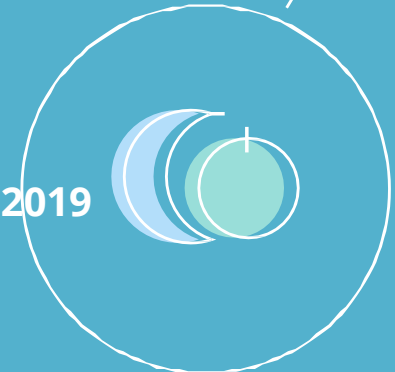
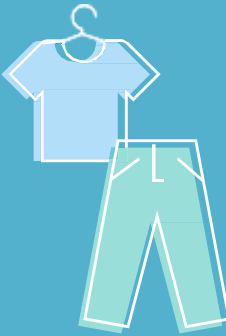


# Linear to Circular, Waste to Value: How far and how fast?

Clean Tech Forum San Francisco | January 30, 2019

C L O S E D  
L O O P partners



## Today's Speakers



Zoé Bezpalko  
Autodesk



Nicholas Flanders  
Opus 12



Ellen Martin  
Closed Loop Partners  
*Moderator*



Isabella Palmgren  
Mimbly



Wade Bitaraf  
Plug and Play  
Technology Center



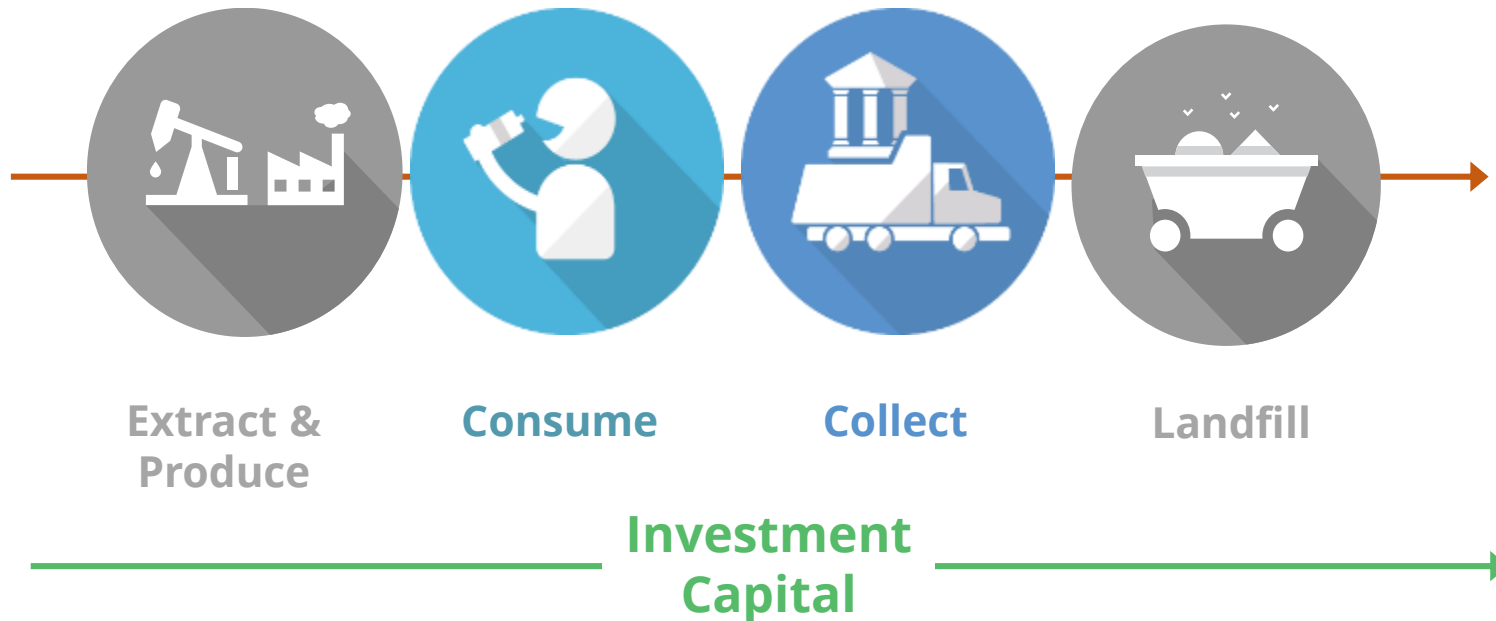
Matanya Horowitz  
AMP Robotics



Jodie Morgan  
GreenMantra Technologies

# Linear supply chains cost us too much

## Linear Supply Chains



**\$5.4 Billion**

To landfill recyclables, food, clothes, and electronics

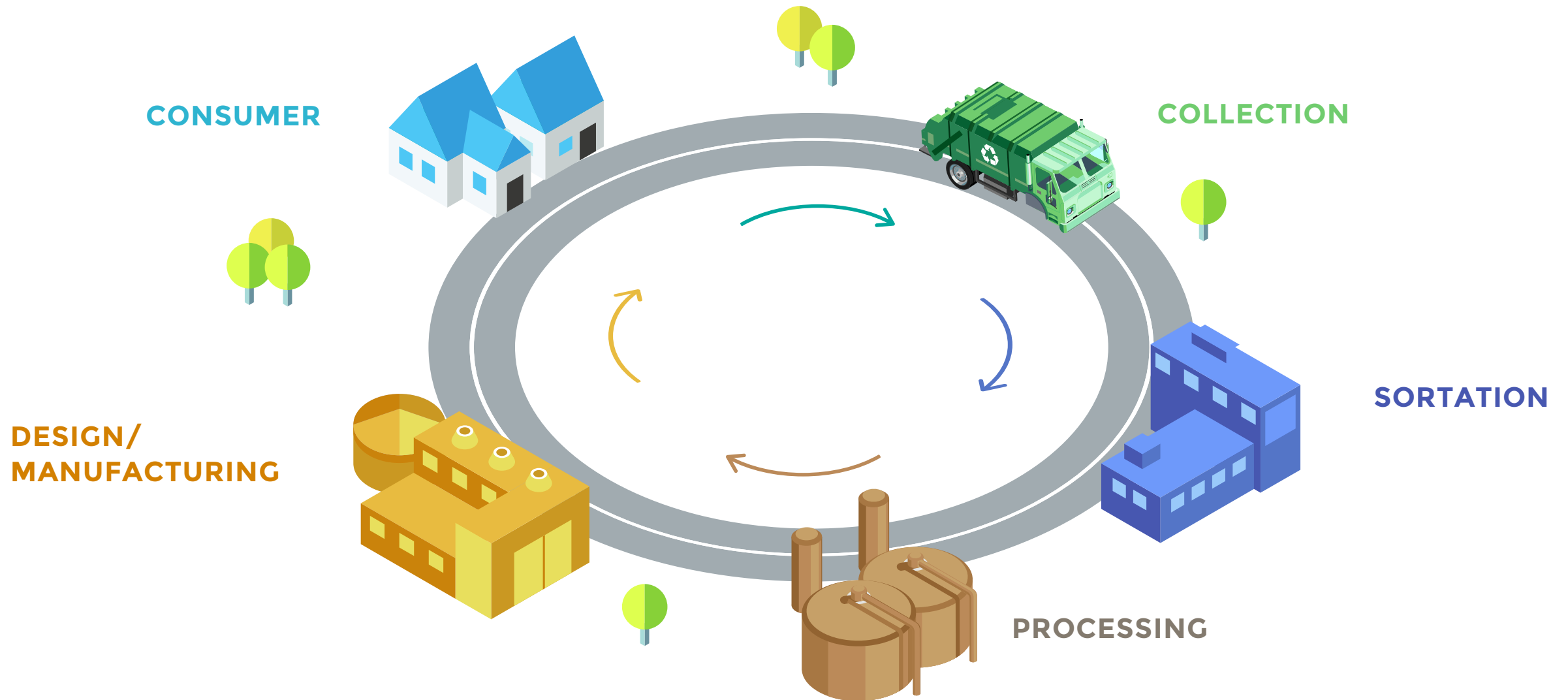
**\$80-120 Billion**

plastic packaging material value lost to the economy

**100s of Millions**

MTs of GHG Emissions Produced

# Circular supply chains show us new ways to create value



## Closed Loop Partners | Our Partners, Investors, and Co-Investors



# Closed Loop Partners Investment Platform

Innovate

**Center for the  
Circular Economy**

*R&D  
Advisory Services*

Commercialize

**Closed Loop  
Ventures**

*Venture Capital*

Grow

**Closed Loop Fund**

*Project Finance*

Scale

**Closed Loop  
Leadership Fund**

*Private Equity*

# Landscape Today: Solutions for Packaging, Apparel, Built Environment, Electronics, Food

## CONSUMER

- For Days
- Linhaus
- Loliware
- Natural Machines
- Preserve
- The Renewal Workshop

## DESIGN/ MANUFACTURING

- Aero Aggregates
- Cambridge Crops
- Evrnu
- GreenMantra
- IntegriCo
- Rebound Technologies
