Ecosystem Design for Developing Sustainable Products and Businesses

PlastLIFE Annual Seminar, 20.11.2024

Esko Hakanen, Aalto University

PHOTO: TX / Tracey Project

LIFE21-IPE-FI-PlastLIFE The PlastLIFE project is co-funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

PLASTLIFE

plastlife.fi | #plastlife

We need collective action *to foster sustainability, innovation, and collaboration*

PLASTLIFE
| plastlife.fi | #plastlife |

This study was funded by the Rethinking Plastics in a Sustainable Circular Economy (PlastLIFE) project (LIFE21-IPE-FI-PlastLIFE). The PlastLIFE project was co-funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

PlastLIFE

D6.4 Innovation toolkit

bit.ly/aaltoD64

This toolkit is designed to promote business related to the circular economy of plastics. The created tools aim to support companies and other actors in developing new types of innovations and business models. The offered exercises are based on leading research on ecosystem design and development.

You can use the tools in any way you like and in the order you choose. The goal of the exercises is often to challenge the established beliefs and practices. It's also good to review and modify previous exercises as you progress – often the best result is achieved only after a few attempts. The toolkit outlines three packages of about one hour each.

1. *Goals and mechanisms for innovation by ecosystem thinking*
2. *Potential for value creation and interaction between ecosystem members*
3. *Developing business models and signaling ecosystem participation*

PLASTLIFE

plastlife.fi | #plastlife

LIFE21-IPE-FI-PlastLIFE The PlastLIFE project is co-funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

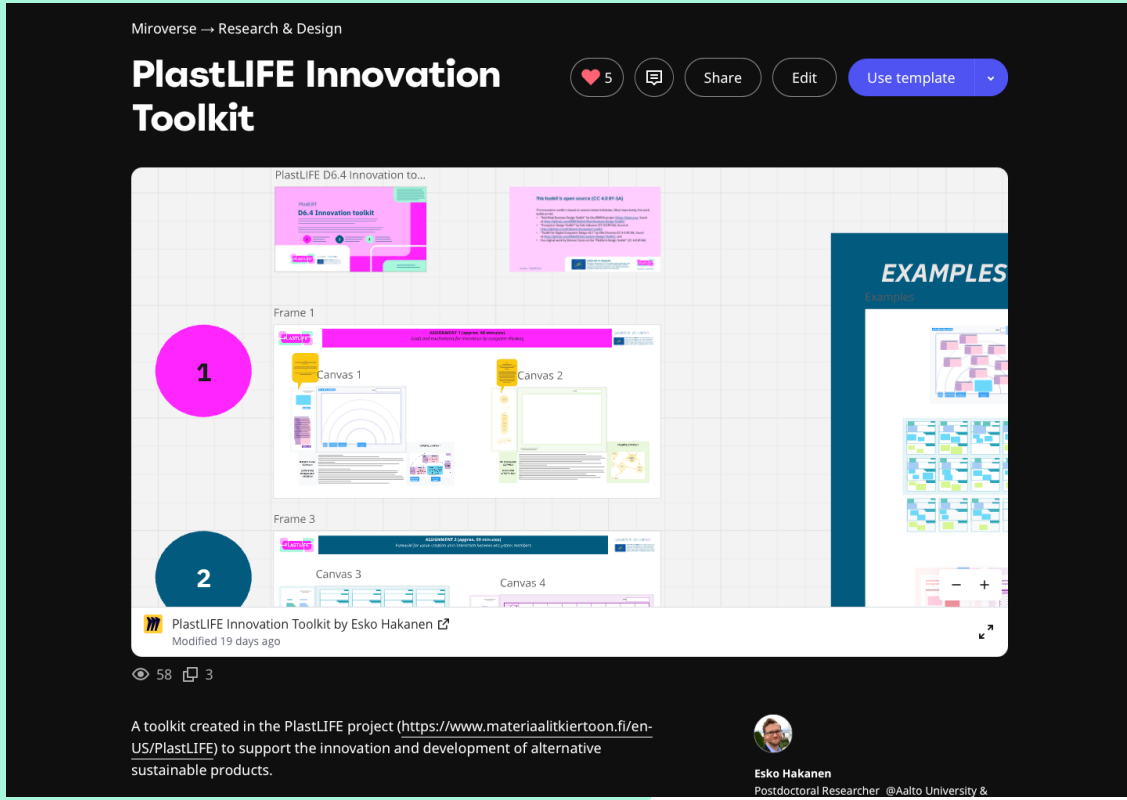
Aalto University, Finland
Esko Hakanen & Jan Holmström

The toolkit is designed and created in an online environment (Miro)

You can explore the tool and create your own canvas at:

bit.ly/aaltoD64

QR code:



A print version of the canvases available at PlastLIFE homepage:

bit.ly/D64print

PLASTLIFE

plastlife.fi | #plastlife

The key question:

Can plastics be a solution to climate change?

