
PREMIER
TECH

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PREMIER TECH

NOWRA 2023

ECO-DESIGN

A way to leverage innovation in sustainable product development

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MARIE-CHRISTINE BÉLANGER and COLIN CÔTÉ

Nickel waste tailings are produced during the hydrometallurgical leaching of nickel – cobalt ore slurry with concentrated sulphuric acid.

- Sudbury, Ontario

CREDIT: Edward Burtynsky

The UN Environment Programme (UNEP) predicts that the amount of plastic in the ocean will nearly triple by 2040, adding 23 million to 37 million tonnes more waste every year.

CREDIT: Ben Curtis/AP/Shutterstock

Globally, only 9% of plastic waste is recycled while 22% is mismanaged.

In USA:

- 73% end up in landfield
- 19% is incinerated
- 4% is mismanaged
- 4% is recycled

CREDIT: Ben Curtis/AP/Shutterstock

Canada endured its second-hottest year ever, with France, Britain, Spain, and Italy setting new average temperature records.

(and getting worst every year)

CREDIT: Shutter stock1798609360

Scientists predict that flooding linked to the effects of climate change will increase as the 21st century continues.

CREDIT: bear_productions

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CREDIT: NASA and William Anders

Meeting the needs of the present without compromising the ability of future generations to meet their own needs

Gro Harmel Brundtland

“Notre avenir à tous“ | *“Our Common future“* 1982

DESIGN and COMPLEXITY

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https://www.premiertech.com/announcements/premier-tech-2023-annual-report-here

Planet

- GHG and climate action
- **Life cycle thinking and eco-design**
- Eco-responsible production and business practices

People

- Team members development
- Health, safety, and wellness
- Community engagement

Prosperity

- Impactful partnerships
- Impactful offers and business models

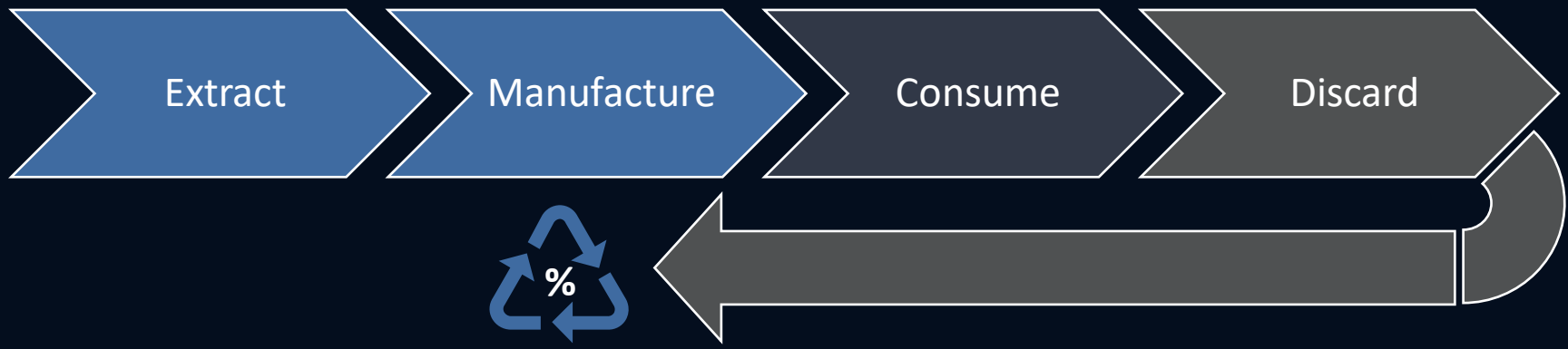
80% of environmental impacts are designed in.

ECO-DESIGN

The integration of environmental aspects into the product development process by balancing ecological and economic requirements.
Eco-design considers environmental aspects at all stages of the product development process, striving for products which make the lowest possible environmental impact throughout the product life cycle.

