



nexeo®
plastics

Achieving Sustainability Goals

*How understanding motivating factors can influence
production process and material choice*

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Meet the Speakers



Jim Shortt

Application Development Engineer
Northeast Region, NAM

Works with OEM customers to help solve problems with resin selection for new and existing applications, support mold design and process design.

- 34 years in plastic industry
- Several roles in production, quality and technical services
- Business development in healthcare plastics compounding



Wayne Staupé

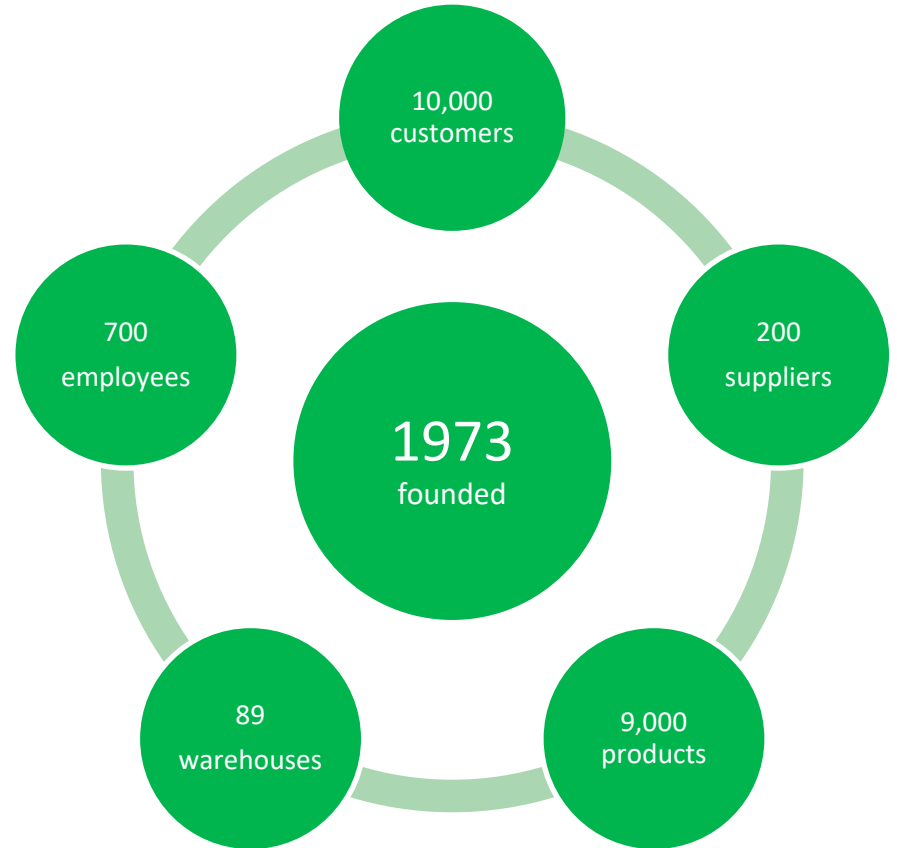
Application Development Engineer
Central Region, NAM

Works with OEM customers to help solve problems with resin selection and choose the optimal material for their business needs.

- 27 years in plastic industry
- Provide extensive scientific molding, simulation training and tooling background to assist OEM's and molders in solving problems both proactively and reactively

About Nexeo Plastics

- **47+ years of industry leading plastics distribution**
- Supply nearly every grade of prime thermoplastic resin for blow molding, extrusion, injection molding and rotational molding plastic processors
- **700** global employees
- **10,000** customers in industry segments such as automotive, compounding, healthcare, packaging, wire and cable, and more
- **200** global suppliers
- **9,000** products distributed into more than **60** countries
- Headquarters: The Woodlands, Texas



Why sustainable plastics?

Sustainable plastics – what does that mean?

Defining the terms

Industry is responding to growing pressure to find alternative solutions that lower the environmental impact of plastic material; however, the terminology can be subjective.

What is a sustainable polymer?