PLASTLIFE
plastlife.fi | #plastlife

Well, yes.
But it depends.

A!

Plastic waste:
Amassing in landfills

Environmental problems:
Microplastics & contamination

Resource availability:
Land use, alternative uses

Industrial production:
Path to zero-emissions?

The problem

Our current practices are **not** sustainable

Too often, the solutions are **also** somehow problematic *(e.g., we can add biomass to plastics >> composite materials* $^{GOOD!}$ *>> often limits recycling options* $^{NOT\ GOOD!}$*)*

We work in a **dynamic** environment *(e.g., the UN's definition sustainability: "meeting the needs of the present without compromising the ability of future generations to meet their own need" >> we aim for a moving target)*

Solutions must be designed to allow **constant adaptation/adjustment**

It is unclear **who should lead** the change: **business** *(through market dynamics)* or the **society** *(public subsidies and investment)*

Many solutions hinge on **multistakeholder collaboration** *("ecosystems")*

The solution?

The solution

Adhere to **planetary boundaries**

Adaptable, **dynamic**, and **multilateral**

Simple: easy to follow and use for the general public

Comprehensive: transparent and traceable to allow for detailed and objective verification for the expert audience

Incentives sustainable operations; discourages unsustainable ones

Based on the above: will have **no limits** on production **while** adhering to planetary boundaries

5

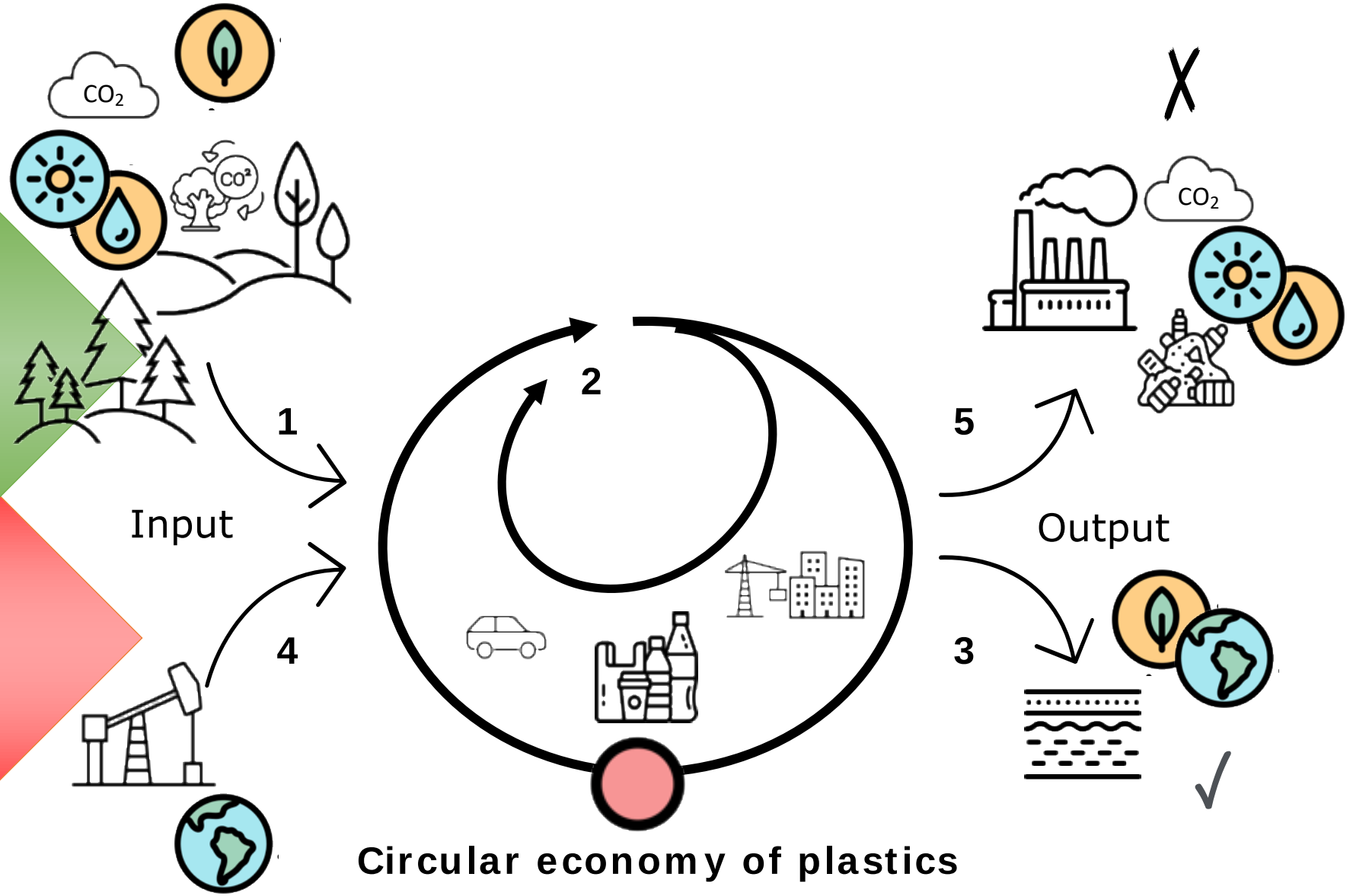
How to get there:

Carbon transfer model to distinguish the problems from the solutions

A!

- ***Reduces atmospheric CO_2***
- ***Renewable inputs that store CO_2 into the ground (permanently)***

- ***Increases atmospheric CO_2***
- ***Fossil inputs that release CO_2 to the atmosphere (indefinitely)***



Circular economy of plastics

A! ***Read more:***

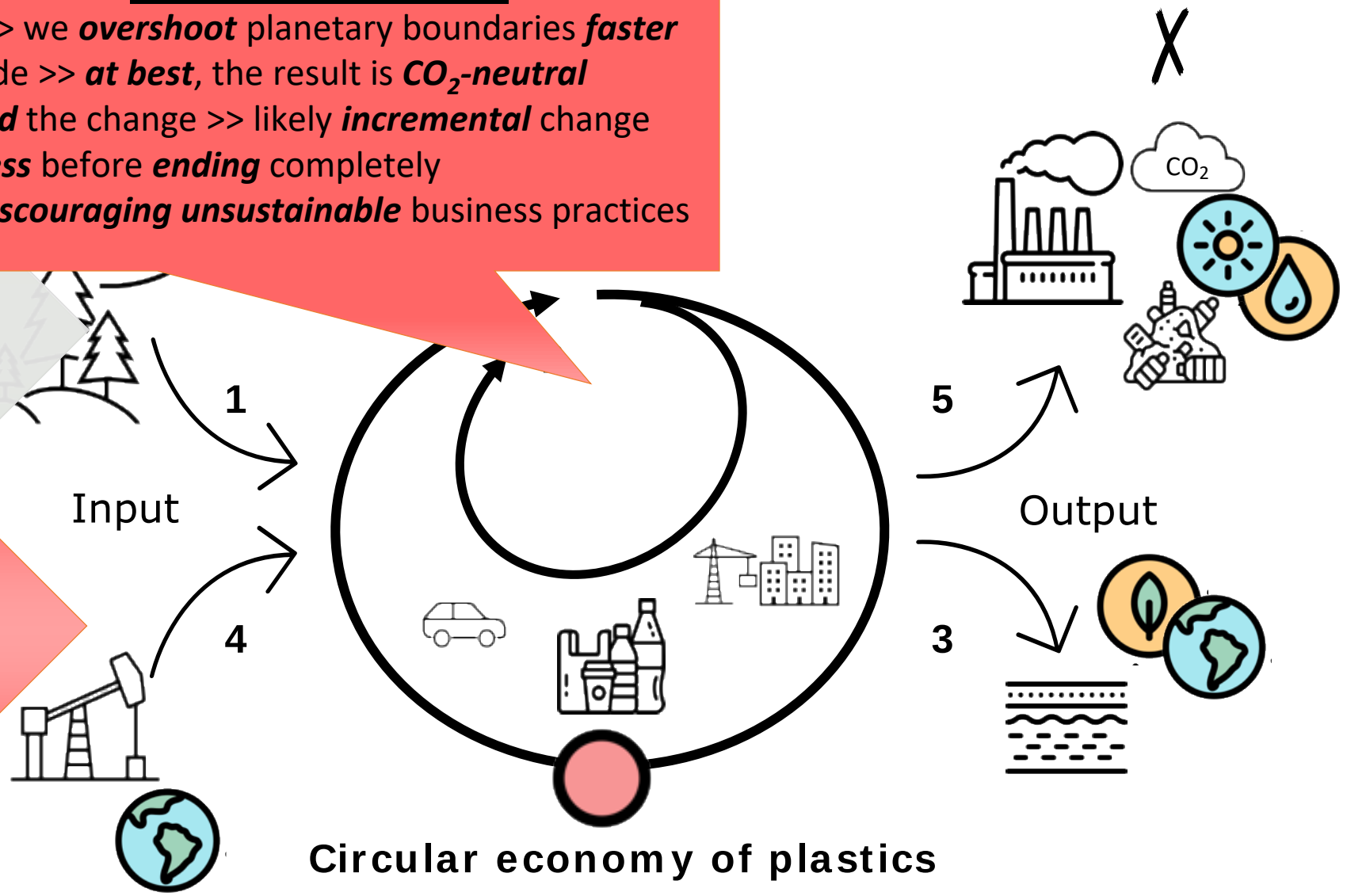
This figure utilizes illustrations from Flaticon.com.