UNEP 2001 Cleaner production: a guide to information sources

ACTUAL PRODUCTION/ CONSUMPTION MODEL



WE NEED TO GO
BEYOND USING
RECYCLED MATERIAL

TAKE MAKE WASTE

ACTUAL ECONOMY

DESIGN

USE MAKE

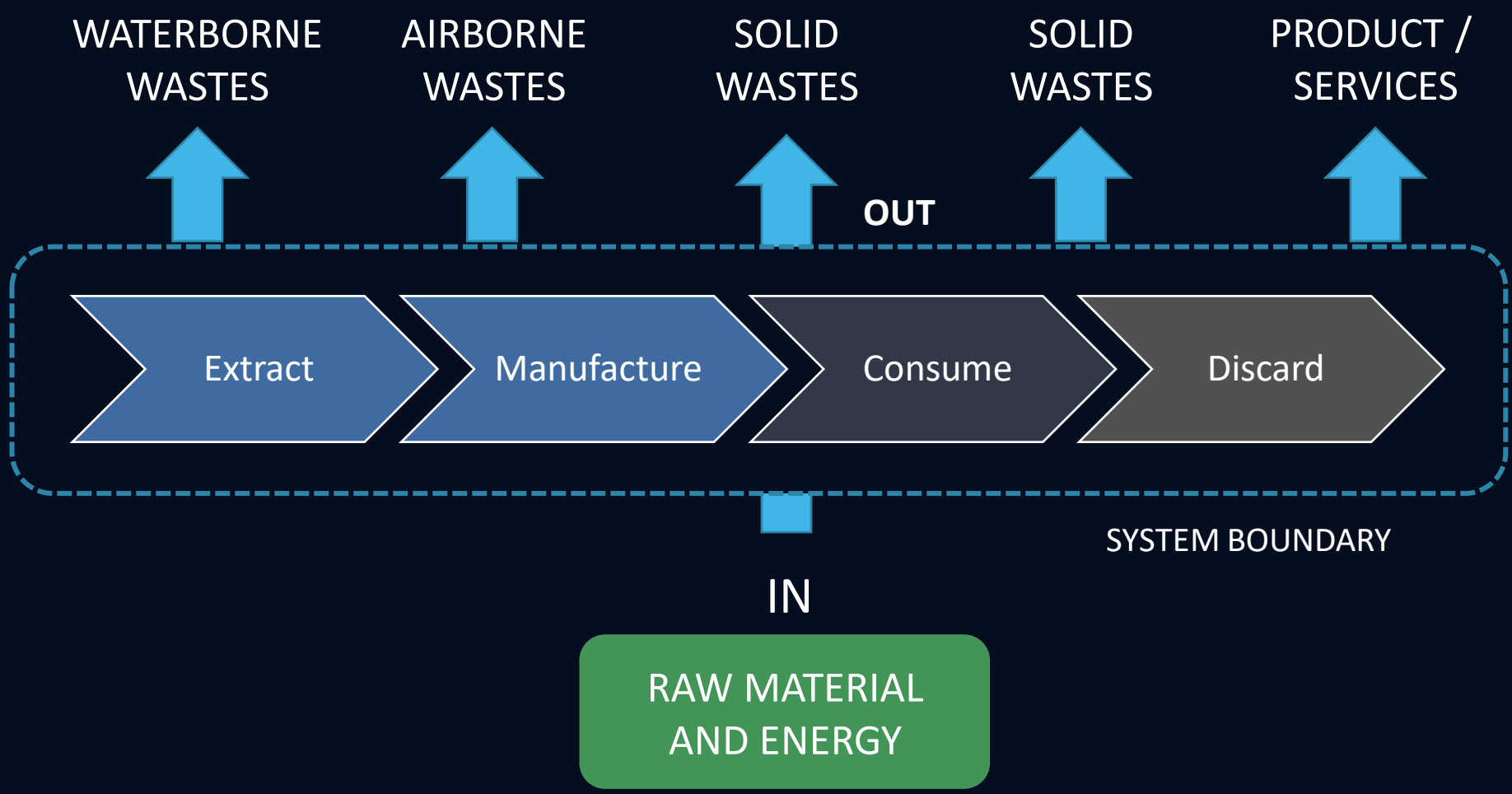
CIRCULAR ECONOMY

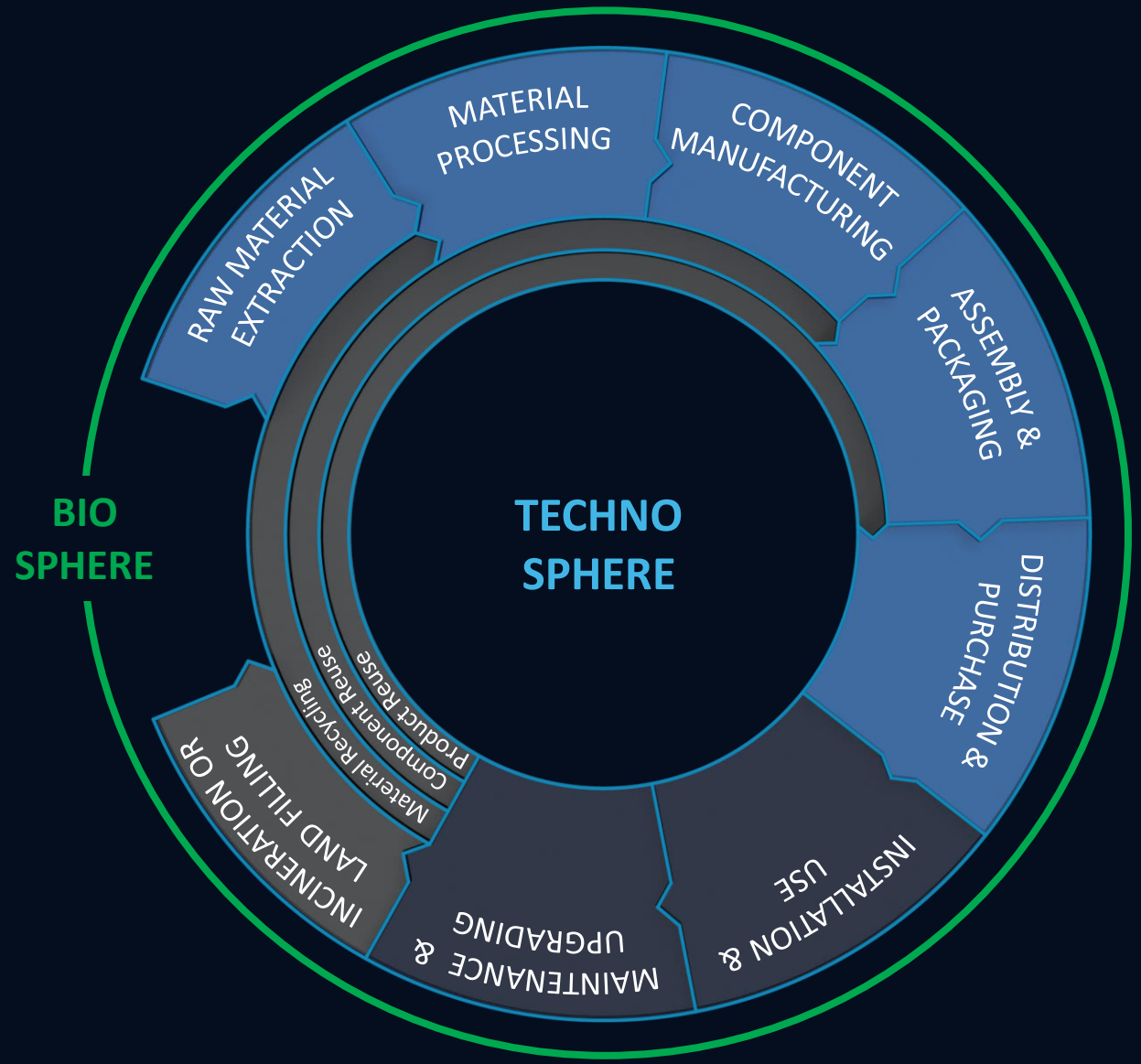
DESIGN

USE MAKE

REGENERATE

REGENERATIVE ECONOMY


WATERBORNE WASTES
AIRBORNE WASTES
SOLID WASTES
SOLID WASTES
PRODUCT / SERVICES
OUT
Extract
Manufacture
Consume
Discard
SYSTEM BOUNDARY
IN
RAW MATERIAL AND ENERGY



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http://www.okala.net/index.html

INNOVATION

MANUFACTURING INNOVATION

PRODUCT SERVICE SYSTEM

SOCIETY

DEMATERIALIZATION

REMANUFACTURE

REDUCE

RECYCLABILITY

REPAIRABILITY

REUSABILITY

DISASSEMBLY

END OF LIFE

DESIGN FOR X

LONGEVITY

EFFICIENCY

MODULARITY

USERS

THE ENVIRONMENT

TRANSITIONAL SYSTEMS

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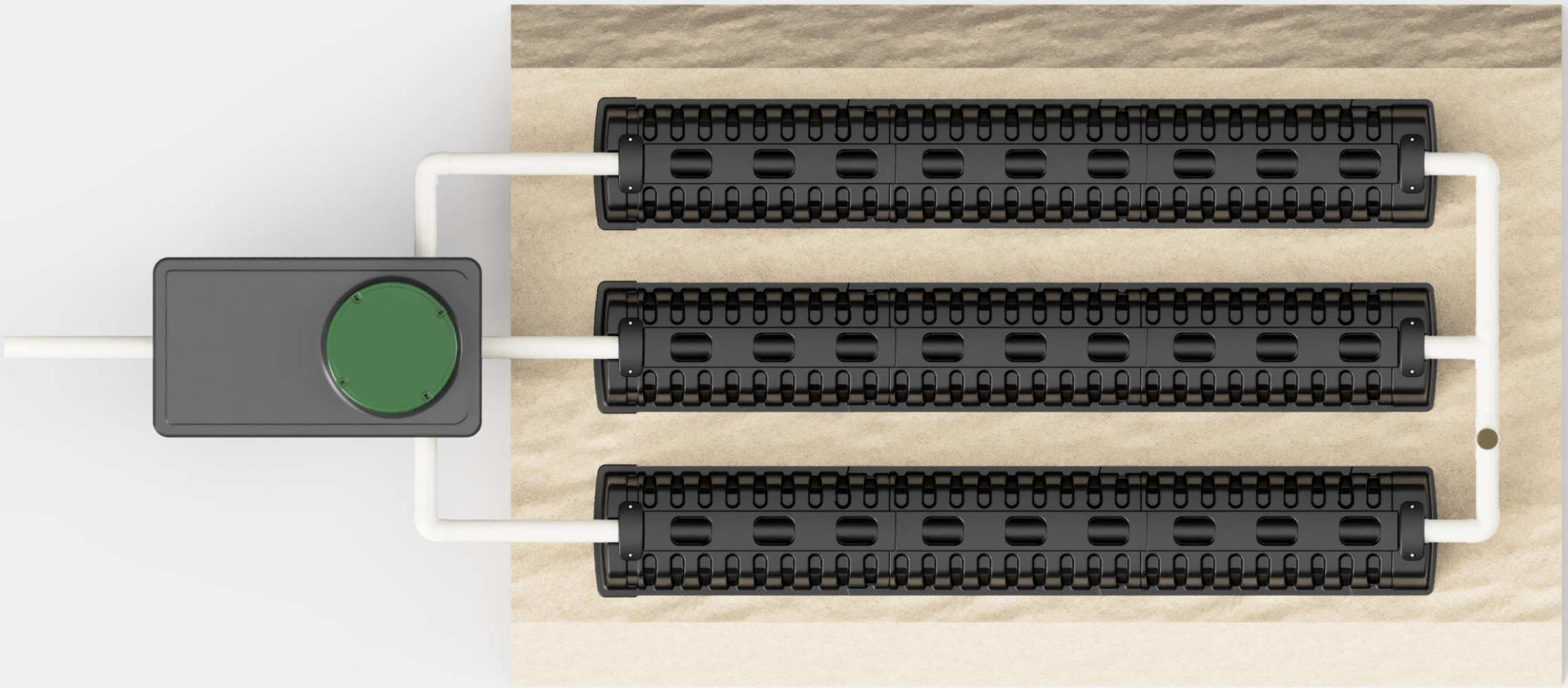

