

BEACON

Behavioural Insights for a Circular Society

Final Project Report

**Project PI:
Professor Lucia A. Reisch**

Project NNF21SA0069203 funded by the Novo Nordisk Foundation





Project Team:

Professor Lucia A. Reisch ^(a,b)

Associate Prof. Efthymios Altsitsiadis ^(b)

Associate Prof. Jan M. Bauer ^(b)

Assistant Prof. Alice Pizzo ^(b)

Research Associate Malte Dewies ^(a)

Research Associate Paul Lohmann ^(a)

Postdoctoral Researcher Mohina Gandhi ^(b)

Senior Advisor Isabel Froes ^(b)

Academic Officer Anna Schmid ^(b)

Student Assistant Alessandra Chiofalo ^(b)

a) El-Erian Institute of Behavioural Economics and Policy,
Cambridge Judge Business School, University of Cambridge, UK

b) Department of Management, Society and Communication,
Copenhagen Business School, DK

Project Funder



Project Partner



Selected Collaborators



UNITED NATIONS
FOOD SYSTEMS
SUMMIT 2021



Ministry of Food, Agriculture
and Fisheries of Denmark



Contents

Project summary	1
Work package overview and key results	2
WP 1 Explore and Map:.....	2
Scoping and systematizing behavioural insights as tools for change	2
WP2 Understand and Test:.....	5
Experimental evidence of what works to foster resilient diets	5
WP3 Reflect and Facilitate:	9
Human-centred design for a resilient circular society	9
Overview outreach activities	13

Project summary

BEACON – Behavioural Insights for a Circular Society was a four-year research initiative (01.09.2021 to 31.12.2025) funded by the Novo Nordisk Foundation. The project was led by Copenhagen Business School in close collaboration with the El-Erian Institute at the University of Cambridge. Formal project partners were the municipality of Copenhagen.

The project explored and tested behavioural changes that support more sustainable lifestyles and contribute to building a circular society. The research focused on urban food systems and real-world experiments in the city of Copenhagen. The project addressed two pressing challenges within urban food systems:

- How to move consumers toward “peak meat” consumption and reduce avoidable food waste.
- How to design more resilient urban food systems and food environments.

The project first mapped and systematised state-of the-art knowledge on behavioural insights as tools for change. It then conducted two field experiments in Copenhagen, testing interventions to encourage sustainable meal choices and food waste reduction. In the final phase, the project examined how human-centred design can support the transition toward a resilient circular society in an urban context.

The project adopted a transdisciplinary approach that combined insights from behavioural economics, sustainable consumption and production research, and systems thinking. The research team worked closely with policymakers, businesses, and local communities to co-create and test practical solutions in the real-world setting of Copenhagen. Through this human-centred design approach, the project fostered community engagement and collaborative events that explored how everyday food environments can be re-designed to make sustainable choices easier, more appealing, and the default option for urban citizens.

More information:

[BEACON website](#)

[BEACON LinkedIn](#)



Work package overview and key results

WP 1 Explore and Map:

Scoping and systematizing behavioural insights as tools for change

Lead Researchers: Lucia A. Reisch, Malte Dewies and Paul Lohmann

WP1 identified gaps in the literature as well as emerging topics based on evidence synthesis. The WP developed a state-of-the-art taxonomy of nudge concepts of tools and standards for methods and procedures in BI research. It also advanced the evidence base of the field of behavioural food policies as regards, what works for whom and for which target. This work was used as the base for understanding the co-creation work in WP3.

The work package resulted in two scientific publications:

1. Dewies, M., and Reisch, L. A. (2025). META BI: A tool for describing behavioural interventions. *Behavioural Public Policy*, 1–28.
<https://doi.org/10.1017/bpp.2025.10015>
2. Lohmann, P., Pizzo, A., Bauer, J. M., Khanna, T., Flecke, S. L., Callaghan, M., Minx, J., & Reisch, L. A. (2026). Demand-side interventions for sustainable food systems: A meta-analysis of food-policy interventions targeting food consumption and waste behaviours. *Nature Food* (forthcoming)

META BI: A tool for describing behavioural interventions

Key Results:

- META BI (Mapping of Environment, Target group and Agent for Behavioural Interventions) is a multidisciplinary, context-rich **classification system of nudge interventions**.
- META BI is a tool for **understanding and describing interventions** across 20 dimensions, using 17 distinct psychological mechanisms.
- META BI provides a **common language for systematic exchange** about behavioural interventions across disciplines and professions.
- Tool for researchers and practitioners to **understand and describe behavioural interventions to steer desired behaviour change**.

