



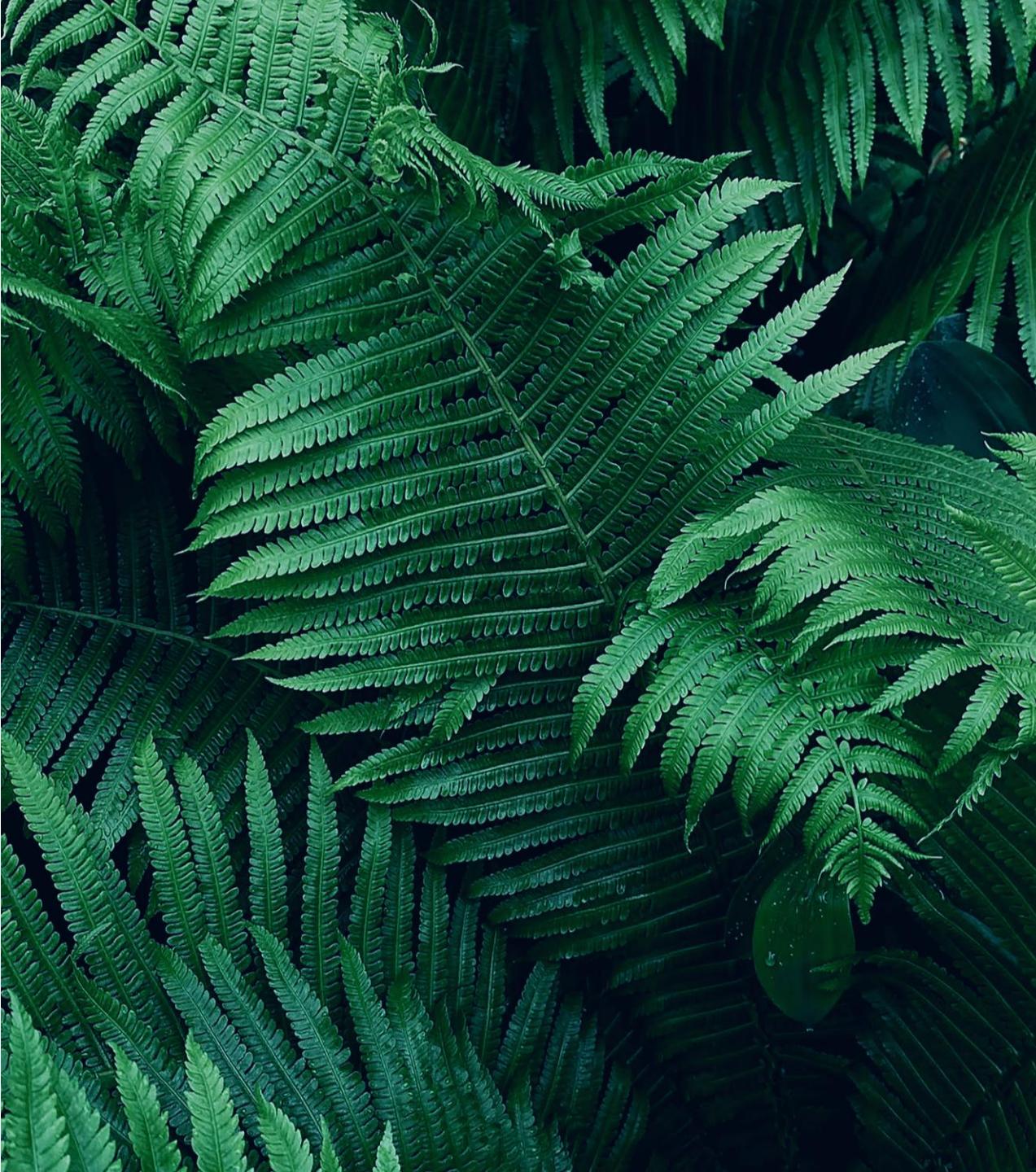
Green to scale

Sustainable and scalable adherent cell expansion solutions

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Dr. Joel Eichmann

Sustainability Circle | 20.07.2022





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- Based in Giessen and Berlin
- Founded in Dec. 2021
- Developing technology since 2018
- University spin-off
- World's first company to make labware from plant-based materials



Plastic waste from single-use equipment

"Everyone wants to get rid of the plastic waste, but no one wants to get rid of the plastic."

