PLANT
CHICAGO

# our mission

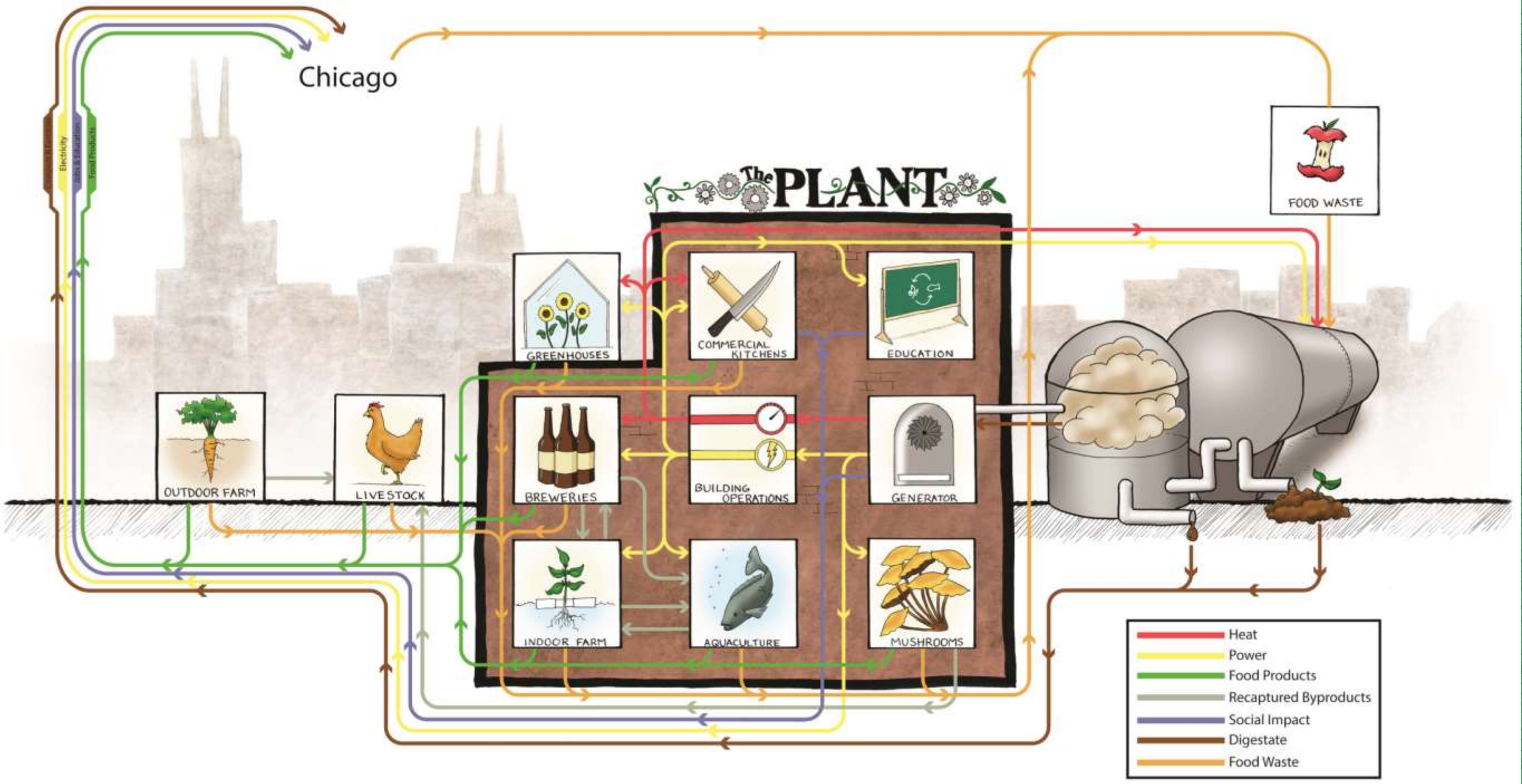
To develop circular economies of food production, energy conservation and material reuse, while empowering people of all backgrounds to make their cities healthier and more efficient.

