



ELLEN
MACARTHUR
FOUNDATION



***CITIES
AND
CIRCULAR
ECONOMY
FOR FOOD***

EXECUTIVE SUMMARY



**THE LINEAR FOOD
SYSTEM IS RIPE
FOR DISRUPTION**

8

**THE CIRCULAR
ECONOMY OFFERS
A VISION FOR A
FOOD SYSTEM FIT
FOR THE FUTURE**

9

**CITIES CAN
TRIGGER A SHIFT
TO A BETTER
FOOD SYSTEM**

9

**CITIES CAN WORK
TOWARDS THREE
AMBITIONS FOR A
CIRCULAR ECONOMY
FOR FOOD**

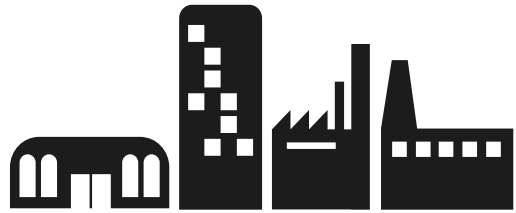
10

**THERE ARE
CLEAR BENEFITS
OF ACHIEVING A
REGENERATIVE
SYSTEM**

12

**MOBILISING THE
TRANSFORMATION
AT SCALE DEMANDS
A NEW APPROACH**

13



The report aims to highlight the often-underappreciated role urban food actors can play to drive food system transformation, and to spark a global public-private effort to build a circular economy for food. Cities and Circular Economy for Food is an affiliate project of the World Economic Forum's Platform for Accelerating the Circular Economy (PACE). The report has been produced as part of Project Mainstream, a CEO-led global initiative created by the Ellen MacArthur Foundation and the World Economic Forum, which helps to scale business driven circular economy innovations. Analytical support provided by SYSTEMIQ.

To quote the report, please use the following reference: Ellen MacArthur Foundation, *Cities and Circular Economy for Food* (2019)

IN SUPPORT OF THE REPORT

“This excellent report is well-grounded in good analysis and provides fresh thinking about how cities will have to play a pivotal role in transforming the food system, from a model that fundamentally cannot work in the long term - whether from an environmental or people’s health perspective - to one that works for people and the planet. Given the strong leadership of many cities in encouraging healthy lifestyles with positive environmental impacts, this is a timely report that can catalyse real action.”

PROFESSOR TIM BENTON, DEAN OF STRATEGIC RESEARCH INITIATIVES,
UNIVERSITY OF LEEDS AND DISTINGUISHED VISITING FELLOW, CHATHAM HOUSE

“By 2040, feeding 9 billion people in the world will be one of our greatest challenges. As noted in this new report, there are solutions to change the way we produce food, creating a better food system through a better use of resources. This will require moving towards a circular economy, especially in cities where 80% of food will be consumed in 2050. Transforming organic waste into compost, fertiliser, or bioenergy are concrete circular solutions that can be implemented and scaled-up today.”

ANTOINE FRÉROT, CEO, VEOLIA

“We cannot achieve a healthy planet and healthy population without a fundamental transformation of our entire food system. This report describes an approach starting with cities and presents a vision of a future where the way we produce and consume food contributes to environmental and health benefits, instead of damaging human health and the environment. Achieving this is urgent, but no quick fix will get us there. We do have the knowledge and tools to act - and the circular economy approach will be a critical component.”

DR. GUNHILD STORDALEN, FOUNDER AND EXECUTIVE CHAIR, EAT

“Cities, where 80% of the world’s food will be consumed by 2050, have a vital role to play in shaping the future of the food system. ‘Cities and Circular Economy for Food’ represents a valuable contribution to the conversation about food’s future.”

MICHAEL POLLAN, AUTHOR, PROFESSOR

“Cities are key to the shift to healthier food systems – food systems that support ways of producing food that nurture the soil and enhance agrobiodiversity, that nourish people better, and that contribute to local economic development.”

OLIVIER DE SCHUTTER, FORMER UN SPECIAL RAPPORTEUR ON THE
RIGHT TO FOOD (2008-2014) AND CO-CHAIR, INTERNATIONAL PANEL
OF EXPERTS ON SUSTAINABLE FOOD SYSTEMS (IPES-FOOD)

“This report provides an insightful look at how cities can move towards a food system that is good for both people and the planet. It highlights the opportunity that businesses, retailers, government and institutions have to work together to create a system that is healthier and that works for generations to come. It also ties in with elements of the City of Toronto’s Long Term Waste Management Strategy, Toronto Food Strategy and Transform TO Climate Action Strategy.”

COUNCILLOR JAMES PASTERNAK, CHAIR OF THE INFRASTRUCTURE
AND ENVIRONMENT COMMITTEE, CITY OF TORONTO

“This report provides us with a sound analysis, along with insightful and concrete options for a more regenerative food system. It also demonstrates that the circular economy is not about the rich or the poor, the developed or the developing, or the political left or right. It connects us all, with the same challenges and responsibilities, while at the same time offering a huge opportunity for large scale innovation and creativity-building resilience, new distributed business and market competitiveness for a common good.”

PEDRO TARAK, CO-FOUNDER AND PRESIDENT, SISTEMA B INTERNATIONAL

“This report not only educates decision-makers on the role cities can play in activating a circular economy - it inspires them to act with urgency. The health of people, economies, and the planet depends on cities shifting from ‘end consumer’ to part of the solution. Let’s get to work.”

