



December 1, 2022

## Circular Economy – Frameworks

Presented by:

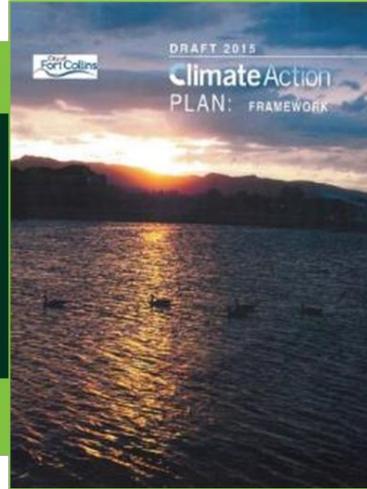
Molly Saylor

Lead Specialist, Waste Reduction and  
Recycling



Funded by the  
European Union

City of  
**Fort Collins**



### Climate Action Plan

Carbon neutral  
by 2050

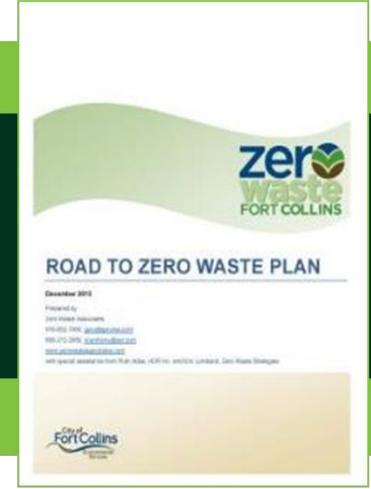
### FORT COLLINS ENERGY POLICY

December 15, 2015



### Energy Policy

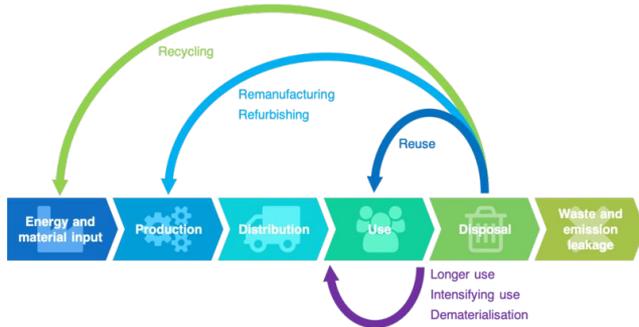
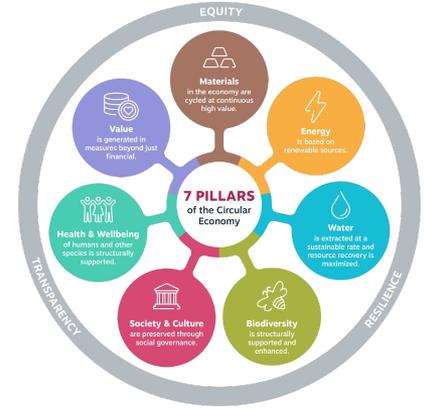
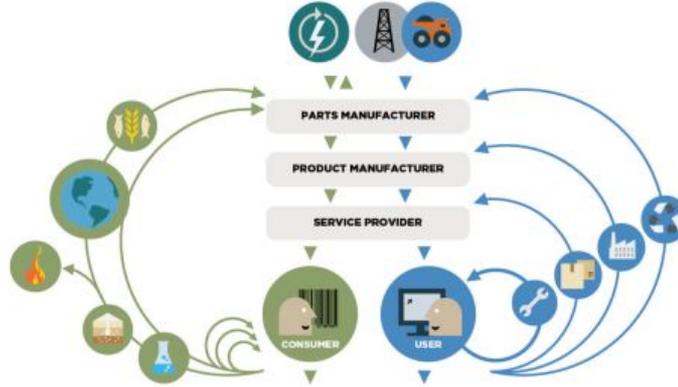
100% renewable  
electricity  
by 2030



