



BASF Australia & New Zealand

Creating chemistry for a sustainable future

 **BASF**

We create chemistry

BASF – We create chemistry

- Our chemistry is used in almost all industries.
- We combine economic success, social responsibility and environmental protection.
- Sales 2021: €78.6 billion
- EBIT before special items 2021: €11.3 billion
- Employees (as of December 31, 2020): 111,000
- 6 Verbund sites and 232 other production sites
- Around 90,000 customers from various sectors in almost every country in the world



BASF Asia Pacific: At a glance



Present in **19** markets



~ **70** production sites*



19,997 employees**



~ **€21.2 billion** sales in 2021***



~ **€3.2 billion** EBIT in 2021

* Some sites are not shown due to scale. Site and office numbers refer to companies of significant size where BASF holds a stake greater than 50%.

** Employee number as of December 31, 2021

*** Sales by location of customer as of December 31, 2021



Australia and New Zealand



- Sub-regional headquarters
- Selected sites
- R&D/Technical centers

Some sites are not shown due to scale.
All figures refer to BASF entities fully consolidated according to IFRS 10/11.



6 production sites*

380 employees**

~ €415 million sales*** in 2021

- * Site number as of December 31, 2021
- ** Employee number as of December 31, 2021
- *** By location of customer as of December 31, 2021

BASF
We create chemistry



We create chemistry

How BASF's certified compostable ecovio[®] contributes to the circular economy

Rowan Williams
Regional Market Development Manager
Asia Pacific
FIAQ Queensland Food Safety Conference
September 7th, 2022

Welcome!

- **BASF certified compostable biopolymer solutions**
- **Learn about fossil-based & biobased compostable biopolymers**
- **Standards and certifications that validate compostable claims**
- **Understand the benefits of recycled organics and the industry's economic contribution**
- **Q&A: Your questions, please!**