## What is a Circular Economy?

In a circular economy, conventional waste streams from one process are repurposed as inputs for another, creating a circular, closed-loop model of material reuse.


PEER®


PEER


Chicago
Electricity
Jobs & Education
Food Products
The PLANT
FOOD WASTE
GREENHOUSES
COMMERCIAL KITCHENS
EDUCATION
OUTDOOR FARM
LIVESTOCK
BREWERIES
BUILDING OPERATIONS
GENERATOR
INDOOR FARM
AQUACULTURE
MUSHROOMS
Heat
Power
Food Products
Recaptured Byproducts
Social Impact
Digestate
Food Waste


arize
ARTISAN KOMBUCHA
THE ORIGINAL
arize
ARTISAN KOMBUCHA
GINGER
arize
ARTISAN KOMBUCHA
HERBAL

# Outputs as Inputs @ The Plant

Bakery: ash → lye
Brewery: spent grain → livestock feed, growing medium, bread, biobricks
Coffee roaster: chaff → growing medium, biobricks
Mushroom farm: straw → bulking agent, mulch
Shrimp/aquaponics farm: poop → nutrients for algae
Algae → Fish feed
Greens/produce: excess organic material → compost

Kombucha: SCOBY → other consumables?
Spices: packaging material → mushrooms?
Ice: water → indoor or outdoor agriculture use?