- TemperPack

## PROCESSING

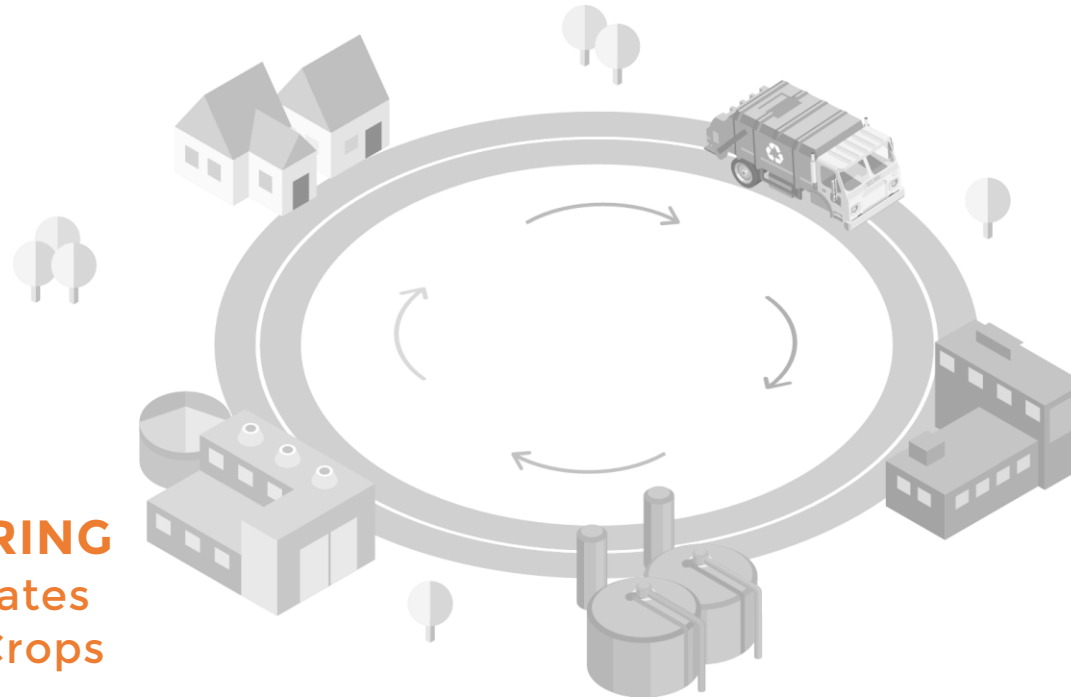
- CoLoadx
- HomeBioGas
- Momentum Recycling
- PureCycle Technologies

## COLLECTION

- Curb My Clutter
- City of Memphis, TN
- City of Moline, IL
- Portage County, OH
- Waste Commission of Scott County, IA
- City of Waterbury, CT

## SORTATION

- AMP Robotics
- Council Bluffs
- Easy Aerial
- ECUA
- Eureka Recycling
- FirstStar Fiber
- ITR
- Lakeshore Recycling Systems
- City of Phoenix, AZ



# How Quickly Can We Transition from Linear to Circular?

- **Coca-Cola World Without Waste Commitment:** Recover 100% of primary packaging; reuse at least 50% by 2030
- **Alliance to End Plastic Waste:** Chemical companies, plastics manufacturers, and brand owners investing **\$1.5 billion over 10 years** in solutions to address ocean plastics in SE Asia
- Ellen MacArthur Foundation: “The potential value unlocked by AI in helping design out waste in a **circular economy for food** is up to **\$127 billion a year** in 2030.”
- **Amazon Liquidity Services** has “3,357,000 registered buyers on its various liquidation websites. In the past fiscal year, it sold **\$626.4 million** worth of stuff.”
- **PepsiCo** acquires Soda Stream for **\$3.2 billion**
- **Procter & Gamble, Unilever, Nestlé, PepsiCo, Danone, Mars Petcare, Mondelēz International** and others are publicly experimenting with new **reusable packaging** models in partnership with Terracycle



# Technology Enabling Circularity

Zoé Bezpalko

Design & Manufacturing Sustainability Strategy







Image courtesy of Tesla Motors, Inc.



Image courtesy of Gensler.