RED PRACTICES EXPEDITE CLIMATE CHANGE – PART OF THE PROBLEM

- ***Not sustainable***: more production >> we ***overshoot*** planetary boundaries ***faster***
- Lots of ***improvements*** are being made >> ***at best***, the result is ***CO_2-neutral***
- Relying on ***current businesses*** to ***lead*** the change >> likely ***incremental*** change
- ***For climate change***; we should do ***less*** before ***ending*** completely
- ***Could become*** a simple metric for ***discouraging unsustainable*** business practices

- *Reduces atmospheric CO2*
- *Renewable inputs that store CO2 into the ground (permanently)*

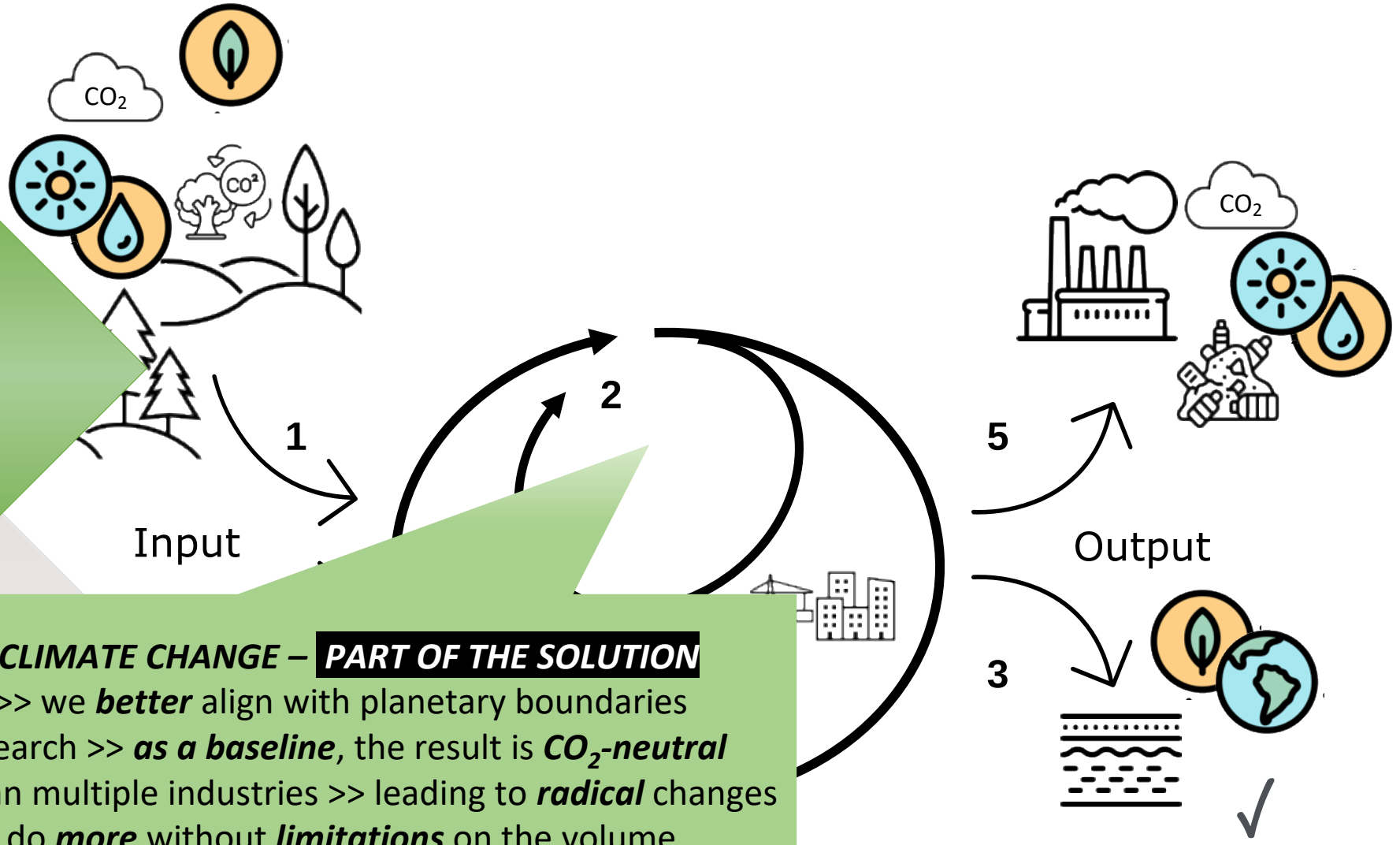
- ***Increases atmospheric CO_2***
- ***Fossil inputs that release CO_2 to the atmosphere (indefinitely)***



