



Compostable materials: innovative solutions in packaging applications

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PAGEV CONFERENCE – ISTANBUL



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Novamont



WHO WE ARE

- OUR MISSION
- THE PILLARS OF OUR DEVELOPMENT MODEL
- NOVAMONT'S PROPRIETARY TECHNOLOGIES
- A SUCCESS STORY
- A COMPANY WITH ROOTS IN THE TERRITORY



OUR MODEL

- THE BIOREFINERY INTEGRATED IN THE LOCAL AREA



THE LEADING PRODUCT: MATER-BI

- TWO WORLDS OF THE SAME PLANET
- FROM NOVAMONT RESEARCH IT BECOMES MATER-BI
- RENAWARE CONTENT
- QUALITY GUARANTEED



MATER-BI APPLICATIONS

- APPLICATION SECTORS OF MATER-BI
- TAILOR-MADE APPLICATIONS
- PACKAGING



GRADES OF MATER-BI

- EXTRUSION COATING
- BLOWN EXTRUSION
- LAMINATION
- THERMOFORMING



OUR MISSION

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Developing materials and biochemicals through the integration of **chemistry** and **agriculture**, by starting up **biorefineries** integrated in the territory and providing application solutions that ensure an efficient use of resources throughout their entire life cycle, with **advantages** for **social**, **economic** and **environmental** systems





THE PILLARS OF OUR DEVELOPMENT MODEL

BIOECONOMY AS TERRITORIAL REGENERATION

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NOVAMONT is the international leader in the **bioplastics** sector and in the development of **biochemicals** and **bioproducts** obtained from the integration of chemistry, agriculture and the environment.

It promotes a **model of the bioeconomy** as a factor of **territorial regeneration**, based on three pillars:



REGENERATION OF DEINDUSTRIALISED SITES

Reindustrialisation of no longer competitive sites thanks to **proprietary technologies first in the world** in order to create "**bioeconomy infrastructure**", integrated with the territory and interconnected



INTEGRATED AGRICULTURAL VALUE CHAIN

Development of **low impact value chains** through the valorisation of marginal land not in competition with food production, integrated in local areas and connected with the bioeconomy infrastructure



PRODUCTS CONCEIVED AS SOLUTIONS

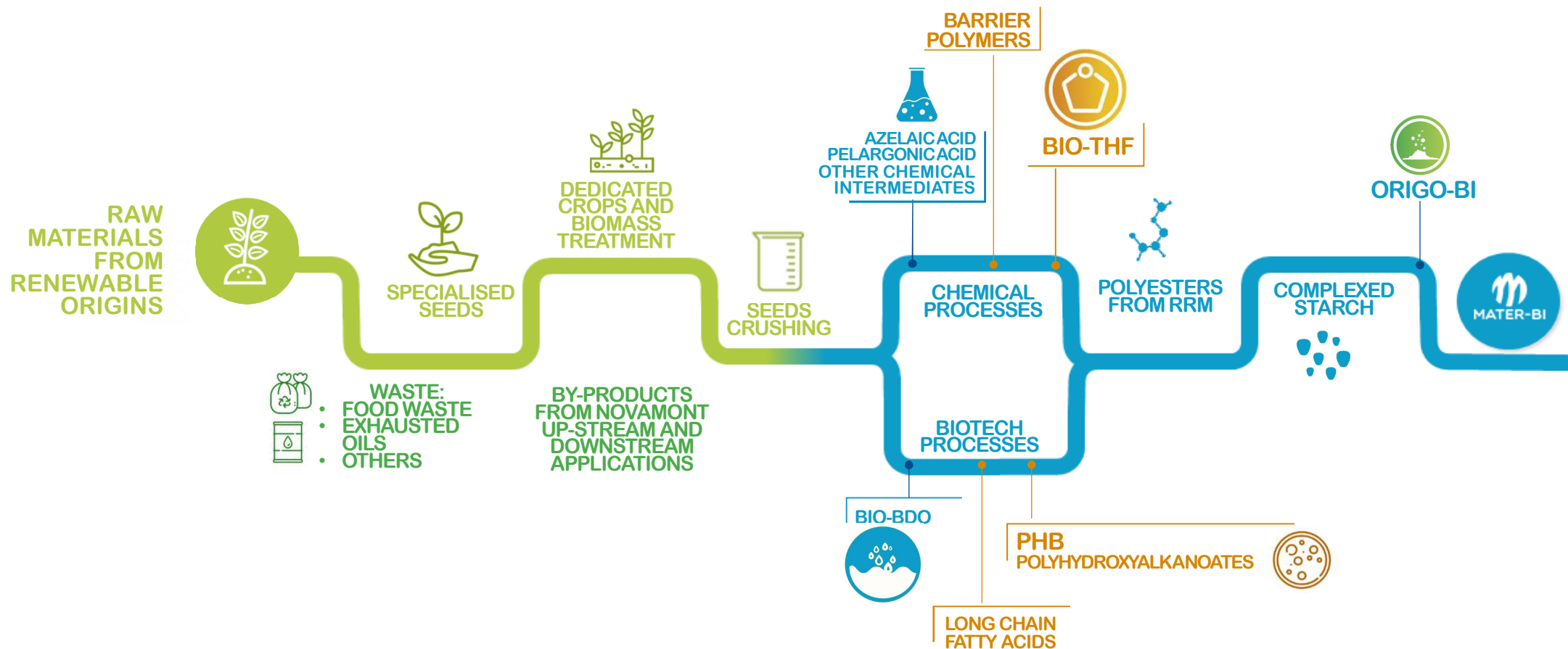
Products and value chains are conceived and designed to provide **unique** and **sustainable solutions** for specific environmental and social problems.
Elements of a system with broader impacts of the single product