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REDUCE

DISTRIBUTION

+

PROTECTION

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INNOVATION

PATENT
PENDING

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REUSABILITY

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INNOVATION

PATENT
PENDING

Keystone

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MODULARITY

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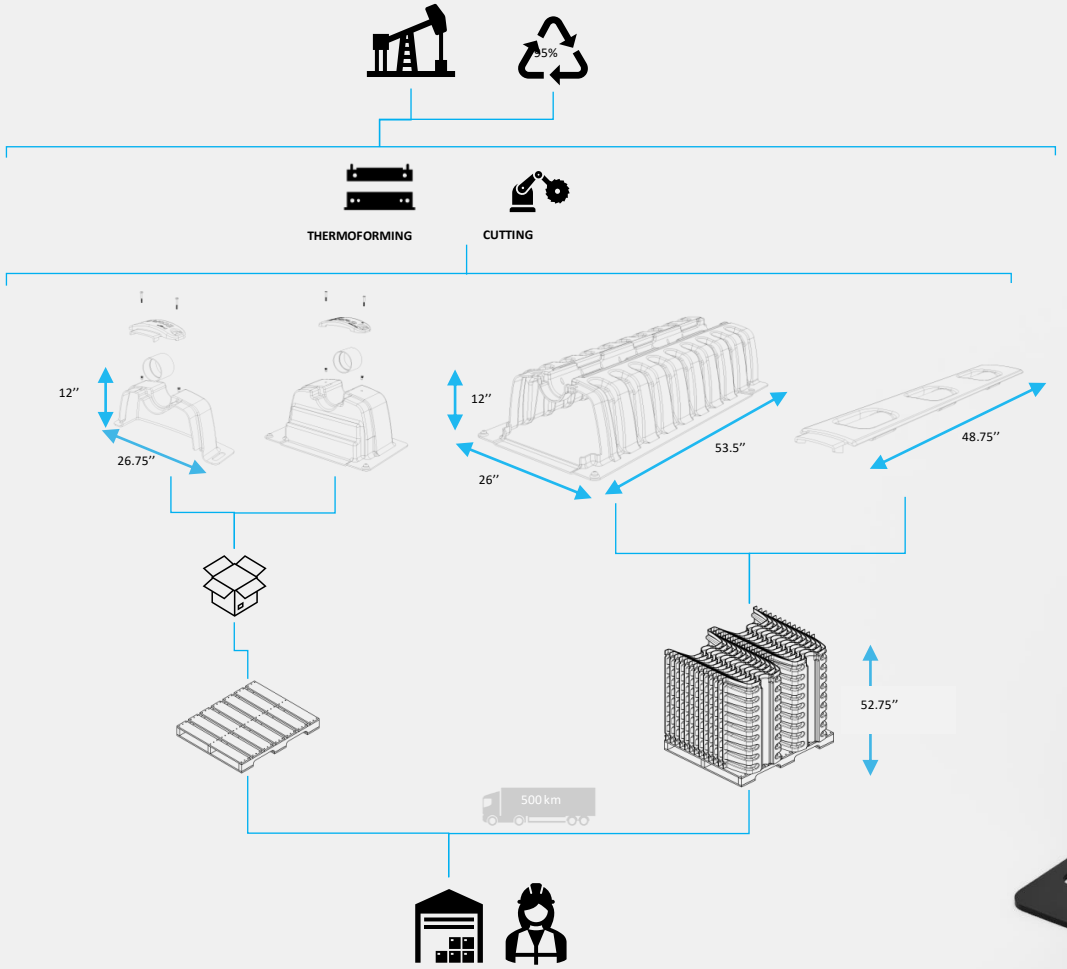
CONFIDENTIAL



RECYCLABILITY

REDUCE

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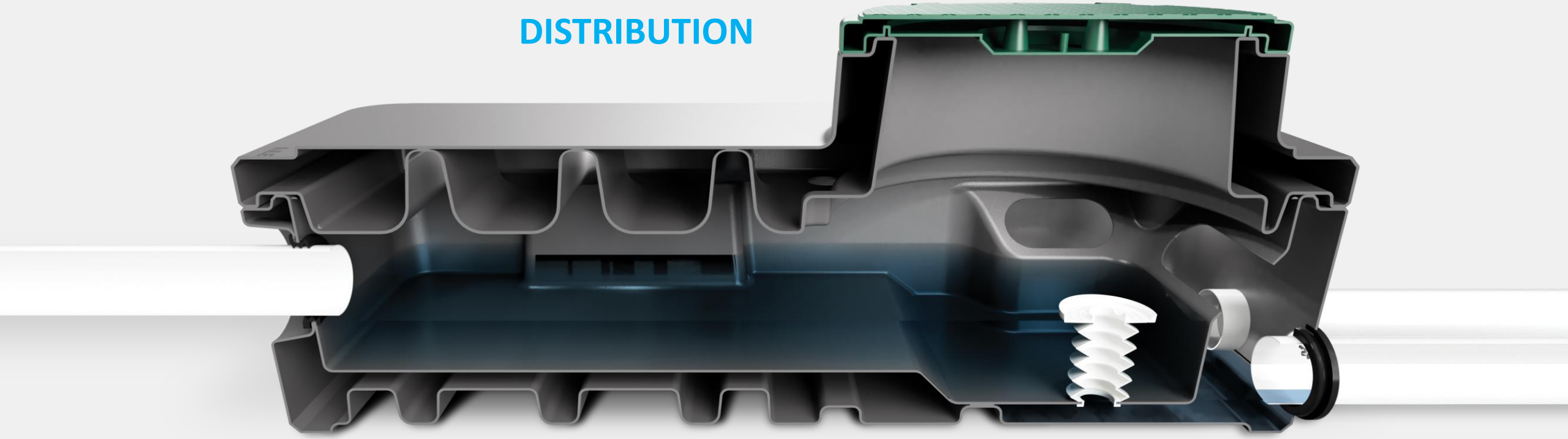
INNOVATION