In 2014

5.5 million tons

plastic waste was generated by labs and bioprocessing

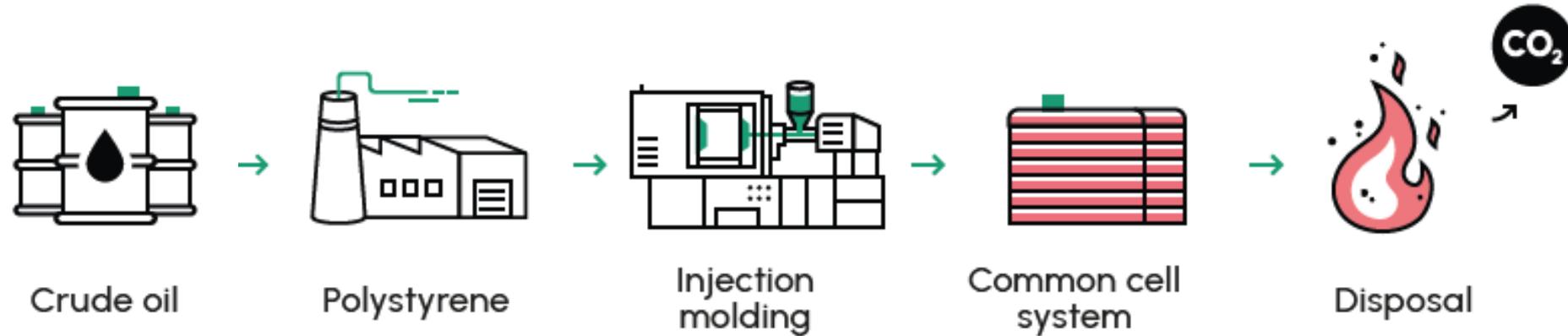
One of the

main challenges

for sustainable research and biopharmaceutical manufacturing

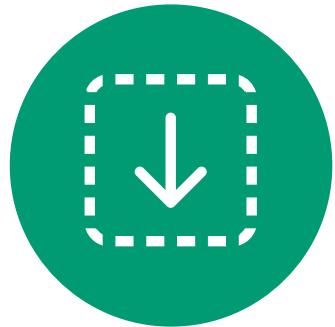


Bioprocessing plastic life cycle



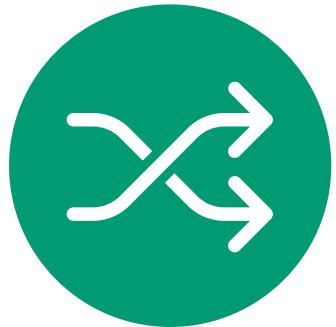
Plastic-related CO₂ emission

Reduction approaches



REDUCE

The amount of material
needed per item



REPLACE

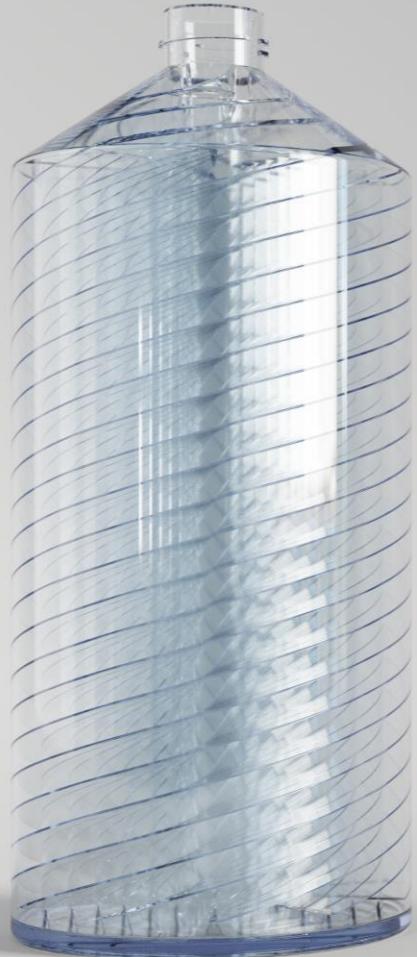
Crude oil-based plastic by
plant-based materials