Plastic material that addresses the needs of consumers while minimizing the impact on our environment, health and the economy. Sustainable polymers are likely to:

- use renewable feedstocks, such as plant-based, for production
- use less net water and non-renewable energy in production
- emit less greenhouse gases during production
- produce less waste in production
- have a smaller carbon-footprint
- have a facile end life





Regulatory

- Governing guidelines domestic and international

Mandates

- Extended Producer Responsibility (EPR) programs in major industries (healthcare, automotive, packaging)

Consumer preferences

- Corporate social responsibility responding to societal concerns over environmental impacts

Industry Trends

U.S. and European Plastics Pact

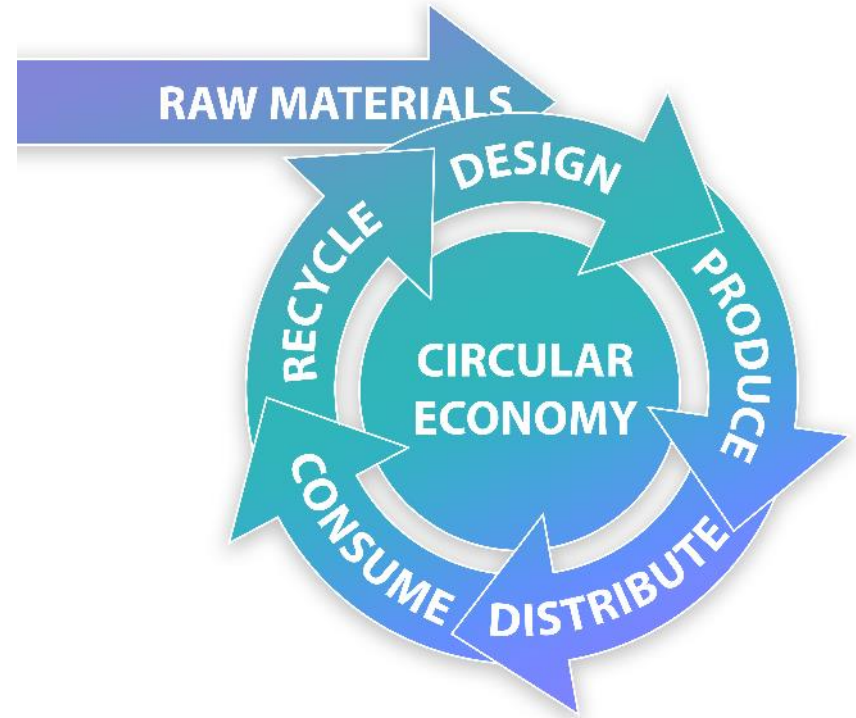
- By 2025, the average recycled content or responsibly sourced biobased content in plastic packaging will be 30%

New Plastics Economy Org

- 1000+ global businesses and governments share common vision of a circular economy
- Led by three key actions: eliminate, innovate, circulate

Consumer trends

- According to GWI, 60% of consumers say they're likely to switch to a brand that is more environmentally friendly than their current brand



Determining goals to achieve targets

Ask

- What is driving company's decision?
- What are my sustainability goals?
 - Recycled material, reduced carbon footprint, biodegradable
- What is the end use market and product application?

Prior to testing materials and processes

- Evaluate the end use application's fit, form and function
- Consider regulatory requirements
- Review product design when considering alternative materials to traditional resins

Confirm that all statements about product attributes and performance are consistent with the information provided by the resin manufacturer.



Discovering the optimal material



Recycled Content

Post Consumer Recycled (PCR)

Materials made from almost any recycled plastic.

Commonly recycled resins include:

- PETE
- HDPE
- PVC
- LDPE

Know

- Unlimited applications for PCR plastics - regulated markets can be more challenging
 - Ex: Food-contact, need to submit to regulatory oversight entire process for approval (FDA/EFSA)
- Recycled content can vary depending on properties and desired appearance.

Targets can help achieve

- Landfill diversion
- Corporate social responsibility



Post Industrial Recycled (PIR)



Plastic waste generated during the production process including industrial scrap, or material with varying melts or processing aids.

Common materials

- PP and PA from carpet fiber, scraps from other manufacturing processes

Know

- For colors, black max recycled PIR can be 100% while natural/colorable ~70%
- Characteristics are like that of their parent material
- Limited feedstock

Targets can help achieve

- Landfill diversion
- Corporate social responsibility

Ocean Bound Plastics (OBP)

Plastics waste that is at risk of ending up in the oceans and found near waterways including rivers and lakes.