A! Read more:

This figure utilizes illustrations from Flaticon.com.

- ***Reduces atmospheric CO_2***
- ***Renewable inputs that store CO_2 into the ground (permanently)***



GREEN PRACTICES SLOW DOWN CLIMATE CHANGE – PART OF THE SOLUTION

- ***Sustainable***: more production >> we ***better*** align with planetary boundaries
- Various ***alternatives*** under research >> ***as a baseline***, the result is ***CO_2-neutral***
- Would likely transform and span multiple industries >> leading to ***radical*** changes
- ***For climate change***; we should do ***more*** without ***limitations*** on the volume
- ***Could become*** a simple metric for ***incentivizing sustainable*** business practices

f plastics

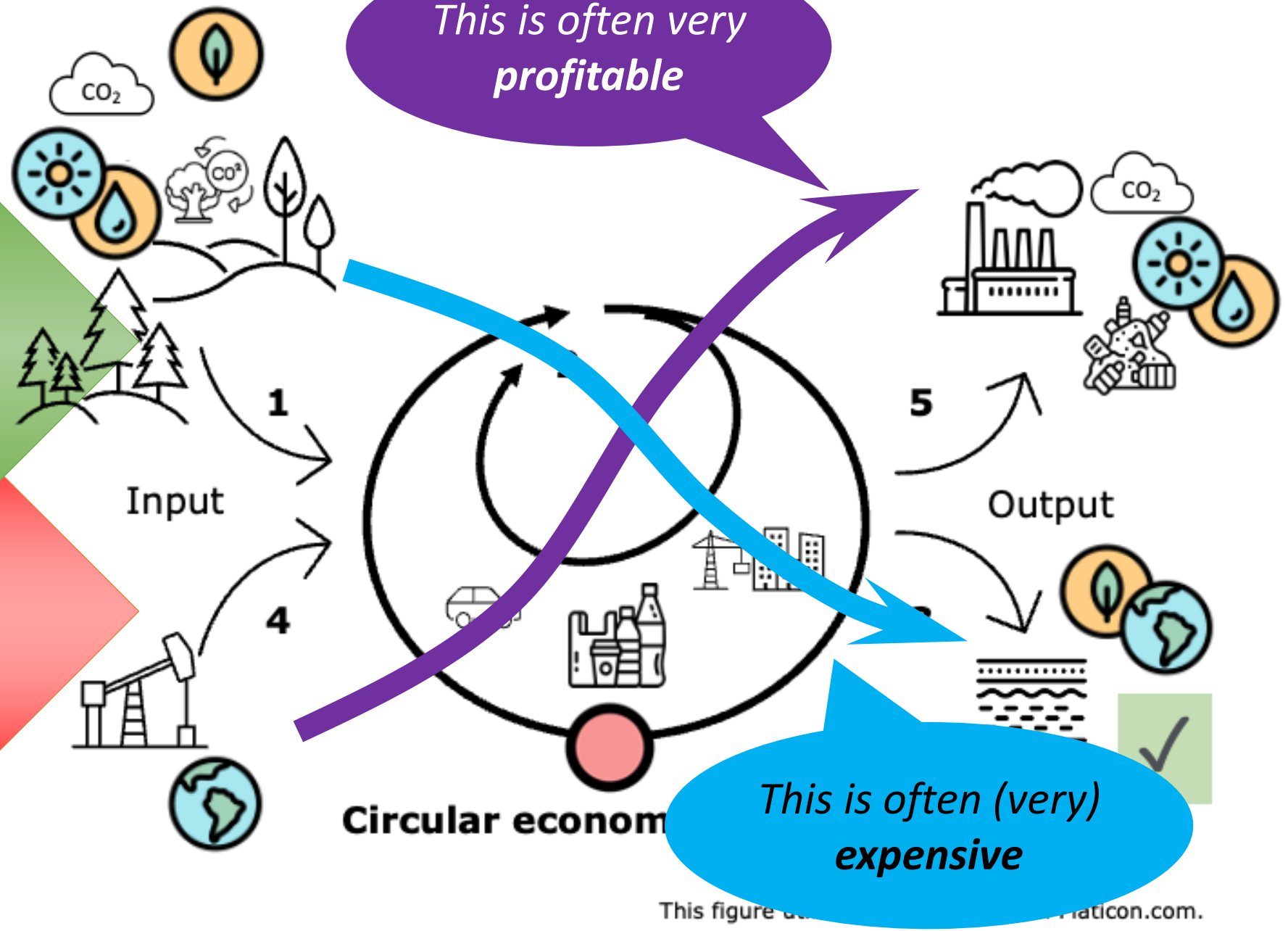
A! ***more:***

This figure utilizes illustrations from Flaticon.com.

What is preventing the change?

- *Reduces atmospheric CO_2*
- *Renewable inputs that store CO_2 into the ground (permanently)*

- *Increases atmospheric CO_2*
- *Fossil inputs that release CO_2 to the atmosphere (indefinitely)*



A! *Read more:*

Where we are:
Upholding the ✗

- Our current ***economic model*** is based on ***constant growth***, drawing more resources
  - ***"Doing more"*** is too often rewarded
  - ***Even*** with 100% resource circulation, ***more is constantly required***
  - Circularity can't escape ***thermodynamics***
  - ***Oil refining*** based on ***fractions*** for various products and industries
- ***Radical change*** is difficult and improbable
- ***The change will remain incremental***

Where we should be:
Incentivizing the ✓

- We should transform ***market mechanisms*** to work ***for sustainability***
  - ***"Doing less"*** should be a valuable option
  - Be ***realistic*** about expansive resource demand while recognizing its ***impact***
  - ***No limitations*** on the production when adhering to planetary boundaries
- ***Modular***, ***transparent***, and ***traceable*** value system to encourage ***constant improvement***
- ***We must incentivize sustainable operations and discourage unsustainable ones***