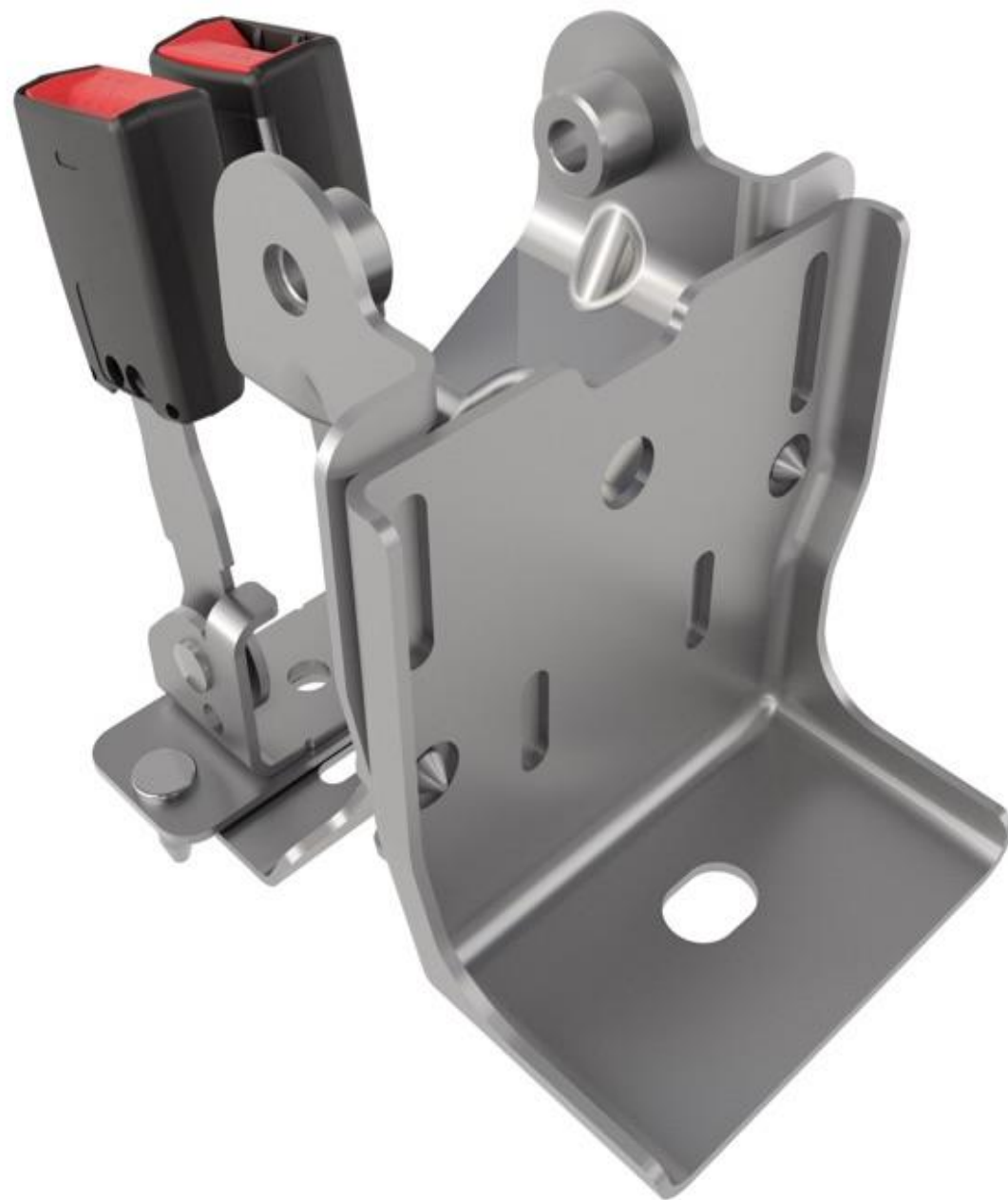
BETTER  
DESIGN



BETTER  
MATERIALS



BETTER  
MANAGEMENT



# Indicators



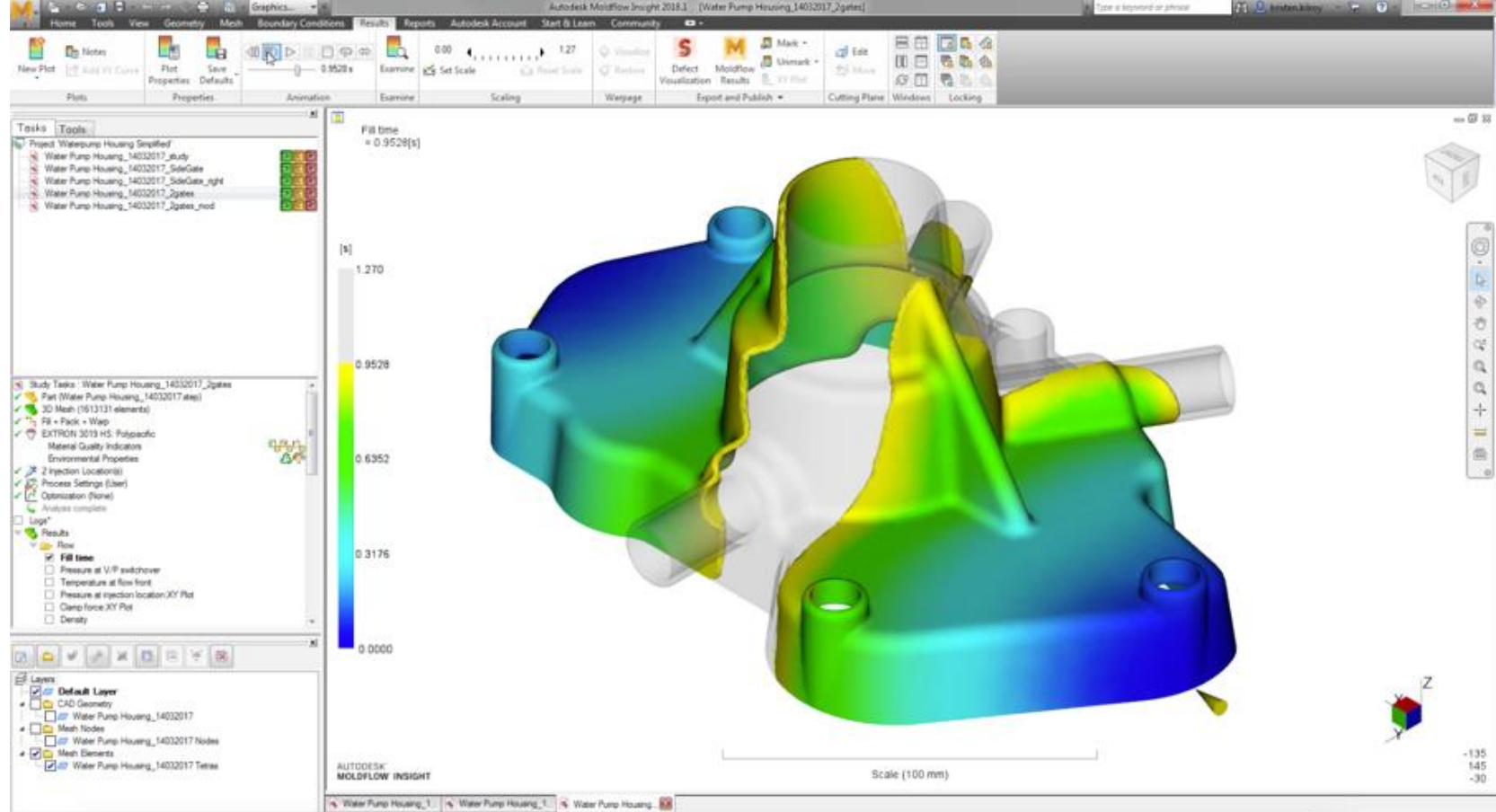
Manufacturability



Cost efficiency



Material Impact



Manufacturability	Cost	Plastic material impact



PROGRAM ID :1129  
NESTING ID :N022\_005 ADMIN  
MATERIAL ID:0.090 AL  
REM NANT ID :  
DATE :11-Sep-18

MACHINE ID :LASER  
QUANTITY :001  
INVENTORY ID :96X60  
COMMENT:0;;;.6  
TIME :12:36:11

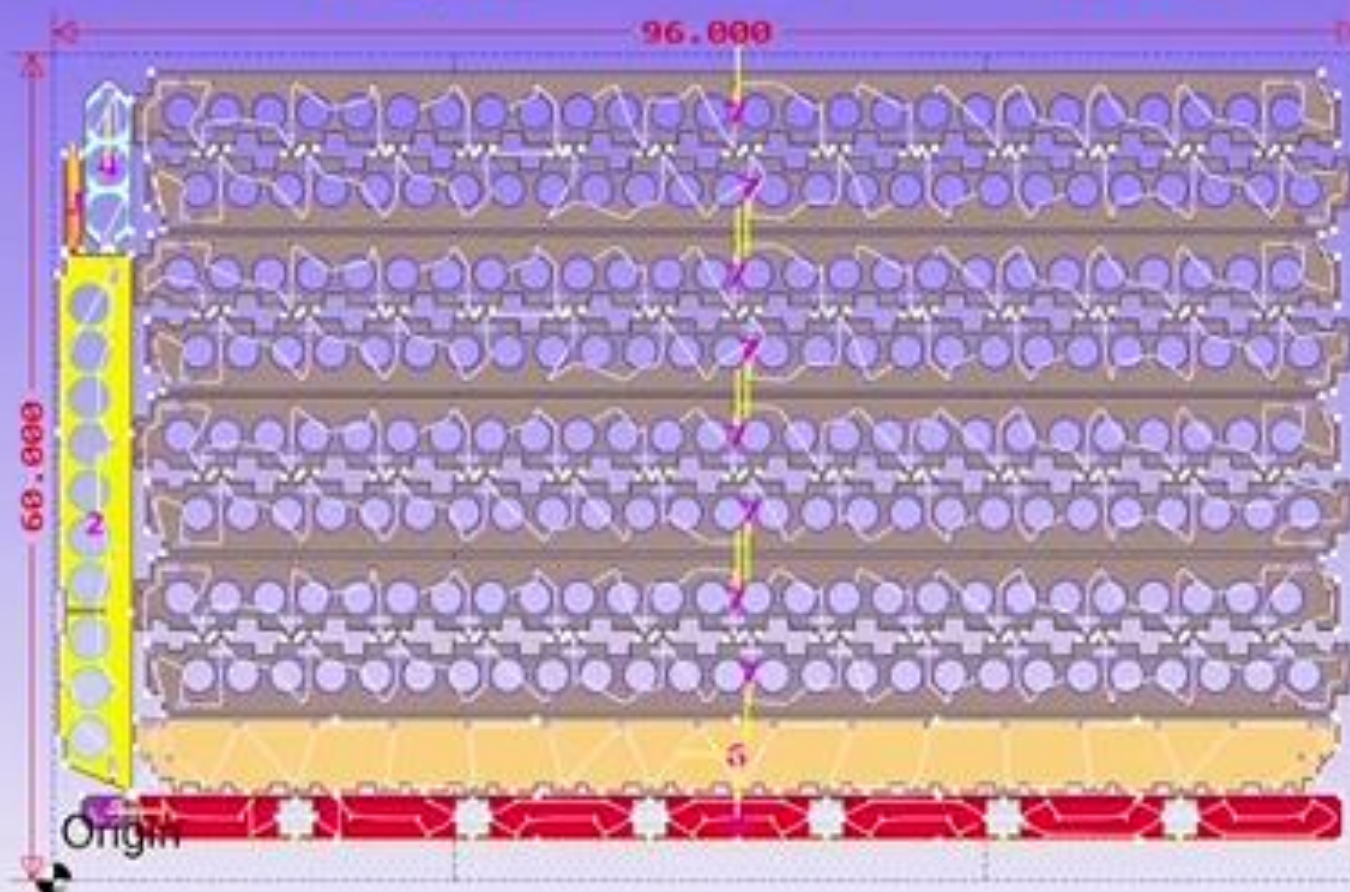
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1) CNB-143275 | MAY-230113 | JOB 2) HPL-230554 | MAY-230113 | JOB 3) ANG-880198 | MAY-230113 | JOB  