DOSING

+

DISTRIBUTION



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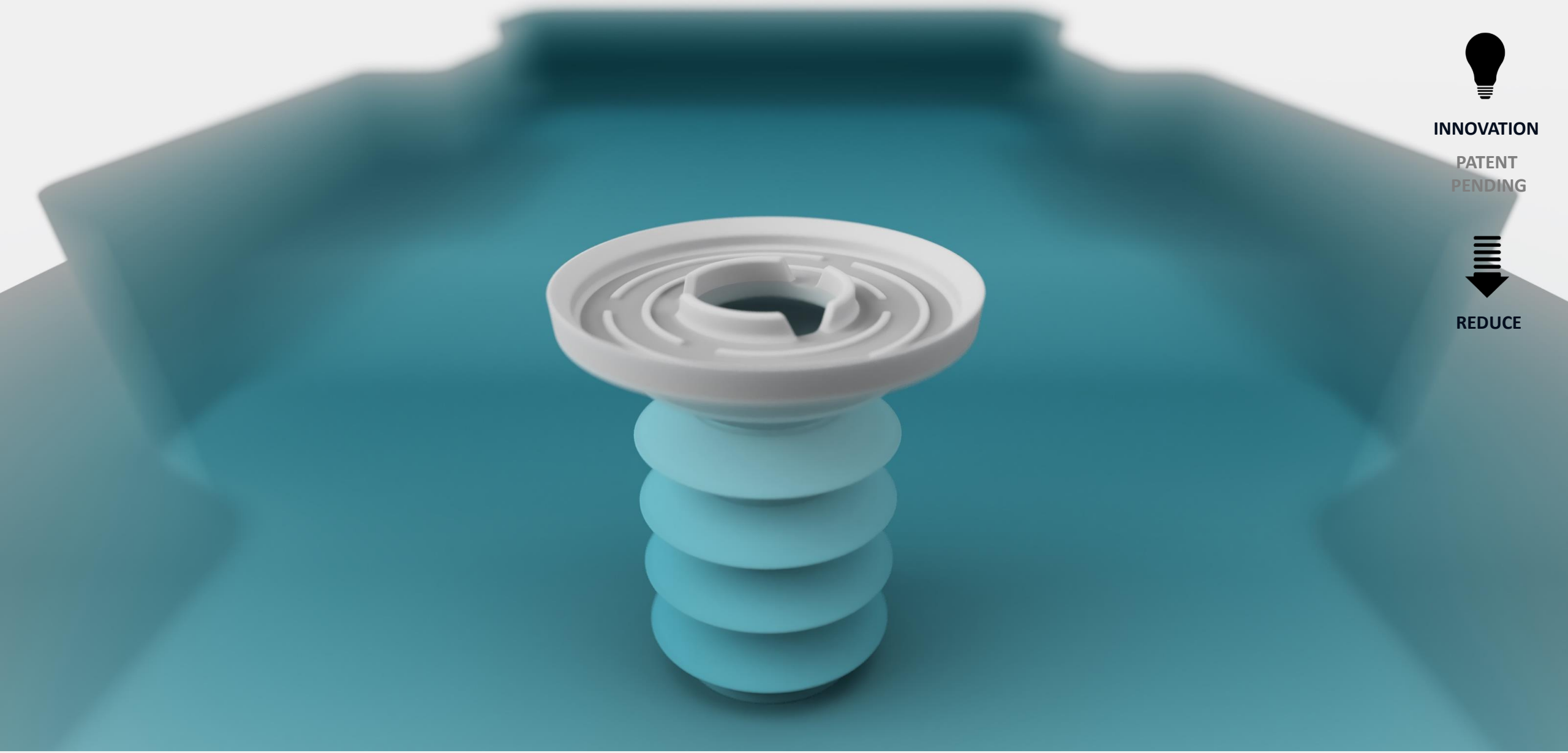

INNOVATION

PATENT PENDING

REDUCE

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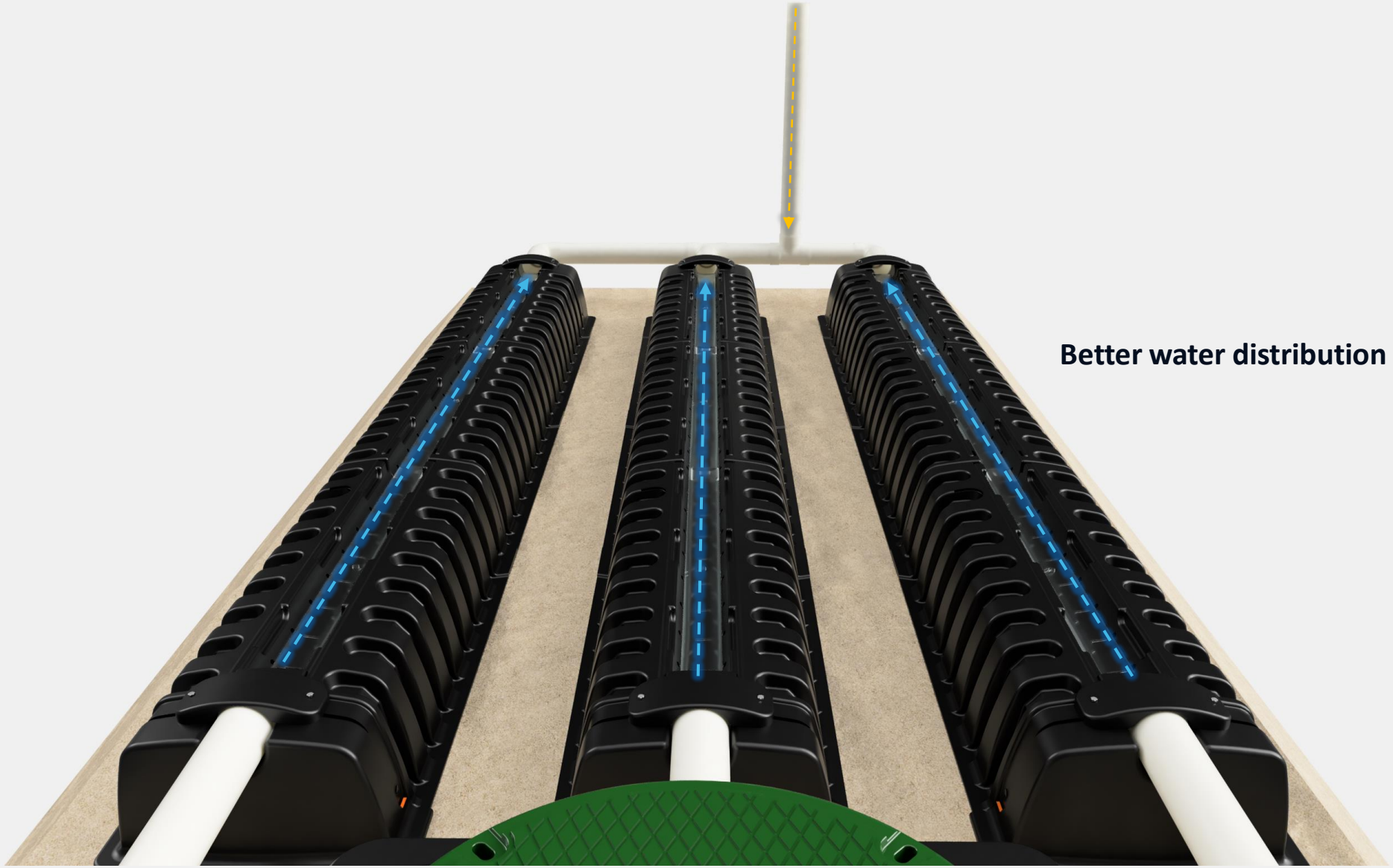
INNOVATION



Better water distribution

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END OF LIFE

Allowing for
visual inspection

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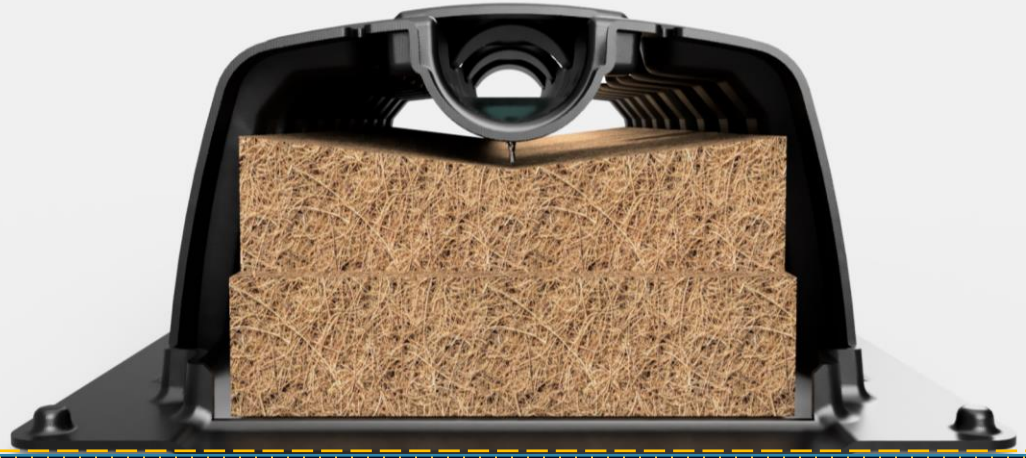
REDUCE