Selected dissemination activities:

Malte Dewies

- Malte Dewies presented the project work at the at 2nd Annual International Behavioural Public Policy Conference, 8th of September 2023, University of North Carolina at Chapel Hill, United States of America.
- Malte Dewies presented the project work at Behavioural Science and the Wider World Seminar Series, Semester 2023, London School of Economics and Political Science, United Kingdom.
- Malte Dewies presented the project work at the 3rd Annual International Behavioural Public Policy Conference, 23-25th of June 2024, Cambridge University, United Kingdom.
- Malte Dewies presented the project work at the at the Maastricht Behavioural Economic Policy Symposium (M-BEPS), 17-18th of June 2024, School of Business and Economics at Maastricht University, Netherlands.
- Malte Dewies presented the project work at the European Forum for Studies of Policies for Research and Innovation Annual Conference (EU-SPRI), 5-7th of June 2024, University of Twente in Enschede, Netherlands.
- Malte Dewies presented the project work (as part of BEACON's professional development workshop) at the 85th Annual meeting of the Academy of Management (AOM), 25-29th of July 2025, Copenhagen, Denmark.

Demand-side interventions for sustainable food systems: A meta-analysis of food-policy interventions targeting food consumption and waste behaviours

Key Results:

- Conducted a machine-learning-assisted systematic review and meta-analysis of 306 effect sizes from 110 articles, covering over 2.4 million observations, to assess the **effectiveness of demand-side interventions targeting actual or incentivised behaviours**.
- On average, **small effect sizes** across both **food consumption** and **food waste interventions** are observed.
- **Effect sizes vary substantially across intervention types**, with certain choice architecture interventions, such as availability and defaults, driving much of the overall effect in both domains, while **incentives also show promise in reducing food waste**.

Selected dissemination activities:

Paul Lohmann

- Paul Lohman presented the project work at the 3rd Annual International Behavioural Public Policy Conference, 23-25th of June 2024, Cambridge University, United Kingdom.
- Paul Lohman presented the project work at What Works Climate Solutions (WWCS Summit), 9-12th of June, Berlin, Germany.
- Paul Lohmann presented the project work at the Cambridge Zero Postgraduate Academy Food and Climate Research Symposium, 28th of May 2024, Cambridge University, United Kingdom.

WP2 Understand and Test:

Experimental evidence of what works to foster resilient diets

Lead researchers: Jan M. Bauer and Alice Pizzo

WP2 designed and tested consumption interventions (nudges). WP2 also achieved understanding mechanisms and causal pathways of behavioural change with regards to reduction of meat consumption and food waste. The work package carried out two behavioural interventions in Copenhagen:

1. **Sustainable meal choices:** The experiment took place at the Festivélo Food market (Copenhagen) on the 1st and 2nd of July 2023. Participants were randomised into two groups for the informational nudge on carbon emission of meal choices (treatment and control) and three price-discount subgroups.
2. **Food waste reduction:** The experiment was carried out at the restaurant Kultarhus Islandsbrygge (Copenhagen) from the 2nd of October to 3rd of December 2023. The experiment introduced a food waste-related message emphasising the salience of food waste as an issue and highlighting the restaurant's commitment to reducing food waste, inviting guests to join its efforts before they select their meals. The intervention additionally informed with details about the portion size of each meal and encouraged reflection on current hunger levels.

This work package carried out one additional study:

3. **Carbon tax:** The project carried out an additional online study which examined the impact of a carbon tax on consumer choices via a large-scale online randomised controlled trial.