NOVAMONT PROPRIETARY TECHNOLOGIES

UPSTREAM INTEGRATION 1996-2018

5

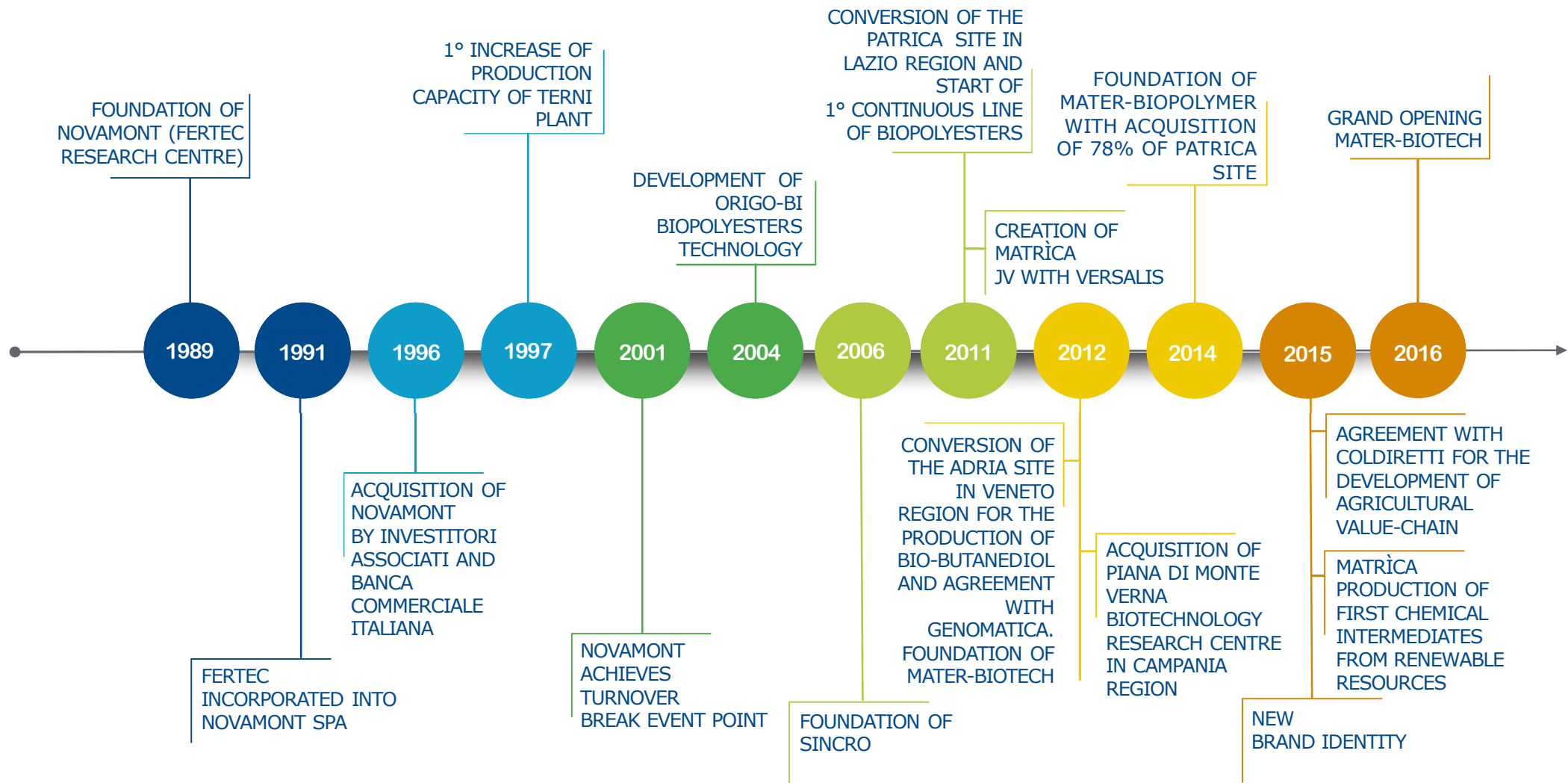




A SUCCESS STORY

COMPANY DEVELOPMENTS 1989 - 2016

6

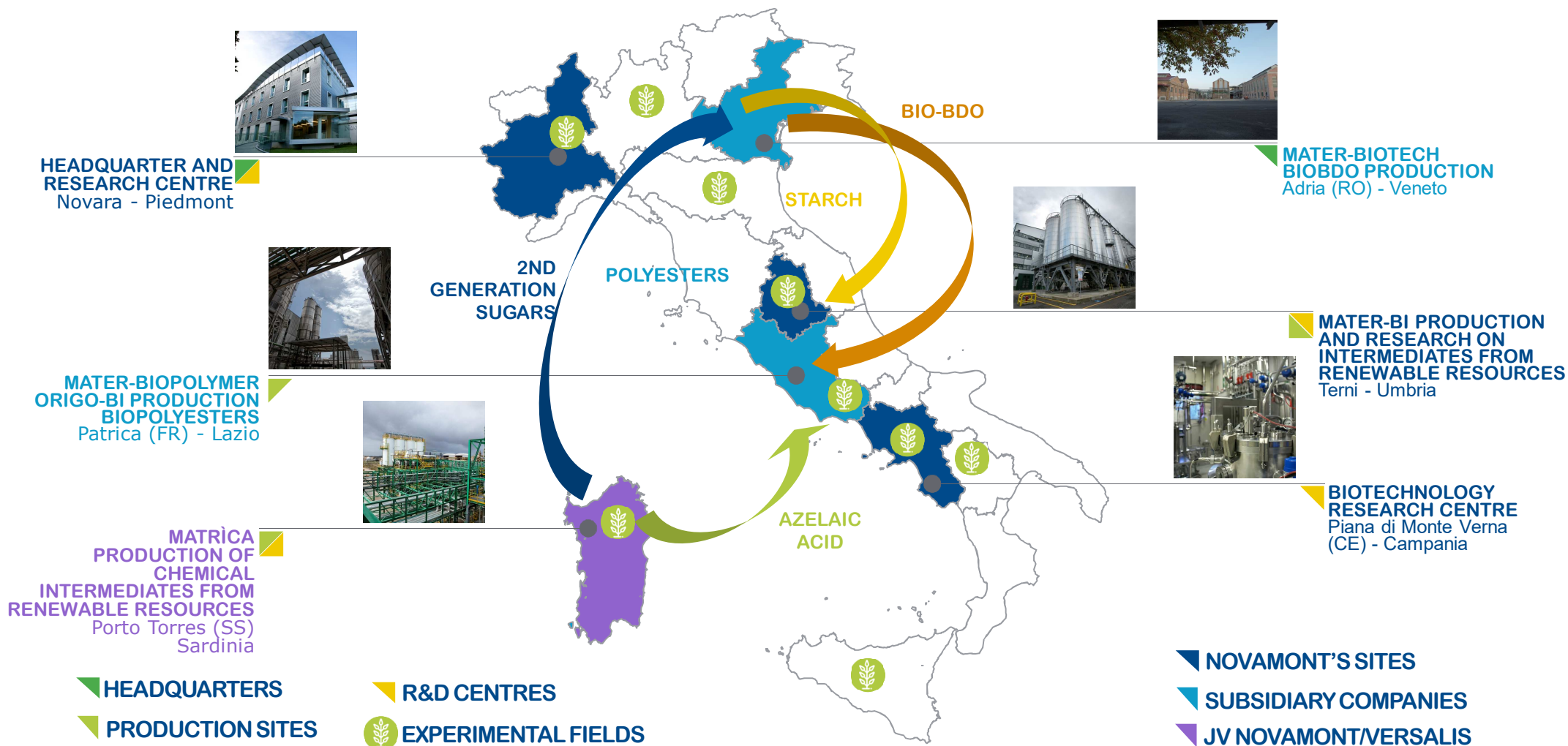




A COMPANY WITH ROOTS IN THE TERRITORY

THE NOVAMONT GROUP IN ITALY

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THE BIOREFINERY INTEGRATED IN THE LOCAL AREA

OUR DEVELOPMENT MODEL

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Dedicated to the production of a **range of bioproducts** (bioplastics and biochemicals) **with high added value**