CLIENT

SAND

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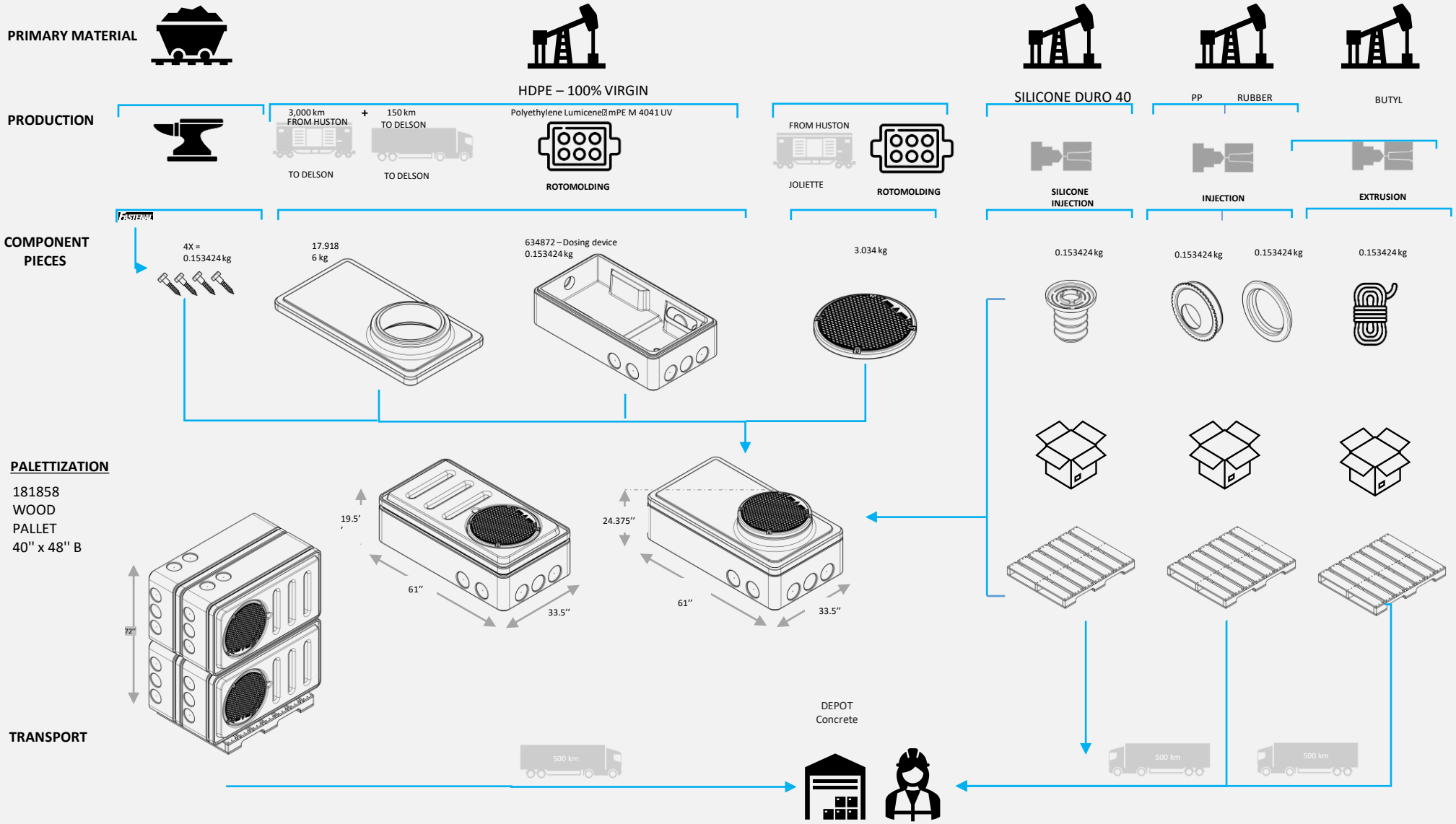
Process tree – From manufacturing to depot

Dosing distribution box



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Process tree – From manufacturing to depot

Treatment modules

Primary material

Primary materials include each element purchased for the production of a filtration system

PRODUCTION

PRODUCTION

STAMPING

THERMOFORMING

CUTTING

Possible to evaluate the volume of loss/components

The transportation of supplies corresponds to the transport from production of the materials to the depot

PIECES AND COMPONENTS

IUTA-0616-PennEngineering

7.8”

48”

15.75”

12”

26.75”

12”

53.5”

26”

48.75’’

PALETTIZATION

181858
WOOD
PALLET
40'' x 48'' B

84.5”

25 UNITS

30 UNITS

500 km

500 km

TRANSPORT

DEPOT

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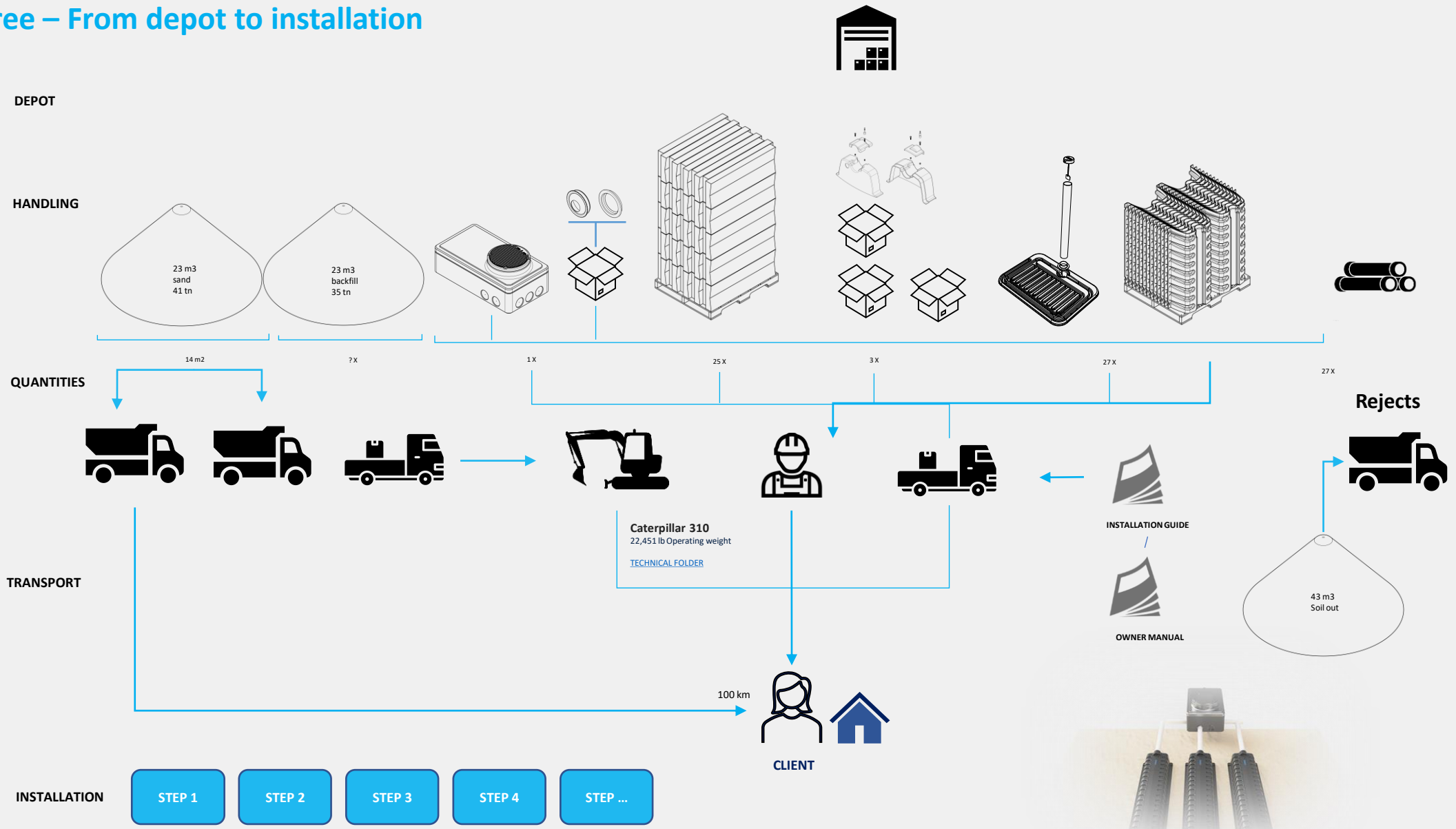
Process tree – From depot to installation