MARK R. TERCEK, CEO OF THE NATURE CONSERVANCY
AND AUTHOR OF NATURE’S FORTUNE

“This report highlights the role of localised urban food systems as essential elements of wider food and agriculture systems, a topic with increasing importance for the 2030 Sustainable Development Agenda”

DAVID NABARRO, STRATEGIC DIRECTOR 4SD SWITZERLAND
PROFESSOR OF GLOBAL HEALTH, IMPERIAL COLLEGE LONDON

“Beyond the fact that agriculture is responsible for a quarter of greenhouse gas emissions globally, the report demonstrates for the first time that the current linear food system not only will face challenges feeding a growing population, but is also generating significant health issues. We call all willing parties to join hands to invent a new circular food system for our cities that will put human health at the centre.”

JEAN-LOUIS CHAUSSADE, CEO, SUEZ CHAIRMAN, PROJECT MAINSTREAM

“Today’s food system has an enormous social and environmental footprint, from climate change to food waste; wellbeing to biodiversity loss; water availability to inequality. But it can change. This report outlines a pathway to building a circular approach to food by 2050, and crucially grounds it in the reality that 80% of the world’s populations will live in cities by then.”

MIKE BARRY, DIRECTOR OF SUSTAINABLE BUSINESS, M&S

“The food system can unlock solutions to climate challenges. Basing these solutions on circular economy principles results in cascading benefits not only to the climate, but to food security, water, forest and wetlands, biodiversity, pollution, and human health. The rewards are truly incalculable.”

CHAD FRISCHMANN, VICE PRESIDENT & RESEARCH DIRECTOR, DRAWDOWN

“We are in the midst of an important global movement which calls into the very concept of consumption. The quality, the safety and the origin of our food should be at the heart of every citizen’s concerns. Carrefour intends to support this movement in favour of healthier eating for all, and supports all research and collaborative work that can help bring about the circular economy for food.”

BERTRAND SWIDERSKI, SUSTAINABILITY DIRECTOR, CARREFOUR

“Global food production is a major contributor to climate change. This report highlights some practical steps we can take and the important role that cities can play. At the London Waste and Recycling Board, we are already working with the hospitality sector and supporting and financing innovative start-ups so that we can promote and accelerate an innovative food economy. I welcome this report and see it as making a significant contribution to tackling UN Sustainable Development Goal 12.3.”

DR LIZ GOODWIN OBE, CHAIR, LONDON WASTE AND RECYCLING BOARD

GLOSSARY

ANAEROBIC DIGESTION (AD)

Microbial (mainly bacterial) breakdown of organic matter in the absence of oxygen, under managed conditions at a temperature suitable for naturally occurring microbial species to produce biogas (mainly methane) and digestates (also known as 'biosolids').

ANTIMICROBIAL RESISTANCE

The capacity of microorganisms – such as bacteria, viruses, and some parasites – to stop antimicrobial substances working against them.¹

BIOECONOMY

The parts of the economy that use renewable biological resources from land and sea – such as crops, forests, fish, animals, and microorganisms – to produce food, materials, and energy.

BIOFERTILISERS

A specific subset of organic fertilisers, which contain living microorganisms that help with nutrient cycling, thereby activating the soil to enrich its own fertility. Sometimes also referred to as inoculants.

COMPOST

A soil-type matter produced from decomposed materials, which can contain more than 50% organic dry matter. The nutrient constitution depends on the feedstock and includes nitrogen, phosphorus, and carbon.

COMPOSTING

Microbial (bacteria and fungi) breakdown of organic matter in the presence of oxygen to produce soil with high organic (humus) content. Composting produces carbon dioxide, and also methane, though at a lower rate than landfilling. In commercial composting, the process can be carried out using a variety of methods, including 'in-vessel' for post-consumer food waste and 'open-windrow' for non-food 'green waste'.

DIGESTATES

The biosolid output from anaerobic digestion. Digestate constitution is dependent on the AD feedstock. Human waste-derived digestates are high in P (phosphorus) and K (potassium), reflected in the characteristics of human urine and excreta. The nutrients in digestates are much more 'available', meaning they can be easily integrated in crop-nutrient planning, but care is required as they can also leach or run-off.

FOOD BY-PRODUCTS

Materials arising from the process of converting food ingredients into food products, e.g. oil seed cake, brewer spent grains, fish guts; as well as human waste. Also from food preparation or consumption that are not edible under normal circumstances, such as egg shells, tea bags, meat bones, coffee grounds or vegetable peelings.

FOOD WASTE, EDIBLE

Food and drink that, at the point of being thrown away, was edible. Generated for a number of reasons, including overproduction, past use-by-date, aesthetic appearance, or mislabelling.

1 World Health Organization (WHO), *Antimicrobial resistance*, <https://www.who.int/antimicrobial-resistance/en/>

FOOD SYSTEM

Encompasses the full value chain of producing food for human consumption, from agricultural activities and other means, through handling, transportation, storage, processing, distribution, and consumption to organic (including human) waste management and disposal / reintroduction into productive use ('looping').

INDUSTRIAL FOOD PRODUCTION

A wide spectrum of farming models based around specialised commodity-crop production and the use of synthetic inputs. This definition thus encompasses smaller-scale 'conventional agriculture' as well as larger-scale industrialised systems.²

NUTRIENTS FOR PLANT NUTRITION

Substances used by plants for healthy growth and metabolism. The principal macronutrients derived from the growth medium are nitrogen, phosphorus, and potassium (NPK), as well as calcium, sulphur, and magnesium. Micronutrients are trace minerals required in much smaller quantities, including iron, zinc, copper, and nickel.