Development of innovative agro-industrial value chains starting from **local raw materials** (low input crops, scraps)



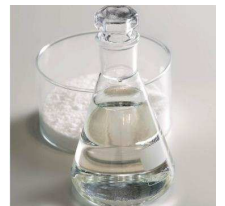
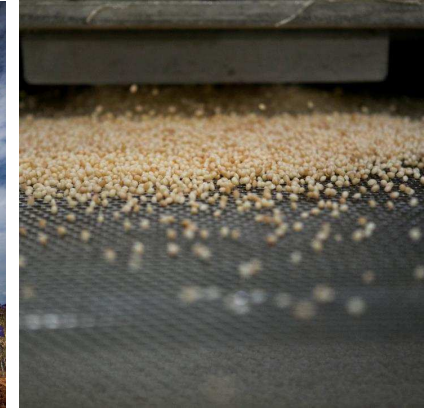
Respect of **local specificities** and development of abandoned and marginal land



Reconversion of deindustrialized sites through **proprietary technologies** first in the world



Creation of **new opportunities** for the entire value chain and collaboration with the actors of the territory: agriculture, researchers, industrial partners, local institutions, citizens and associations





TWO WORLDS OF THE SAME PLANET

THE EXCELLENCE OF RESEARCH AND OF THE PRODUCT IN ONE BRAND

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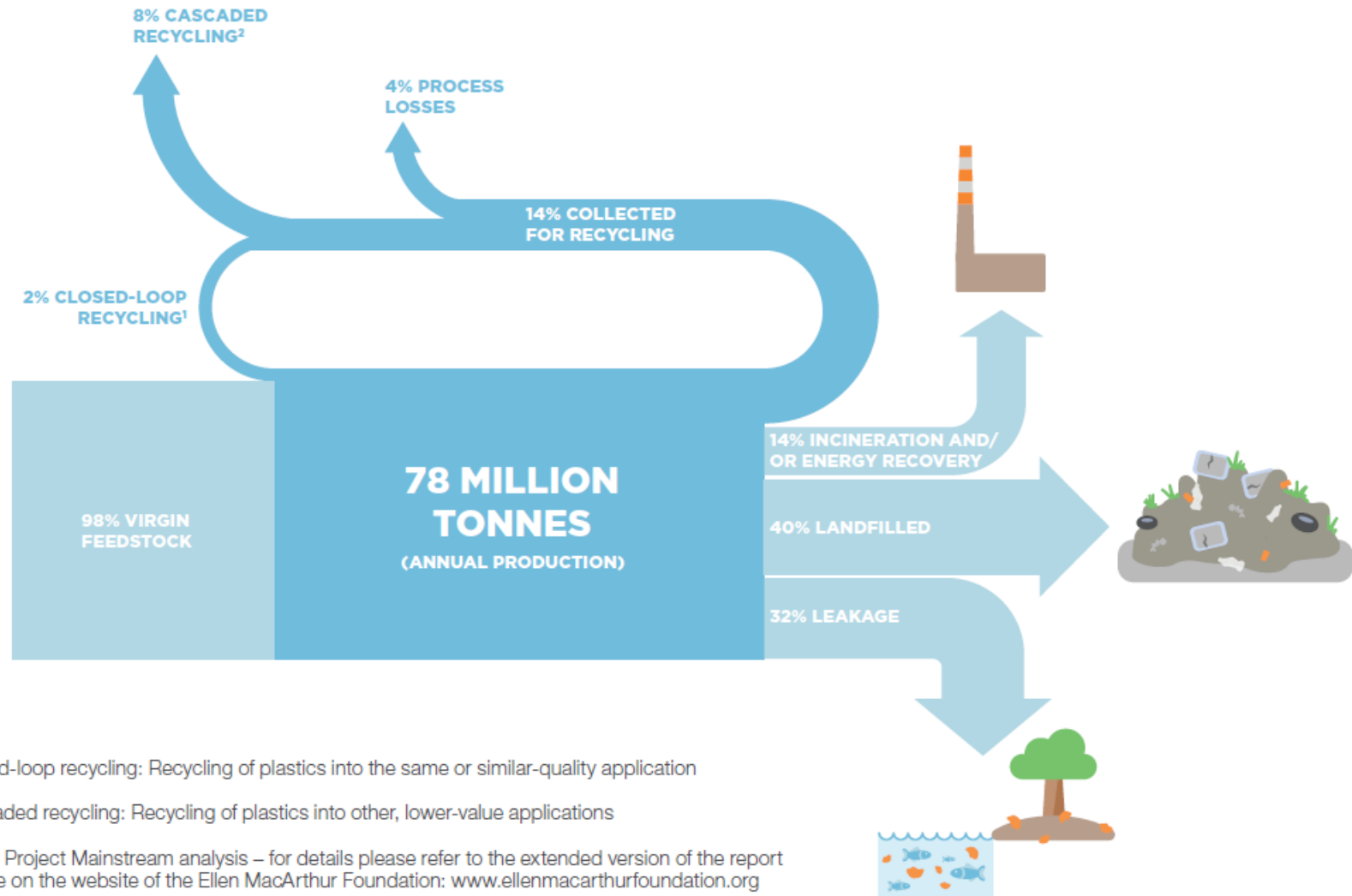
NOMATEROBT