The work package resulted in three scientific publications:

1. Pizzo, A., Bauer, J.M. and Reisch, L.A. (2025). What shapes vegetarian food choices: Information or money? A field experiment. *Ecological Economics* (forthcoming)
2. Pizzo, A., Suter, M., Bauer, J.M. and Reisch, L.A. (2025). Food waste salience and task knowledge to reduce individual food waste: A field experiment in a restaurant setting. *Journal of Behavioural and Experimental Economics*. 117. <https://doi.org/10.1016/j.socec.2025.102375>
3. Pizzo, A., Gravert, C. A., Bauer, J. M. and Reisch, L. A. (2025). Carbon Taxes Crowd Out Climate Concern: Experimental Evidence from Sustainable Consumer Choices. *SSRN Working paper*. <http://dx.doi.org/10.2139/ssrn.5147485>

What shapes vegetarian food choices: Information or money? A field experiment

Key Results:

- Experiment to assess the effectiveness of informational nudge, price intervention, and their combination **on consumers' choices between meat-based and vegetarian food options.**
- **No significant effect** of the **informational nudge** on meal choices.
- **Price intervention** significantly reduces the likelihood of choosing meat-based options over vegetarian ones.

Selected dissemination activities:

Alice Pizzo and Jan M. Bauer

- Alice Pizzo presented the project work at the *3rd Annual International Behavioural Public Policy Conference*, 23-25th of June 2024, Cambridge University, United Kingdom.
- Jan M. Bauer presented the project work at the *16th Nordic Conference in Behavioural and Experimental Economics*, 26-27th of September 2024, University of Copenhagen, Denmark.
- Jan M. Bauer and Alice Pizzo presented the project work (as part of BEACON's professional development workshop) at the *85th Annual meeting of the Academy of Management (AOM)*, 25-29th of July 2025, Copenhagen, Denmark.
- Alice Pizzo presented the project work at *from insights to impact: BEACON Final International Conference*, 1st of December 2025, Copenhagen, Denmark.

Food waste salience and task knowledge to reduce individual food waste: A field experiment in a restaurant setting

Key Results:

- Experiment to explore two **informational strategies for reducing food waste** among restaurant guests.
- **Highlighting the issue of food waste before ordering food** reduces the probability of customers leaving food waste on their plate from 41% to 25%.
- **No evidence** that **providing portion size information affects plate waste**.
- Behavioural interventions **reduce food waste without affecting customer satisfaction**.

Selected dissemination activities:

Jan M. Bauer and Alice Pizzo

- Jan M. Bauer presented the project work at the *3rd Annual International Behavioural Public Policy Conference*, 23-25th of June 2024, Cambridge University, United Kingdom.
- Jan M. Bauer presented the project work (as part of BEACON's professional development workshop) at the *85th Annual meeting of the Academy of Management (AOM)*, 25-29th of July 2025, Copenhagen, Denmark.
- Alice Pizzo presented the project work at the *From insights to impact: BEACON final international conference*, 1st of December 2025, Copenhagen, Denmark.

Carbon Taxes Crowd Out Climate Concern: Experimental Evidence from Sustainable Consumer Choices

Key Results:

- **Impact of a carbon tax on consumer choices** via a large-scale online randomized controlled trial.
- **Any tax reduces high-carbon choices.**
- For climate-concerned consumers, a salient carbon tax can backfire.
- When the tax is **announced but not yet implemented**, the signal leads **climate-concerned consumers to choose low carbon options**.
- Findings suggest that **carbon taxes can crowd out climate concerns**, leading to important implications for policy.
- **Price signals** and **moral signals** interact.

Selected dissemination activities:

Alice Pizzo

- Alice Pizzo presented the project work at the 16th Nordic Conference in Behavioural and Experimental Economics, 26-27th of September 2024, University of Copenhagen, Denmark.
- Alice Pizzo presented the project work at the Copenhagen Network of Experimental Economics (CNEE) Workshop, Semester 2024, University of Copenhagen, Denmark.
- Alice Pizzo presented the project work at the Copenhagen Network of Experimental Economics (CNEE) Workshop, 22nd of November 2024, University of Lund, Sweden.
- Alice Pizzo presented the project work at the Advances with Field Experiments (AFE) 2024 Conference, 5-6th of September 2024, London School of Economics, United Kingdom.
- Alice Pizzo presented the project work at the 30th Annual Conference of the European Association of Environmental and Resource Economists (EAERE), 16th of June 2025, Norwegian School and Economics (NHH), Norway.
- Alice Pizzo presented the project work at the 4th International Behavioural Public Policy Conference, 10-12th of September 2025, King's College, London, United Kingdom.
- Alice Pizzo presented the project work at the From insights to impact: BEACON final international conference, 1st of December 2025, Copenhagen Denmark.