NUTRIENT LOOPING

The processes by which discarded organic resources can be turned into an array of valuable products. From low-tech organic compost to innovative, high-value biomaterials (see Figure 7), nutrient looping can help regenerate peri-urban farming areas and create new bioeconomic activity in the city.

ORGANIC FERTILISERS

Fertilisers derived from natural materials and processes, such as animal, human or insect excreta; decomposing plant matter; animal or fish waste including bone meal; marine flora including seaweed or kelp. Organic fertilisers can be added to the soil to improve soil structure and/or enhance the growth of plants and crops.

ORGANIC MATTER

A large group of carbon-based compounds found in terrestrial and aquatic ecosystems, known as 'biomass'.

PARTICULATE MATTER

Microscopic solid or liquid matter, generated by human or natural activity that are suspended in the atmosphere and affect human health, climate, and precipitation. A subtype is referred to as PM2.5, which indicates fine particles with a diameter of 2.5 µm or less. These smaller particles are a particular risk to human health due to their ability to penetrate deep into the lungs or bloodstream.

PERI-URBAN

The area located within 20 km of the city boundary.

REGENERATIVE FOOD PRODUCTION

Food production, in its broadest sense, using approaches that contribute to the improved health of the surrounding natural ecosystem.

SMALLHOLDER FARMS

Over 500 million small (<10ha) normally family-owned farms that depend on family labour to meet their own living needs. The sale of surplus 'cash crops' provides the basis for income for non-food needs, such as medicine, education, and housing. It is estimated that such farms provide food for approximately 70% of the world.

SYNTHETIC FERTILISERS

Also known as 'chemical' or 'mineral' fertilisers, these are derived from mineral rocks, synthetic origins or produced industrially. They are added to the soil to enhance the growth of plants and crops.

URBAN FARMS

Farms located within a city's boundary that produce food primarily for consumption in that city.

2 International Panel of Experts on Sustainable Food Systems (IPES-Food), *Breaking Away from Industrial Food and Farming Systems* (2018)

EXECUTIVE SUMMARY

Few things are as interwoven with human existence and culture as food. At the most basic level, we need it to survive. Beyond sustenance, food can bring joy and takes a central place in cultures around the world, often as the centrepiece of celebrations and festivities.

The current food system has supported a fast-growing population and fuelled economic development and urbanisation. Yet, these productivity gains have come at a cost, and the model is no longer fit to meet longer term needs. Shifting to a circular economy for food presents an attractive model with huge economic, health, and environmental benefits across the food value chain and society more broadly.

THE LINEAR FOOD SYSTEM IS RIFE FOR DISRUPTION

There are well-known drawbacks related to our consumption of food, including the twin scourges of hunger and obesity. Less well-known is the extent of the negative impacts of current food production methods. Overall, for every dollar spent on food, society pays two dollars in health, environmental, and economic costs. Half these costs – totalling USD 5.7 trillion each year globally – are due to the way food is produced.



The extractive, wasteful, and polluting nature of current food production costs society as much as all costs related to food consumption (e.g. from obesity and hunger) combined.

These USD 5.7 trillion costs are a direct result of the ‘linear’ nature of modern food production, which extracts finite resources, is wasteful and polluting, and harms natural systems. Currently, the agrifood industry is responsible for almost a quarter of greenhouse gas emissions globally, degrades the natural resources on which it depends, and pollutes air, water, and soil. The equivalent of six garbage trucks of edible food is lost or wasted every second. In cities, less than 2% of the valuable biological nutrients in food by-products and organic waste (excluding manure) is composted or otherwise valorised.

Perhaps most surprisingly, even when apparently making healthy food choices, people’s health is still being harmed by the way we produce food and deal with its by-products. By 2050, around 5 million lives a year – twice as many as the current obesity toll – could be lost as a result of current food production processes. Among the harmful impacts of such methods are diseases caused by air pollution and water contamination, health consequences of pesticide use, and increased antimicrobial resistance. Some of the principal causes are overuse of fertilisers, excessive reliance on antibiotics in animals, and untreated human waste.



THE CIRCULAR ECONOMY OFFERS A VISION FOR A FOOD SYSTEM FIT FOR THE FUTURE

The report offers a vision for a healthy food system fit for the 21st century and beyond, underpinned by the circular economy principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. In this vision, food production improves rather than degrades the environment, and all people have access to healthy and nutritious food. While far from the current reality, we believe this vision is completely achievable. After all, food comes from natural systems in which organisms have thrived for billions of years and, when they reach the end of their life, become food for new cycles to begin.

CITIES CAN TRIGGER A SHIFT TO A BETTER FOOD SYSTEM

Cities have a unique opportunity to spark a transformation towards a circular economy for food, given that 80% of all food is expected to be consumed in cities by 2050. The report focuses on the ability of urban food actors to catalyse this change by getting more value out of their food, and substantially influencing which food is produced and how. The ambitions presented are intended to complement the range of valuable ongoing initiatives that together aim to shift the food system onto

a better trajectory. Work conducted with four focus cities (Brussels, Belgium; Guelph, Canada; Porto, Portugal; São Paulo, Brazil) during the development of the report suggests cities have a major opportunity to apply these ambitions, regardless of their unique physical, demographic, and socio-economic profiles. By shifting towards a circular economy for food, cities can help realise the vision and generate significant environmental, economic, and health benefits within and beyond their boundaries.



DEFINING CITIES

In the report we define cities as urban areas and the combination of all businesses, public bodies (e.g. city governments), organisations, institutions (e.g. schools, hospitals), communities, and citizens located within them.