GLOBAL FLOWS OF PLASTIC PACKAGING MATERIALS

ELLEN MACARTHUR FOUNDATION 2016 (2013 DATA)

10





TRANSFORM PROBLEMS INTO OPPORTUNITIES

SOURCE: EUROPEAN COMPOST NETWORK, BUDIMAN MINASNY ET AL. (2017)

11

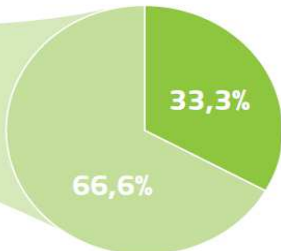
ORGANIC WASTE IN LANDFILL



TOTAL WASTE



TOTAL BIOWASTE



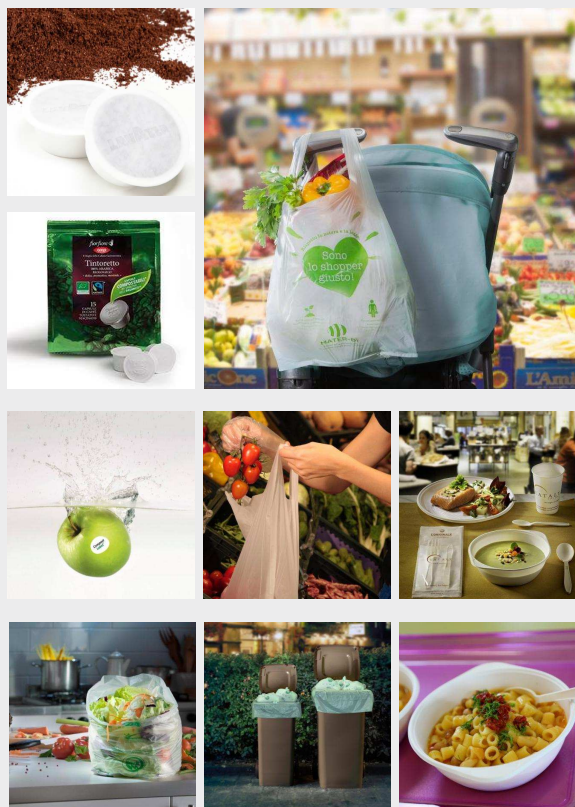
potential biowaste in MSW EU28 96 Mt pa

regular waste

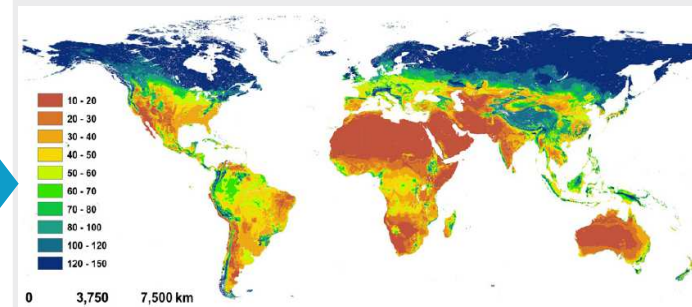
utilized potential biowaste

non-utilized potential biowaste

DEVELOPMENT OF NEW ORGANIC WASTE COLLECTION SYSTEM THROUGH THE USE OF BIOPLASTICS



COMPOST AS A DRIVER FOR SOILS FERTILITY





COMPOSTABLE END OF LIFE

A SOLUTION TO SIMPLIFY THE WASTE MANAGEMENT

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products and sectors of use



forks, plates, cup
COLLECTIVE
CATERING



bags
SEPARATE WASTE
COLLECTION



shopping bag
ORGANIZED
RETAIL TRADE



thermoformed articles

Tubs and rigid
containers
for foods,
compostable
pots for nursery
gardening.



injection moulded products

Disposable cutlery,
pens, combs, toys.



extruded products

Cotton buds,
drinking straws,
flexible pipes for
agriculture.



expanded plastics

Packaging
Loose fillers that
have excellent shock-
resistant properties.



films

Shopping bags, bags
for separate waste
collection, (food)
packaging.

