



**ORIGINAL** UNITEX®  
MADE IN GERMANY

# BIOTRANSFORMATION

“ The world’s first biodegradation technology capable of delivering full biological conversion of polyolefin packaging materials in the open environment ”



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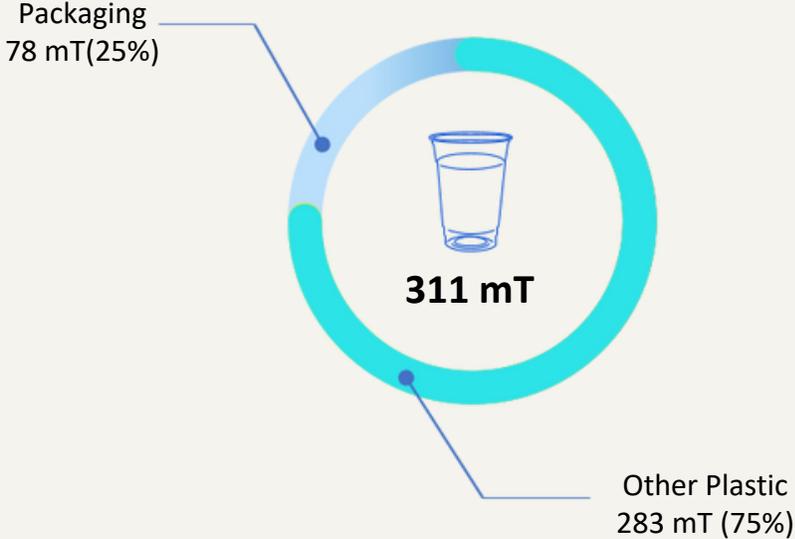