RECYCLE

Instead of burning
single-use items after use





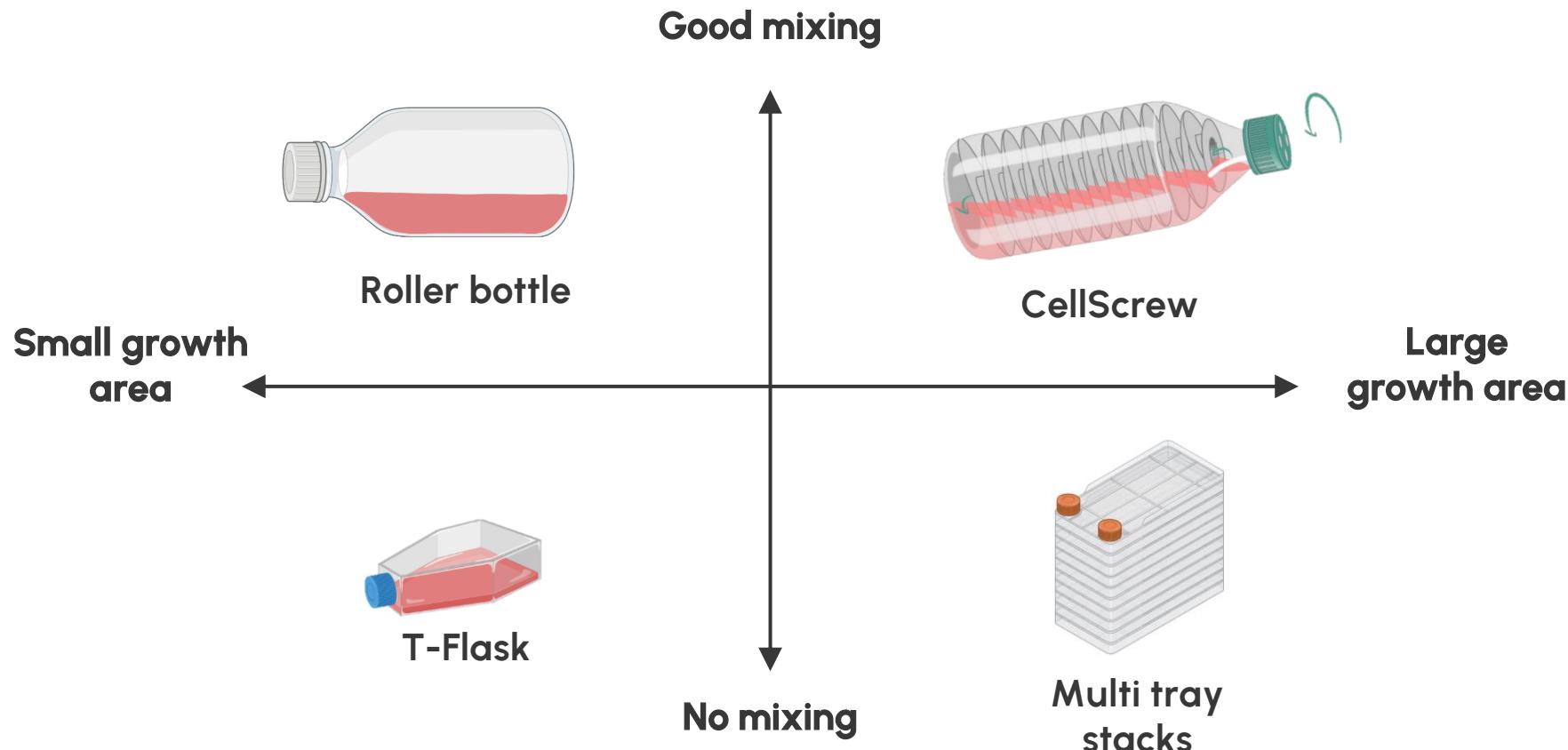
CellScrew®

Scalable
and **sustainable**
cell culture system for
adherent cell expansion



The idea behind the CellScrew®

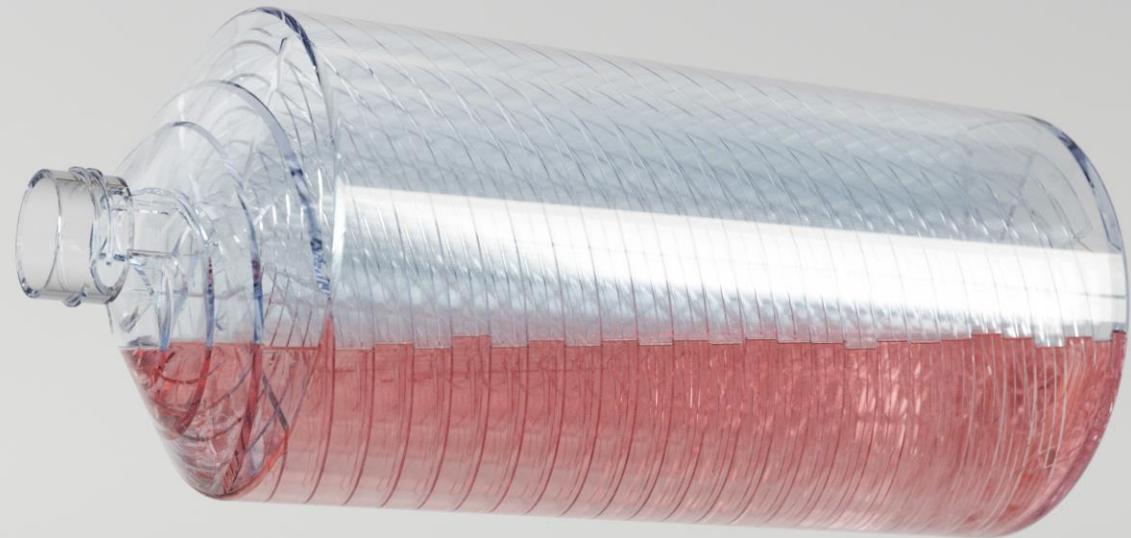
The CellScrew combines advantages of common cell expansion solutions



Applications

- Cell & gene therapy
- Virus manufacturing
- Cultivated meat / seafood

**Whenever large amounts of
adherent cells (or their products)
are required!**



Dimensions

CS10K

Cell culture area: **10.000 cm²**

Media volume: **800 – 1.000 mL**