Mycofloral Farm
**Flowers**

Bubbly Dynamics
**Building management / Construction**

4 letter word coffee
**Coffee**

Nick Greens
**Vegetables**

*burlap*

*compost*

*ash*

*coffee chaff*

*barm*

Bike a bee
**Honey**

*honey*

Pleasant House Bakery
**Bread/Pies**

*biobricks*

*spent grains*

Whiner Brewery
**Beer**

*high ABV kombucha*

Pleasant Farm
**Vegetables**

Arize Kombucha
**Kombucha**

*medicinal mushrooms*

Fruiting Mushrooms
**Mushrooms**

*scallions*

*Spent medium*

Patchwork Farm
**Vegetables**

Plant Chicago
**Vegetables / Mushrooms**

*saffron*

*wheatgrass trays*

Just Ice
**Ice**

*imperfect Ice*

Urban Canopy
**Vegetables**

Rumi Spices
**Saffron**

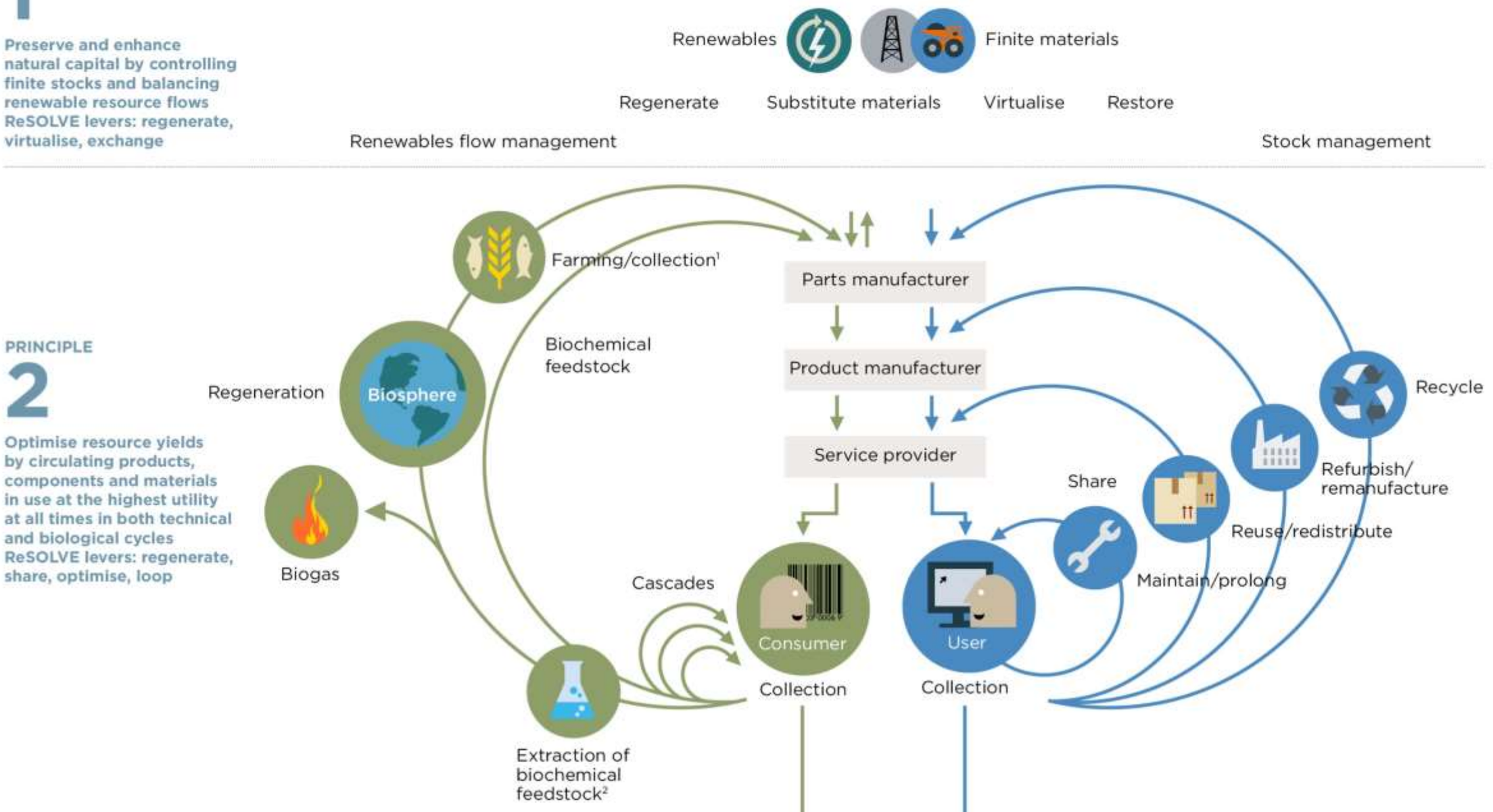
waste exchange
good exchange
future exchange
actual exchange
main exchange
different entities and same owner

## OUTLINE OF A CIRCULAR ECONOMY

**PRINCIPLE**

**1**

**Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows**
**ReSOLVE levers: regenerate, virtualise, exchange**




**PRINCIPLE**

**2**

**Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles**
**ReSOLVE levers: regenerate, share, optimise, loop**

**PRINCIPLE**

**3**

**Foster system effectiveness by revealing and designing out negative externalities**
**All ReSOLVE levers**

Minimise systematic leakage and negative externalities

1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input

Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

# Rethinking vocabulary in a circular economy

- We become “users” not “consumers”
- Redefining “waste”.  Waste is an opportunity!
- Biological and technical “nutrients”
- CE is “regenerative” or “restorative” by design
- The many  R’s (reduce), reuse, refurbish, remanufacture, recycle.
- Materials, nutrients, molecules… whatever you call it… it’s not <u>waste</u>!

# Key principles of our local circular economy

1) Renewable energy is requirement!
2) “Waste” is minimized, either in materials or energy
3) Product economy moves towards a service economy
4) Fast moving goods (high volume and frequent purchases) should be biologically based and safe to return to the environment
5) Economic growth without using “new” materials or nutrients
6) Shared economic success

