PEFerence

The Renewable Innovation

From bio-based feedstocks via di-acids to multiple advanced bio-based materials with a preference for polyethylene furanoate

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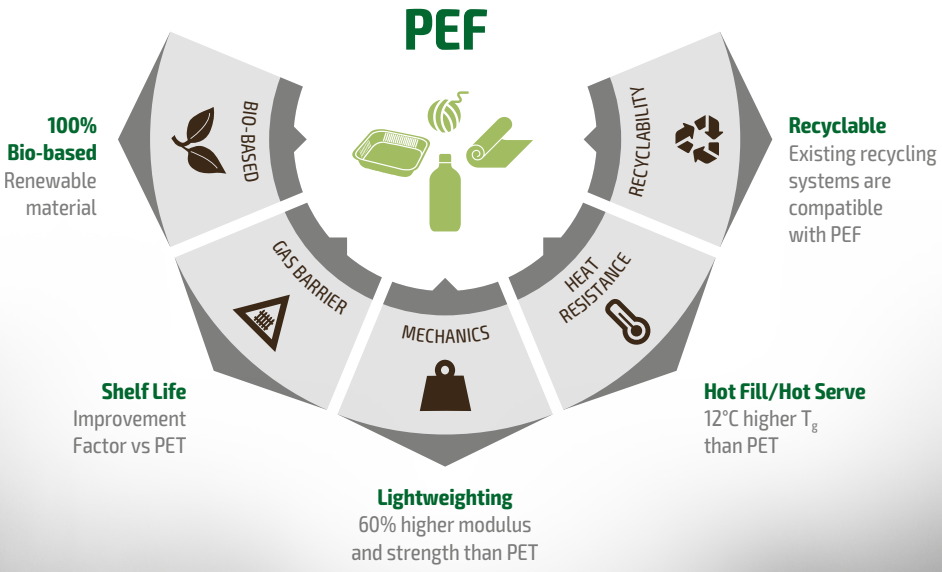

PEFerence will establish a unique, industrial scale, cost-effective biorefinery flagship plant producing FDCA (furandicarboxylic acid), a bio-based building block to produce high value products.

Bio-based FDCA can be used to make a wide range of chemicals and polymers such as polyesters, polyamides, coating resins and plasticizers, and can also be used to make PEF (polyethylene furanoate), a 100 % bio-based polyester used to make bottles, films and fibres.

The PEFerence consortium aims to replace a significant share of fossil-based polyesters, such as polyethylene terephthalate (PET), and packaging materials like glass and metal with 100 % bio-based furanics polyesters.

PEF's excellent barrier properties and its calculated cost price indicate that it can compete with traditional, multi-million tonne, packaging products such as aluminium cans, multilayer packaging and small size multilayer PET bottles, on price and performance when produced at large scale.

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Objectives

- Engineer and build the flagship plant for the production of purified FDCA (5,000 tonnes/year)
- Demonstrate and validate at least three 100 % bio-based materials in end user applications
- Commercialize the 100 % bio-based end products demonstrated in the project
- Demonstrate and optimize the new local bio-based value chain from raw material sourcing to PEF end products
- Evaluate the environmental and socio-economic performance of the developed products

Impact

- Maximising the use of regional agricultural resources and decreasing dependence on oil imports while increasing added value to the European economy
- Establishing a new bio-based value chain that will create jobs in rural areas while developing technological know-how and translating it into industrial products
- Best scenario to have an industrial scale MMF-FDCA plant (≥100,000 tonnes/year FDCA) built in Europe
- Demonstrate new 100 % bio-based materials (PEF and polyurethanes) based on the di-acid FDCA
- Demonstrate cost efficiency and improved properties of PEF compared to PET and multi-layer PET/polyamide, and focus on applications where PEF brings most value
- Using PEF, substantially reduce non-renewable energy use and carbon emissions compared to petroleum-based plastics and other materials
- PEF is 100 % recyclable into other PEF applications
- Reduce food waste and energy consumption of end products and increase the sustainability of coatings, elastomers and adhesives through superior barrier
- Augment the drive towards bio-based industrial products for global markets and establish FDCA as a versatile furanics building block

Project details

Type of action:	Innovation Action – Flagship
Value Chain:	VC1 – lignocellulose
Start date:	01 September 2017
End date:	28 February 2025
BBI JU contribution:	€ 24,999,610.00

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avantium

Carlsberg Group

Henkel

kebony Natural wood Made to last

LEGO

LVMH PERFUMES & COSMETICS

Nestlé Research

nova Institute for Ecology and Innovation

OMV TECHNOLOGIES

SPINVERSE

Tereos

Worley energy | chemicals | resources

BBI JU

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Bio-based Industries Consortium

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