1

BASF certified compostable biopolymer solutions

Innovative plastics align with circular economy principles



Products made of ecovio® fuel the nutrient loop



ecoflex® and ecovio® find application primarily in 3 segments

Consumer



- Fruit & Vegetable Bags
- Organic Waste Bags
- Shopping Bags

Packaging



- Rigid Packaging
- Flexible Packaging
- Paper Coating

Agro



- Mulch Film

Certified commercial or home compostable

Certified soil-biodegradable

Certified soil-biodegradable plastics



Certifications

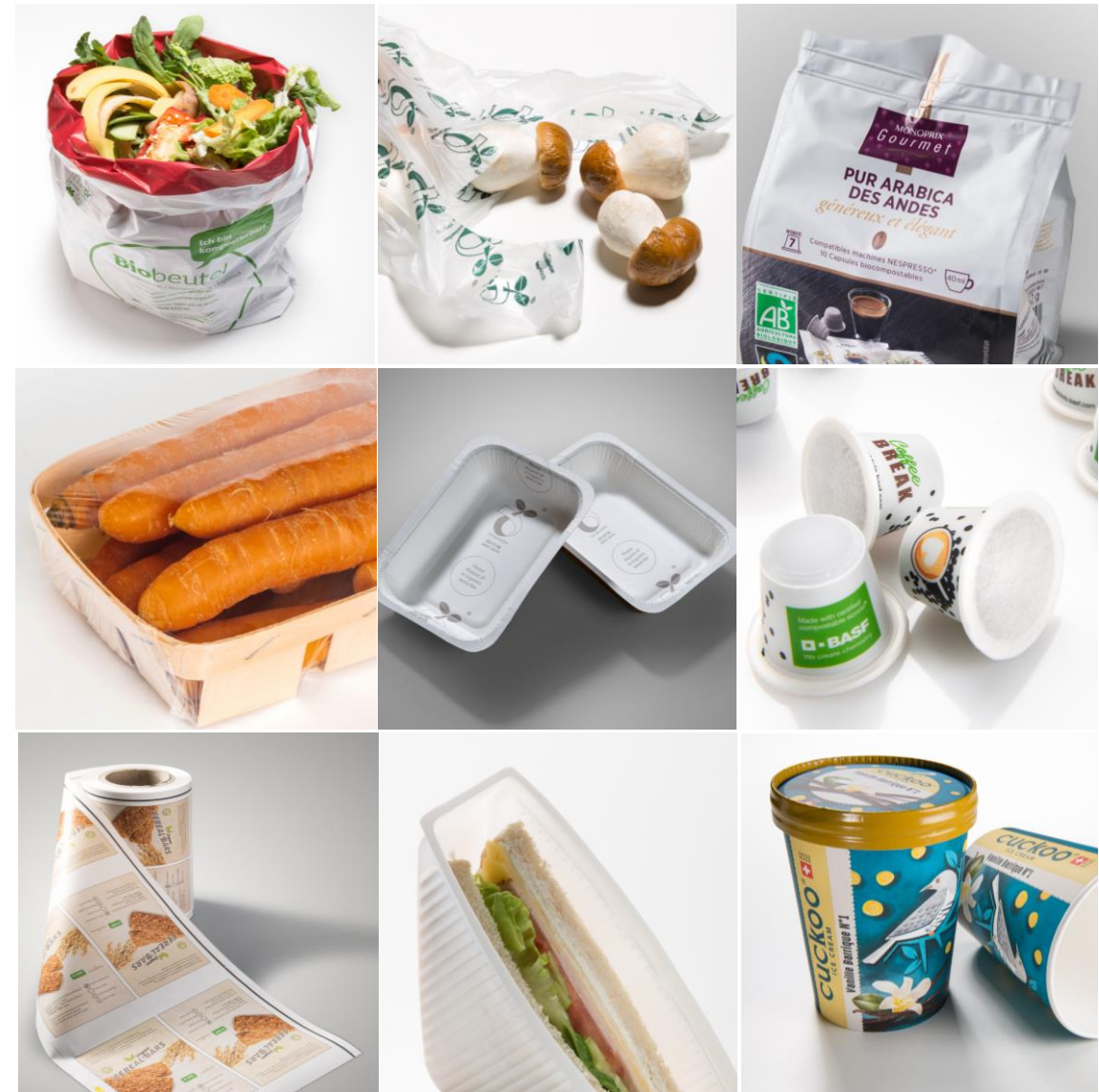
Global

OK bio-degradable
TÜV AUSTRIA
SOIL S0062
EN 17033

Mulch film made of certified soil-biodegradable ecovio® can replace thin mulch films made of polyethylene to prevent microplastics in soil!

ecovio® compostable plastics help close the loop for food value chain

- Enabler for **easier separate collection of food waste**
- Support diversion of organic waste from landfills and incineration to organics recycling