7) <u>Equitable</u> economic success

# The limitations of a circular economy

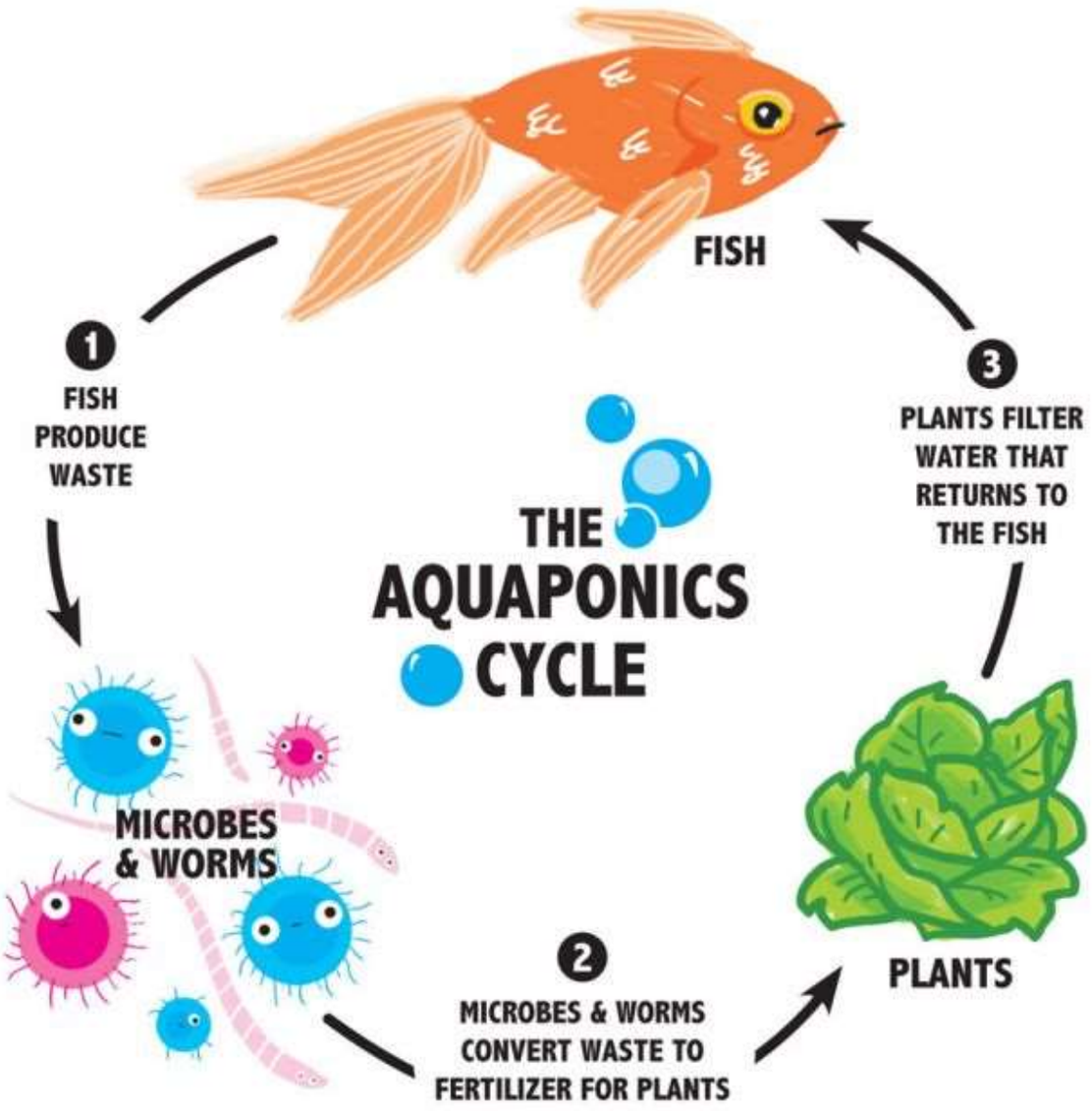
Creating a “regenerative” economy has to take into account those aspe
cts of society that are not easily monetized.