**Context:**

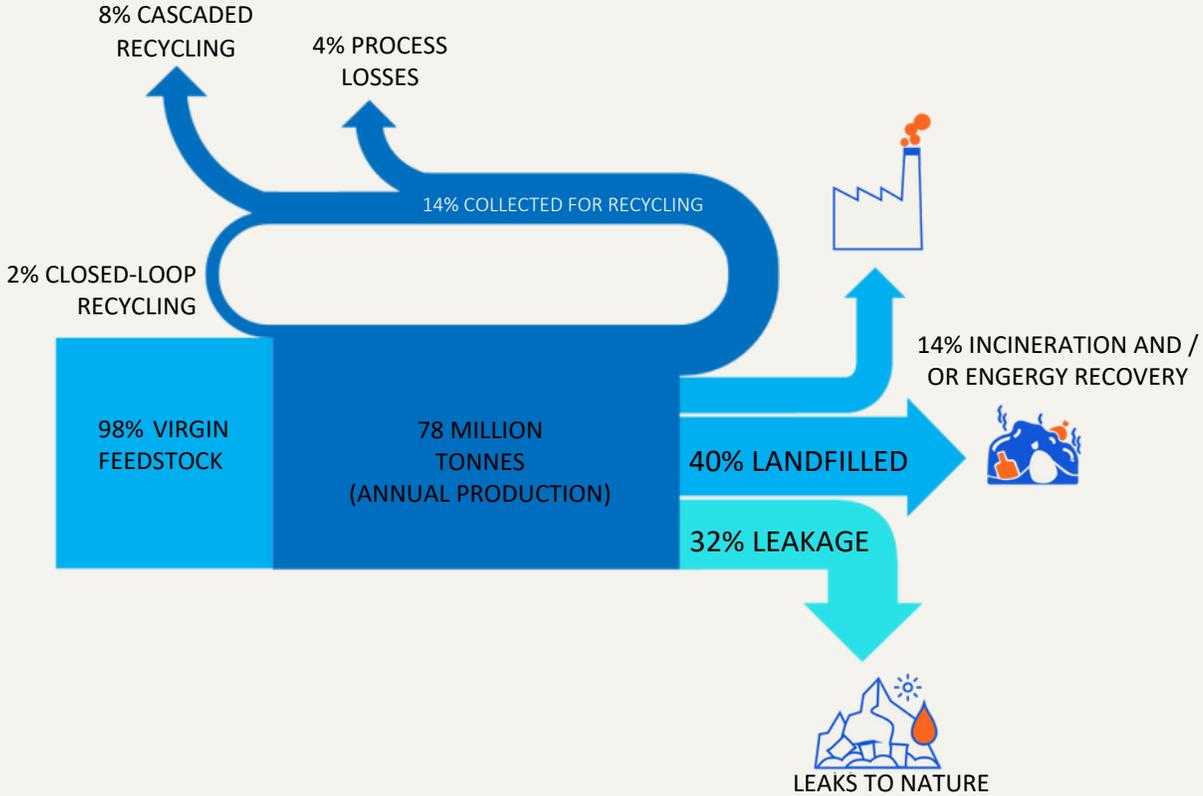
**A GLOBAL ISSUE**

# PLASTIC POLLUTION –A GLOBAL MATERIAL FLOW CHALLENGE

Global Plastic Production



Global Plastic Packaging Material Flow



# PLASTIC POLLUTION – REGIONAL CONCERN



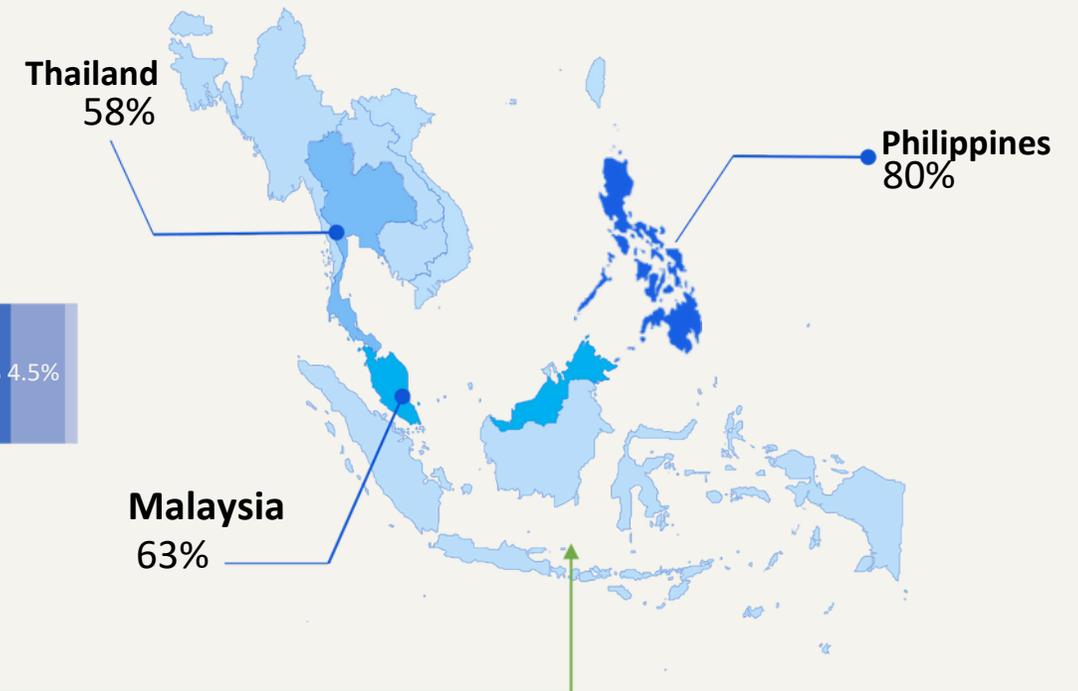
**80%**  
of plastic in the ocean,  
comes from land