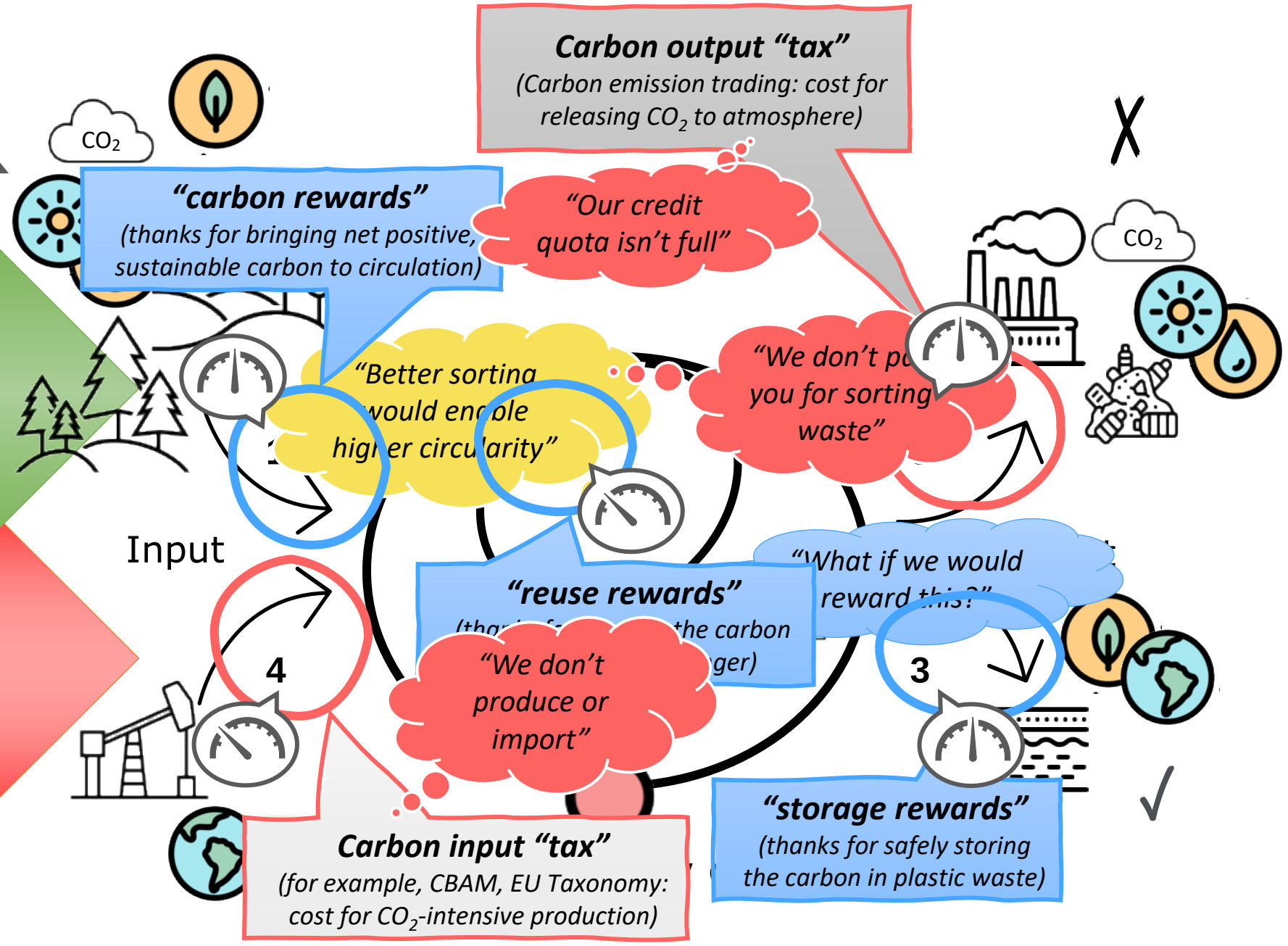
A!

What can we do?

Dynamic environment?

- ***Reduces atmospheric CO_2***
- ***Renewable inputs that store CO_2 into the ground (permanently)***

- ***Increases atmospheric CO_2***
- ***Fossil inputs that release CO_2 to the atmosphere (indefinitely)***



This figure utilizes illustrations from Flaticon.com.