4) PLT-023186 | MAY-230113 | JOB 5) HST-880275 | MAY-230113 | JOB 6) CHL-880034 | MAY-230113 | JOB  
7) VMB-880292 | MAY-230113 | JOB (8)





# Catalyze entrepreneurship + innovation using disruptive technologies to create positive impact

## Financial Resources

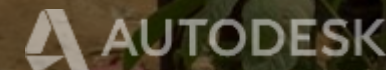
Grant-funding  
Direct investment

## Technology Resources

Software Granting  
Learning Services  
Impact Residency

## Human Resources

Pro Bono Volunteering  
Student Expert Internships







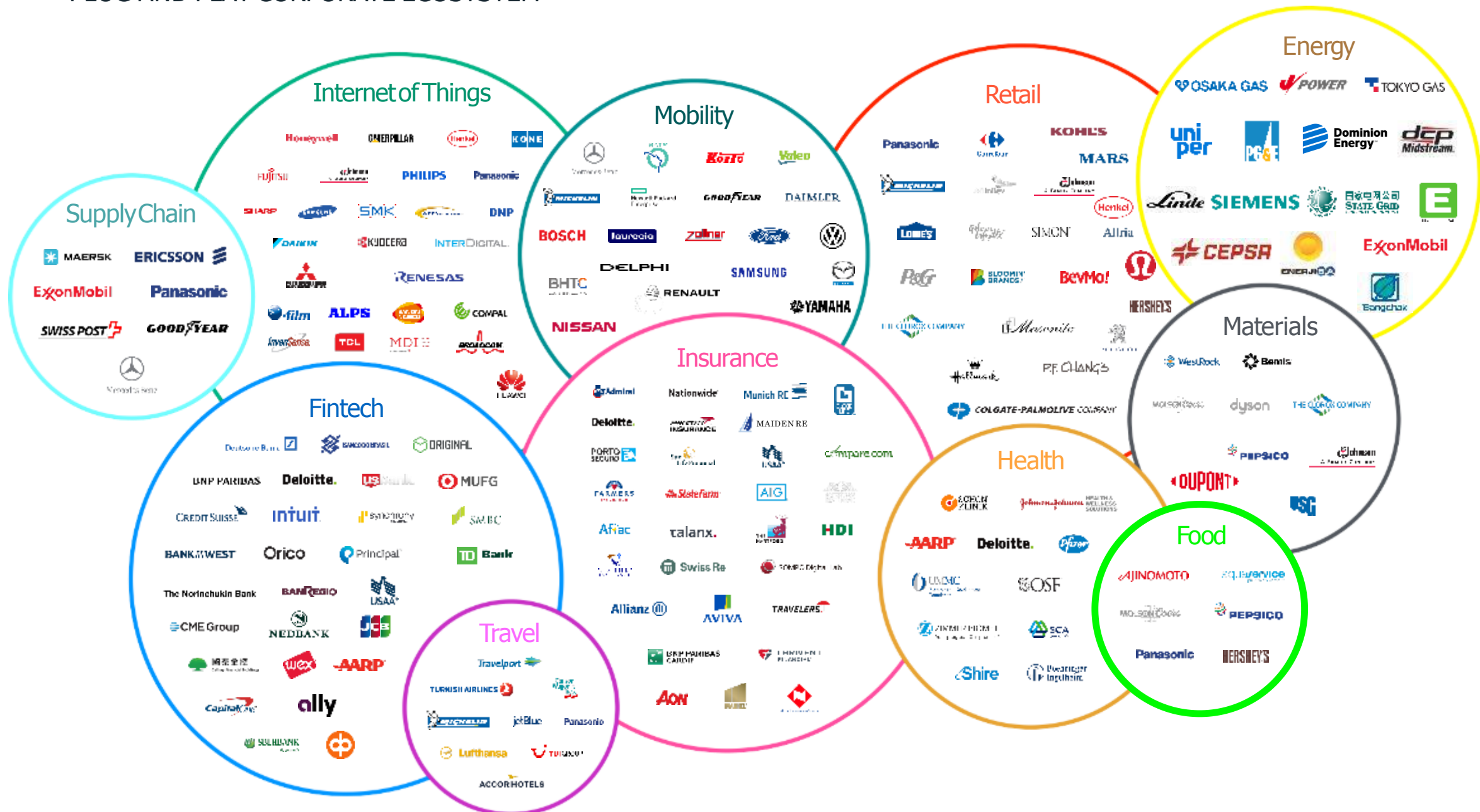
Make anything™

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# PLUG AND PLAY CORPORATE ECOSYSTEM