### Road to Zero Waste Plan

Zero Waste  
by 2030

**Over 70 strategies, including updating Economic Health Strategic Plan with first ever circular economy focus!**



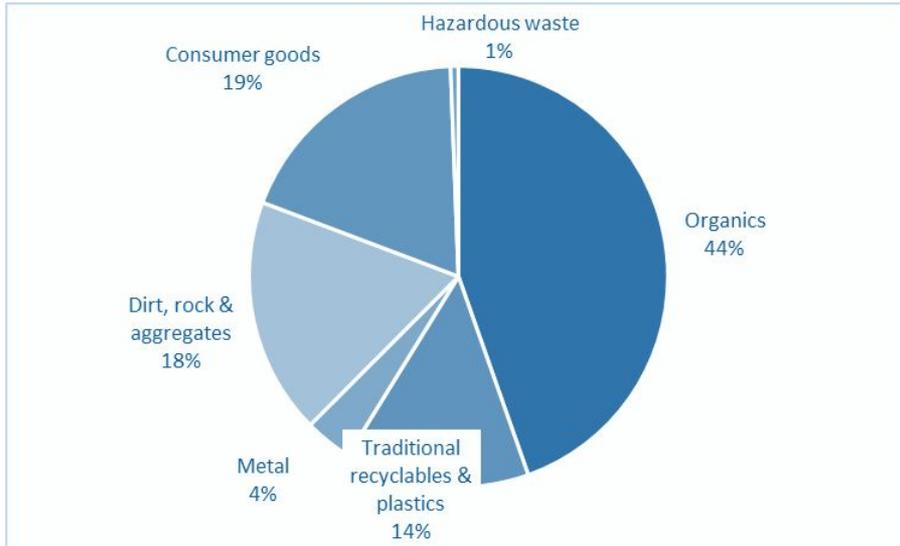
## Fort Collins manufacturing landscape

- Not historically manufacturing town, prior focus on agriculture (sugar production)
- Now is university town with some industry
- Large-scale manufacturing in high-tech, machinery and beer brewing
- Small/medium manufacturers in a variety of industries

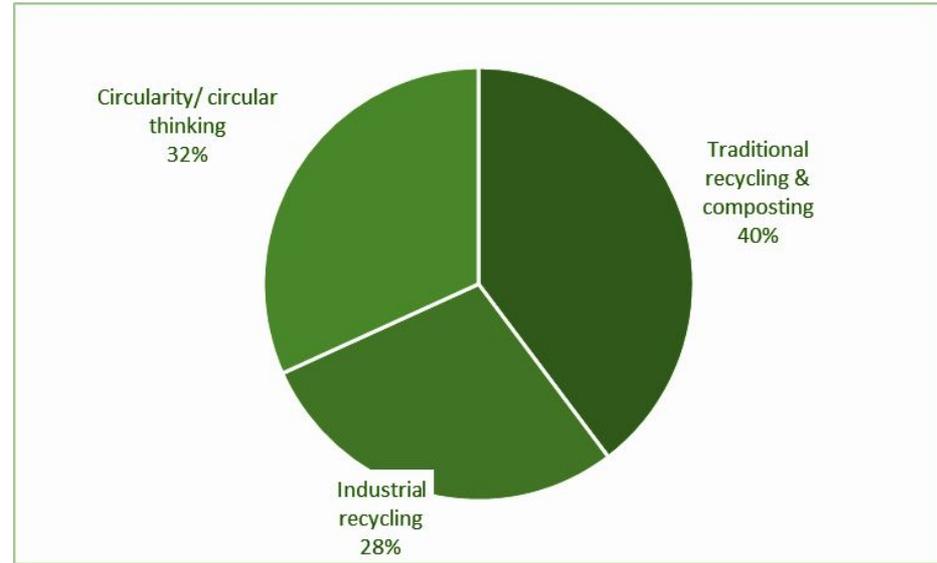
## Raw materials needed in Fort Collins industries

Tech	Beer	Machinery
<ul style="list-style-type: none"> <li>● Silica</li> <li>● Plastics</li> <li>● Metals, including rare metals</li> <li>● Packaging materials</li> </ul>	<ul style="list-style-type: none"> <li>● Water</li> <li>● Hops</li> <li>● Yeast</li> <li>● Glass</li> <li>● Paper</li> </ul>	<ul style="list-style-type: none"> <li>● Metal</li> <li>● Plastics</li> <li>● Textiles...?</li> <li>● ...?</li> </ul>

## 51% waste diversion with low rates for residential and commercial recycling, high rates for industrial diversion



Landfilled waste



Diversion approaches

## Leading by example



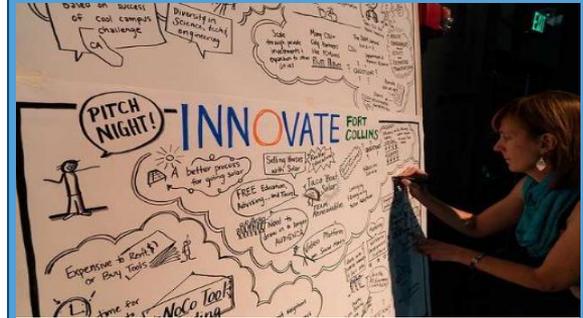
- Hoffman Mill crushing facility
- Forestry mulching program

## Regulation



- Colorado law - Extended Producer Responsibility
- FC law - all new roofs use Class IV shingles
- FC law - all grocers divert food waste or compost

## Supporting businesses



- Innovate Fort Collins Challenge
- Sustainable Business Program

*We want to learn more here-  
what else can we do to  
support businesses?*

## Key questions

In many climate/waste/circular economy plans, we are seeing recycling strategies rebranded as circular economy. We get it, recycling *is*, by definition, circular, and...

- *What framework can help ensure we are identifying strategies that impact new sectors and materials for which we don't have good recycling strategies?*

We know there are regulatory approaches like extended producer responsibility and... in which ways can we best support businesses in starting or scaling their circular efforts?