Know

- Common applications are bottles, durables, footwear and clothing
- Color available in black compounds or natural variations
- Offered as blends, with 15% maximum OBP content typically

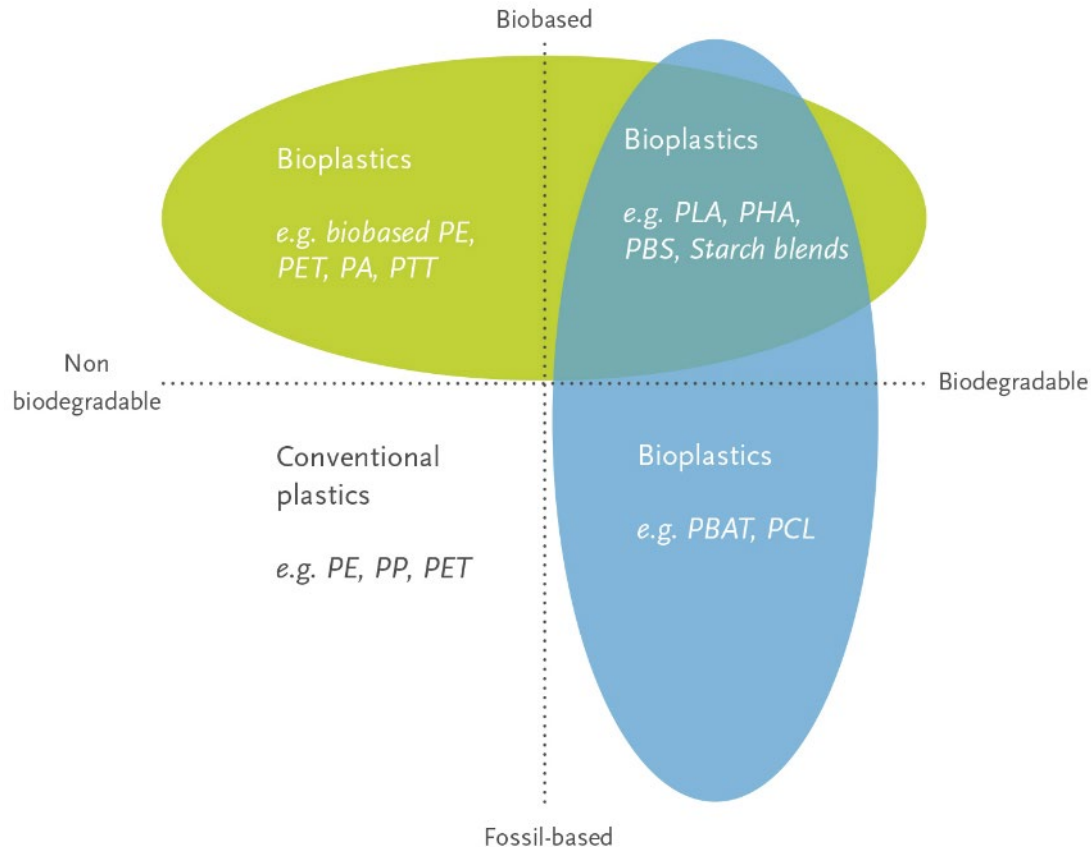
Targets can help achieve

- Direct, positive impact on wild and aquatic life
- Landfill diversion

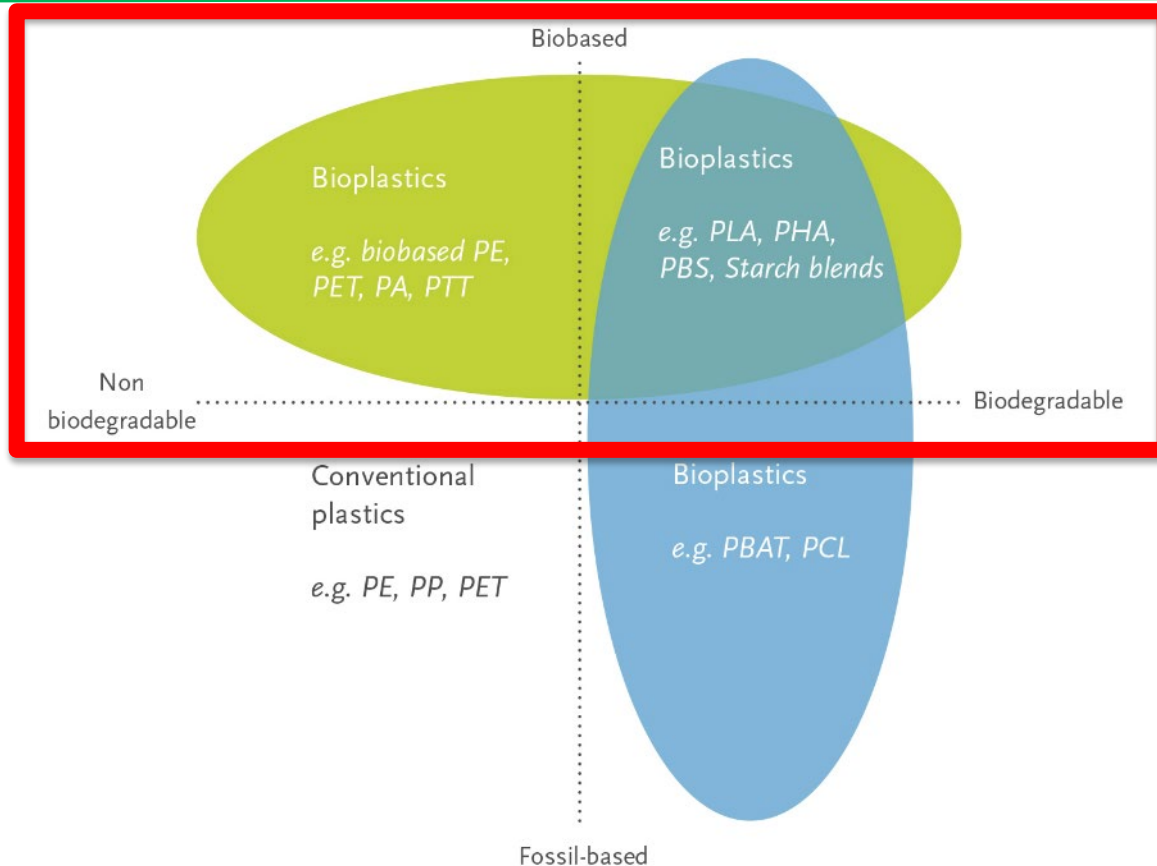


Goal: Bioplastics