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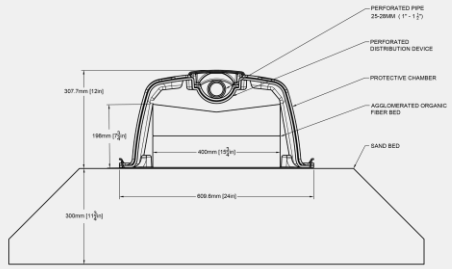
Process tree – From usage and maintenance to end of life



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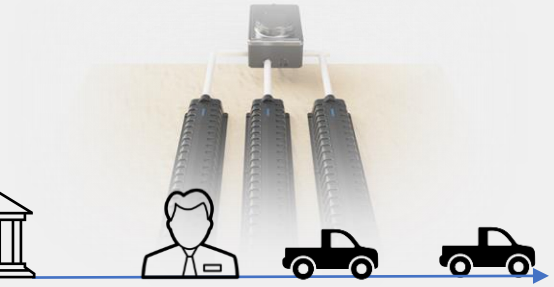
QA - Audit



CLIENT

SERVICE

LAB

REGULATIONS

AUDIT

Yearly
Visual Inspection
Sampling

Yearly
Tank pumping

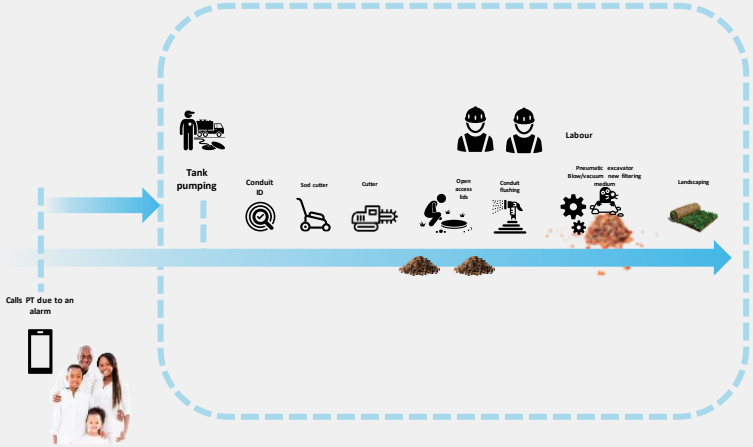
LANDFILL

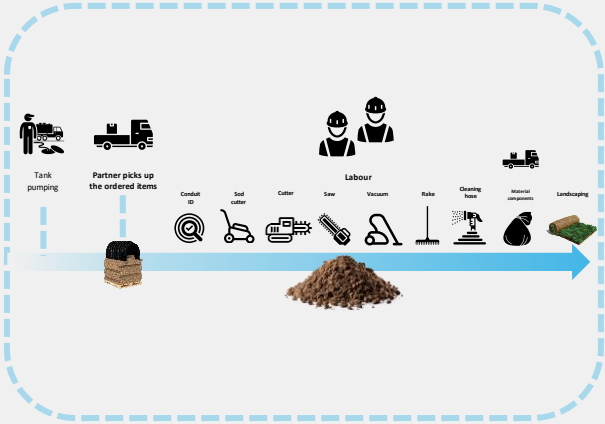
2 x F.M. replacements over 50 years

END OF LIFE

PT Service sends
a partner

REPAIR AND TROUBLESHOOTING





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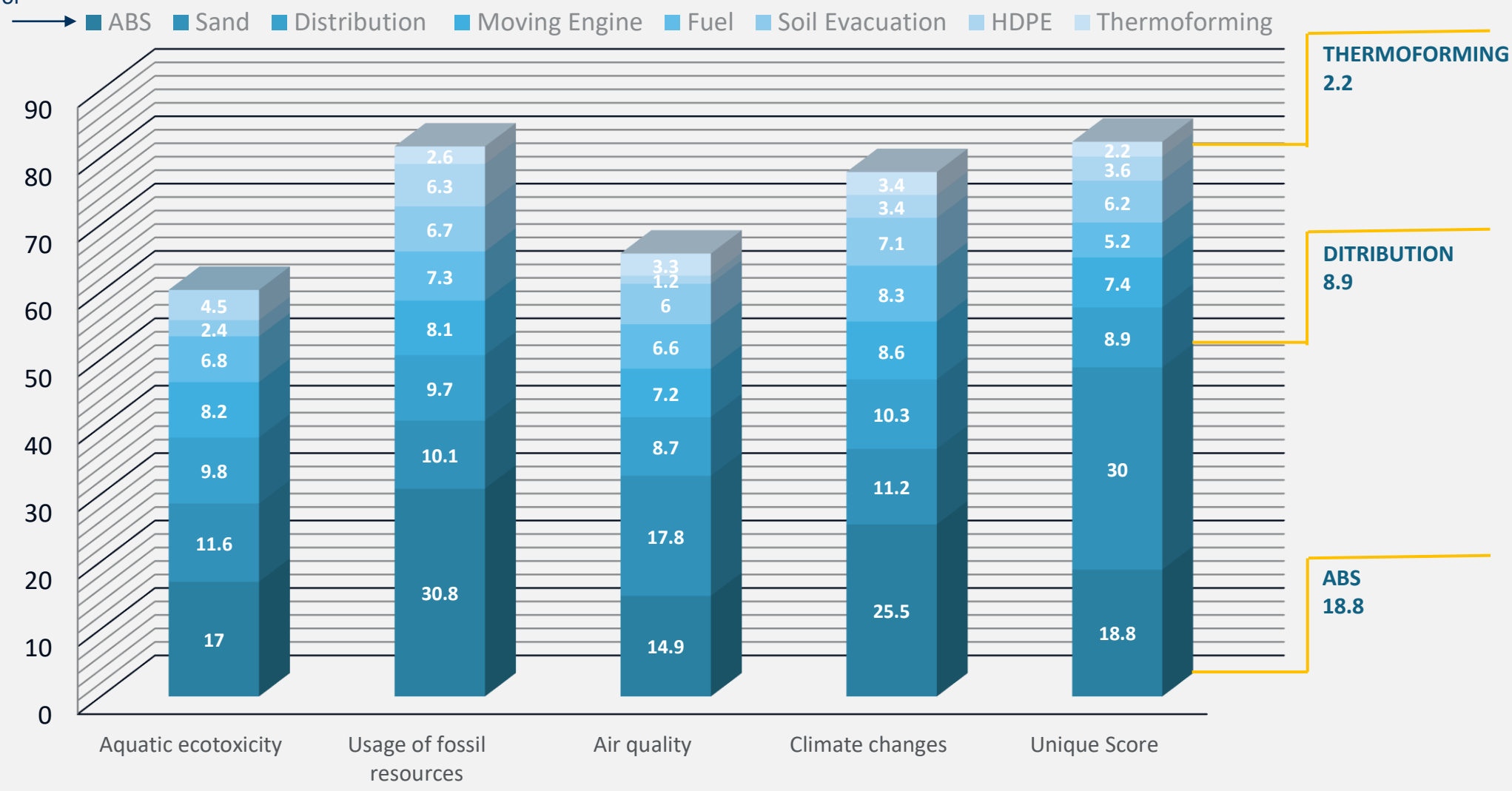
Simplified Life Cycle Assessment / SLCA