CITIES CAN WORK TOWARDS THREE AMBITIONS FOR A CIRCULAR ECONOMY FOR FOOD

SOURCE FOOD GROWN REGENERATIVELY, AND LOCALLY WHERE APPROPRIATE

Since 80% of food will be consumed in cities by 2050, cities can significantly influence the way food is grown, particularly by interacting with producers in their peri-urban and rural surroundings. Regenerative approaches to food production will ensure the food that enters cities is cultivated in a way that enhances rather than degrades the environment, as well as creating many other systemic benefits.

In the report, regenerative food production is considered in a broad sense as encompassing any production techniques that improve the overall health of the local ecosystem. Examples of regenerative practices include shifting from synthetic to organic fertilisers, employing crop rotation, and using greater crop variation to promote biodiversity. Farming types such as agroecology, rotational grazing, agroforestry, conservation agriculture, and permaculture all fall under this definition. Regenerative practices support the development of healthy soils, which can result in foods with improved taste and micronutrient content. Cities cannot of course implement these techniques alone. Collaborating with farmers, and rewarding them for adopting these beneficial approaches, will be essential. In parallel, cities can use circular urban farming systems, such as those that combine indoor aquaculture with hydroponic vegetable production in local loops.

The feasibility and benefits of increasing local sourcing have been the subject of intense debate. While urban farming can provide cities with some vegetables and fruits, it is currently limited in its ability to satisfy people's broader nutritional needs. However, cities can source substantial amounts of food from their peri-urban areas (defined in the report as the area within 20 km of cities), which already hold 40% of the world's cropland. While local sourcing is not a silver bullet, reconnecting cities with their local food production supports the development of a distributed and regenerative agricultural system. It allows cities to increase the resilience of their food supply by relying on a more diverse range of suppliers (local and global),

and supporting native crop varieties. It offers city dwellers the opportunity to strengthen their connection with food and the farmers who grow it, often increasing the likelihood that people will demand food grown using regenerative practices that benefit the local environment and their own health. Local sourcing can also reduce the need for excess packaging and shorten distribution supply chains.

MAKE THE MOST OF FOOD

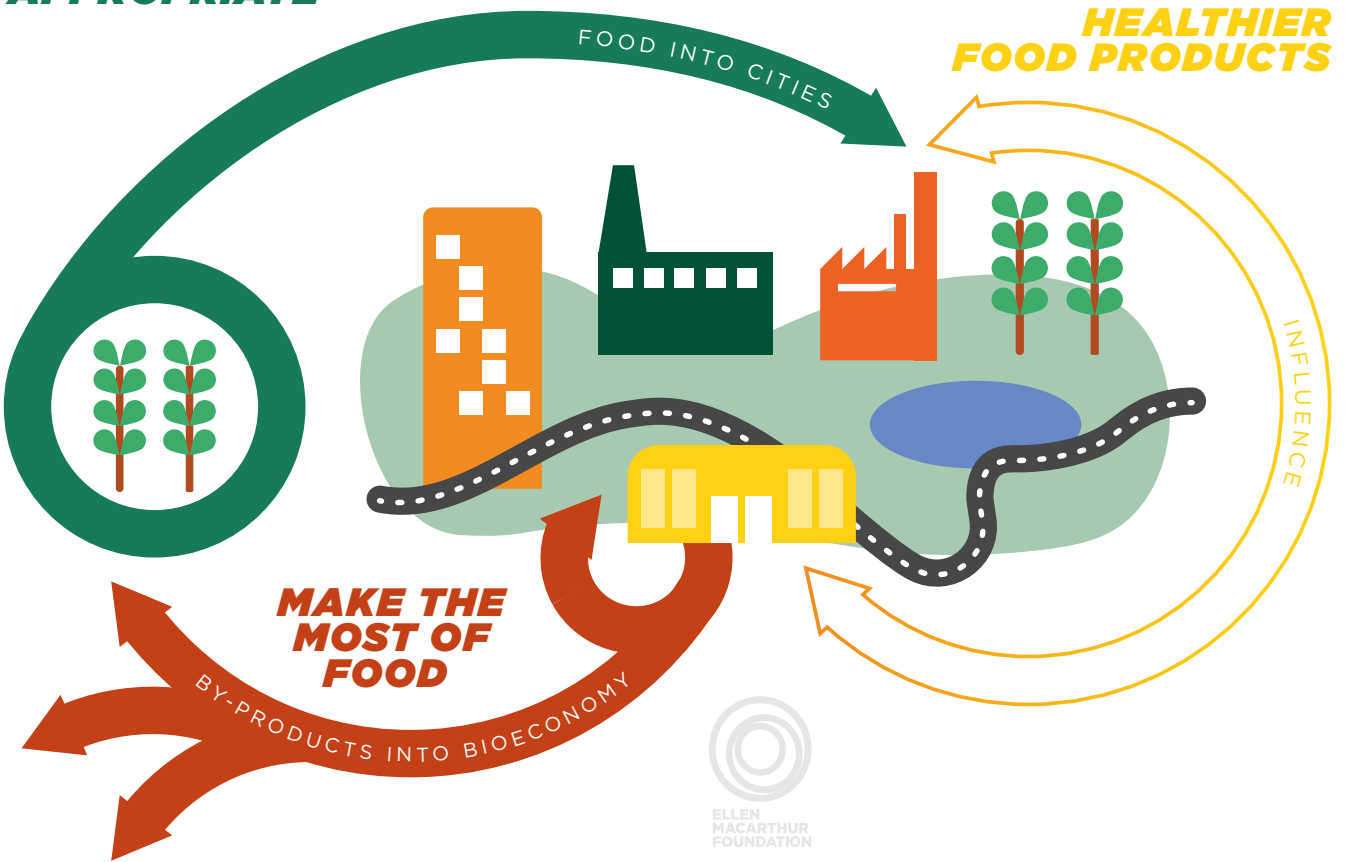
Cities can play an important role in sparking a shift to a fundamentally different food system in which we move beyond simply reducing avoidable food waste to designing out the concept of 'waste' altogether. As the place where most food eventually ends up, cities can ensure inevitable by-products are used at their highest value, transforming them into new products ranging from organic fertilisers and biomaterials to medicine and bioenergy. Rather than a final destination for food, cities can become centres where food by-products are transformed into a broad array of valuable materials, driving new revenue streams in a thriving bioeconomy.