APAC	81%
AFRICA.	8%
S. AMERICA	5.5%
N. AMERICA	4.5%
EU & OCEANIA.	<1%

## SPLIT OF OCEAN PLASTICS



## Leaked plastics

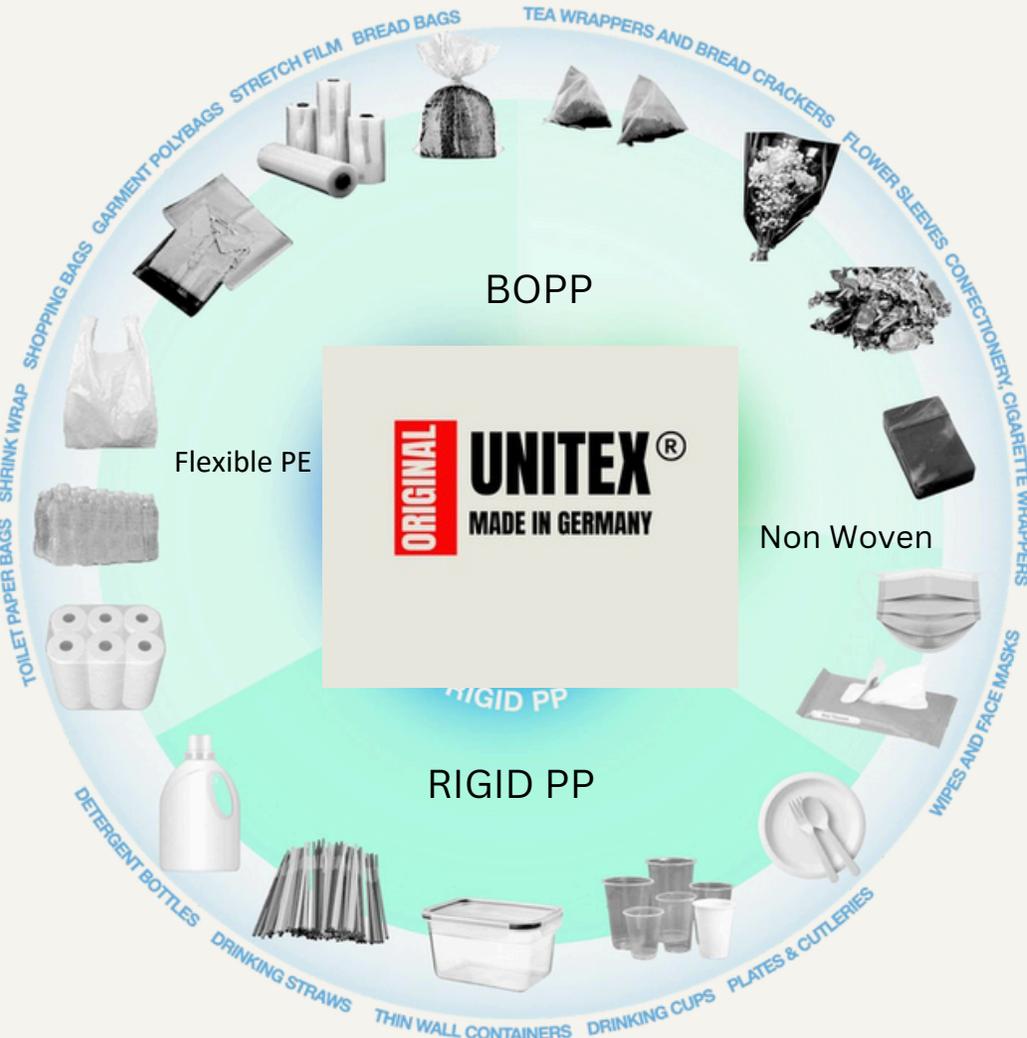




**Solution:**  
**BIOTRANSFORMATION**

# OUR SOLUTION

**World's first  
biodegradation  
technology capable  
of delivering full  
biological conversion  
on PP & PE materials**



# OUR TECH IN A NUTSHELL



## OFFERS 2 END OF LIFE SCENARIOS

Time controlled process to allow optimal use phase and recycling recovery, if recycling option is available.



## TRANSFORMS PLASTIC INTO WAX

Transforms PP & PE materials into a bioavailable wax which naturally occurring microorganisms can easily assimilate.