8 elements accountable for 80% of the total impacts →



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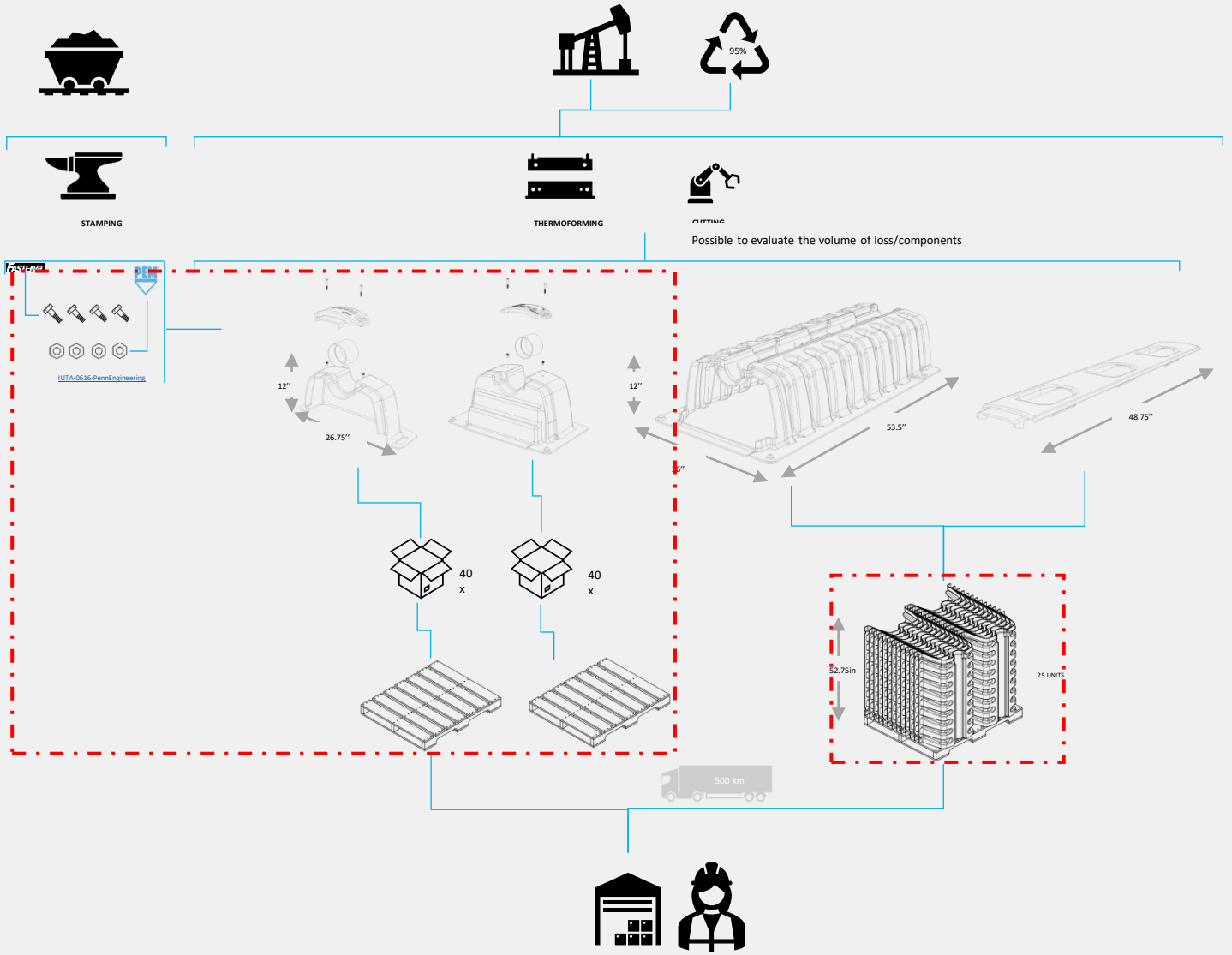
What's next

Thermoforming

8 PARTS



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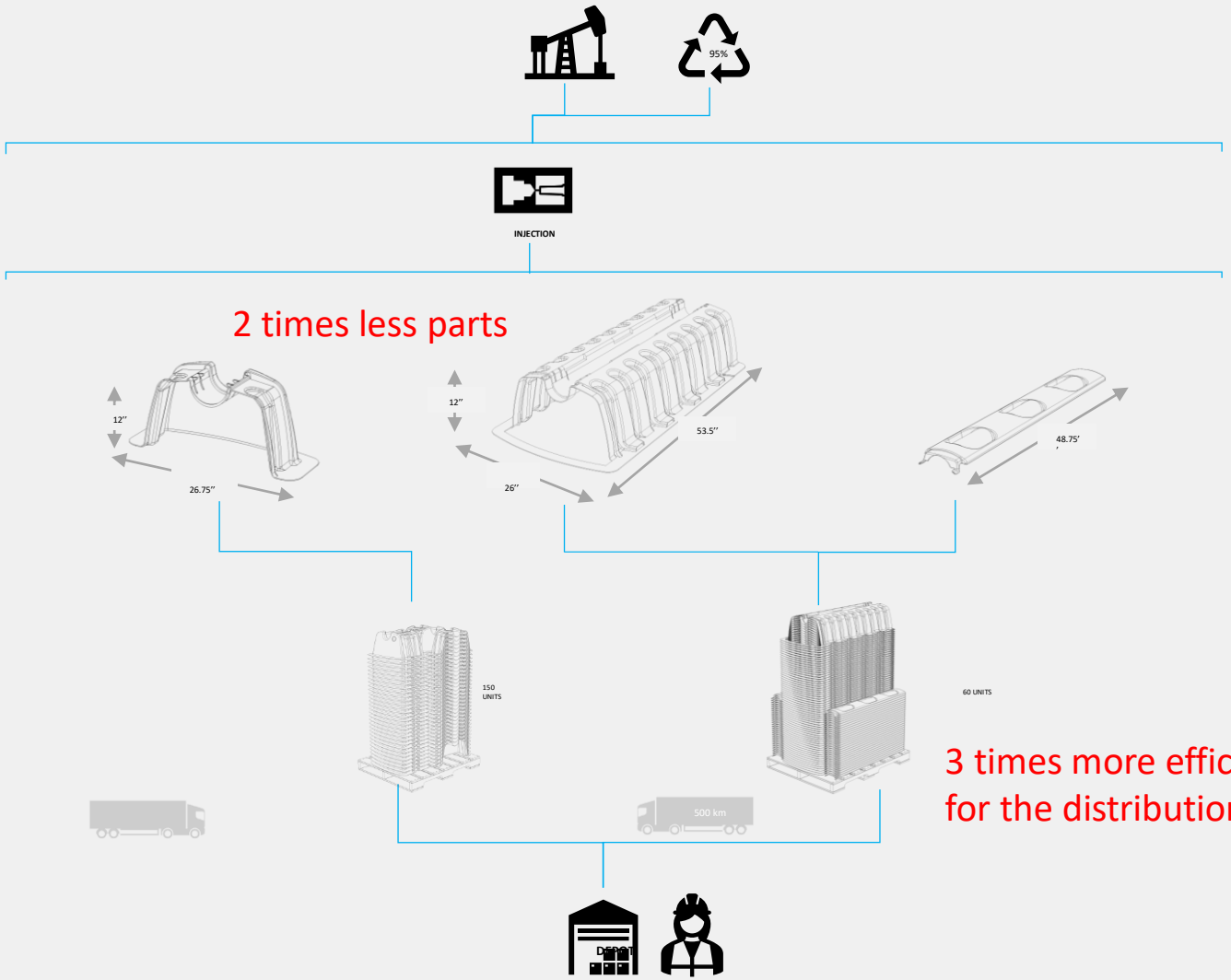
Motivated by production capacity and economic considerations