Bioplastics in view



Goal: Biobased



Biobased

Biobased plastics are made in whole or partially from renewable resources including:

- Corn
- Potato skins
- Sugar cane
- PLA, Bio PE, Nylon, etc.

Know

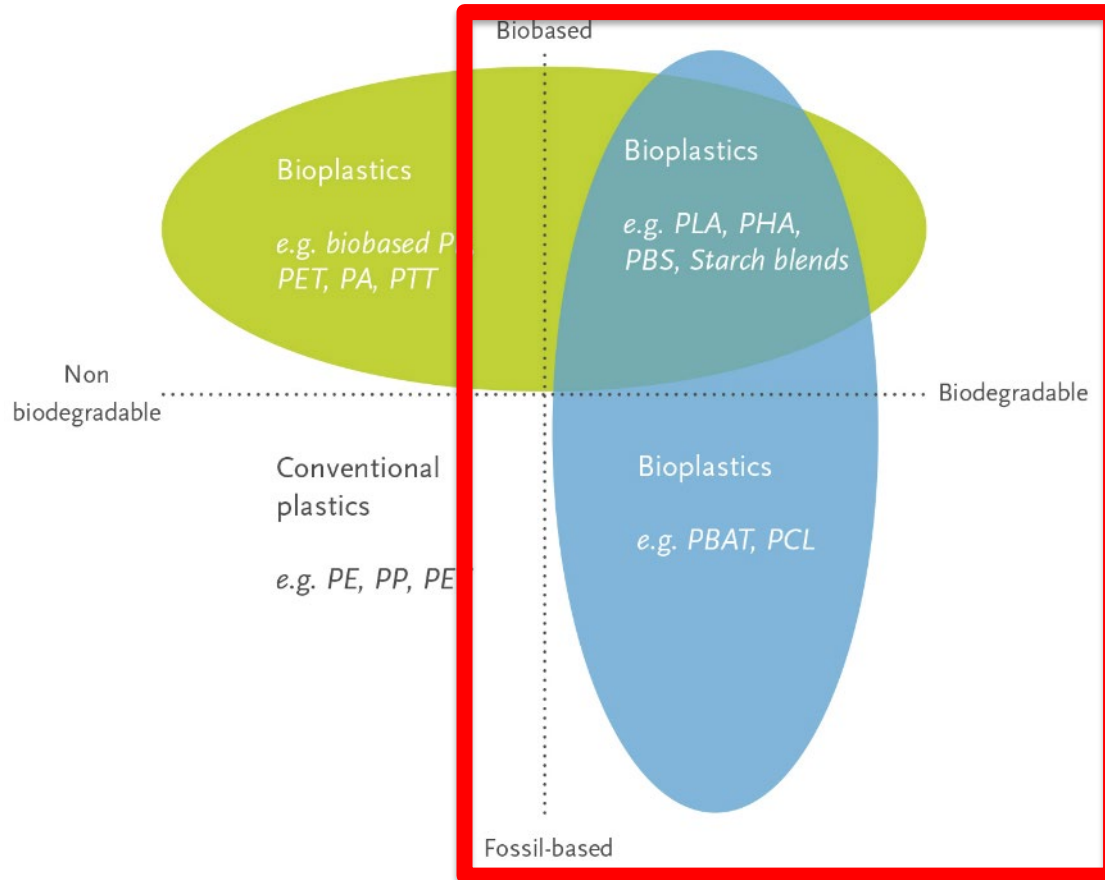
- Mechanical properties can be like their fossil fuel counterparts
- Regulatory claims must be validated with governing bodies and material source
 - ASTM D6866