## ENSURES SAFE RETURN TO NATURE

No microplastics<sup>2</sup> or toxic substances are left behind post-Consumption stage.



## BACKED BY INDEPENDENT LABS

Tested & certified to international biodegradability standard (BSI PAS 9017)<sup>3</sup> underpinned by EN, ASTM and ISO standards (ASTM D5988/ISO 17556)



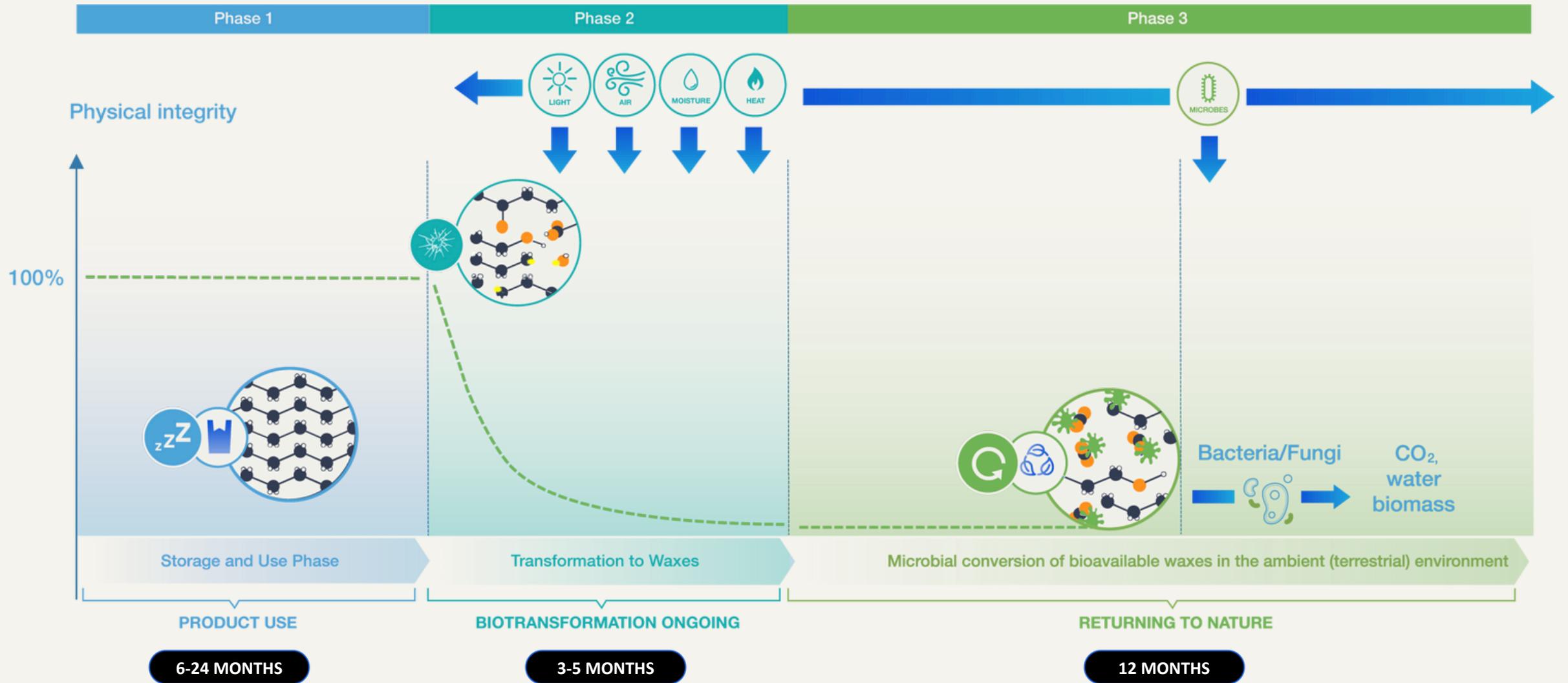
## ALLOWS IMMEDIATE SCALABILITY

Integrated at the point of resin and packaging manufacturing to ensure seamless integrations.

