategies and possible future circular business experiments.

7. The boundary tool workshops led by Myrthe Velter helped organisations in The Netherlands develop collaborative circular business models by exploring each other's organizational boundaries that might change as a result of a newly introduced circular economy proposition in the value chain and by defining follow-up interventions to start collaborating.

PROJECT TIMELINE AND PROGRESS

Circular X consists of 4 sub projects, based on the main objectives. Figure 2 shows that the project is on track. For sub project 1 on understanding circular business models, our online case database was first launched in 2020. Since its inception, the case database has been growing and includes many examples of circular business model experimentation. For sub project 2, progress has been made in understanding the concept of circular business model experimentation through literature and practice review which has led to a joint publication.

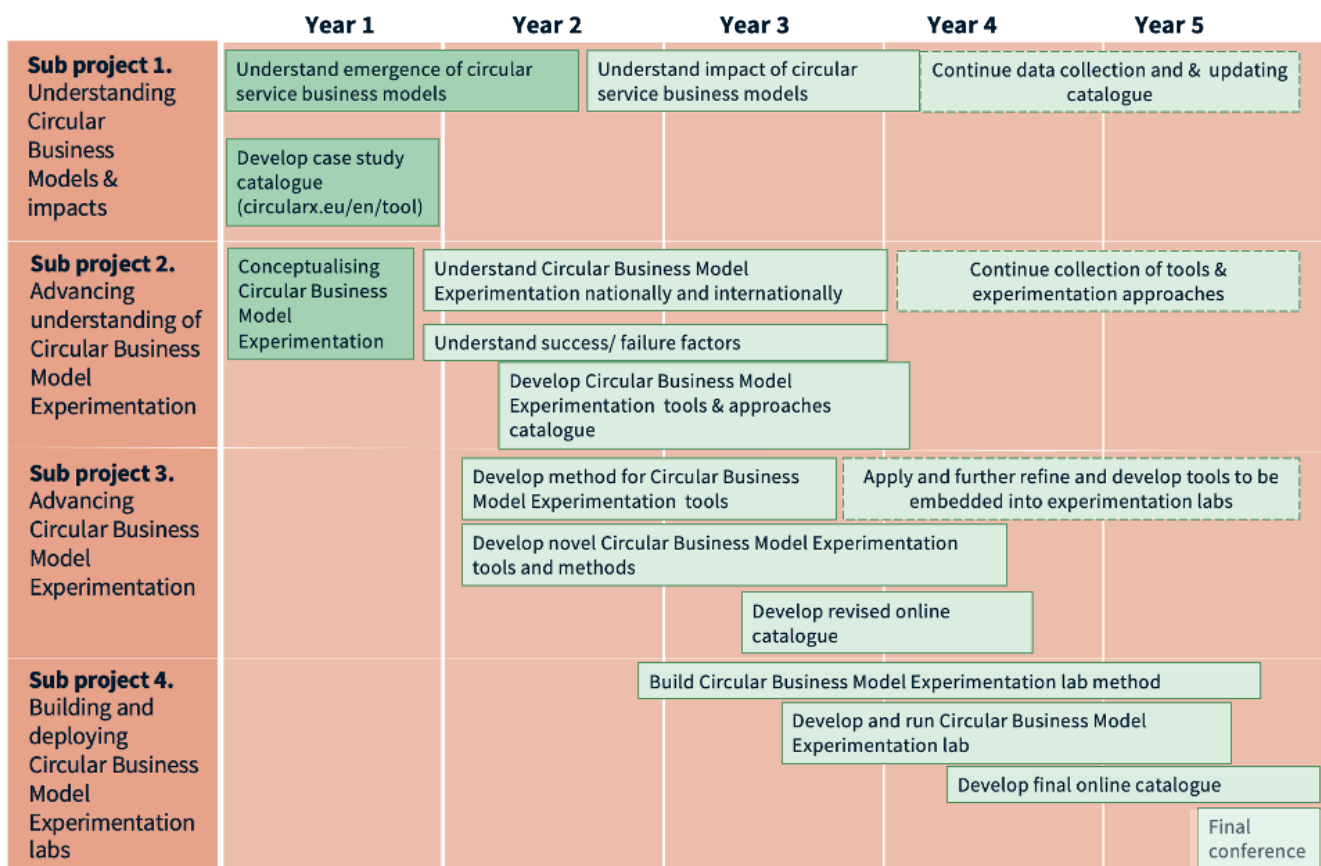


Figure 2. Project overview



Work on various circular business model experimentation tools has started. For example, the boundary tool tested by business and academics, work led by Myrthe Velter, got launched in 2021. In the same year, Laura