01

collection

ORGANIC WASTE COLLECTION



02

organic recycling

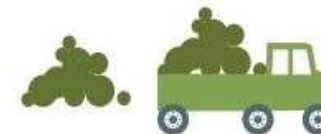
MATERIAL PLACED INTO
FACILITY AND CONSUMED BY
MICROORGANISMS



03

compost use

COMPOST, USED AS
AGRICULTURAL FERTILIZER





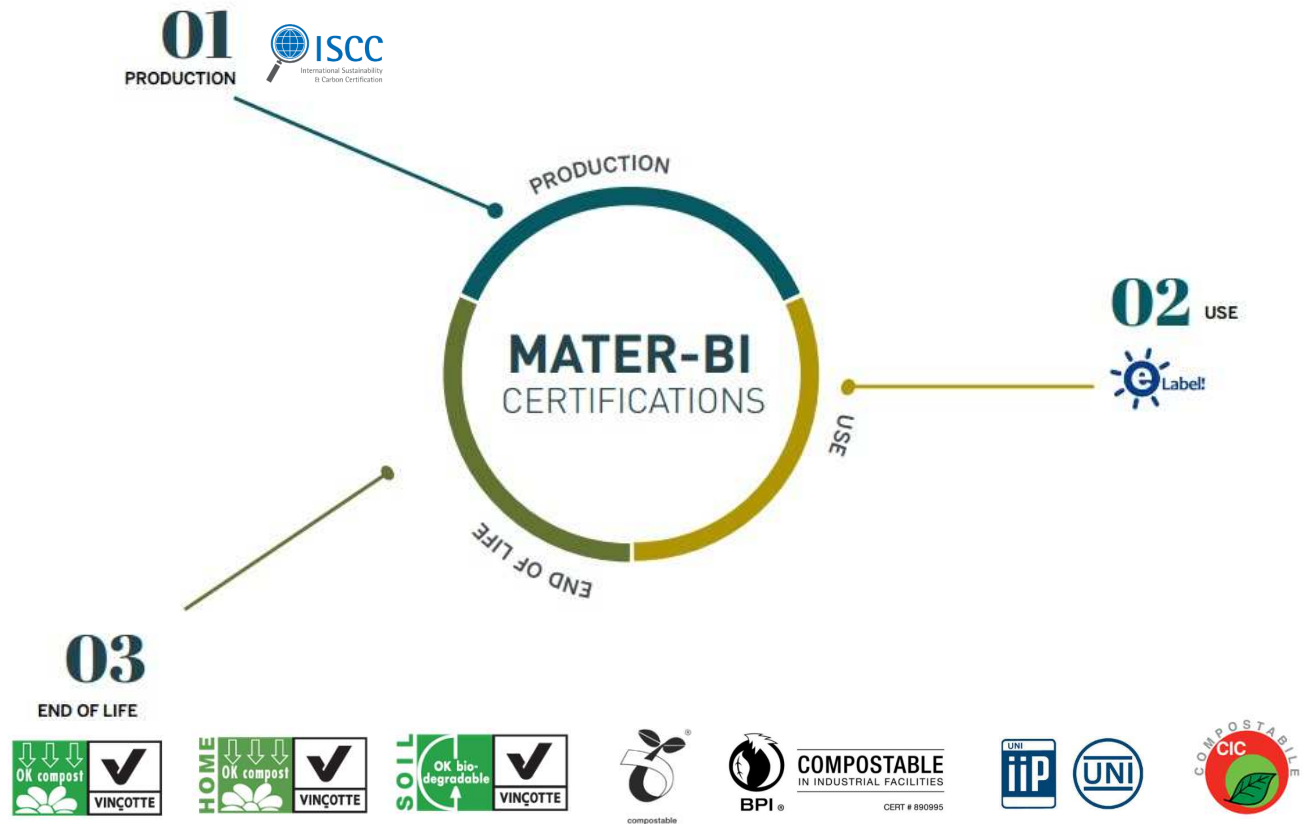
QUALITY GUARANTEED

THE CONTROLLED, INNOVATIVE, GUARANTEED BIOPLASTIC

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Guaranteed, indeed, certified quality.

Product certification is a procedure in which an independent third party formally guarantees that a product conforms to the requisites of a specific standard. MaterBi has certified biodegradability and compostability from several international bodies, who also carry out periodical checks and market surveillance. .