WP3 Reflect and Facilitate: Human-centred design for a resilient circular society

Lead researchers: Efthymios Altsitsiadis, Isabel Froes, Mohina Gandhi and Anna Schmid

WP3 identified the flaws of the current, non-resilient urban food system and facilitated and structured debate to co-create a common understanding, exchange, and vision for a resilient circular (urban) society with focus on the macro level of contexts (infrastructure, regulation, policies, markets).

WP3 has carried out a set of co-creation networks in Copenhagen (2024-2025):

- Two co-creation workshops on understanding the current flaws in the urban food system (Copenhagen), February and March 2024, >25 participants, Copenhagen, Denmark. Title:
- One co-creation workshop on developing concrete actions towards a more circular food system, September 2024, >35 participants, Copenhagen, Denmark.
- One cross-project event (collaboration with EU project FEAST) with workshops focusing on Circular Society, March 2025, >35 participants, Copenhagen Denmark.

The work package resulted in one scientific and two other publications:

1. Gandhi, M., Pizzo, A., Schmid, A., Froes, I., Jaeger-Erben, M., Altsitsiadis, E., & Reisch, L.A. (2025). Food System through the Lens of a Circular Society: A Transdisciplinary Approach to Integrating Literature and Practice. *Business Strategy and the Environment (Review & Revision)*
2. Schmid, A. & Froes, I. (2024). Discussion Card: Highlighting the challenges, barriers, needs & wishes and opportunities of local food practitioners. <https://beaconproject.dk/publications-disseminations/>
3. Schmid, A., Froes, I., Gandhi, M. & Reisch, L.A. (2025). Promising pathways towards a Circular Society. A Roadmap towards a Sustainable Food System. <https://beaconproject.dk/publications-disseminations/>

Food System through the Lens of a Circular Society: A Transdisciplinary Approach to Integrating Literature and Practice

Key Results:

- Systematic literature review and analysis of stakeholder workshops to explore the **concept of a Circular Society (CS)** and how its principles participation, equity, and community resilience can be applied within food systems.
- The review reveals a shift from **efficiency-centred CE framings toward socially embedded CS perspectives**.
- The workshops help **identify leverage points** such as **circularity education, local food networks, and participatory monitoring**.
- Need to **align material innovation** with **social transformation**, and **improving coordination** between **organisational practices** and **governance processes**, to support more inclusive and adaptive food systems.

Selected dissemination activities:

Mohina Gandhi

- Mohina Gandhi presented the project work at the Circular Society Conference 2024, 6th of November 2024, Ede, Netherlands.
- Mohina Gandhi presented the project work at the START Conference: Green Minds Gather 2025, 29-30th of April 2025, Copenhagen Business School, Denmark.
- Mohina Gandhi presented the project work (as part of BEACON's professional development workshop) at the 85th Annual meeting of the Academy of Management (AOM), 25-29th of July 2025, Copenhagen, Denmark.

Discussion Cards: Highlighting the challenges, barriers, needs & wishes and opportunities of local food practitioners

Key Results:

- Systematised and summarised insights from **two co-creation workshops** on understanding the current flaws in the urban food system.
- Set of **discussion cards** focusing on **challenges, barriers, needs & wishes and opportunities** regarding **legislation, resources, market dynamics and social and consumption habits**.
- The cards provide insights in the **current perspectives of different stakeholders** (civil society, academia, government, business) in the urban food system of Copenhagen.
- **Challenges & Barriers:** E.g. dominant market for non-organic and meat production, lack of methods for change, understand cultural changes and emotions, vocabulary and framing of novel products, need for co-creation and transdisciplinary.
- **Wishes & Opportunities:** E.g. bottom up, local and community-based approaches, increase accessibility, change narrative, knowledge sharing, create alternatives as the new normal.

Selected dissemination activities:

Anna Schmid

- Anna Schmid presented the Discussion cards at the *Hack for food the event*, 13-14th of March 2024, Copenhagen Business School, Copenhagen, Denmark.
- Anna Schmid presented the Discussion cards at the *From insights to impact: BEACON final international conference*, 1st of December 2025, Copenhagen, Denmark.