Niessen published a conceptual framework on Business strategies for Sufficiency together with Nancy Bocken, which could serve as an inspiration for others. Deanna Han has presented her work on strategic location decisions when companies launch different circular business models in different countries, supporting the understanding of the international emergence of different business models at the 2021 virtual NBM conference. At the same conference, Ankita Das presented on her findings on how companies assess the environmental impact of new circular service business models, contributing to project 1.

The monthly team meetings (and walks!) continue to help shape the project (and keep the project team in shape!).



IN THE MEDIA

Presentations by team members

To raise awareness of circular business models and experimentation opportunities as well as to share insights gained through the Circular X research, the team members have regularly taken the opportunity to present Circular X and its research outputs to expert as well as laymen audiences. Table 1 below provides an overview of presentations and their approximate outreach potential from June 2020 to June 2021.

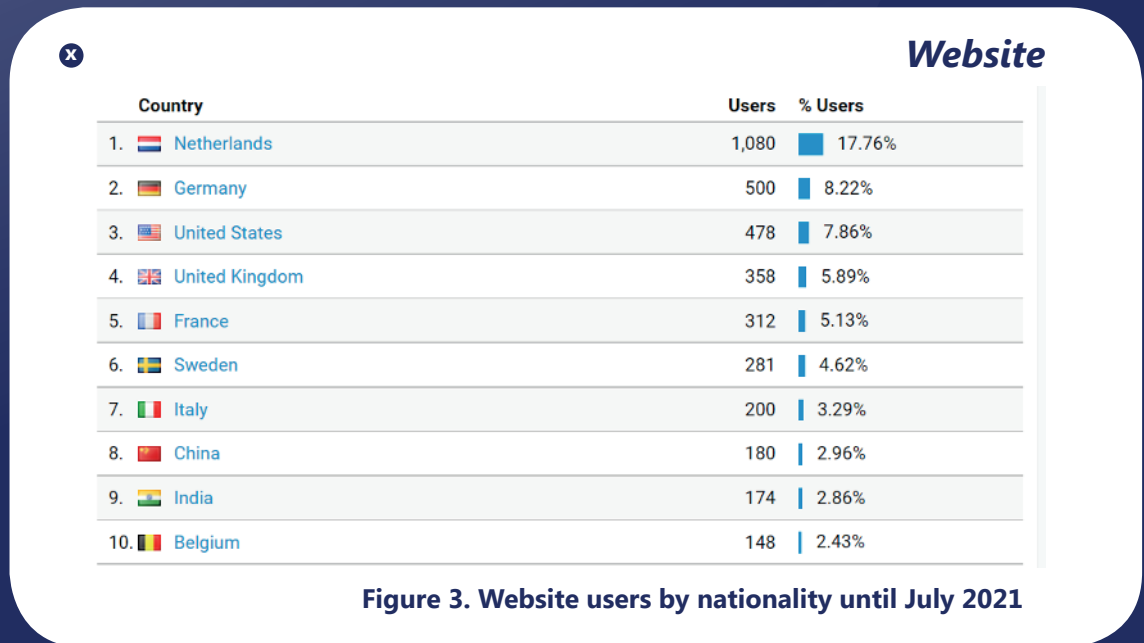
Table 1. Presentations/ interviews by the team