# OFFERS 2 END-OF-LIFE SCENARIOS

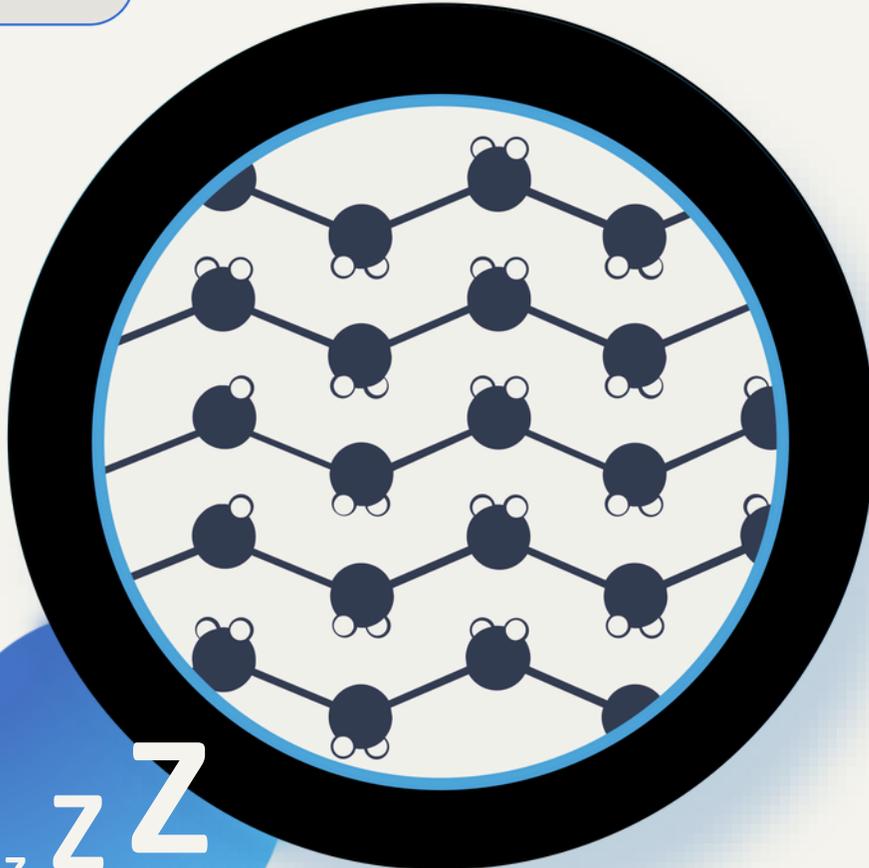


# TRANSFORMATION OF PLASTICS INTO BIOAVAILABLE WAX



# BIOTRANSFORMATION-STAGE 1