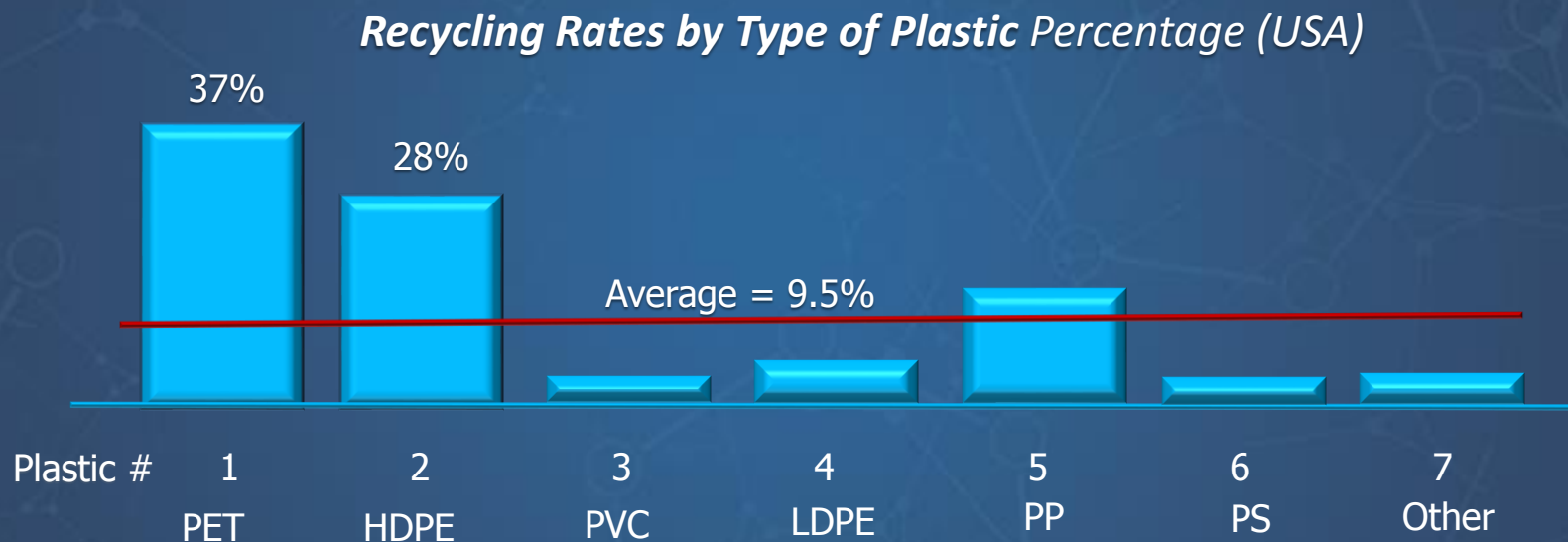
PLUG AND PLAY GLOBAL REACH





# EVERY YEAR A MOUNTAIN OF PLASTIC – ENDS UP IN A LANDFILL OR OUR OCEANS

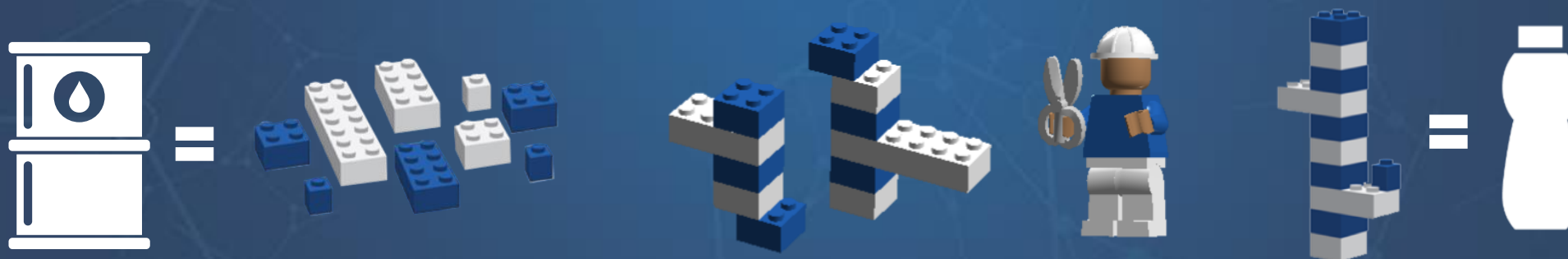
North Americans throw away 30+ million tons of plastic annually. Most ends up in landfill (remarkably plastic only has a 9.5% recycling rate). This is a **mountain of valuable hydrocarbons** just waiting to be used as feedstock for chemical recycling.



**~30 million tons / year of Non-Recycled Plastic with few outlets but landfill**



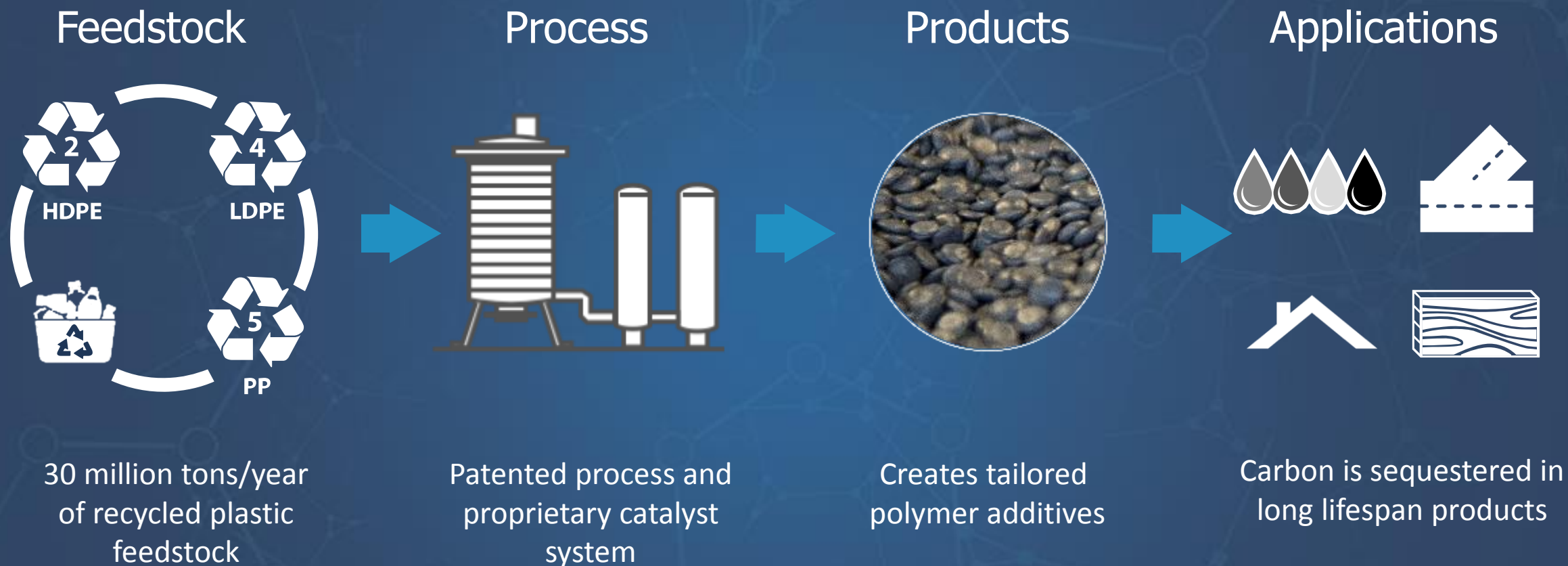
# GREENMANTRA TECHNOLOGIES – *A PARADIGM SHIFT IN POLYMER PRODUCTION*







# GREENMANTRA TECHNOLOGIES – *DISRUPTIVE TECHNOLOGY CREATES SUSTAINABLE VALUE*





# Transforming Recycling Through AI & Robotics

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Presented by Dr. Matanya Horowitz, Founder and Chief Executive Officer







# RECYCLING CHALLENGES



Tough decisions between high operational and capital costs.