Date	Title / Topic	Team member	Channel	Approx. Audience #
11/06/2021	Locality Matters – Understanding the emergence of business models across different countries	<i>Deanna Han</i>	New Business Models Conference 2021 (online)	40+ (mainly academia)
10/06/2021	Tracking environmental impacts while experimenting with circular service business models	<i>Ankita Das</i>	New Business Models Conference 2021 (online)	35+ (mainly academia)
08/06/2021	The Road towards Sustainable Consumption	<i>Laura Niessen & Nancy Bocken</i>	York Festival of Ideas (online)	100 (mainly general public)
27/05/2021	Business action for sufficiency – Towards viable business strategies	<i>Laura Niessen</i>	Product Lifetimes & Environment (PLATE) 2021 conference (online)	20 (mainly academia)
19/05/2021	Boosting circular economy: Sustainable business models, innovation and experimentation	<i>Nancy Bocken</i>	University of Helsinki Sustainability Science Days (online)	400+ participants (mainly academia, and policy and business)
18/05/2021	Business models for the circular economy	<i>Nancy Bocken</i>	Nuffic MOOC in Global Entrepreneurship	400+ participants (all continents, professionals and academics +- aged 18-40)
15/04/2021	Circular Business Models	<i>Nancy Bocken</i>	Pakhuis de Zwijger podcast (online)	Freely available online: https://dezwijger.nl/update/podcast-99-nancy-bocken
01/04/2021	City as a Service	<i>Nancy Bocken</i>	ABN AMRO Bank's Destination 2032 podcast (online)	Freely available online: https://www.big-orange.nl/news/26-abn-amro-podcast-destination-2032
26/03/2021	Masterclass on Circular Business Models	<i>Jan Konietzko</i>	Impact Hub Amsterdam (online)	
24/03/2021	Sustainable business models	<i>Nancy Bocken</i>	Deloitte Sustainability Week at Technical University of Denmark (online)	170 (business)
24/02/2021	Circular solutions	<i>Nancy Bocken</i>	Studium Generale lecture, Maastricht University (online)	80 (academic and business)

Date	Title / Topic	Team member	Channel	Approx. Audience #
18/02/2021	Sustainable business models and the circular economy: initial findings from project Circular X	Nancy Bocken	Trinity Business Ethics Speaker Series at Trinity College Dublin (online)	100 + (academic)
19/01/2021	Circularity as the new normal	Nancy Bocken	Report launch webinar with WWF and PwC(online)	260 (business, policy, academic)
04/01/2021	Wat doet jouw bedrijf om de wereld te redden? (What does your company do to save the world?)	Nancy Bocken	BNR radio podcast Werkprofessor (online)	Freely available podcast series: https://www.bnr.nl/podcast/
25/11/2020	How to implement circular business models?	Nancy Bocken	Livin Innovation interview (online)	Freely available online interview: https://business-spirit.news/video/how-to-implement-circular-business-models-living-innovation-interview
29/10/2020	Workshop and keynote: Experimentation with - Circular Service Business Models	Nancy Bocken	University of Helsinki Sustainability Science Days (online)	400+ participants (mainly academia, and policy and business)
09/11/2020	Circular X – Experimentation with Circular Service Business Models	Nancy Bocken	LUT University, Lappeenranta, Finland (online)	100+
09/10/2020	Four lessons for Entrepreneurs (for Dutch Sustainability Day)	Nancy Bocken & Innoboost	Blog	Freely available online: https://www.circularx.eu/en/news/29/four-lessons-for-circular-entrepreneurs
01/10/2020	A Circular Economy Approach	Nancy Bocken	ABN AMRO Bank's Destination 2032 podcast (online)	Freely available online: https://www.big-orange.nl/news/26-abn-amro-podcast-destination-2032
29/09/2020	Circular economy innovation – an introduction	Nancy Bocken	Act4GlobalGoals festival (online)	75
01/07/2020	Business model experimentation for the Circular Economy: an emerging research agenda	Nancy Bocken	New Business Models (NBM) Conference 2020 (online)	250
09/06/2020	Panel speaker at "Shaping the Post-Corona World: Responses for Society and Business – Online Event"	Nancy Bocken	Studium Generale lecture, Maastricht University (online)	80 (academic and business)

SOCIAL MEDIA & NEWSLETTER

Project Circular X is actively represented on social media through the LinkedIn and Twitter platforms and additionally reaches out to its audience through a quarterly newsletter. After first going live in mid-2020, the social media accounts and newsletter have seen a steady increase in interest and subscriptions (Figure 3).



LinkedIn

With the first post going live in September 2020, the Circular X LinkedIn page has seen a continuous rise of followers. The top ten locations with the highest amounts of followers were located in the Netherlands, Germany, the United Kingdom, Finland, Denmark and Sweden. The top three lines of work of Circular X LinkedIn followers were business development, education and research. In the first year of Project Circular X (until September 2021), 25 posts were created with a total combined reach of 22.999 impressions, 529 reactions and 53 shares.