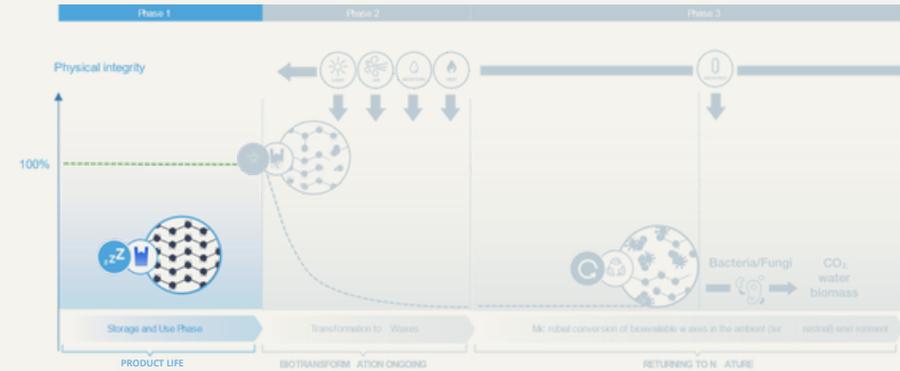
SERVICE LIFE



z z z

6-24 MONTHS

storage and use phase

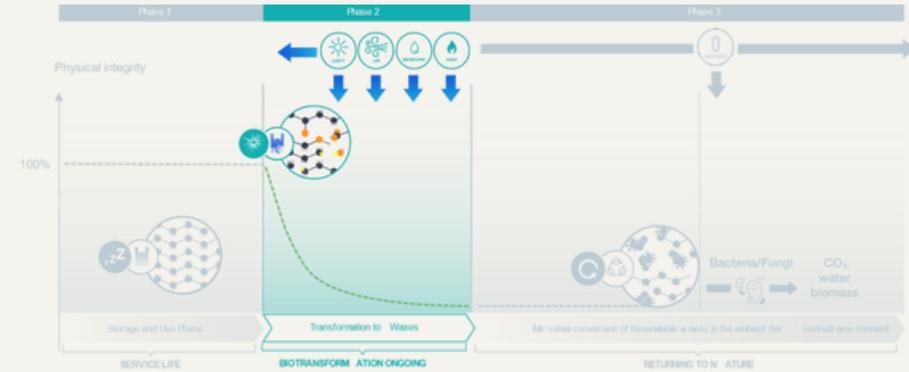
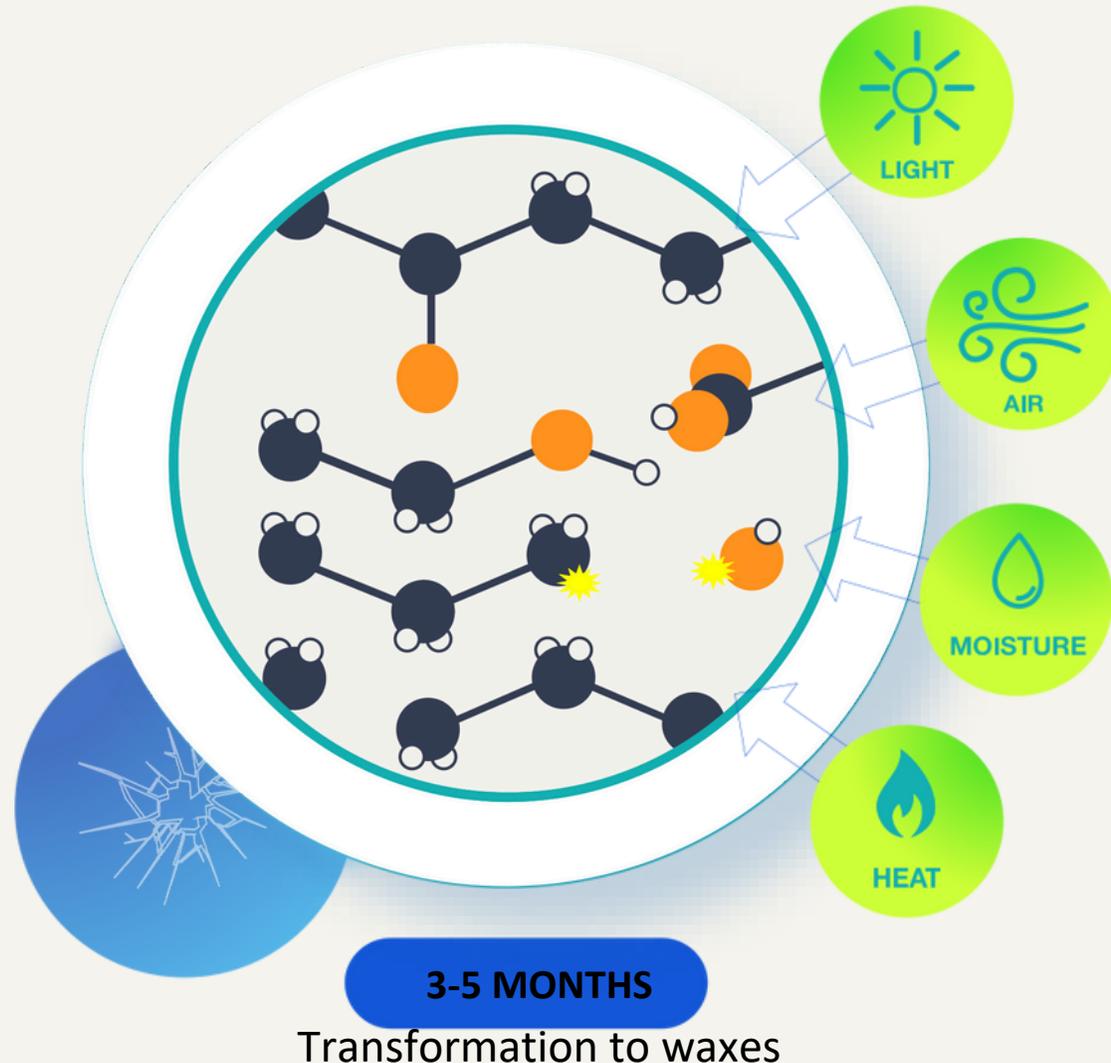