CS6K

Cell culture area: **6.000 cm²**

Media volume: **500 – 600 mL**



Dimensions





Automation potential

The CellScrew can be fully automated without robots and equipped with sensors for online-monitoring.

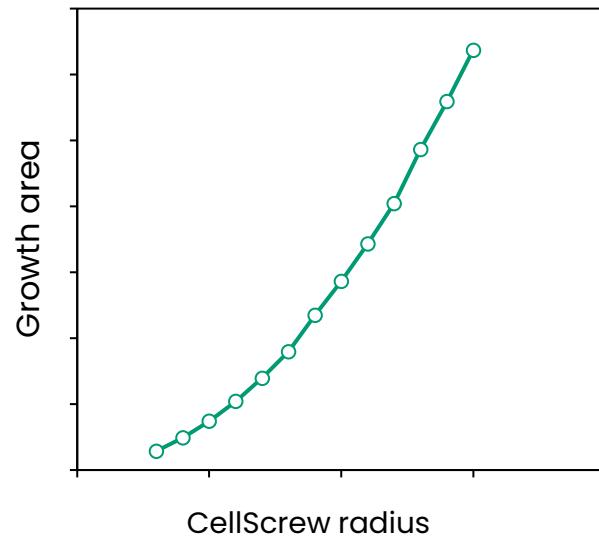
Automation includes:

- Coating (if required)
- Seeding, media change
- Cell harvesting
- Processing in Fed-batch or perfusion mode



Scalability

The CellScrew can be scaled from a **stand-alone device** at lab scale to an automated system at **manufacturing scale** without changing the cultivation environment for the cells.