- *Is it start-up funding? Incubation? Skilled workers? Clusters and partnerships?*

What are other cities doing? We're just not seeing many examples of business support strategies focused on circular economy in cities' planning documents but surely they are out there... right?

- *Who is working with their manufacturers well? What can we learn?*



Metabolic

# Circular Economy

FROM FRAMEWORKS TO  
ACTION

December 2022 - Erin Kennedy -  
[erin@metabolic.nl](mailto:erin@metabolic.nl)



# Introduction

# Personal Background





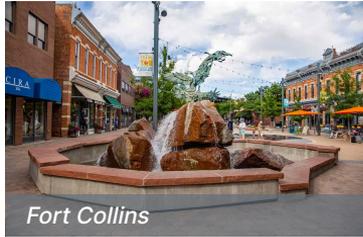
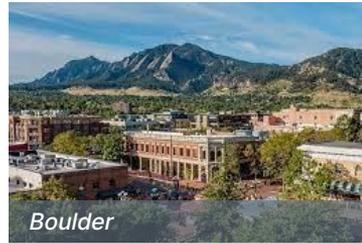
**OUR MISSION**  
**is to transition the global**  
**economy to a fundamentally**  
**sustainable state.**

# Our “ecosystem”

We are a group of organizations working together to drive systems change and build a sustainable economy. We **advise** the public and private sector, **research** sustainable solutions, build **software** tools, scale impactful **ventures**, and **empower communities** on the ground.



# Some of the cities we have worked with



# Concepts and Frameworks to help in your journey

## Defining the Circular Economy

What to consider when defining the circular economy for your own context

## Systems transformation

Understanding what scale to act and which levers to push to create more meaningful change

## Ideas to enable action

How CE frameworks and key concepts can help identify concrete actions to take forward