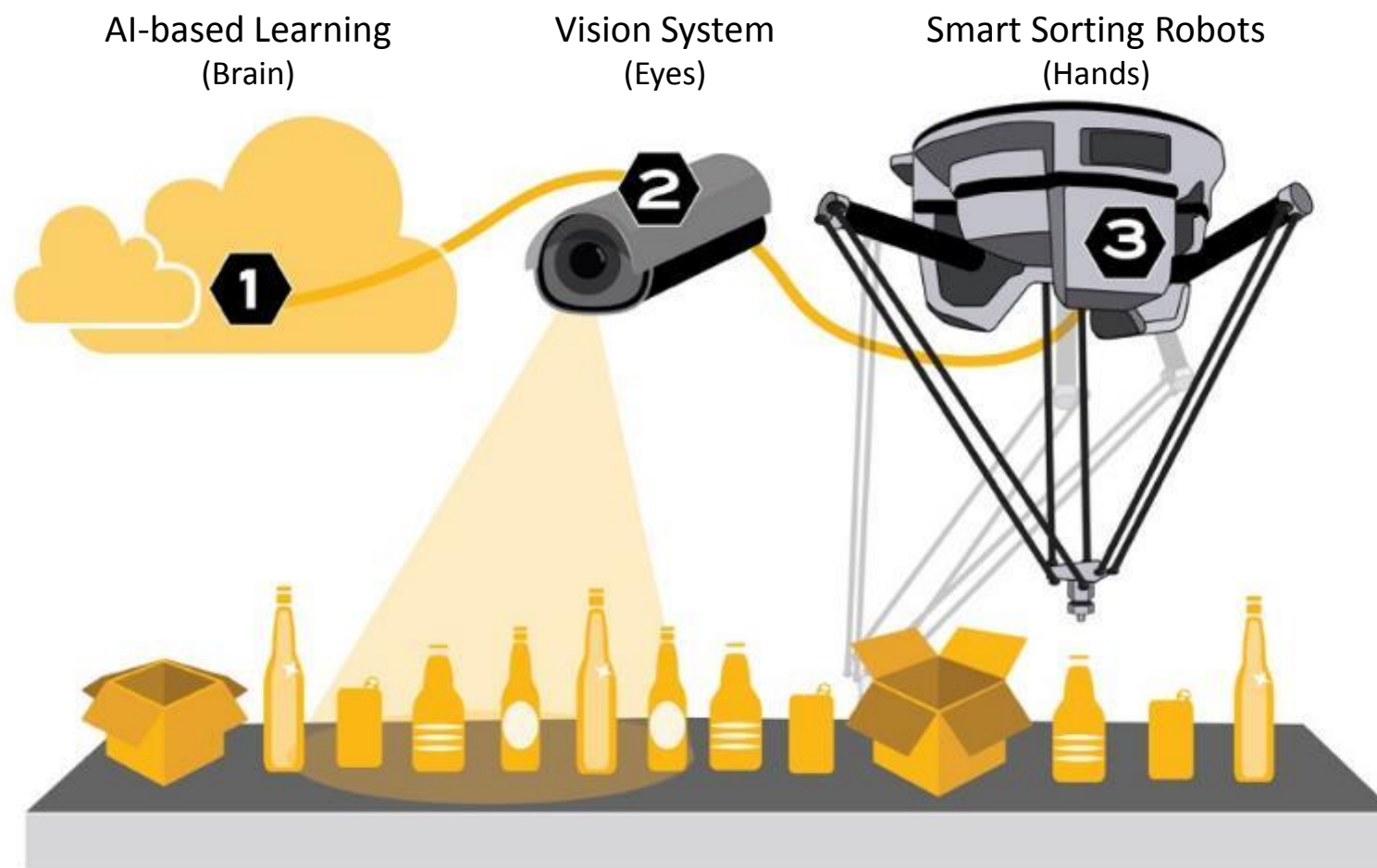
Filling landfill exhausts a capital resource.



Challenging material quality, resale value, and loss to landfill.

Injury rates, challenging work conditions, and high turnover.

# THE AMP CORTEX™ SOLUTION





# ARTIFICIAL INTELLIGENCE (AI) DRIVEN

- AMP Neuron™ machine learning distinguishes features like a human
- Avoids need for expensive spectral, infrared sensors
- Handles complex piled, non-singulated mixed waste