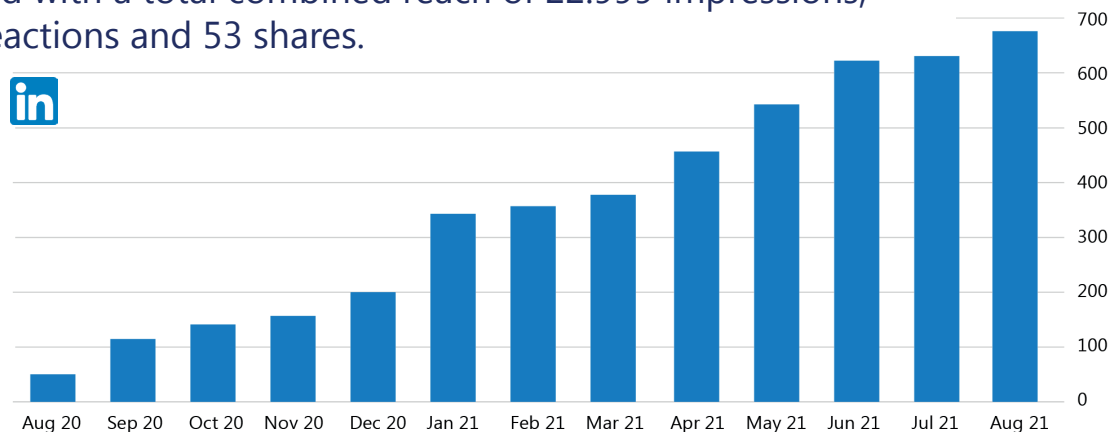


Figure 4. LinkedIn followers Circular X

Since its launch in June 2020, the Project Circular X Twitter account has steadily gained followers (Figure 5). Circular X Twitter provides audience updates on new publications, outreach, and project development, as well as news related to broader sustainability and circular economy issues. Additionally, Circular X Twitter actively engages with top scholars and practitioners in the field. In the first year of Project Circular X (until September 2021), 135 posts were tweeted with a cumulative reach of 348.665 impressions and 7.324 profile visits.

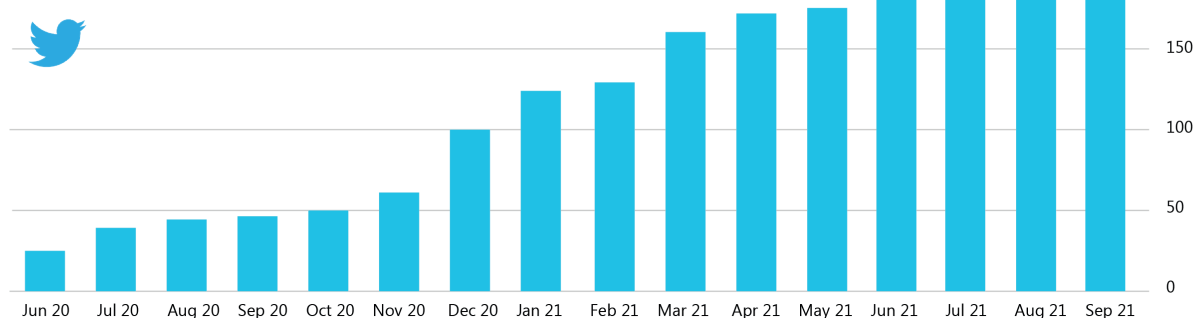


Figure 5. Twitter followers

Newsletter

The Circular X newsletter is sent on a quarterly basis through the Mailchimp application. In addition to the four newsletters sent in September 2020, December 2020, April 2021 and July 2021, a 'flash news' item was sent in January 2021 to inform subscribers of the upcoming Circular Economy Week in the Netherlands. The newsletters provide updates about progress in the project, collaborations, publications, and outreach. Interested parties can subscribe through the website and the audience list is updated regularly. There has been a continuous stream of new subscribers with 261 subscribers at the end of August 2021 (Figure 6).