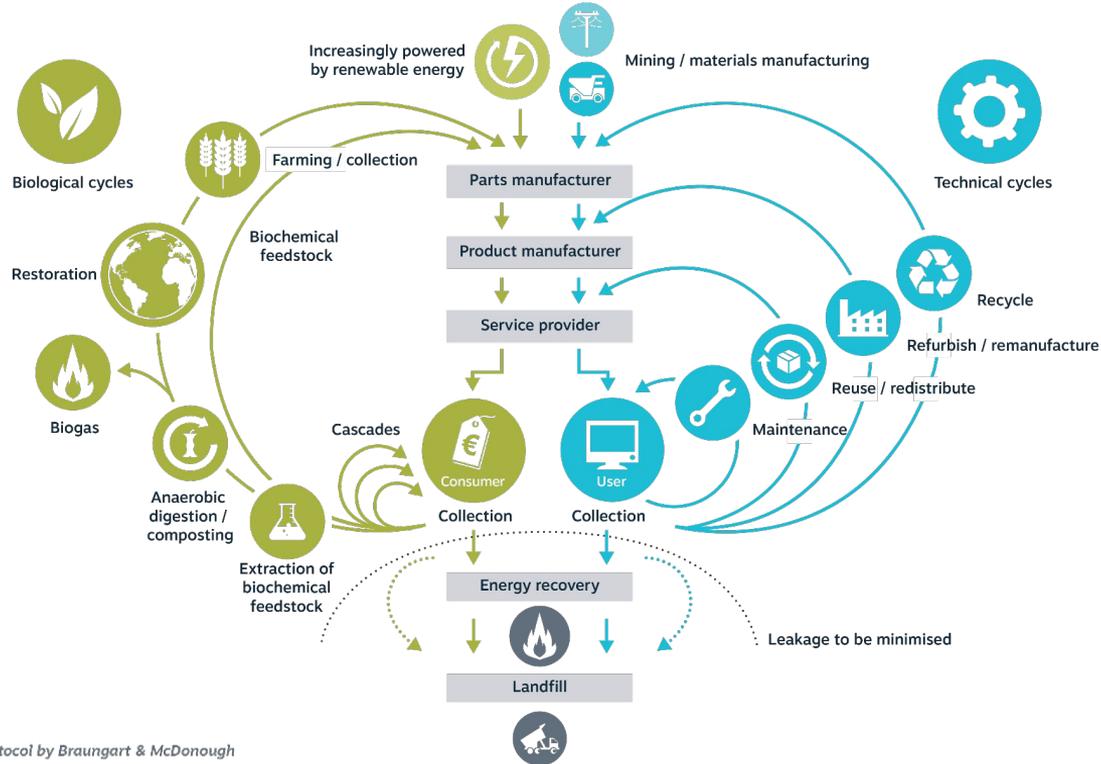
# Defining the Circular Economy

# From a Linear Economy...

## THE LINEAR ECONOMY an unsustainable model

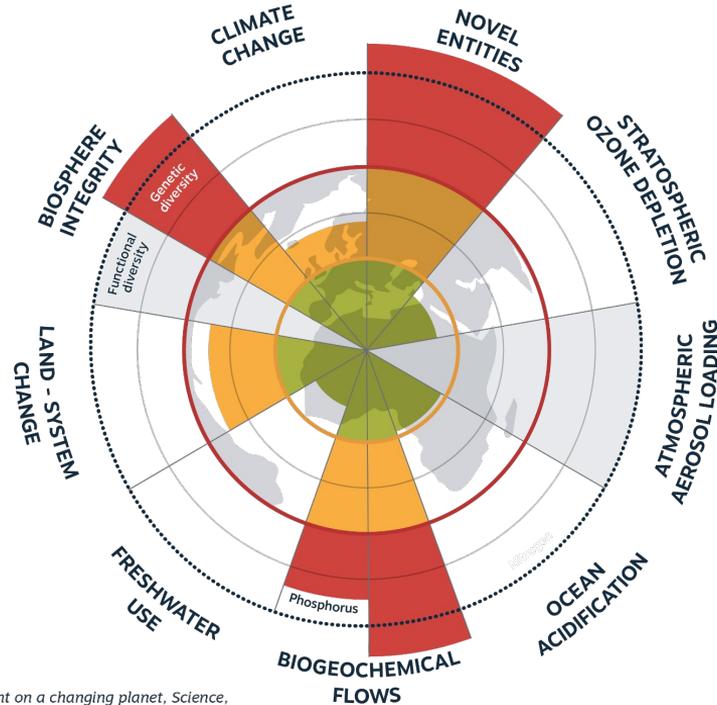


# ... to a “circular” one



Source: Ellen MacArthur Foundation  
Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough

# The Planetary Boundaries



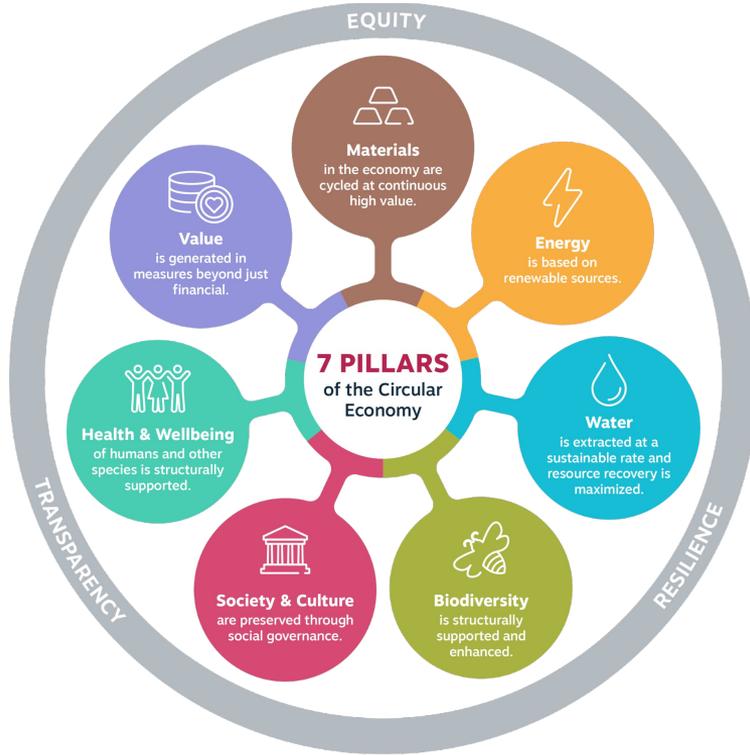
- Beyond zone of uncertainty (high risk)
- In zone of uncertainty (increasing risk)
- Below boundary (safe)
- Boundary not yet quantified

Source: Steffen et al. *Planetary Boundaries: Guiding human development on a changing planet*, *Science*, 16 January 2015. Persson et al. *Outside the Safe Operating Space of the Planetary Boundary for Novel Entities*, *Environ. Sci. Technol.*, 18 January 2022. Design: Globala

# Is this circular?



# Seven Pillars of the Circular Economy



**Materials** in the economy are cycled at continuous high value



All **Energy** is based on renewable resources



**Water** is extracted at a sustainable rate and resource recovery is maximized



**Biodiversity** is preserved and protected



**Human society and culture** is enhanced



The **health and wellbeing** of humans and other species is structurally supported