DESIGN AND MARKET HEALTHIER FOOD PRODUCTS

In a circular economy, food products are designed not only to be healthy from a nutritional standpoint, but also in the way that they are produced. From breakfast cereals to takeaway meals, a significant proportion of food eaten today has been designed in some way by food brands, retailers, restaurants, schools, hospitals, and other providers. These organisations have shaped our food preferences and habits for decades, particularly in cities, and can now help reorient them to support regenerative food systems. One example is for food designers to innovate new plant-based protein options as alternatives to meat and dairy, and encourage consumers towards them. Designers can also develop products and recipes that use food by-products as ingredients, and that can – for example by avoiding certain additives – be safely returned to the soil or valorised in the wider bioeconomy. In this way food designers can play their part in designing out food waste. Marketing can position these delicious and healthy products as easy and accessible choices for people on a daily basis.

**SOURCE FOOD GROWN
REGENERATIVELY,
AND LOCALLY WHERE
APPROPRIATE**

**DESIGN AND
MARKET
HEALTHIER
FOOD PRODUCTS**

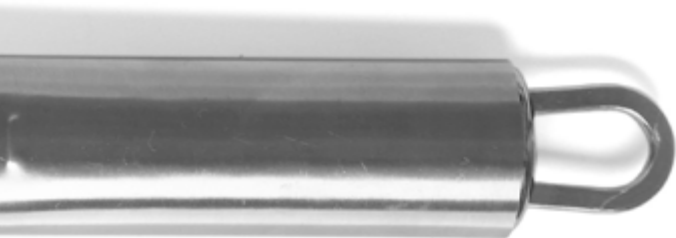


THERE ARE CLEAR BENEFITS OF ACHIEVING A REGENERATIVE SYSTEM

The three ambitions will have greatest impact if pursued simultaneously. Designing and marketing food products that appeal to people using more locally available and seasonal ingredients would increase cities' connection with local farmers and could help spark the transition to regenerative practices. Using more local ingredients would likely increase the traceability of food and therefore potentially its safety. Similarly, making the compost and fertilisers derived from food by-products attractive to peri-urban farmers would help drive efforts in cities to collect and make the most of these by-products and other organic materials. As hubs of innovation and connectivity, cities are ideally placed to successfully link up all elements of the food value chain.

Achieving these three ambitions would allow cities to move from passive consumers to active catalysts of change, and generate annual benefits worth USD 2.7 trillion by 2050 that can be enjoyed by people around the world.

These benefits include reducing annual greenhouse gas emissions by 4.3 billion tonnes of CO₂ equivalent, comparable to taking nearly all the 1 billion cars in the world off the road permanently; avoiding the degradation of 15 million hectares of arable land per year; and saving 450 trillion litres of fresh water. Health benefits include lowering the health costs associated with pesticide use by USD 550 billion, as well as significant reductions of antimicrobial resistance, air pollution, water contamination, and foodborne diseases. Cities can also unlock an economic opportunity upwards of USD 700 billion by reducing edible food waste and using nitrogen and phosphorus from food by-products and organic materials for new cycles. From producers and brands to processors and retailers, businesses across the food value chain can tap into high-growth sectors such as biomaterials or delicious plant-based protein products.



MOBILISING THE TRANSFORMATION AT SCALE DEMANDS A NEW APPROACH

While the principles of healthier, regenerative food systems are well understood in broad terms, and many examples already exist, the challenge is realising the vision at scale.

Realising the vision at scale will require a global systems-level change effort that is cross-value chain, spans public and private sectors, and complements existing initiatives.

This effort will need to mobilise unprecedented collaboration between food brands, producers, retailers, city governments, waste managers, and other urban food actors. It will entail an orchestration of multiple efforts to build mutually reinforcing momentum, including connecting local flagship demonstration projects in key cities around the world with global scaling mechanisms that use the reach of multinational businesses and collaborative platforms. The orchestration of supportive policy frameworks, innovations, financial instruments, and communications to engage the wider public will also all be needed to create the enabling conditions for a systems shift.

The report has clearly demonstrated that using the catalytic potential of cities to spark change can be a powerful addition to the landscape of efforts needed to transform our relationship with food.

Now is the time to make it happen.





NOTE ABOUT THE REPORT

Cities and Circular Economy for Food (2019) is designed to initiate a deeper exploration of the role that cities, and the businesses and governments in them, can have in the creation of a circular economy for food. It acknowledges cities as only one key driver of change among many others. It advocates the circular economy as one of several approaches that can support the development of a healthier and regenerative food system.

The authors of the report collected information from more than 200 articles, publications, and reports, and consulted more than 100 experts during its preparation. However, uncertainties remain within the report as the scientific understanding of the various components of a circular economy for food supply continues to evolve.