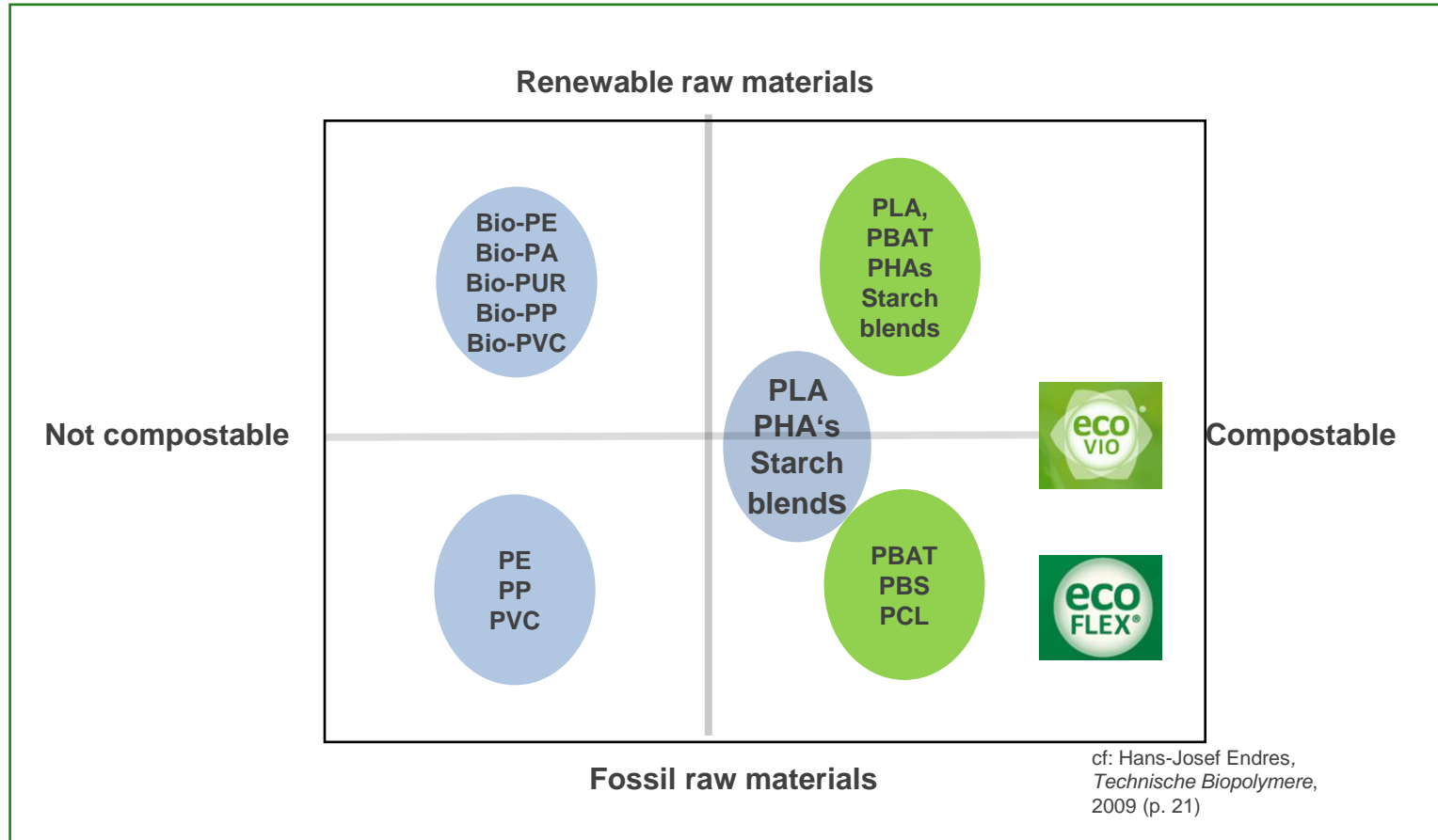


Certified compostable materials should only be used where there is a benefit in using them, e.g., when the application is contaminated with organic matter

2

Fossil-based, biobased & compostable biopolymers

Fossil-based, biobased & compostable polymers







Biodegradability is based on molecular structure; therefore, both fossil-based and biobased polymers can biodegrade by action of naturally occurring microbes in organics recovery processes.

PBAT polybutyrate adipate terephthalate
 PBS Polybutylene succinate
 PCL Polycaprolactone

3

Certification to Standards and use of logos validate compostable claims

Standards and certification validate performance

North America	Europe	Australia	Japan
			
ASTM D6400	EN 13432	AS 4736	Biodegradable Pla



- No “magic” additives – naturally biodegradable
- Evaluation is performed at a product-specific level
- Standard specifications are similar around the world
- Ensure safety for the environment
- Communicate performance to waste generator

Biodegradable – claims and references

- Biodegradable as a term is meaningless as it does not communicate the following:
 - ▶ Under what conditions does biodegradation occur?
 - ▶ Does biodegradation actually take place?
 - ▶ What are the by products of the biodegradation if any actually occurs?
 - ▶ Are there any environmental or ecotoxicity questions related to the by products if biodegradation occurs?
 - ▶ When does the biodegradation occur and how long does it take?
- Only certification to an internationally recognised Standard or Specification confirms that biodegradation occurs without negative consequences environmentally or ecologically

