



EU flagship project to
establish an innovative supply
chain for FDCA and PEF

PEference

The Renewable Innovation

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

PEference will establish a unique, industrial scale, cost-effective biorefinery flagship plant producing FDCA (furan dicarboxylic 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, crucially, 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 scale. PEF is sustainable and also completely recyclable.

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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This project receives funding from the Bio-based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 744409. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Bio-based Industries Consortium.



Horizon 2020
European Union Funding
for Research & Innovation

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 ($\geq 100,000$ 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
- Augment the drive towards bio-based industrial products for global markets and establish FDCA as a versatile furanics building block while developing PEF for packaging applications

Consortium



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