While most of the trends and examples listed in the report relate to OECD countries, the broad principles underpinning the vision for a circular economy for food laid out are intended to be applicable globally, with relevance to both the industrial and the smallholder food systems.

The report does not intend to provide diet recommendations or advice on food consumption, although it does highlight the role that food brands, manufacturers, and providers have in offering healthy foods with positive environmental impacts.

DISCLAIMER

The report has been produced by a team from the Ellen MacArthur Foundation. SYSTEMIQ provided analytical support. The Ellen MacArthur Foundation makes no representations and provides no warranties in relation to any aspect of the report, including regarding the advisability of investing in any particular company or investment fund or other vehicle. Whilst care and attention has been exercised in the preparation of the report and its analyses, relying on data and information believed to be reliable, neither the Foundation nor any of its employees or appointees shall be liable for any claims or losses of any nature in connection with information contained in this document, and the full report, including, but not limited to, lost profits or punitive or consequential damages.

The Ellen MacArthur Foundation would like to thank the organisations who contributed to the report (see following pages) for their constructive input. Contribution to the report, or any part of it, should not necessarily be deemed to indicate any kind of partnership or agency between the contributors and the Ellen MacArthur Foundation, nor an endorsement of its conclusions or recommendations.

© **Ellen MacArthur Foundation 2019**

The full report can be found at:
<http://www.ellenmacarthurfoundation.org/publications>

To quote the report, please use the following reference:
Ellen MacArthur Foundation, *Cities and Circular Economy for Food* (2019).

ACKNOWLEDGEMENTS

We are very grateful for the support we have received in producing the report. Special thanks go to our Advisory Board, our Participating Organisations for their active involvement, and also to the many leading academic, industry, NGO, and government agency experts who provided invaluable perspectives.

LEAD PARTNER

INTESA  SANPAOLO

 INTESA SANPAOLO
INNOVATION CENTER

CORE PARTNERS



SITRA

 SUEZ



 VEOLIA

PHILANTHROPIC PARTNERS

 CALOUSTE GULBENKIAN
FOUNDATION



 PORTICUS

KNOWLEDGE PARTNER

S Y S T E M I Q

CORE PROJECT TEAM

ELLEN MACARTHUR FOUNDATION

Andrew Morlet, Chief Executive
Rob Opsomer, Systemic Initiatives Lead
Clementine Schouteden, Project Lead and Lead Author
Emma Chow, Project Manager
Nick Jeffries, Case Study Programme Manager
Luisa Santiago, Brazil Lead
Del Hudson, North America Lead
Aurélien Susnjara, Research Analyst
Camille Gillet, Research Analyst
Marco Meloni, Research Analyst
Victoria Almeida, Brazil Associate

SYSTEMIQ

Martin Stuchtey, Managing Partner
Jaap Strengers, Senior Associate
Lauren Boutillier, Associate
Tilmann Vahle, Associate
Florian Fesch, Intern
Lisa Griebel, Intern
Mayra Buschle, Working Student



FURTHER CONTRIBUTORS

ELLEN MACARTHUR FOUNDATION

Ian Banks, Editorial Lead

Joe Iles, Editor

Jocelyn Bleriot, Executive Officer; Head, International Institutions & Governments

Clementine d'Oiron, Network Manager

Sarah Churchill-Slough, Design and Branding Manager

Ross Findon, Media and Social Media Manager, Systemic Initiatives

Katie Schuster, Communications Executive, Systemic Initiatives

Alix Bluhm, Communications Manager, Systemic Initiatives

Sebastian Egerton-Read, Social Media Manager

Vicky Deegan, Digital Project Manager

CONKER HOUSE PUBLISHING

Jo de Vries, Editor

Emma Parkin, Editor

ADVISORY BOARD

CALOUSTE GULBENKIAN FOUNDATION

Catarina Grilo, Manager Sustainability Program

Luis Lobo Xavier, Director Sustainability Program

DANONE

Merijn Dols, Senior Director of Business Processes, Open Innovation & Cycles

INTESA SANPAOLO AND INTESA SANPAOLO INNOVATION CENTER

Massimiano Tellini, Global Head - Circular Economy

Luigi Riccardo, Innovation Specialist - Circular Economy

PEOPLE'S POSTCODE LOTTERY

Will Humpington, Climate Change & Environmental Programmes Advisor

PORTICUS

Federico Bellone, Regional Director for Latin America

SUEZ

Henry Saint-Bris, Senior Advisor

TETRA PAK

Mario Abreu, Vice President - Sustainability

Sabine von Wirén-Lehr, Director Public Affairs

THE FINNISH INNOVATION FUND SITRA

Hanna Mattila, Specialist, Circular Economy

VEOLIA

Gary Crawford, Vice President - International Affairs

PROJECT MAINSTREAM BOARD

AVERDA

Malek Sukkar, Chief Executive Officer

DSM

Feike Sijbesma, Chief Executive Officer

PHILIPS

Frans van Houten, Chief Executive Officer

SUEZ

Jean-Louis Chaussade, Chief Executive Officer

VEOLIA

Antoine Frérot, Chief Executive Officer

WORLD ECONOMIC FORUM

Sean de Cleene, Head, Food System Initiative

Antonia Gawel, Head, Circular Economy Initiative

EXPERTS

Alexi Ernstoff, Sustainability Consultant and Global Science Lead, Quantis International

Alice Holden, Head Grower, Growing Communities Dagenham Farm

Andrew Merritt, Director, Something & Son

Andrew Stephen, Chief Executive Officer, The Sustainable Restaurant Association

Brandi DeCarli, Founding Partner, Farm from a Box

Calla Rose Ostrander, Strategic Advisor Climate and Food Systems, Phoenix Rising Resources, LLC