Targets can help achieve

- Renewable feedstock
- Reduced carbon footprint



Biodegradable



Biodegradable / Compostable

Ability of a material to biodegrade within a specified time period and leave no toxic residue in the soil.

- ATSM 6400 and EN13432: 6 months

Common material

- Renewable materials like corn, potato, and tapioca starches, cellulose, soy protein, and lactic acid
- PLA

Know

- Performance and characteristics vary depending on blend ratios
- Common applications include packaging, food ware, agricultural and horticultural

Targets can help achieve

- Reduced carbon footprint
 - Less energy on manufacturing process



Biocomposites

Combine conventional plastics with biomaterials like wood, starch, flax, jute, hemp, and other similar material.

- Can be added to many polymers
- Applications are not limited
- Can be part of existing manufacturing processes
- Performance and characteristics highly customizable

Targets can help achieve

- Reduced carbon footprint



Reduced carbon footprint



Can be achieved from sustainable material aspect through ***recycled, biobased, compostable, degradable or bio-composite material.***

Claims + Regulatory

- Validate with supplier
- Adhere to industry mandates and guidelines
- Marketing claims should be a rigorous process

Manufacturing Process

- ISO/TR 14062: "eco-design"
 - Lightweight design
 - Substitution or fewer input of material
 - Amount of energy and material consumed in manufacturing process
 - Consider additive manufacturing

Case Study

Challenge

Manufacturer needed a suitable material to bring first cradle-to-gate, low-carbon, food-contact products to market.

Solution

DSM EcoPaXX®, optimize the formula for food contact and troubleshoot production challenges.

Result

In EU, customer launched the first food grade utensil made of 50% biobased material, effectively reducing overall carbon footprint by 83%.



Navigating challenges

Delivering reliable solutions

Our goal is to help our customers solve material and supply chain challenges.

We solve complex challenges through *innovation, agility and optimization.*

- Global coverage
- End-market knowledge
- Logistics and supply chain expertise
- Technical resources
 - Application development engineer
 - *TechConnect (NAM)*
 - Field Technical Representative

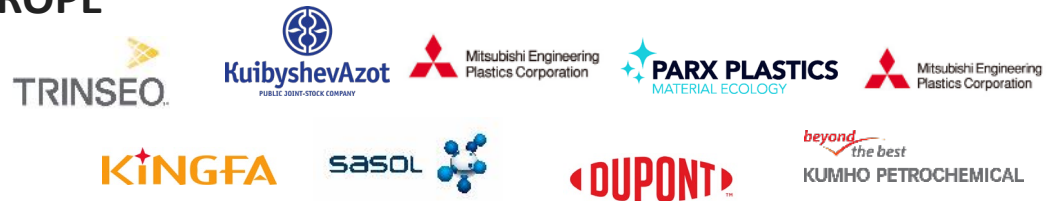
Global Partners



NORTH AMERICA



EUROPE



For specific supplier offerings, please connect with our team as sustainable materials vary depending on classification or claim.

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Questions