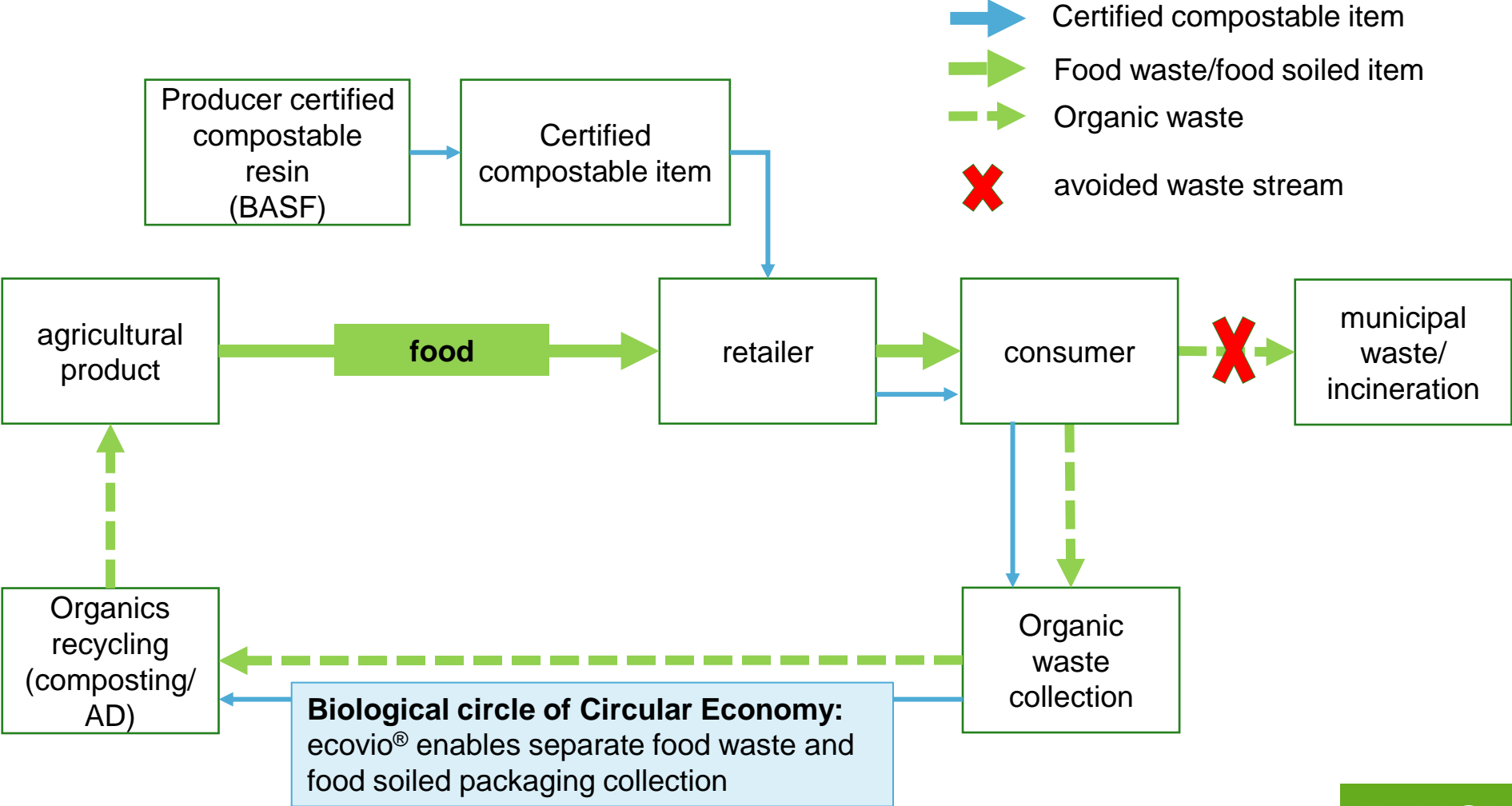
Certified compostable appropriate applications

- Certified compostable materials should only be used where there is a benefit in using them e.g.
 - ▶ to return the nutritional food material that remains in contact with packaging or in source separating food waste from other recyclables in the home or commercial premises, to the soil through organics recycling such as composting or anaerobic digestion.
- Examples of beneficial applications are:
 - ▶ liners for food caddies,
 - ▶ food service type items in controlled closed loops and
 - ▶ packaging that is highly contaminated by food and currently poses significant challenges to recycle economically suitable for FOGO and FO kerbside collections

Certified compostable appropriate applications

- Examples of packaging applications are:
 - ▶ Teabags and coffee pods,
 - ▶ Fruit and vegetable stickers,
 - ▶ Ready Meal Trays as always food contaminated post consumer
 - ▶ Films for food trays
 - ▶ Cling film used in food packaging
 - ▶ Multi layer food packaging and wrappers
- Food service ware such as catering plates, cups, bowls and cutlery perhaps limited to specific closed loop environments such as music festivals, concerts and sporting events in closed

Closing the loop: Certified Compostable ecovio®



Oxodegradable or fragmentable technologies

- Oxo-degradable plastic packaging is not a solution to plastic pollution and does not fit in a Circular Economy – Ellen Macarthur Foundation – New Plastics Economy
- Synonyms such as landfill biodegradable, oxobiodegradable, enzyme mediated are ***fragmentable technologies***
- Cannot be certified compostable, contain an additive that accelerates fragmentation, ultimately lead to creation of microplastics
- Should not be used for source separation of food waste intended for organics recycling as they are a contaminant
- **EU member states need to ban** oxodegradable plastic in all single use plastic packaging applications from July 2021
- In Australia by July 2022 (National Plastic Plan Australia, Federal Government [National Plastics Plan 2021 | Department of Agriculture, Water and the Environment](#))

4

The benefits of recycled organics and the organics recycling industry's economic and environmental contribution

Source Separated Organic Waste and improving soil health through application of recycled organics to agricultural land - compost, soil amendments, mulches

- Our soils are between 4 and 23 times more polluted with plastic than our oceans.*
- Source separation of food waste is an opportunity to divert food waste from landfills, dumpsites and incinerators to organics recycling using compostable packaging as the vector and return it to soil as a high nutrient organic output.
- Separate food waste collection across EU coming into force in 2024 is an example of the opportunity for food waste diversion to organics recycling.
- The climate change mitigation benefit of returning recycled organics to agricultural land is enormous as soil organic carbon is replaced. At low SOC levels, soil health and fertility are affected negatively.
- Increasing SOC has a dramatic impact on all aspects of soil health, such as water holding capacity, yield, reduced disease, reduced erosion and run off.