Chris Thornton, Secretariat, European Sustainable Phosphorus Platform

Christian Schader, Head of Sustainability Assessment, Research Institute of Organic Agriculture (FiBL)

Evan Fraser, Director and Canada Research Chair, Arrell Food Institute, University of Guelph

Experts from GAIN

Experts from the Global Alliance for Incinerator Alternatives (GAIA)

Gauthier Boels, Senior Innovation Manager –
Circular Economy, Yara International ASA

Hunter Lovins, President of Natural Capitalism Solutions;
Professor of Sustainable Management at Bard MBA

René van Veenhuizen, Senior Programme
Officer, RUAF Foundation

Jean de Barrau, Regenerative Agriculture
Director, Danone North America

Jim Harris, Professor of Environmental Technology,
Cranfield Soil and Agrifood Institute

Jun Axup, Scientific Director & Partner, IndieBio

Kevin Bayuk, Senior Research Fellow,
Project Drawdown

Marco Ricci, CIC-Italian Composting and Biogas
Association and ECN-European Composting Network

Marine Legrand, Research and Network Animation,
Programme OCAP, Laboratoire Eau Environnement
Systèmes Urbains, École des Ponts ParisTech

Mark C.M. van Loosdrecht, Chair Professor,
Environmental Biotechnology, Delft
University of Technology

Michael Doane, Managing Director of Agriculture
and Food Systems, The Nature Conservancy

Miriam Otoo, Senior Economist and Research
Group Leader – Resource Recovery and Reuse,
International Water Management Institute

Patricia Minaya, Project Manager – Nutrient
Recovery Processes, Hamburger Umweltinstitut

Patrick Holden, Chief Executive, Sustainable Food Trust

Pay Drechsel, Strategic Program Leader ‘Rural-Urban
Linkages’, International Water Management Institute

Philippe Ciais, Researcher, LSCE

Ruerd Ruben, Professor, Wageningen
University & Research

Susanna Gionfra, Policy Analyst in Natural
Resources and Circular Economy, Institute
for European Environmental Policy

Tim Benton, Dean of Strategic Research
Initiatives, University of Leeds and Distinguished
Visiting Fellow, Chatham House

Weber Amaral, Professor, University of São Paulo –
ESALQ (Luiz de Queiroz College of Agriculture)

PARTICIPATING ORGANISATIONS

ACR+ (ASSOCIATION OF CITIES AND REGIONS FOR SUSTAINABLE RESOURCE MANAGEMENT)

Jean-Benoit Bel, Senior Project Manager

Philippe Micheaux Naudet, Senior Project Manager

AGRIPROTEIN

David Drew, Executive Director

BARILLA CENTER FOR FOOD & NUTRITION

Marta Antonelli, Research Project Manager

BIOPOLUS

Erzsébet Poór-Pócsi,
Senior Circular Economy Specialist

BITS X BITES

Matilda Ho, Founder and Managing Director

BRIGHTLANDS CAMPUS GREENPORT VENLO

Maikel Borm, Business Developer

C40 CITIES CLIMATE LEADERSHIP GROUP

Zachary Tofias, Director, Food, Water and
Waste Programme

CITY OF MILAN

Andrea Magarini, Food Policy Coordinator

CENTER FOR ECOLITERACY

Leyla Marandi, California Thursdays Network Coordinator

CITY OF TORONTO

Annette Synowiec, Acting Manager, Unit
for Research Innovation & a Circular Economy

EAT

Sudhvir Singh, Policy Director

FEC ENERGY

Edward Hardy, Senior Engineer

FROM WASTE TO TASTE - ASSOCIATION

Satu Vainio, Executive Director

FULL CYCLE BIOPLASTICS

Andrew Falcon, Chief Executive Officer

HERA GROUP

Filippo Bocchi, CSR Director

IDEO

Chris Grantham, Executive Director, Circular Economy

Holly Bybee, Director

Lauren Yarmuth, Director

INSTITUTE FOR EUROPEAN ENVIRONMENTAL POLICY

Susanna Gionfra, Policy Analyst

KRIKET

Michiel Van Meervenne, Founder

LEANPATH INC

Andrew Shakman,
Co-founder and Chief Executive Officer

MAPLE LEAF FOODS INC

Tim Faveri, Vice President, Sustainability & Shared Value

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

David Allaway, Senior Policy Analyst

PLANT CHICAGO**Jonathan Pereira**, Executive Director**RENEWAL MILL****Claire Schlemme**, Chief Executive Officer**REPLATE****Maen Mahfoud**, Chief Executive Officer**RESTAURANT NOLLA****Carlos Henrique**, Co-owner**SAN FRANCISCO DEPARTMENT OF THE ENVIRONMENT****Jack Macy**, Zero Waste Senior Coordinator**SDG2 ADVOCACY HUB****Paul Newnham**, Director**ULTIMA HELSINKI****Henri Alen**, Restaurateur**VCS DENMARK****Mads Leth**, Chief Executive Officer**YEAST****Federico Duarte**, Founder**THE WASTE TRANSFORMERS****Coen Bakker**, Marketing Manager**TINY LEAF RESTAURANT AND SATIVA RESTAURANT****Justin Horne**, Eco-Chef/Director**UNIVERSITY OF LINCOLN****David May**, Senior Project Manager**VERT D'IRIS INTERNATIONAL****Frédéric Morand**, Founding Manager**WBCSD****David Bennell**, Manager of Food, Land and Water**WINNOW****Marc Zornes**, Chief Executive Officer