REDUCE

Injection

3 PARTS



3 times more efficient for the distribution

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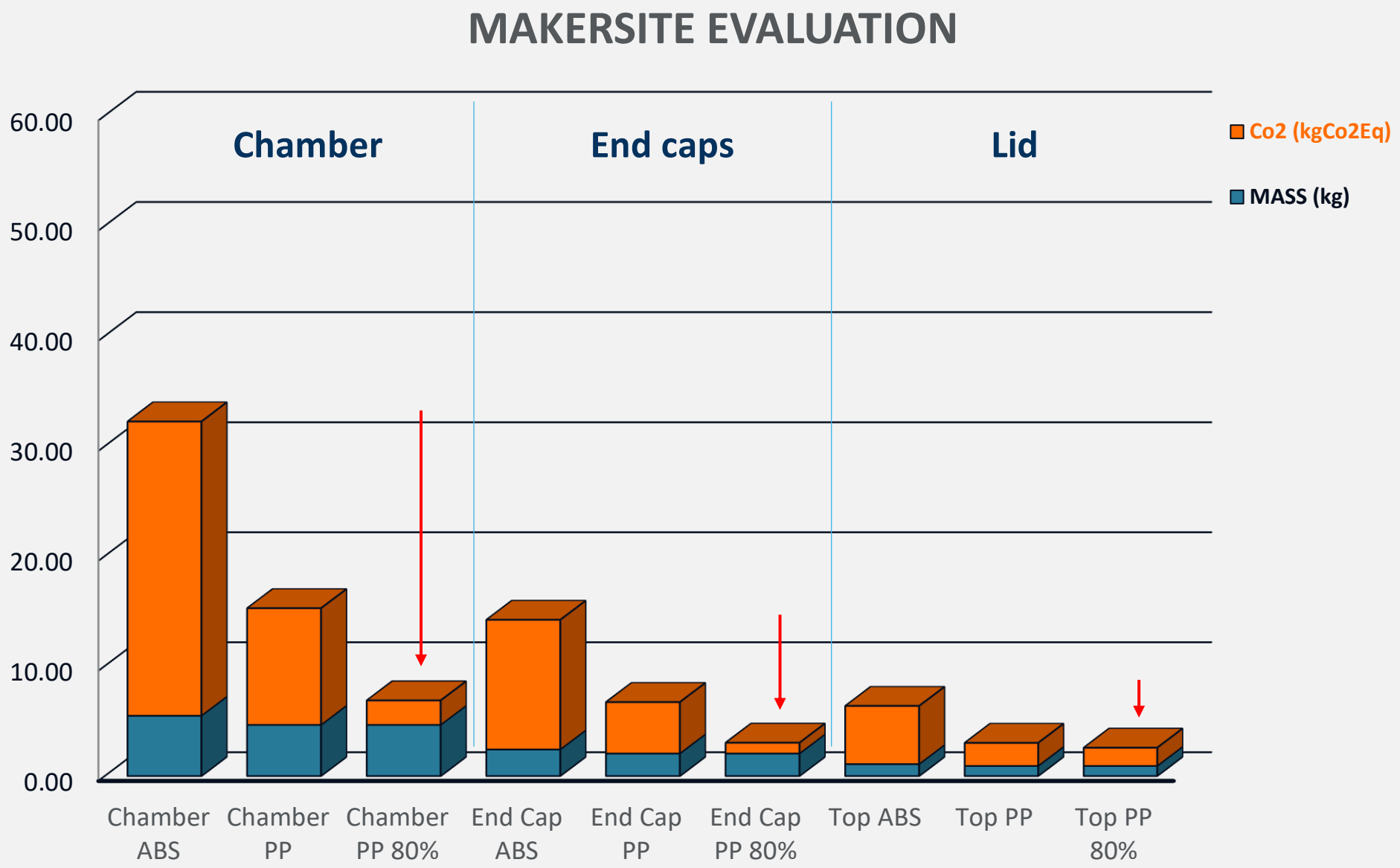
Next generation – Preliminary evaluation



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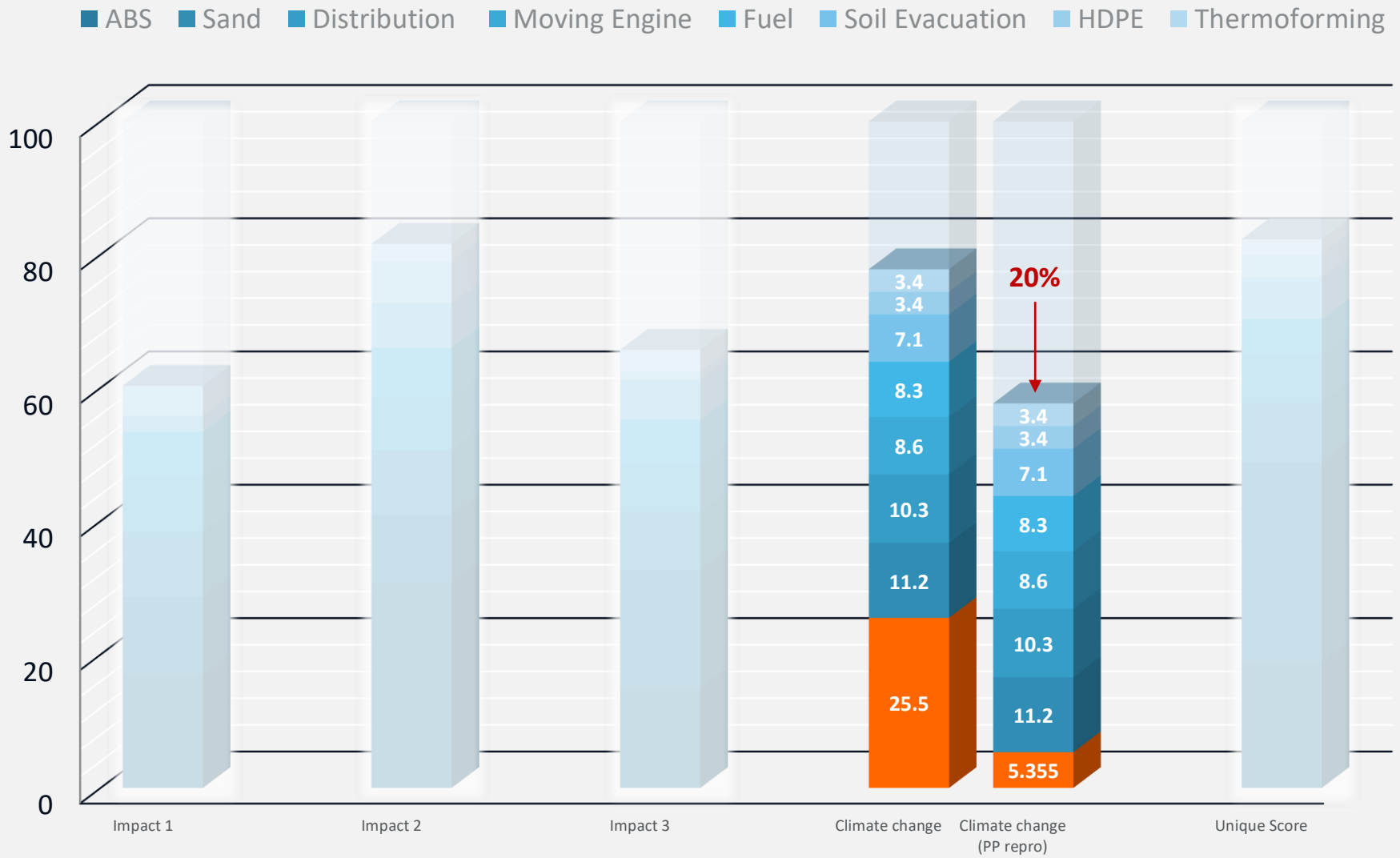
Next generation – Anticipated positive impacts

Simplified Life Cycle Assessment / SLCA



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Questions?