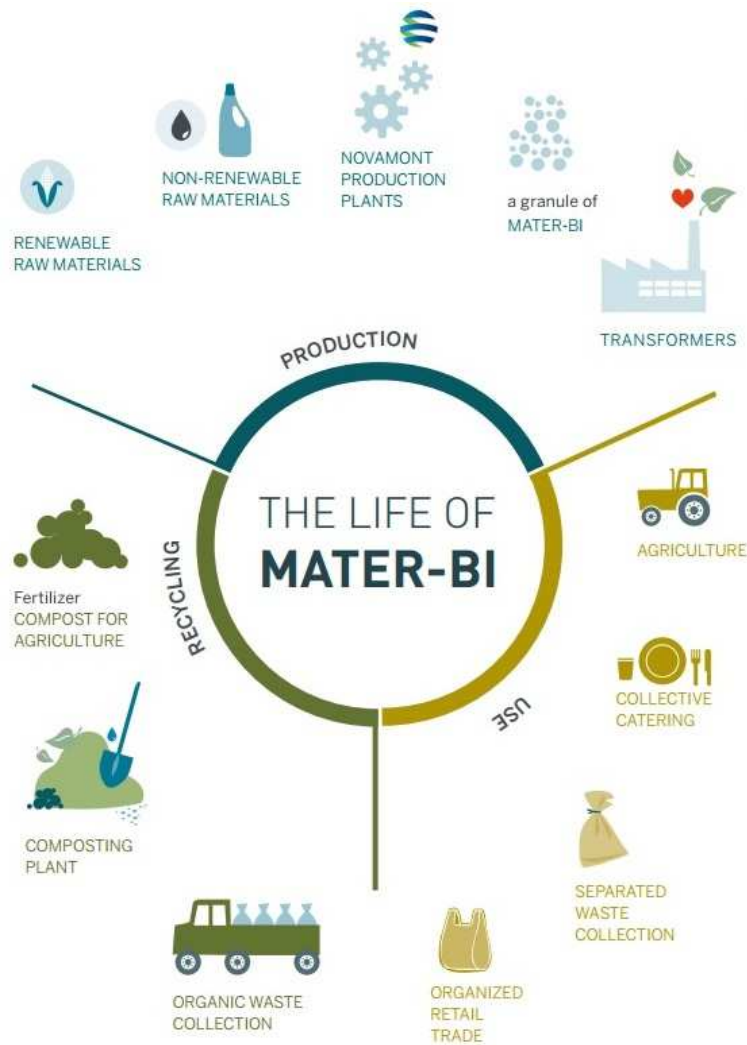
- Accredited and certified by international bodies as conforming to European standard EN 13432
- Controlled bioplastic as a result of a constant innovation towards attaining the highest and most stringent quality standards



FROM NOVAMONT RESEARCH IT BECOMES MATER-BI

FROM RENEWABLE RAW MATERIALS TO AGRICULTURE AGAIN

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RENEWABILITY
Use of **renewable raw materials**
(dedicated crops, scraps)



BIODEGRADABILITY AND COMPOSTABILITY
Biodegradable with the possibility of the organic recycling (composting and anaerobic digestion)



MATER-BI

- Solution for specific environmental problems
- Added value both in use and in the end-of-life
- Biodegradation in composting, soil and marine environment



APPLICATION SECTORS OF MATER-BI

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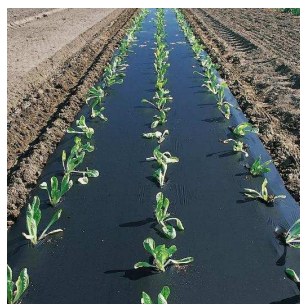
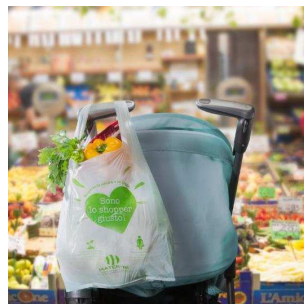
FOODSERVICE

RETAIL

AGRICULTURE

SEPARATE COLLECTION

PACKAGING

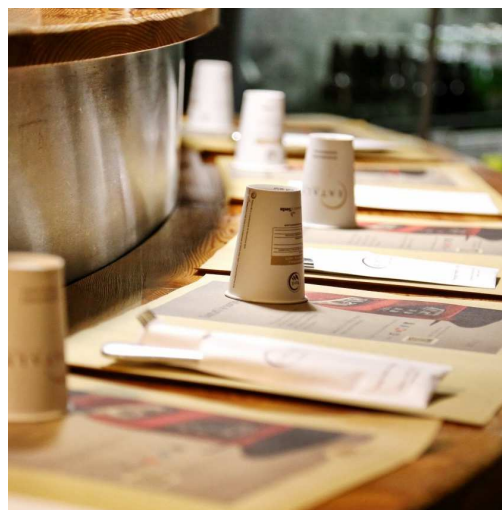
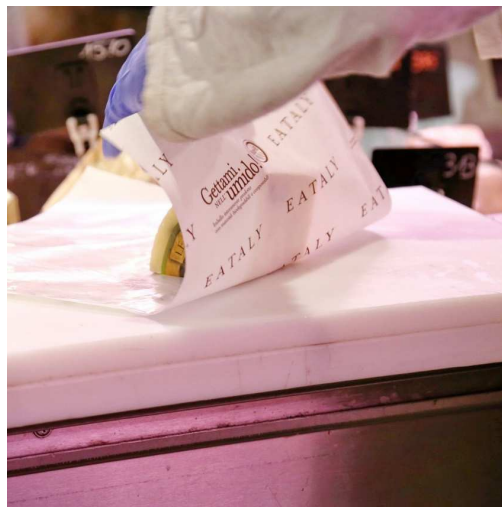
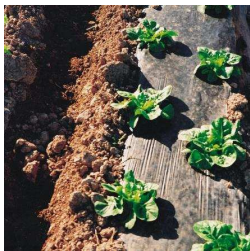