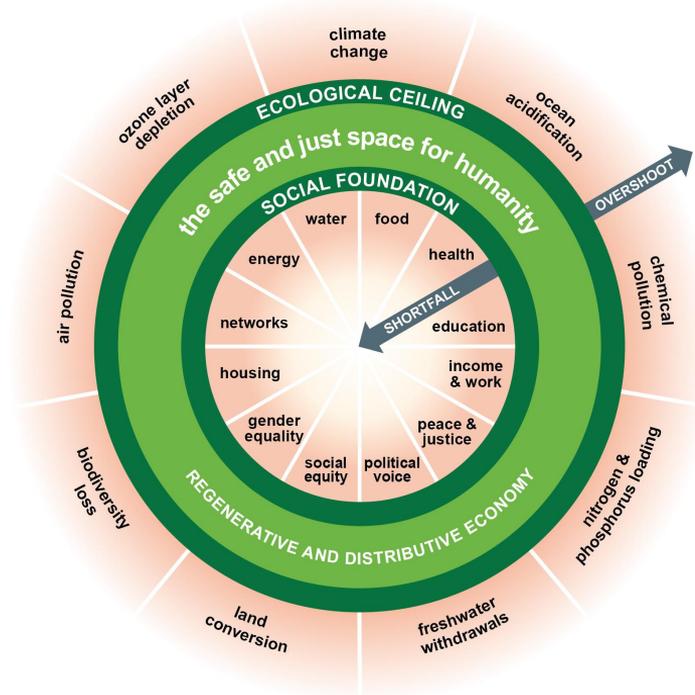


Human activities generate **value** in measures **beyond just financial**

## **A circular economy is...**

A new economic model for addressing human needs and fairly distributing resources, without undermining the functioning of the biosphere or crossing any planetary boundaries

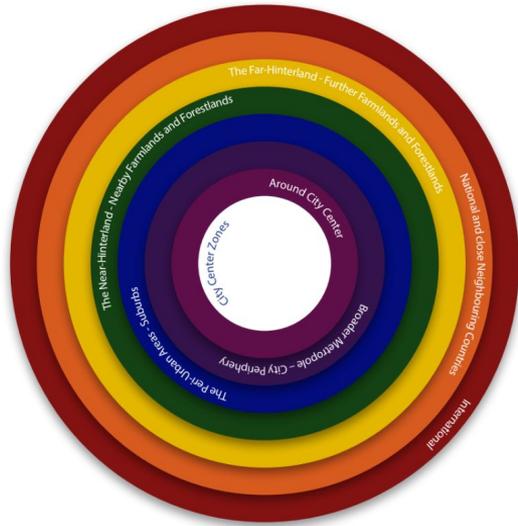
# Other Systemic Frameworks



Raworth, Kate (2012). A Safe and Just Space for Humanity: Can We Live within the Doughnut? (PDF). Oxfam Discussion Papers.  
 From: [https://www-cdn.oxfam.org/s3fs-public/file\\_attachments/dp-a-safe-and-just-space-for-humanity-130212-en\\_5.pdf](https://www-cdn.oxfam.org/s3fs-public/file_attachments/dp-a-safe-and-just-space-for-humanity-130212-en_5.pdf)

# Concepts and Frameworks for Systems Transformation

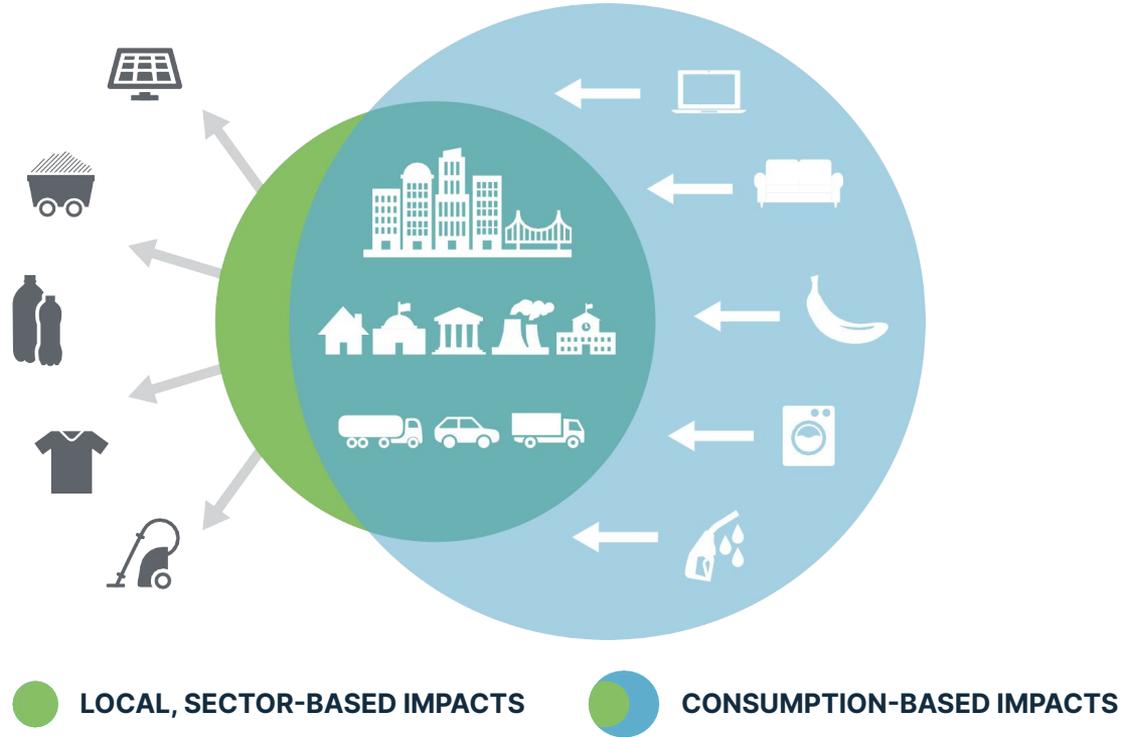
# On what scale do you act and how?