During the storage and use phase the technology is inactive. The packaging behaves the same way as its non-degradable conventional correspondents.

## CRITERIAS:

- ✓ Mechanical Properties
- ✓ Functional benefits
- ✓ Product performance
- ✓ Recyclability

# BIOTRANSFORMATION-STAGE 2



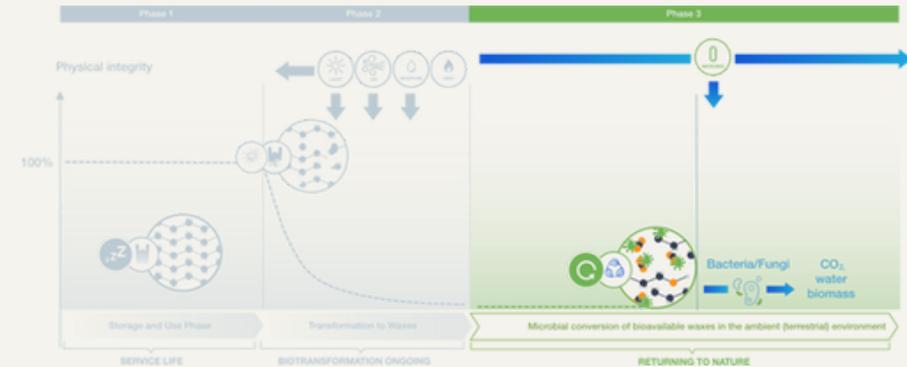
If leaked into the open-air land-based environment, the prolonged exposure to various environmental stimuli will trigger a rapid chemical transformation to wax.

## CRITERIAS:

- ✓ Low molecular weight
- ✓ High carbonyl index

# BIOTRANSFORMATION-STAGE 3

RETURNING TO NATURE



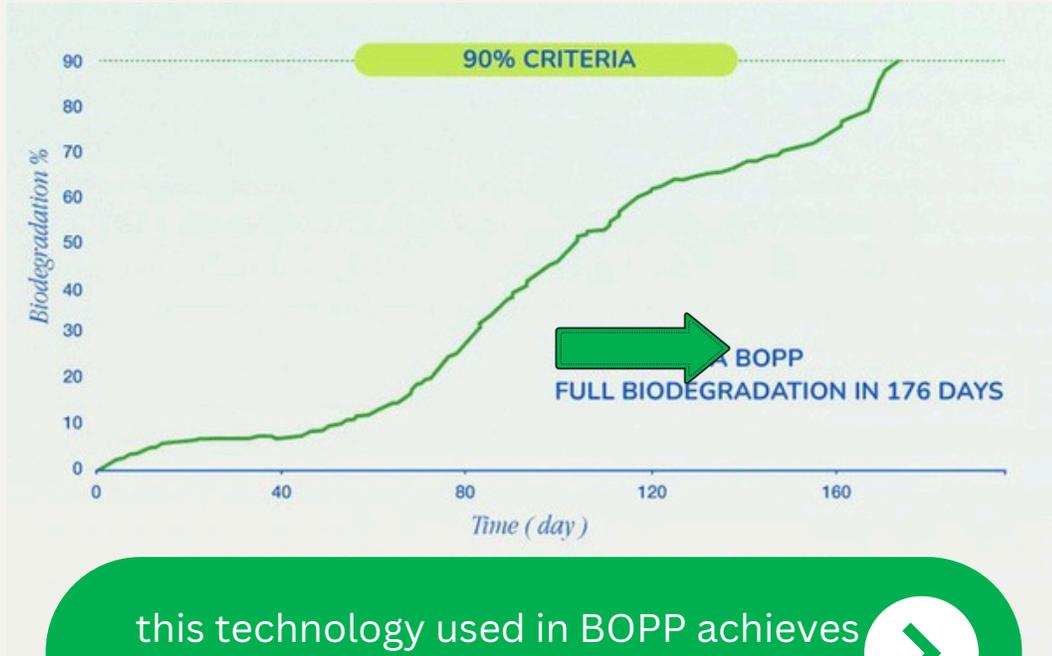
The bioavailable wax is biologically transformed through mineralization by naturally occurring bacteria and fungi in soil and under mesophilic/ambient temperature conditions.