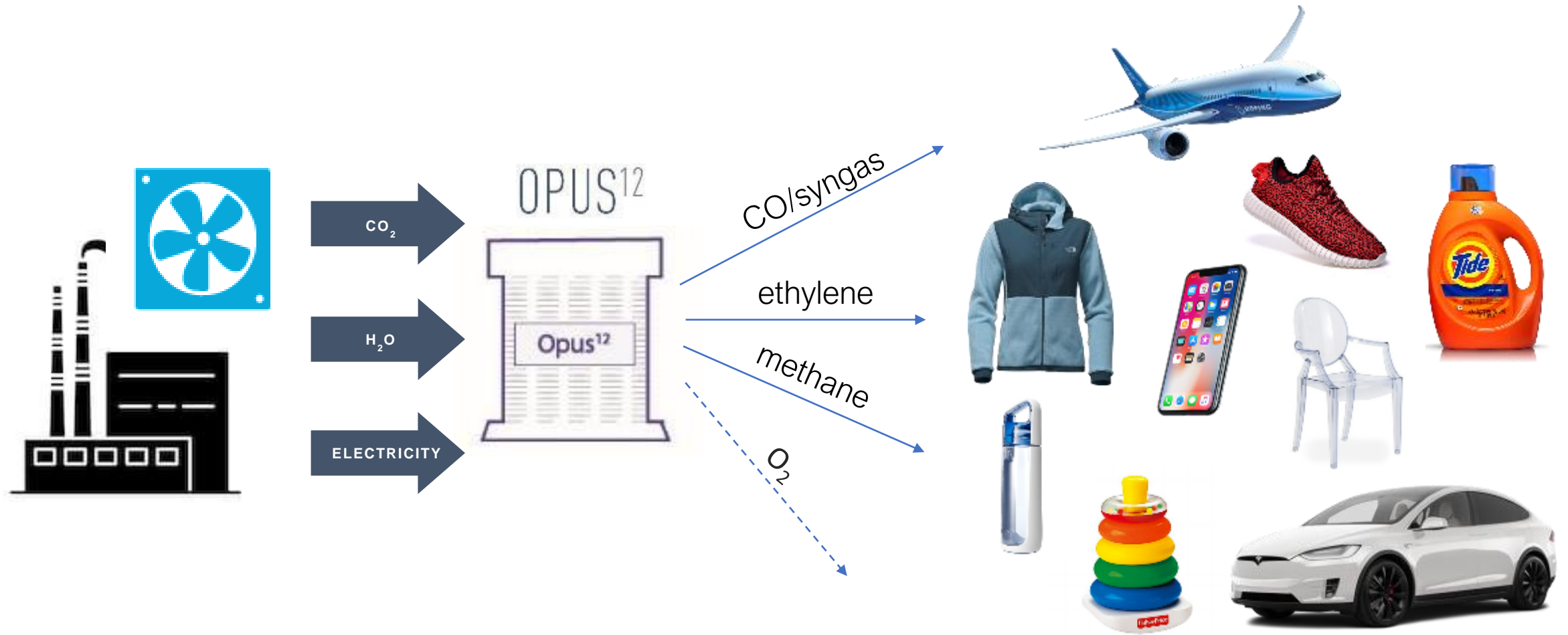




# — opus 12

Press rewind on CO<sub>2</sub>

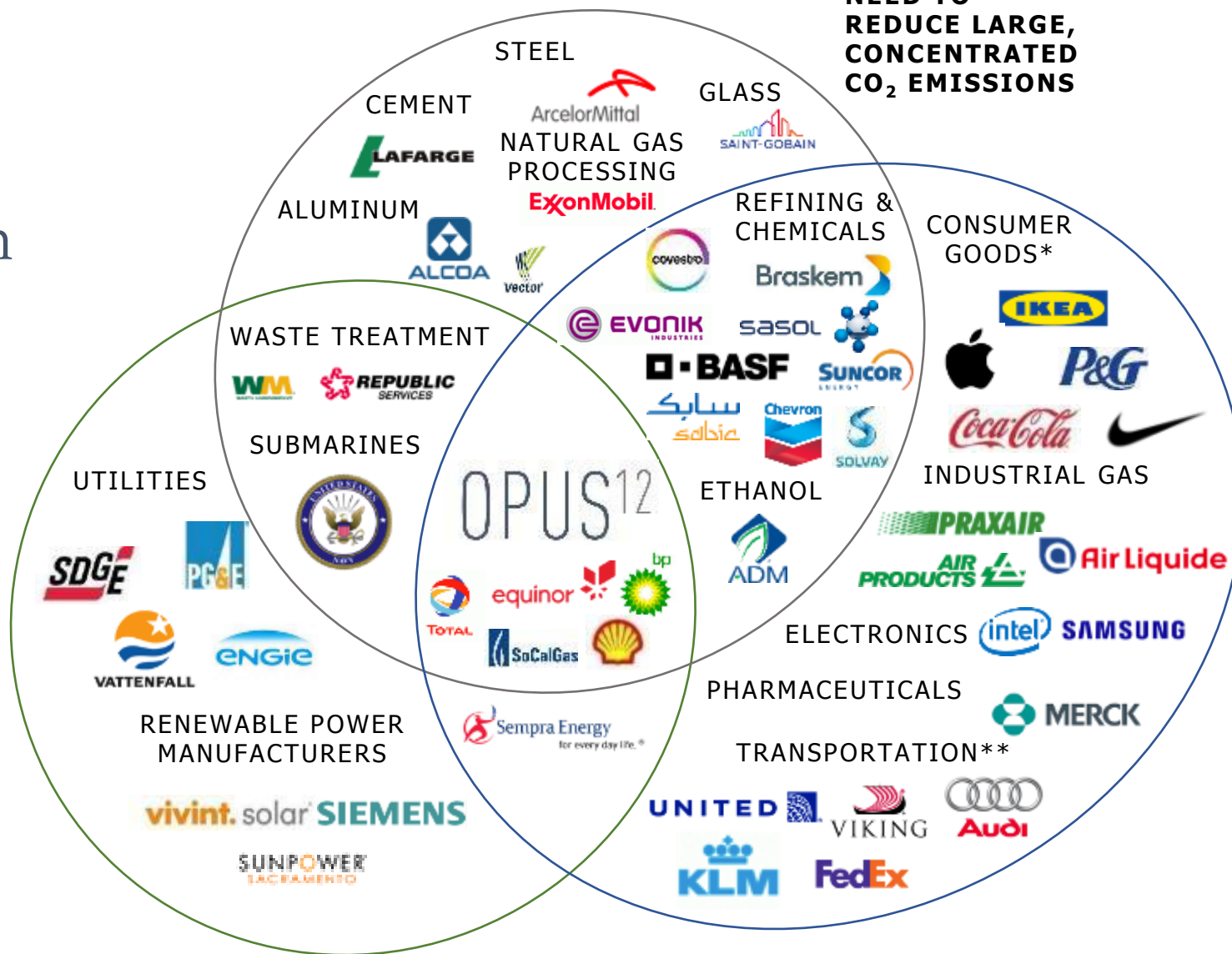
# One Drop-in Component, Many Value Chains



## Potential impact

Opus 12 sits at the nexus of the energy and chemicals system of the future.

**NEED TO FIND  
USES FOR LARGE  
SCALE  
RENEWABLES**



**NEED TO  
REDUCE LARGE,  
CONCENTRATED  
CO<sub>2</sub> EMISSIONS**

**NEED THE  
PRODUCTS WE  
CAN MAKE (I.E.,  
CO, ETHYLENE,  
ETHANOL,  
METHANE)**

\*Need polymers (i.e. from ethylene, syngas)

\*\*Need liquid fuels (i.e. from syngas – CO + H<sub>2</sub>)