FOCUS CITIES

BRUSSELS, BELGIUM

BRUSSELS ENVIRONNEMENT**Joséphine Henrion**,
Food and Consumption Service Manager**CIRCLEMADE.BRUSSELS BY HUB.BRUSSELS****Anthony Naralingom**,
Circular Economy Cluster Coordinator**SHORT CHAIN SUPPORT FLANDERS****Clara Moeremans**, Advisor Steunpunt Korte Keten**UNIVERSITÉ LIBRE DE BRUXELLES (IGEAT)****Simon De Muynck**, Research-action Coordinator**UNIVERSITÉ LIBRE DE BRUXELLES (LA CAMBRE-HORTA)****Stephan Kampelmann**,
Chair in Circular Economy and Urban Metabolism

GUELPH, CANADA

ARRELL FOOD INSTITUTE**Evan D.G. Fraser**, Director, Arrell Food Institute and
Canada Research Chair, University of Guelph**LYSTEK INTERNATIONAL INC****Kevin Litwiller**, Director, Marketing and Communications
Mike Dougherty, Director, Product Management**LOBLAW COMPANIES LTD****Jennifer Lambert**, Senior Manager, Sustainability**MICHAEL KEEGAN AND ASSOCIATES,****Michael Keegan**, President**ONTARIO AGRI-FOOD TECHNOLOGIES****Tyler Whale**, President

PORTO, PORTUGAL

ALIADOS - THE CHALLENGES CONSULTING**Vasco Sousa**, Co-founder & Managing Partner**FÓRUM OCEANO - ASSOCIATION OF MARITIME ECONOMY****Carla Domingues**, Project Officer**LIPOR - INTERMUNICIPAL WASTE MANAGEMENT OF GREATER PORTO, PORTUGAL****Susana Lopes**, Senior Technician, Environmental Engineer**MUNICIPALITY OF PORTO, DEPARTMENT OF ENVIRONMENTAL PLANNING AND MANAGEMENT****Sara Velho**, Senior Technician**Nuno Morais**, Senior Technician**Pedro Pombeiro**, Head of Department**SONAE MC****Pedro Lago**, Director, Sustainability and Circular Economy

SÃO PAULO, BRAZIL

AB INBEV (AMBEV BREWERY)

Filipe Barolo, Environment Sustainability Manager

Richard Lee, Corporate Sustainability Manager

ABRELPE

Carlos R.V. Silva Filho, Executive Director

BASF SOUTH AMERICA

Emiliano Graziano, Corporate Sustainability Manager

CARREFOUR BRASIL

Felipe Luiz Alves, Sustainability Specialist

CEAGESP - GENERAL WAREHOUSING COMPANY OF SÃO PAULO STATE

Flávio Godas, Economist

CETESB - ENVIRONMENTAL AGENCY OF THE STATE OF SÃO PAULO

Flávio de Miranda Ribeiro, Manager, Department of Public Policy in Solid Waste and Resource Efficiency

COCA-COLA BRASIL

Andréa Valle Mota, Sustainability Director

IMPACTO ENERGIA

Danilo Trevisan, Director of Development and Technology

INSTITUTO ARGOFUTURO

Beatriz Vanzolini Moretti, Project Developer

MORADA DA FLORESTA

Victor Hugo Argentino de Morais Vieira, Project Coordinator

PAULISTA STATE UNIVERSITY "JULIO DE MESQUITA FILHO" / ENGINEERING SCHOOL OF BAURU

Gustavo Henrique Ribeiro da Silva, Professor, Environmental and Sanitary Engineering

PLANT FAZENDAS URBANAS

Le Andrade, Founding Partner

Jean Roversi, Founding Partner

Jeison Cechella da Silva, Entrepreneur

SISTEMA B BRASIL

Flavia Pascowitch, Communications and Community Manager

Tatiana Mendizabal, Business and Strategic Alliances Manager

UNILEVER BRASIL

César Maida Freire, Sustainability and Communications Manager

Luísa de Moura Roberto, Marketing Coordinator

Michael Amorim de Oliveira, Sustainability Coordinator

UNION OF SÃO PAULO COMMUNITY GARDENS

Claudia Visoni, Member

ABOUT THE ELLEN MACARTHUR FOUNDATION

CORE PHILANTHROPIC FUNDERS



GLOBAL PARTNERS



The Ellen MacArthur Foundation was launched in 2010 with the aim of accelerating the transition to the circular economy. Since its creation, the charity has emerged as a global thought leader, putting the circular economy on the agenda of decision-makers around the world. The charity's work focuses on seven key areas: insight and analysis; business; institutions, governments, and cities; systemic initiatives; circular design; learning; and communications.

Further information: ellenmacarthurfoundation.org • @circulareconomy

IMAGE CREDITS

in order of appearance:

KOHLRABI: © IMAGINEILONA, ADOBESTOCK.COM

PEPPERCORNS: © NIK_MERKULOV, ADOBESTOCK.COM

FLOUR AND ROLLING PIN: © STEPHANIE FREY, ADOBESTOCK.COM

PINEAPPLE: © EMIL BIZYAEV, ADOBESTOCK.COM

SPATULA: © BECKYSTARSMORE, ADOBESTOCK.COM

ROSEMARY: © MARGO555, ADOBESTOCK.COM

SUSHI: © VANKAD, ADOBESTOCK.COM



ELLEN
MACARTHUR
FOUNDATION

© ELLEN MACARTHUR FOUNDATION 2019
www.ellenmacarthurfoundation.org