* <https://www.sciencedaily.com/releases/2018/02/180205125728.htm>

Source Separated Organic Waste and improving soil health through application of recycled organics - compost, soil amendments, mulches

- “Source separation” refers to sorting waste at the time the waste is generated; for example, placing organic waste into a dedicated organics bin or a garden/green waste bin (FOGO) rather than a general waste bin.
- FOGO means **Food Organics & Garden/Green Organics – **FOGO****
- Increasing source separation can reduce the quantity of waste sent to landfill and consequently avoid emissions from waste.
- Source separation can also reduce the associated cost of sending waste to landfill and produce a more homogenous waste which is easier to process into suitable recycled organics products such as compost, soil conditioners and mulches.
- The value of the recycled organics industry and its contribution to both economic and environmentally better outcomes than landfill or incineration is discussed later.

Certified compostable products and organics recycling align with the United Nations Sustainable Development Goals

PROPERTY	TOPIC	SDG #
Certified soil biodegradable mulch film	Environment	2,13,14 & 15
Material circularity	Waste prevention	2 ,12 & 13
Renewable content	Renewable raw materials	9, 12 & 13
Economic Prosperity	Improve farmers incomes	8
Agronomic benefits	Product Functionality	2,12 & 13



The value of recycled organics (RO) – two dimensions to consider

Inputs to the RO stream, organic waste collection and processing

- Collection of organics such as food waste or garden waste diverts this resource from landfill or incineration
- Source separation of the food waste, in ecovio bags, for example, provides cleaner and less contaminated organics to the processor
- A stable organic recycling stream can also then handle compostable packaging
- Greenhouse gas emissions are reduced (methane, NoX, Co2) and urban amenity improved
- Employment, wages, revenues, taxes - all created domestically – **no offshoring required**
- Organics recycling closes the loop on food and other organic wastes and ultimately returns them to production through the soil or other value added inputs to our economy. It is an exemplar of the “circular economy”.*

Outputs from the RO stream, organic outputs and end user application

- Agricultural and sequestration benefits stem from the application of the recycled organics as composts, soil amendments, mulches or other organic material replenishing soil organic matter and soil organic carbon in the soil
- Cleaner outputs can be produced with reduced contamination from the source separated food waste e.g., no microplastics from compostable bags or compostable packaging
- Use of finished product in urban amenity, intensive and extensive agriculture, rehabilitation and environmental remediation are global markets*

* Source: AORA Economic Contribution of the Australian Organics Recycling Industry

Case Study of the recycled organics industry – Australia 1/2

- Population of Australia circa 25 million pax recycling 298 kgs of organic material per capita
- 305 processors, with throughput of 7.5 million tonnes of organic material annually, growing at 3.4% per annum
- Garden organics make up 41.6%, biosolids 18.8%, timber 13.7% and food organics (food waste) 7.2%
- National organic recycling rate was 51.5% - refer to attached slide for model of increased recycling rate*
- Collective turnover of >AUD 2 billion, with greenhouse gas emissions savings of 3.8 million tonnes of CO₂e

Case Study of the recycled organics industry – Australia 2/2

- These GHG savings are equivalent to:
 - 5.7 million trees planted to absorb same amount of CO₂
 - The GHG emissions that 876,663 cars would produce in a year
- Additionally,
 - Composts build soil carbon in agricultural soils and one tonne of organics applied to land can sequester 0.5 tonnes of CO₂e
 - Application of compost creates healthy soils, which use less water, less fertiliser, fewer pesticides and reduces nutrient leaching which protects the aquatic environment
 - Composted organic mulch suppresses weed growth and can save more than 30% of irrigation water annually

BASF engages with this sector to create chemistry

- A robust organics recycling sector is necessary to divert food waste from landfill to bring all attendant benefits of this diversion – universally acknowledged reasons
- Without a robust organics recycling sector certified compostable packaging does not have a stream to go into and single use items are not **packaging**
- BASF engages to contribute to the discussion about certified compostable biopolymers based on science and chemistry, for applications that raise awareness of the possible solutions for problematic packaging that **might** be made certified compostable
- Look in the landfill to find the packages that today are not reusable, recyclable or compostable and dare to dream of the future for this problematic packaging –stay tuned

5

Q&A: Your questions, please!

For more information, please contact:

Asia Pacific:

Rowan Williams
rowan.williams@basf.com



We create chemistry