Promising pathways towards a Circular Society. A Roadmap towards a Sustainable Food System

Key Results:

- Systematised and analysed results from one **co-creation workshop** on developing concrete actions towards a more circular food.
- Co-created **Roadmap** proposing **current, near future and long-term actions** for to move **towards a more sustainable food system**.
- **Bottom-up approach** suggesting concrete action within **Capacity building & Education, Procurement & Legislation**; and **Communication & Perception**.
- Detailed descriptions and overview of the proposed actions and **best practice examples from Copenhagen and beyond**.
- **Current actions**: E.g. Implement food education for teachers (train the trainers), establish food procurement teams within public procurement initiatives and develop shared language.
- **Near-future actions**: E.g. promote local food networks, create funding schemes and organise cross-actor events.
- **Long-term actions**: E.g. Establish holistic food education, implement changes in taxation, and establish awareness campaigns.

Selected dissemination activities:

Isabel Froes and Anna Schmid

- Isabel Froes and Anna Schmid presented the Roadmap to the *Vegetarian Society of Denmark*, 4th of September 2024, Copenhagen, Denmark.
- Anna Schmid presented the Discussion cards at the *Hack for food the event*, 13-14th of March 2024, Copenhagen Business School, Copenhagen, Denmark.
- Isabel Froes and Anna Schmid presented the Roadmap to the *City of Copenhagen*, 25th of April 2025, Copenhagen, Denmark.
- Isabel Froes and Anna Schmid presented the Roadmap (as part of BEACON's professional development workshop) at the *85th Annual meeting of the Academy of Management (AOM)*, 25-29th of July 2025, Copenhagen, Denmark.
- Isabel Froes and Anna Schmid presented the Roadmap at the *From insights to impact: BEACON final international conference*, 1st of December 2025, Copenhagen Denmark.

Overview outreach activities

2021

Reisch, L.A. (2021). Participation at the UN Food System Summit - a stage for global food systems transformation to achieve the Sustainable Development Goals by 2030. New York, United States.

Reisch, L.A. (2021). "A circular society at scale". Invited talk at the online event "BE.Hive: Behavioral Solutions to Water Pollution Online Event, organized by rare.org, Washington DC, United States. <https://rare.org/be-hive-behavioral-solutions-to-water-pollution/>

Reisch, L.A. (2021). "Can we nudge to net zero?" Podcast episode by the Behavioural Insights Team. London, United Kingdom. <https://www.bi.team/blogs/podcast-can-we-nudge-to-net-zero/>

Reisch, L.A. (2021). "The Transformative Business School. A series of webinars by the Copenhagen Business School - A discussion about Transformative Partnerships". Copenhagen Business School, Copenhagen, Denmark.

Reisch, L.A. (2021) "Behavioural transformations for a more sustainable world: behavioural science to support green public governance". Panel discussion at the online event Government Beyond Recovery: Towards a future-fit public sector, organized by the OECD. Online. <https://oecd-events.org/gov-beyond-recovery/session/4e5cf966-b0eb-eb11-b563-a085fc3e7f45>

Reisch, L.A. (2021) "Leveraging the power of the plate: How behavioural food policy can help mitigate climate change". Invited keynote at the "Congress of the European Association of Agricultural Economists" hosted by the European Association of Agricultural Economists (EAAE), Prague, Czech Republic. <http://www.eaae2021.org/en/keynote-speakers>

Reisch, L.A. (2021). "The Case for Behavioural Food Policy—what it adds, where it ends". Invited talk at the Consumer Conference 2021, Session 6: Sustainable consumption of food, water and energy, hosted by NOVA Consumer Lab and partners, Portugal. Online. <https://novaconsumerlab.novalaw.unl.pt/consumer-conference/>

Bauer, J.M. (2021). "Eating Tomorrow: the challenges of the future. Ways towards a more sustainable diet." Annual Forum of the German Federal Agency for Nutrition. Online. <https://bonner-ernaehrungstage.de/>

2022

Reisch, L.A. (2022). „Enabling a Circular Society – Empowering Consumers” GLOBE EU Conference on design solutions for a Circular Economy. Online. <https://www.globe-eu.org/sustainable-product-policy-framework-changing-the-game-or-missing-the-point/>

Pizzo, A. (2022). "Sowing the seeds of environmental and resource economics". Project presentation at IAERE 10 Tour, 1st Padova Workshop on Environmental and Resource Economics. Padova, Italy.