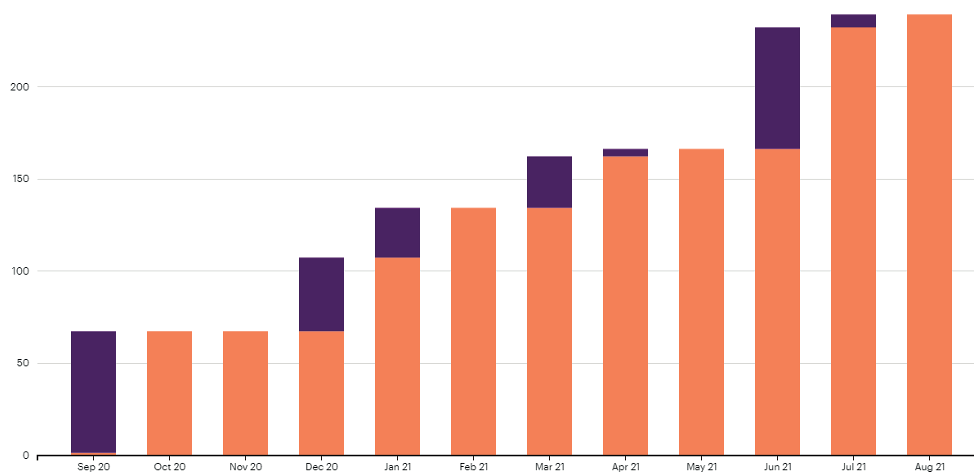


Figure 6. Newsletter subscriptions

THE CASE STUDY DATABASE

In its first year, Circular X has created [a curated online catalogue](#) of 39 circular business model cases. The case studies span across 8 high environmental impact industrial sectors: Mobility, Energy-using appliances, Fashion, Food, Furniture, Construction, Consumer goods and Digital Platforms. Each business case describes the main circular resource strategies used by the company, the main business model aspects (value proposition, creation, capture and delivery) and the potential sustainability outcomes of such business models and institutional contexts. Many of the cases have been developed with direct input from the case companies. The future plan is to expand this case study database to at least 100 business cases.

TOOLS AND FRAMEWORKS

As part of advancing knowledge on circular service business models and supporting business in driving innovation, the research undertaken by Circular X involves developing tools and frameworks.

Business for Sufficiency framework

The Business for Sufficiency (BfS) framework (Figure 7) was developed by Laura Niessen and Nancy Bocken in order to provide a conceptual background on different strategies for businesses to drive sufficiency or sustainable consumption. Based on the waste hierarchy and research by Sachs (1993) and Bocken & Allwood (2012), the BfS framework categorises 16 different strategies into sufficiency dimensions ('the four lessens') and the messaging of the business to the consumer ('Rethink-Reduce-Refuse consumption').

	Rethink <i>Consume differently</i>	Reduce <i>Consume less</i>	Refuse <i>Don't (over)consume</i>
Less clutter <i>Simplified & less</i>	No ownership (N.O.) Personalised production Green alternative	N.O. + price incentive Demand reduction service	Moderating sales Question consumption
Less speed <i>Slower & more reliable</i>	Reuse Personalised production Green alternative	Life extension service Long product warranties	Question consumption
Less distance <i>Regional & disentangled</i>	Green alternative	Short distance promotion	Question consumption
Less market <i>Beyond commerce</i>	Open-Source creation Exchange platforms	Support for repair & reuse Exchange platforms	Support for self-sufficiency
	Design	Awareness-raising	

Figure 7 . Business for Sufficiency framework

While already useful for both research and practitioners in providing a clear overview of sufficiency strategy options, the BfS framework can in a next step be developed into a tool for use in companies aiming to promote sufficiency.

The Boundary Tool

The Boundary Tool (Figure 8) was developed by Myrthe Velter as part of her PhD research to help businesses engage in multi-stakeholder collaboration for circular business model innovation by focusing on complementarities and mismatches in stakeholders' identities, relations, competences and activities. It is a process tool that consists of five steps to facilitate multi-stakeholder alignment for sustainable business model innovation:

1. Defining a collective ambition,
2. Mapping and negotiating the changing organizational boundaries,
3. Exploring opportunities and tensions for aligning stakeholders,
4. Defining first interventions, and
5. Developing a collaboration pitch.