Consider adopting a spatial model - considering where materials are produced and consumed when deciding what to focus on locally vs. start regional or global cooperation

- **Food and nutrients are produced and consumed everywhere in large volumes** → Ideally these cycles are closed on a local scale
- **Mineral products like concrete are produced in many, but not all places, and are heavy** → Regional programs can ensure an economically viable scale while realizing environmental savings
- **Scarce metals in electronics are mined and manufactured only in specific regions in the world** → Global cooperation is needed to create a circular system, but local stakeholders need to participate in that global system

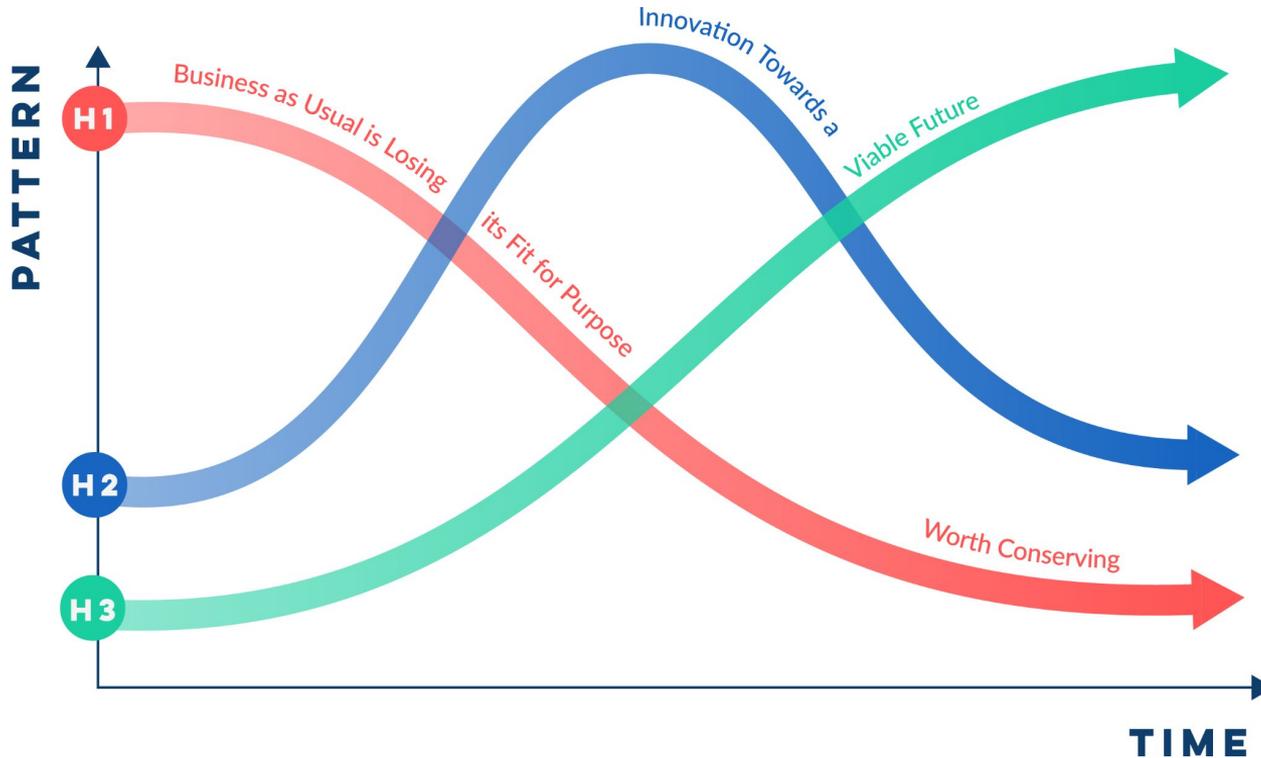
# How to address consumption?