## CRITERIA:

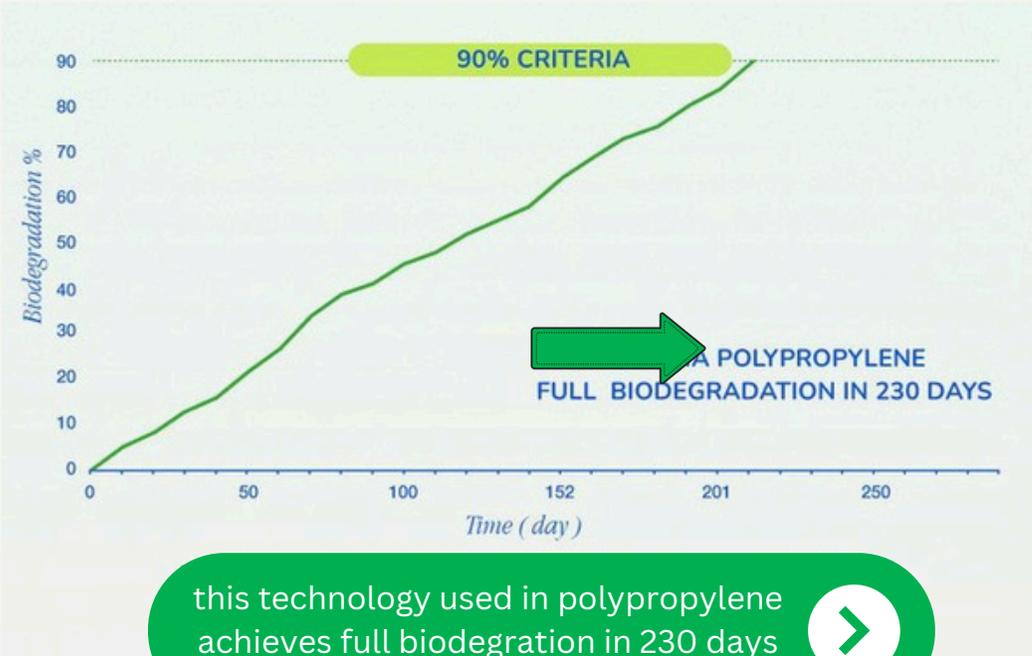
- ✓ Wax Fully Assimilated
- ✓ No Toxins left in The environment
- ✓ No Microplastics

Microbial conversion of bioavailable waxes in the ambient (terrestrial) environment

# BACKED BY INDEPENDENT LABS



this technology used in BOPP achieves full biodegradation in 176 days



this technology used in polypropylene achieves full biodegradation in 230 days



- CRITERIA:
- ✓ REAL WORLD CONDITIONS
  - ✓ TESTED IN DIFFERENT CLIMATES
  - ✓ VERIFIED BY INDEPENDENT SCIENTISTS