Figure 8. Boundary tool

The Boundary Tool helps organizations bridge the gap between stakeholders by letting them explore each other's organizational boundaries and collaborate towards creating common actionable goals.

PUBLICATIONS

As part of the academic efforts of Circular X, the project so far developed 8 journal articles, 4 conference contributions, one report, one contribution in Dutch and one book chapter.

Articles published during project Circular X:

[Niessen, L., Bocken, N. \(2021\). How can business drive sufficiency? The business for sufficiency framework. Sustainable Production and Consumption, 28, 1090-1103 \(open access\).](#)

[Bocken, N., Short, S. \(2021\) Unsustainable Business Models – Recognising and resolving institutionalised social and environmental harm. Journal of Cleaner Production, 312, 127828 \(open access\).](#)

[Bocken, N. M., Weissbrod, I., & Antikainen, M. \(2021\). Business Model Experimentation for the Circular Economy: Definition and Approaches. Circular Economy and Sustainability, 1-33 \(open access\).](#)

[Bocken, N., Weissbrod, I., & Antikainen, M. \(2021\) Business experimentation for sustainability: emerging perspectives. Journal of Cleaner Production, 281, 124904124904.](#)
Open access available [here](#).

[Çetin, S., De Wolf, C., Bocken, N. \(2021\) Circular Digital Built Environment: An Emerging Framework, Sustainability, 13, 6348](#)

[Ritala, P., Albareda, L., & Bocken, N. \(2021\) Value creation and appropriation in economic, social, and environmental domains: Recognizing and resolving the institutionalized asymmetries. Journal of Cleaner Production, 290, 125796.](#)
Open access available [here](#).

[Henry, M., Schraven, D., Bocken, N., Frenken, K., Hekkert, M., & Kirchherr, J. \(2021\) The battle of the buzzwords: A comparative review of the circular economy and the sharing economy concepts. Environmental Innovation and Societal Transitions, 38, 1-21.](#)

[Velter, M., Bitzer, V., & Bocken, N. \(in press\). A boundary tool for multi-stakeholder sustainable business model innovation. Circular Economy and Sustainability.](#)

Conference contributions project Circular X:

[Bocken, N., Weissbrod, I., & Antikainen, M. \(2020, June\). The Emerging Research Field of Experimentation for Circular Business Model Innovation. In 5th international online conference on New Business Models: Sustainable. Circular. Inclusive. \(pp. 106-110\).](#)

[Das, A., Konietzko, J., Bocken, N. \(2021\). Tracking Environmental Impacts while Experimenting with Circular Service Business Models. New Business Models Conference, Halmstad, 9-11 June 2021 \(pp. 662-666\).](#)

[Han, D., Bocken, N., Dijk, M., Konietzko, J. \(2021\). Locality Matters-Understanding The Emergence of Circular Service Business Models across Different Countries. New Business Models Conference, Halmstad, 9-11 June 2021 \(pp. 253-257\).](#)

[Niessen, L., Bocken, N. \(2021\). Business action for sufficiency – towards viable business strategies, Product Lifetimes and the Environment \(PLATE\), \(virtual\) 26-28 May 2021.](#)

Book chapters Circular X

[Bocken, N. \(2021\) Circular Business Models – mapping experimentation in multinational firms. In: Kopnina, H., Poldner, K.A., \(Eds\).“ Circular Economy: Challenges and opportunities for ethical and sustainable business”, Routledge.](#)

Other outputs

[Bocken, N. M. P., Stahel, W., Dobrauz, G., Koumbarakis, A., Obst, M., Matzdorf, P. \(2021\) Circularity as the new normal. Future fitting Swiss business strategies. WWF Switzerland and PWC.](#)

[Niessen, L., Bocken, N., Dijk, M. \(2021\). Sufficiency in de stad: ‘Leven van genoeg’. Degrowth Daily, p.40.](#)



TEAM AND VISITORS

Nancy Bocken is Professor in Sustainable Business at Maastricht Sustainability Institute, Maastricht University. She is also visiting professor at Lund University, Sweden and LUT University Finland, and Fellow at the Cambridge Institute for Sustainability Leadership. She is co-founder of HOMIE, a 'pay-per-use' business pursuing the circular economy. Nancy's research evolves around the broad field of Sustainable Business, including topics like sustainable business models, business experiments, Circular Economy, sufficiency, and closing the 'idea-action' gap in sustainability through novel tools and approaches. She is the Principal Investigator of Circular X which focuses on 'experimenting with circular service business models'.