# How to address consumption?



# Where are you at in the journey?

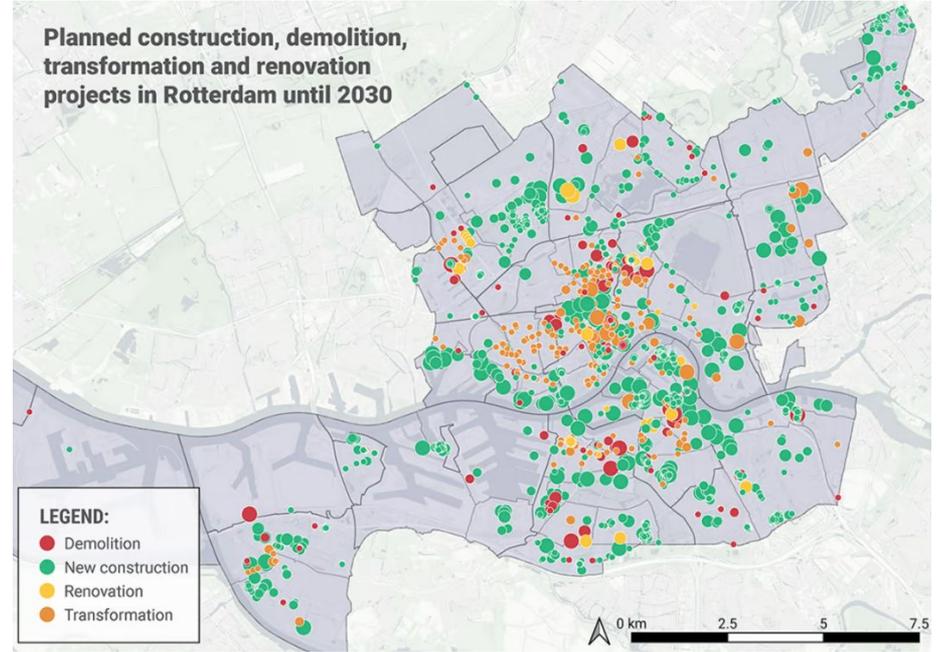


## Three horizons framework

A framework for understanding and facilitating societal transformation and exploring innovation and action in the face of uncertainty

# **Ideas to Enable Action**

# Cities as “Urban Mines”



# Uncovering “Industrial Symbiosis” Opportunities



# “R Strategies”

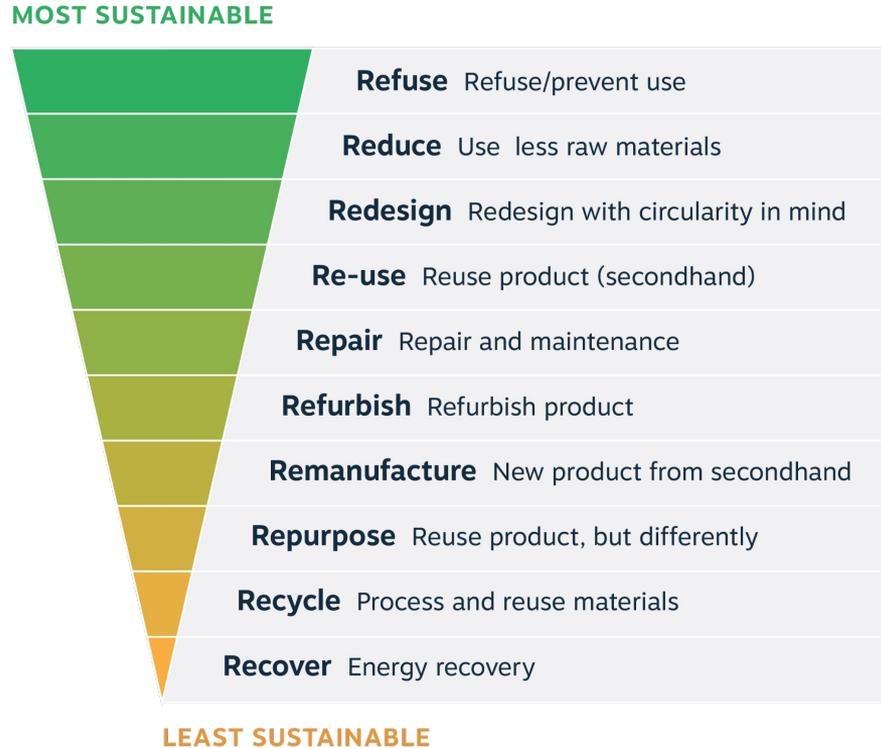


Image adapted from:  
<https://www.erasmusmc.nl/-/media/erasmusmc/pdf/2-themaoverstijgend/erasmusmcsustainabilityreport2020endef-v-200721.pdf?la=en>

# Building “Innovation Ecosystems”



## Textiles Production

- > Deciding which virgin or recycled materials to source
- > Blending fibers to create yarns and fabrics



## Fashion Design

- > Timeless design vs. trends
- > Design for longevity
- > Design for disassembly