— opus 12

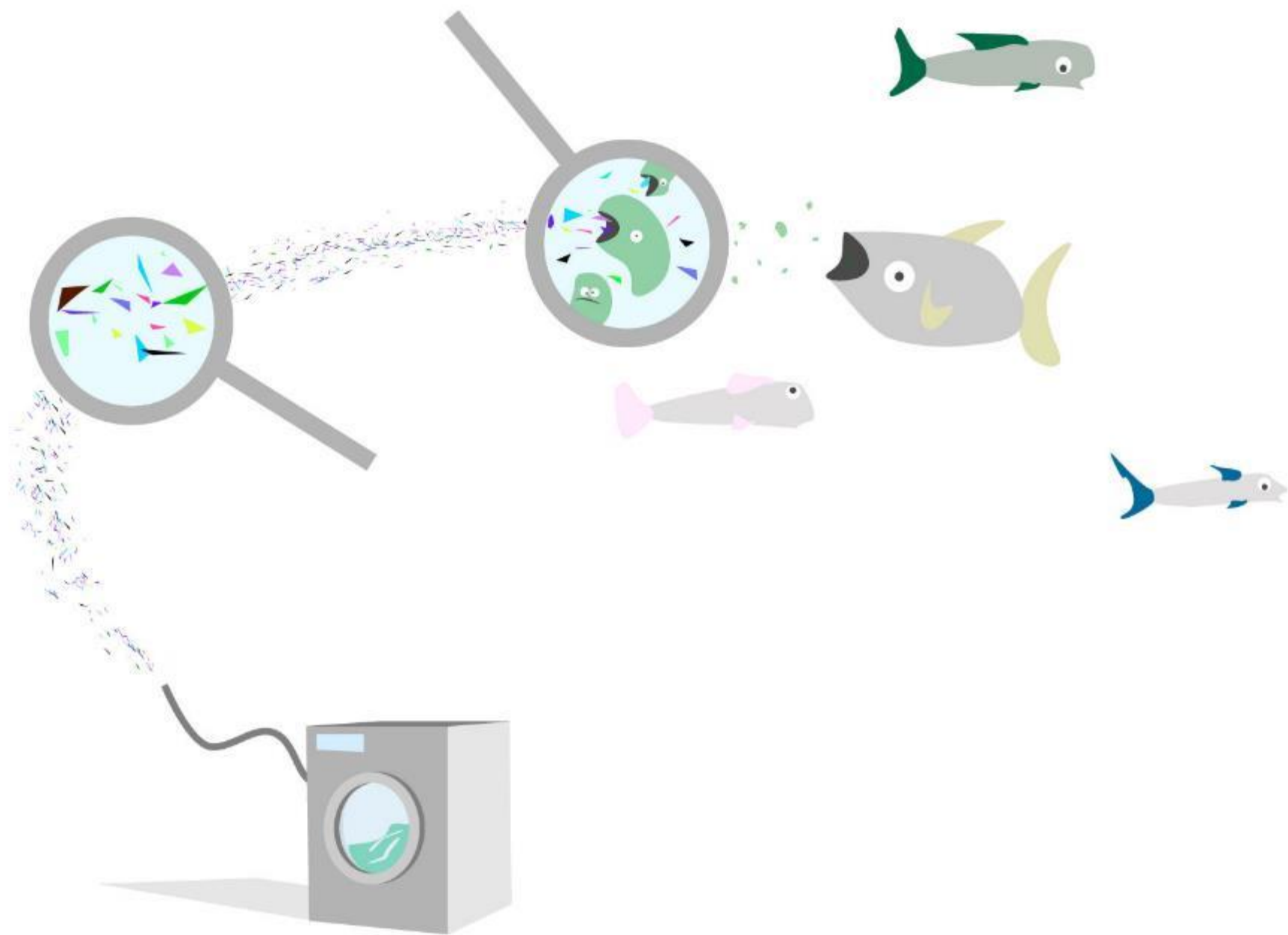
Nicholas@Opus-12.com



Creating sustainable water solutions



**= 25%**





# Mimbox



**End users**

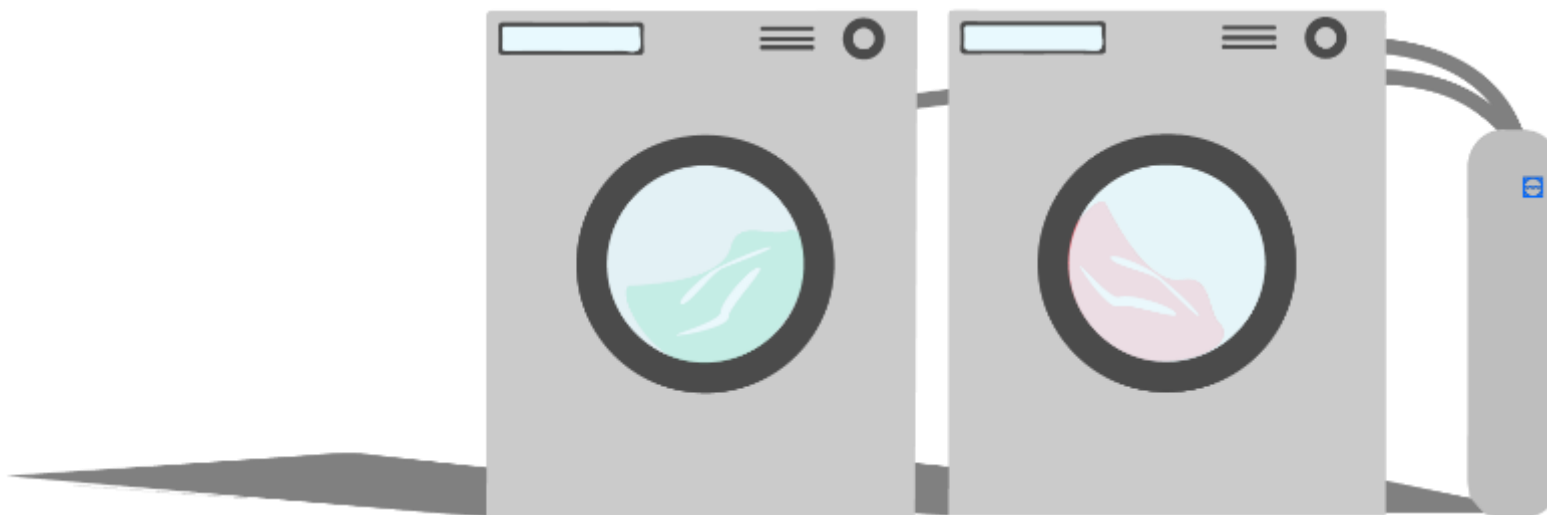
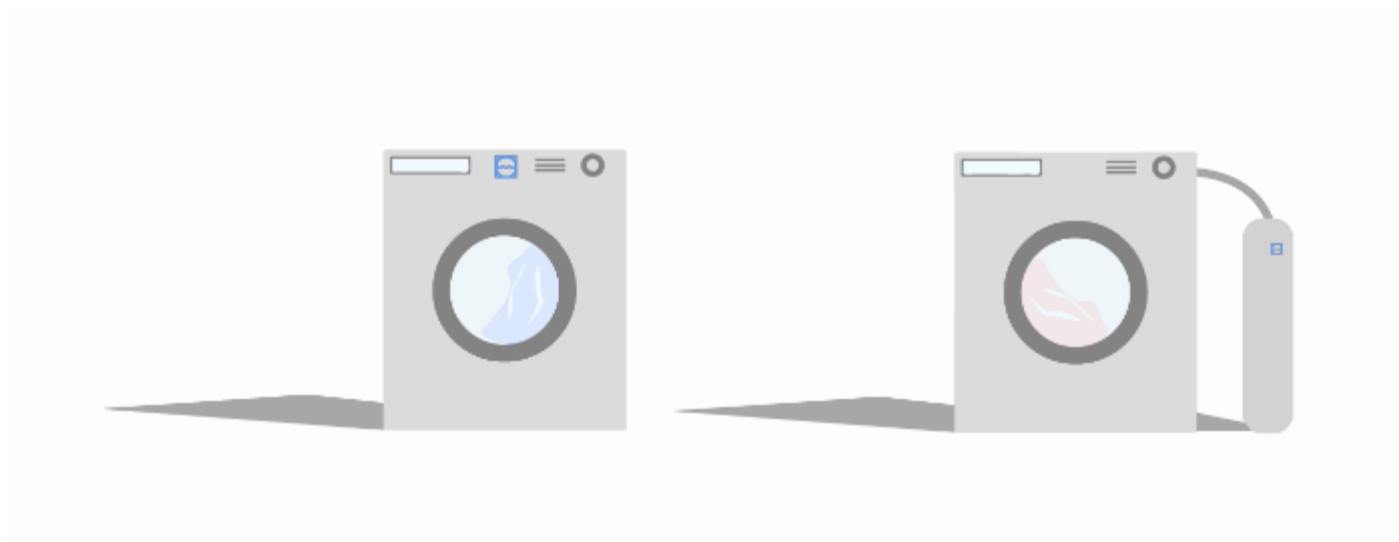


**Realestate owners**



**Manufacturers**







[hello@mimbly.se](mailto:hello@mimbly.se)  
[isabella@mimbly.se](mailto:isabella@mimbly.se)  
[www.linkedin.com/in/isabellapalmgren](https://www.linkedin.com/in/isabellapalmgren)