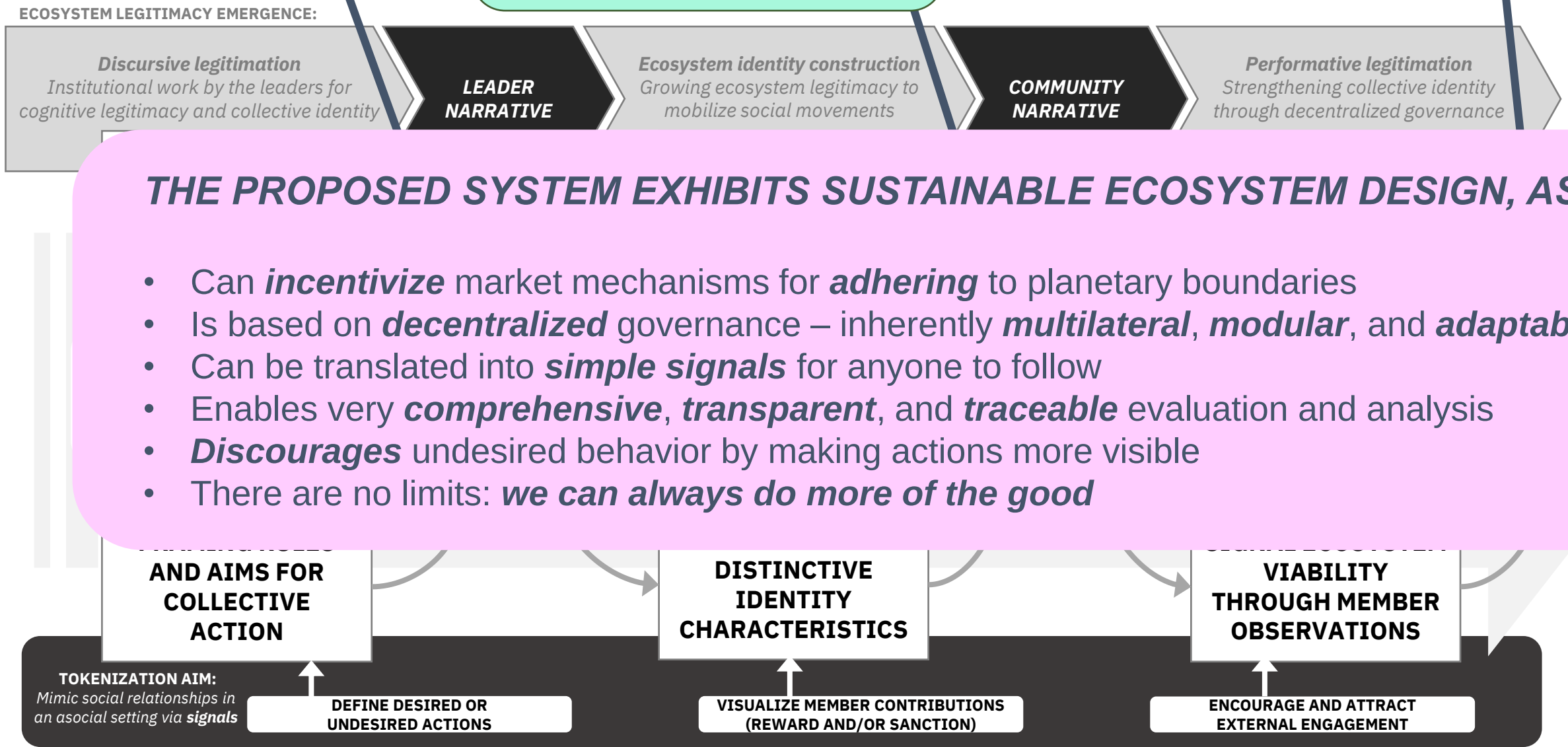
We need collective action
that incentives being better…

PLASTLIFE
| plastlife.fi | #plastlife |

Mitigating the effects of climate change
(e.g., disincentivize unsustainable behavior)

Mitigating the effects of climate change **by better supporting more sustainable businesses**
(e.g., setting taxes and rewards for different alternatives)

Modular and adaptive incentive mechanisms for mitigating the effects of climate change by better supporting more sustainable businesses
(e.g., adjusting the "dials" for the best possible combination constantly)



THE PROPOSED SYSTEM EXHIBITS SUSTAINABLE ECOSYSTEM DESIGN, AS IT…

- Can ***incentivize*** market mechanisms for ***adhering*** to planetary boundaries
- Is based on ***decentralized*** governance – inherently ***multilateral***, ***modular***, and ***adaptable***
- Can be translated into ***simple signals*** for anyone to follow
- Enables very ***comprehensive***, ***transparent***, and ***traceable*** evaluation and analysis
- ***Discourages*** undesired behavior by making actions more visible
- There are no limits: ***we can always do more of the good***

Research

Signaling Collective Action in Ecosystems

Esko Hakanen, Ville Eloranta, Claire Shaw, Pekka Töytäri

Academy of Management Perspectives
Special Issue "Grand Challenges and the Rhetoric of Collective Action"

Aalto-yliopisto
Aalto-universitetet
Aalto University

Preprint:
https://bit.ly/AMPsignaling

Podcast (*NB! AI-generated*):
https://bit.ly/AMPpodcast

Explainer video:
https://bit.ly/AMPin5min

Thank you!

Contact: esko.hakanen@aalto.fi

LIFE21-IPE-FI-PlastLIFE The PlastLIFE project is co-funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

PLASTLIFE
plastlife.fi | #plastlife