## Repair Cafes

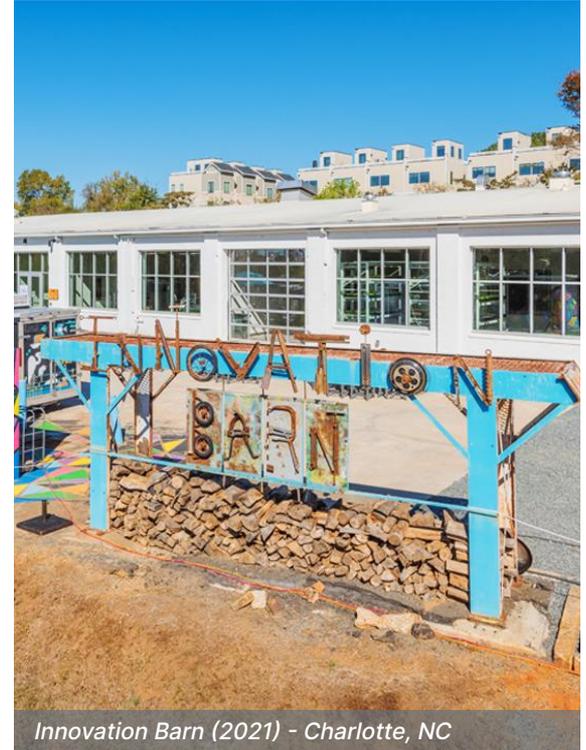
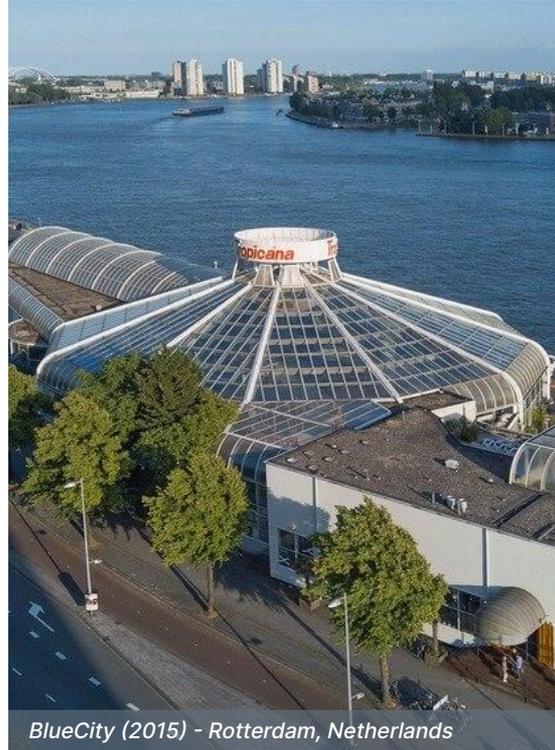
- > Helping extend the lifespan of products
- > Identifying common points of failure



## Textiles recycling

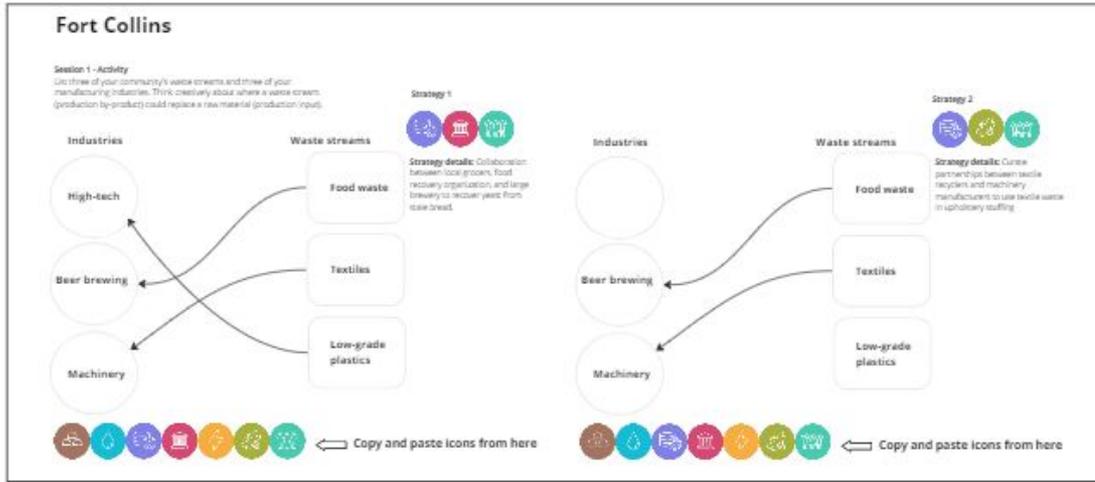
- > Disassembling parts
- > Identifying blends
- > Technologies for recycling and maintaining fiber quality

# Letting “Living Labs” Demonstrate & Experiment



# Exercise

# Exercise



We will do an exercise in Miro today to get you started on thinking about Circular Economy in your own city. In the following workshops, we will build on this basis.

Today, consider:

- What is manufactured/produced in your cities?
- What are key waste streams or other outputs?
- How could these be recombined to create a more circular system in ways that create multiple benefits for the economy, environment, and community?



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