Prof. Dr. Nancy Bocken

*Principal investigator/
project lead*



Ankita Das
PhD student

Ankita's research interests are on designing tools that can foster circular business experiments, balancing the environmental and social costs of circularity, and scaling circular business models to developing countries. She is originally from Odisha, India. and has a BSc. (Hons.) in Zoology & Biochemistry. She moved to Europe in 2017 to pursue an Erasmus Mundus Joint Master's in Environmental Sciences, Policy & Management at three European Universities. Since then, she has worked in various roles; as a consultant for universities, research agencies, and UNIDO, and co-founded a circular water reuse start-up in Sweden. Under Circular X, her current research focuses on exploring how companies can forecast the environmental impact of their circular business model ideas, during the experimentation phase.

Ankita presented her first paper at the New Business Models conference 2021:

- Das, A Das, A., Konietzko, J., Bocken, N. 2021. Tracking Environmental Impacts while Experimenting with Circular Service Business Models. New Business Models Conference, Halmstad, 9-11 June 2021.

Marc's main research interests are innovation and innovation policy, sustainability assessment and societal transformation. Currently he also works in an action-research project on Urban Living Labs experiments focused on learning and upscaling. He has published on innovation in electric mobility, urban mobility, solar energy and resource efficiency. He teaches an integrative approach to sustainability assessment & innovation. It combines the understanding of stakeholders (perspectives, practices, etc.) with systems analysis (Qualitative Systems Analysis, Life Cycle Analysis, etc.). In Circular X, Marc supervises PhD-students and is excited to contribute to circular services innovation.



Dr. Marc Dijk

*Assistant professor
in Innovation &
Sustainability
at Maastricht
Sustainability
Institute at Maastricht
University**

**Honorable Research Associate at Oxford University (School of Geography and the Environment, Transport Studies Unit)*



Deanna Han
PhD student

Deanna is a PhD student in circular business models under the ERC funded Circular X project at the Maastricht Sustainability Institute. Prior to her PhD studies, she completed a BSc in Chemistry at York University in Canada. In 2018, Deanna obtained an MSc in Carbon Management from the University of Edinburgh, finishing with distinction. Her dissertation was on exploring the role of stakeholders in circular entrepreneurship in Denmark. Since graduation, she co-founded a consultancy start-up that helps organizations mitigate their emissions through negative emissions technologies. In her current research, she explores the factors influencing circular service business model pilots in different countries and the strategies companies employ to adapt to these factors. Deanna presented her first paper at the New Business Models conference 2021:

- Han, D., Bocken, N., Dijk, M., Konietzko, J. 2021. *Locality Matters-Understanding The Emergence of Circular Service Business Models across Different Countries*. New Business Models Conference, Halmstad, 9-11 June 2021.

Jan researches and supports organizations in their transformation towards sustainability and a circular economy. His mission is to develop knowledge and tools that facilitate positive environmental change. He has a Ph.D. from Delft University of Technology in Innovation Management for a Circular Economy, and a M.Sc. in Sustainability Economics and Management from Leipzig University. Within Circular X, Jan researches the innovation process for a circular economy in organizations. Next to his role at Circular X, Jan works as a Sustainability Consultant at Cognizant, where he leads the domain on circular economy.

Jan has run various Circular X workshops, completed his PhD thesis on business innovation for a circular economy, and has been co-supervising the two PhD students Ankita Das and Deanna Han.