TAILOR-MADE APPLICATIONS

WHERE BIODEGRADABILITY AND COMPOSTABILITY REPRESENT AN ADDED VALUE

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PACKAGING SOLUTIONS

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BAGS FOR FRUITS AND VEGETABLES



BAGS FOR FRUIT AND VEGETABLES



MULTILAYER PACK



SUGAR BAGS



COFFE CAPSULES



NETS TUBULAR EXTRUDED



BIO STICKER



PAPER BENCH

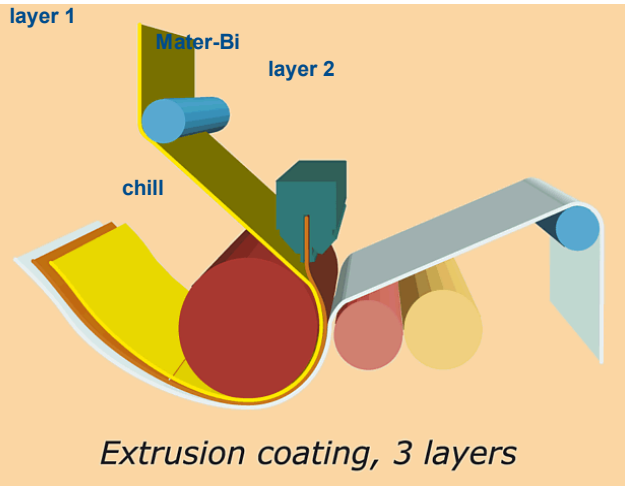


WRAPPING BUTTER



GRADES OF MATER-BI FOR EXTRUSION COATING

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- 2 tailor made grades with a different melting point and a different content of RRM
- Processability on standard extrusion coating equipment, as for LDPE
- Thickness and mechanical properties comparable with LDPE
- Peculiar barrier properties to greases and oils
- Excellent adhesion onto many substrates





GRADES OF MATER-BI FOR BLOWN EXTRUSION

19

- MECHANICAL PROPERTIES RANGING FROM LDPE TO HDPE
- SUITABLE TO BE EXTRUDED ON STANDARD LINES FOR HDPE AND LDPE
- HIGH BIOCOMPATIBILITY
- SOFT, SILKY HAND
- WIDE RANGE OF VAPOUR PERMEABILITY (UP TO 1400 (g*30 μ m)/(m²*24 h))
- COMBINATION OF HIGH PERMEABILITY AND TOTAL BIOLOGICAL BARRIER
- ANTISTATIC
- COLOURABLE WITH FOOD CONTACT APPROVED PIGMENTS





GRADES OF MATER-BI FOR LAMINATION

20

- Combination of different films having distinctive properties
- Different technologies available (extrusion lamination, adhesive lamination, thermal lamination)
- Improving tenacity
- Improving seal integrity
- Improving temperature resistance
- Improving WVTR and O₂TR
- Possibility of metallization



Muesli



Roasted Coffee



Biscuits

WVTR: 2-3 to 200 g/m²·24h (38° C 90% RH)

O₂TR: 1 – 30 cc/m²·24h·atm (23° C 50% RH)



GRADES OF MATER-BI FOR THERMOFORMING

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- SUITABLE TO BE USED ON STANDARD LINES FOR EXTRUSION AND THERMOFORMING
- NO NEED OF PRE-DRYING
- GOOD STIFFNESS: 2200-2900 MPA



- GOOD HEAT RESISTANCE: HDT UP TO 97 ° C
- NO NEED OF POST CRYSTALLIZATION PROCESS
- GOOD BARRIER PROPERTIES:
O2TR 8-10 (@23° C-50%RH thickness 300 µm)

""The challenge of our millennium is in the balance between the technical means that humanity possesses and the wisdom in how we will make use of them""

UMBERTO COLOMBO



Alberto Castellanza



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THANK YOU FOR YOUR ATTENTION

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