Pizzo, A. (2022). Project presentation at Seminar: Brown Bag series, Department of Economics, Copenhagen Business School, Copenhagen, Denmark.

2023

Reisch, L.A. (2023). "Defaulting to Plant Based Foods". Online article at Project Syndicate. <https://www.project-syndicate.org/commentary/plant-based-meal-defaults-combat-climate-change-by-lucia-reisch-2023-07>

Reisch, L.A. (2023). "On influencing behaviour for the good". Blog post on Looking at 2023 on Cambridge University Judge Business School. <https://www.jbs.cam.ac.uk/2023/looking-at-2023/>

Reisch, L.A. (2023). "Experts in conversation: Contemporary debates in our field. Invited debate at the OECD Behavioural Insights Network Meeting, OECD, Paris, France.

Reisch, L.A. (2023). "Behaviourally informed food policy". Annual Behavioural Public Policy Lecture, London School of Economics and Political Science, London, United

Reisch, L.A. (2023). "Expert Workshop on Sustainable Food Consumption", Science Advice for Policy by European Academies (SAPEA), Brussels, Belgium.

Froes, I. (2023). "How can Public Sector Innovation bring us a step closer to Sustainable Development?" Episode of Copenhagen Business School's podcast series Big Questions Little Time. <https://channels.podcastfeed.eu/8ae07d98-d345-4dd6-9aaa-95ba7cb32059>

Pizzo, A. (2023). "Quantitative approaches to green transition research at CBS" Seminar at Copenhagen Business School, Copenhagen, Denmark.

2024

Reisch, L. A. (2024). "Towards a behavioural food policy – Theory, Pathways, Challenges". Invited Keynote at University of Exeter, Behavioural Economics Lab, Business School, Exeter, United Kingdom.

Reisch, L.A. (2024). "Climate nudging in the food system". Invited Keynote at Behavioural and Economic Sciences (BEES) Research Cluster, University of Leicester, Leicester, United Kingdom.

Reisch, L.A. (2024). "Food policy through the behavioural lens". Invited Keynote at Economic and Social Research Institute (ESRI), Dublin, Ireland.

Pizzo, A. (2024). "Indulgence for the climate conscious. Study on CO₂ taxes sheds surprising new light on consumer behavior". Article and interview in Berlingske, Business, Copenhagen, Denmark.

Schmid, A. (2024). "Perspectives on circular economy - cross-project presentation and networking: BEACON, P2Green, CBS Permahaven and Aarhus Green Academy". Project presentation, Copenhagen Business School, Copenhagen, Denmark.

2025

Froes, I. & Schmid, A. (2025). "Project presentation and business visit at Bispebjerg Hospital", Project presentation and cross-learning, Copenhagen, Denmark.

Froes, I. & Schmid, A. (2025). "COP30 Food System Series: Brazil x Denmark – Partnerships for Innovation". Project presentation and networking, Copenhagen Business School, Copenhagen, Denmark.

Reisch, L.A., Bauer, J. M. & Pizzo, A. (2025). "Study finds simple restaurant table message cuts food waste", Article at Cambridge University Judge Business School. <https://www.jbs.cam.ac.uk/2025/study-finds-simple-restaurant-table-message-cuts-food-waste/>

Gandhi, M., Schmid, A., Altsitsiadis, E., Bauer J.M., Dewies, M., Froes, I. & Reisch, L.A., (2025). "Harnessing Behavioural Insights for Policy Development: Learning from a Real-World Case Study". Professional development workshop at the 85th Annual meeting of the Academy of Management (AOM), 25th of July 2025, Copenhagen, Denmark.

Reisch, L.A., Altsitsiadis, E., Bauer J.M., Dewies, M., Lohmann, P. Pizzo, A., Froes, I., Gandhi, M., Chiofalo, A. & Schmid, A. (2025). "From insights to impact: BEACON final international conference". Final project conference, Copenhagen, Denmark.

Schmid, A., Chiofalo, A. & Froes, I. (2025). "CBS booklet: The role of business in a sustainable food transition". Agri-food project network at Copenhagen Business School, Copenhagen, Denmark.



<https://beaconproject.dk/>



beaconproject@cbs.dk



[BEACON Behavioural Insights for a Circular Society](#)