- Equity
- Open space
- Meeting community needs
- Meeting ecosystem needs

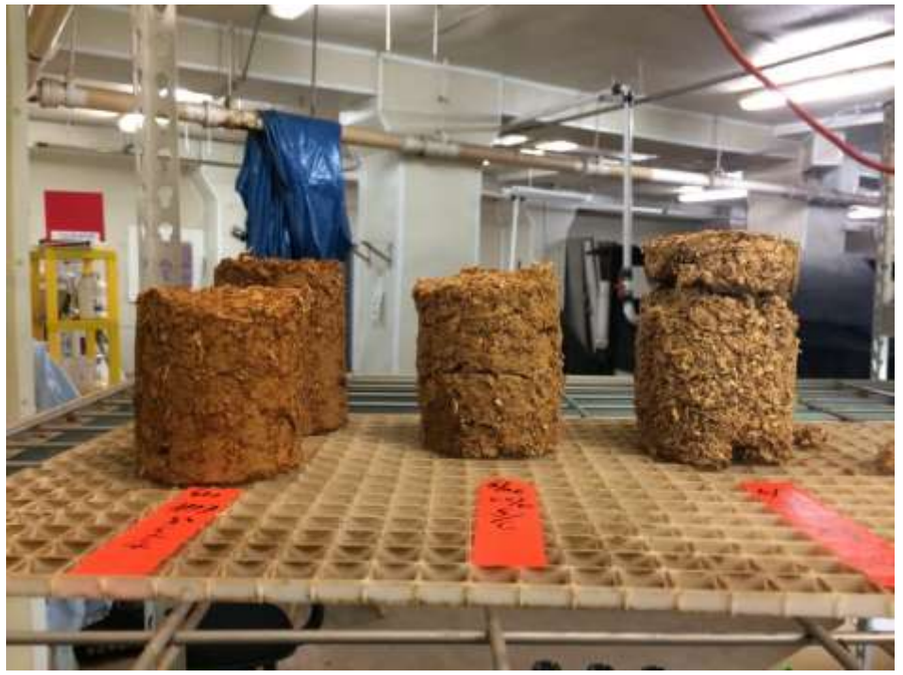
# Three examples in a local circular economy

- Technology example: Anaerobic Digestion

- Research and Demonstration
- Education
- Markets


FISH
1
FISH PRODUCE WASTE
3
PLANTS FILTER WATER THAT RETURNS TO THE FISH
THE AQUAPONICS CYCLE
MICROBES & WORMS
2
MICROBES & WORMS CONVERT WASTE TO FERTILIZER FOR PLANTS
PLANTS

# Research



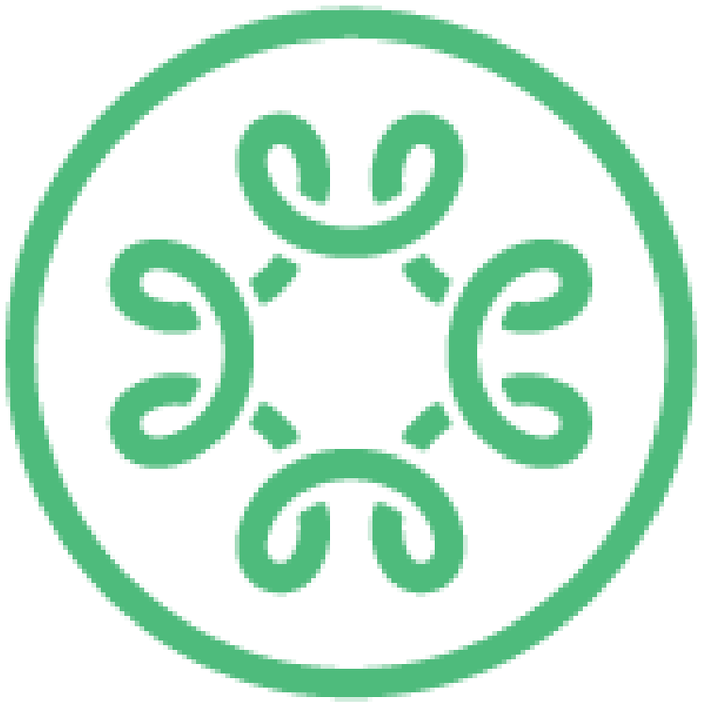
# Technology Demonstration

# Education

# Markets


# Plant Chicago's 2016 Programmatic Achievements

- Over $3,800 worth of healthy food incentives distributed
- 35 small food businesses supported in 2016 (60% women or minority owned)
- Currently averaging over 400 visitors per market (30% from Back of the Yards)
- Over 3,000 students participated in education programming
- 6 reports on research projects open sourced on our website
- Supported 7 future innovators in the circular economy space
- Partnered on a material flow analysis on businesses in *The Plant*



# PLANT CHICAGO

Closed Loop • Open Source

# Technology Demonstration

# Plant Chicago programs:

- Education
- Markets
- Research and Demonstration