Dr. Jan Konietzko
Research fellow



Laura Nießen
PhD student

Laura is a PhD student in businesses driving sufficient consumption under the ERC funded Circular X project at the Maastricht Sustainability Institute. Her background is interdisciplinary with a BA in European Studies and an MSc in Environmental Studies and Sustainability Sciences. Previously, Laura worked on circular economy research and policy in Ireland, providing support for research and circular economy business development. Her PhD research investigates how businesses can drive sustainable consumption through sufficiency-based approaches. Laura presented and published the following studies in her first PhD year:

- Niessen, L., Bocken, N. (2021). *Business action for sufficiency - towards viable business strategies, Product Lifetimes and the Environment (PLATE) (virtual)* 26-28 May 2021.
- Niessen, L., Bocken, N., Dijk, M. (2021). *Sufficiency in de stad: 'leven van genoeg'. Degrowth Daily*, p. 40.
- Niessen, L., Bocken, N. (2021) *How can Businesses Drive Sufficiency? The Business for Sufficiency Framework. Sustainable Production and Consumption*, 28, 1090-1103

Sam Short holds a PhD in industrial sustainability (University of Cambridge), an MBA, and an MEng in manufacturing, and has extensive international business experience. He is currently working with business start-ups in green mobility and the built environment, and as a freelance business consultant. He is also a mountaineer and climbed the seven summits, the highest mountain on each of the seven continents – including Mount Everest. Sam published one of the first doctoral theses on Sustainable Business Models, and co-wrote the highly cited articles on 'sustainable business model archetypes' and the 'value mapping tool'. He is interested in bridging theory and practice and will contribute to the research and tools for project Circular X. Sam joined the team parttime from 26 October 2020 for a period of a year. Sam collaborated on the following joint Circular X publications:



Dr. Sam Short
Visiting researcher

- Bocken, N. M., & Short, S. W. (2021). *Unsustainable business models- Recognising and resolving institutionalised social and environmental harm. Journal of Cleaner Production, 127828.*
- Bocken, N. M., & Short, S. W. (2020). *Transforming business models: towards a sufficiency-based circular economy. In Handbook of the Circular Economy. Edward Elgar Publishing.*



Myrthe Velter
PhD researcher,
collaborator

Myrthe is a PhD Researcher in Business Innovation for Sustainability at Maastricht Sustainability Institute and senior researcher in Circular Business Model Innovation at Fontys University of Applied Sciences. Her research focuses on theory and tool development for collaborative sustainable, circular business model innovation, multi-stakeholder boundary work and organizational boundary reconfigurations. She translates and applies her research in practice work with business at the Fontys Centre of Expertise on Circular Transitions Eindhoven. Myrthe led the following joint Circular X related publication:

- Velter, M., Bitzer, V., & Bocken, N. (2021). *A boundary tool for multi-stakeholder sustainable business model innovation. Circular Economy and Sustainability.*

CONTACT DETAILS



Are you a business and are you interested in the Circular X research agenda and do you fit the Circular X core sectors (food, mobility, energy-using appliances, housing/ construction)? Do you want to serve as a Circular X case study? Are you a researcher with a clear research idea related to Circular X? Do you have any other queries related to the Circular X project?

Please contact us at: info@circularx.eu

The Circular X team is based at Maastricht Sustainability Institute (MSI), School of Business and Economics, Maastricht University, Tapijn 11-D, P.O. Box 616, 6200 MD Maastricht, The Netherlands. The project lead Prof Dr Nancy Bocken can be contacted at: Nancy.Bocken@maastrichtuniversity.nl

SOURCES

[Bocken, N., & Allwood, J. M. \(2012\). Strategies to reduce the carbon footprint of consumer goods by influencing stakeholders. Journal of Cleaner Production, 35, 118-129. doi:10.1016/j.jclepro.2012.05.031](#)

[Bocken, N. M., & Geradts, T. H. \(2020\). Barriers and drivers to sustainable business model innovation: Organization design and dynamic capabilities. Long Range Planning, 53\(4\), 101950.](#)

[Boons, F., & Lüdeke-Freund, F. \(2013\). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. Journal of Cleaner production, 45, 9-19.](#)

[Konietzko, J., Bocken, N., & Hultink, E. J. \(2020\). A tool to analyze, ideate and develop circular innovation ecosystems. Sustainability, 12\(1\), 417.](#)

[Lüdeke-Freund, F., Gold, S., & Bocken, N. M. \(2019\). A review and typology of circular economy business model patterns. Journal of Industrial Ecology, 23\(1\), 36-61.](#)

[Sachs, W. \(1993\). Die vier E's. Merkposten für einen massvollen Lebensstil. Politische Ökologie\(33\), 69-72.](#)



This project has received funding from the European Union's Horizon 2020's European Research Council (ERC) funding scheme under grant agreement No 850159