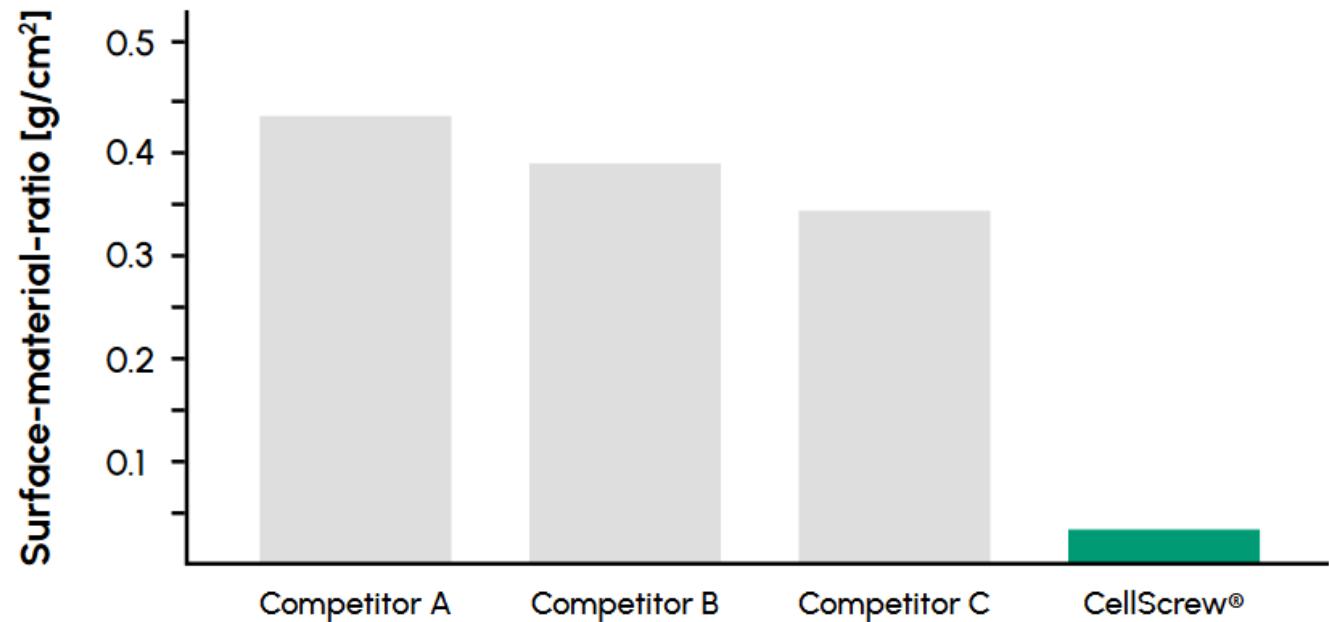


Sustainability

Additive manufacturing reduces plastic waste

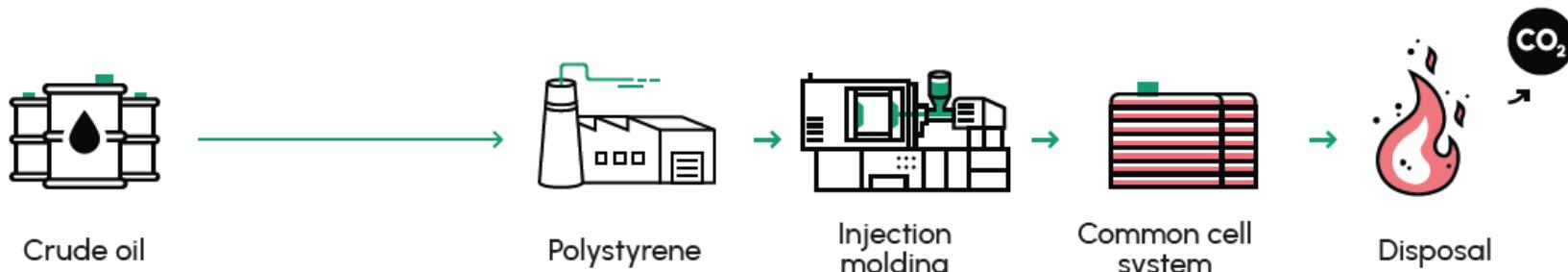
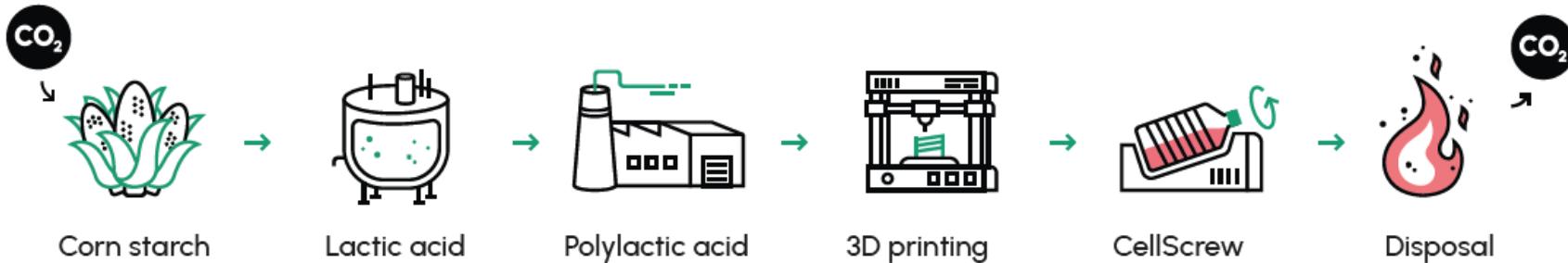
**90 % less
raw material!**

The additive manufacturing process allows us to make **more growth area** from **less raw material**.



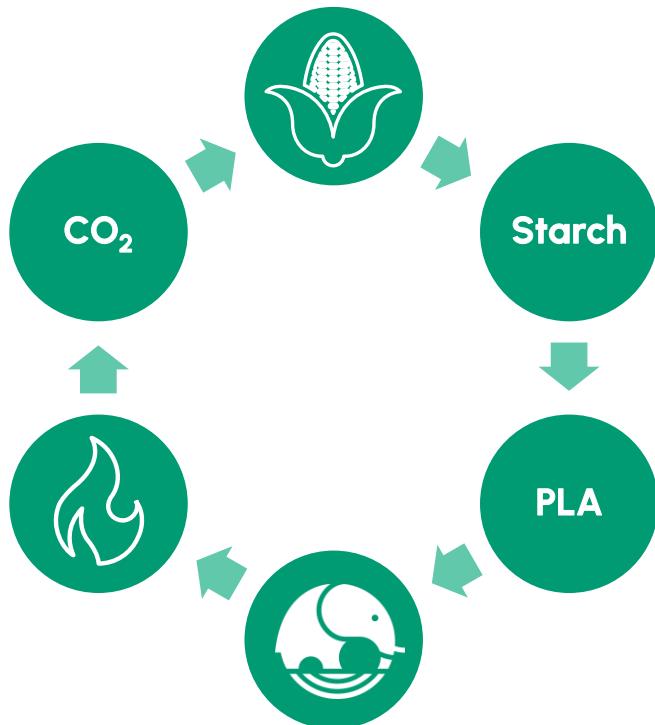
Sustainability

The CellScrew is made from the plant-basted plastic PLA



Why PLA?

PLA has the potential to substitute PS and PP in many applications



- Biocompatible
- Already used in MedTech applications
- Very good mechanical properties
- Visually clear (like PS)
- Cell attachment
- Can be Gamma-irradiated
- Can be processed by 3D printing and injection molding

①



Reduced manufacturing costs

The large growth area, intensified processes and ease of handling reduce **labour costs** and required **manufacturing space**.

②



Reduced time to market

As the CellScrew can be applied from lab scale to manufacturing scale, **no additional process development** is necessary to scale-up.

③



Reduced environmental impact

Your **CO₂ emission** is reduced by more than **90%** using the CellScrew, compared to conventional multilayer flasks.



THANK YOU!



A dense, overlapping pattern of green fern fronds, creating a lush, natural texture. The fronds are dark green with prominent veins and small, serrated leaflets.

Backup

1: Prepare



2: Inoculate



3: Rotate



4: Incubate

