NPVI Nationaal Programma **Verduurzaming Industrie**

Welkom NPVI Connect! 2025

Break-out cluster Noord Nederland - Avantium

Avantium
Industry Connect 2025

October 27, 2025

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Avantium at a glance

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Key pillars and investments highlights

Introducing a better & cleaner monomer and polymer: FDCA and PEF

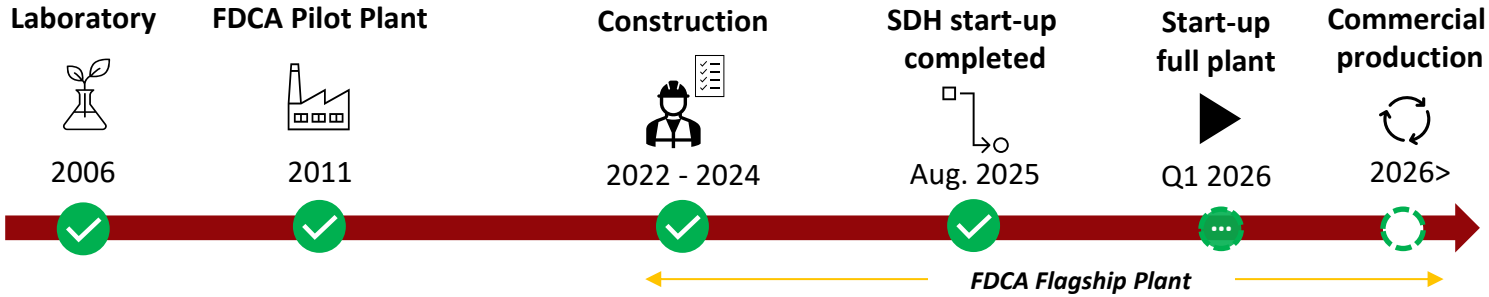
Finalized construction & anticipates sales under the offtake agreements in Q1 2026

Successfully paving the way towards future licenses

From sugars to the next generation polymer

FDCA / PEF

- ✓ 100% bio-based feedstock
- ✓ Fully recyclable in PET stream
- ✓ Lower carbon footprint
- ✓ With superior properties



releaf Made by Avantium

20 **offtake agreements**

7 **capacity reservations** for future plants

1 **license agreement** signed

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Commitments from leading brands

20
Offtake Agreements

7
Capacity Reservations Future Plants

1
Technology License Agreement

Marit van Egmond
Former CEO of
Albert Heijn

"Besides packaging reduction, recyclability and reuse, fossil-free materials are high on our wish list. With the use of PEF, we are giving substance to this."

Simon Boas Hoffmeyer
Senior Sustainability Director at
Carlsberg

"The things that lured us into looking at PEF are the quality properties, and that PEF is able to retain the fizz of the beer 8 times better than PET."

Anders Byriel
CEO
at
kvadrat

"We have been positively surprised about the properties of PEF, the look and feel [of the textile] is impressive."

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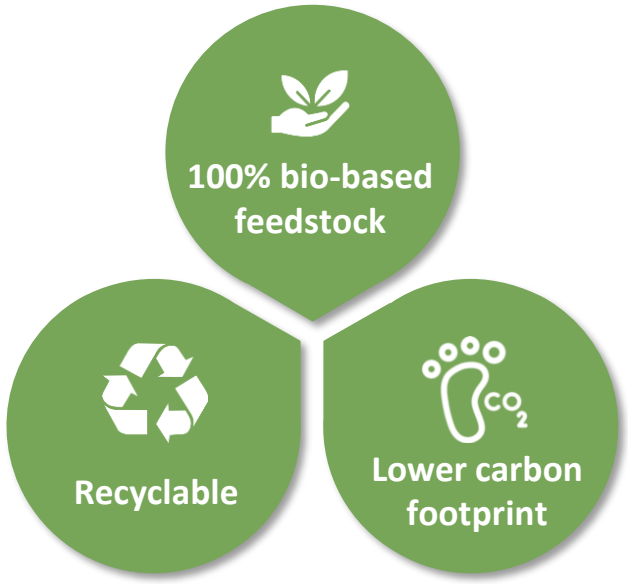
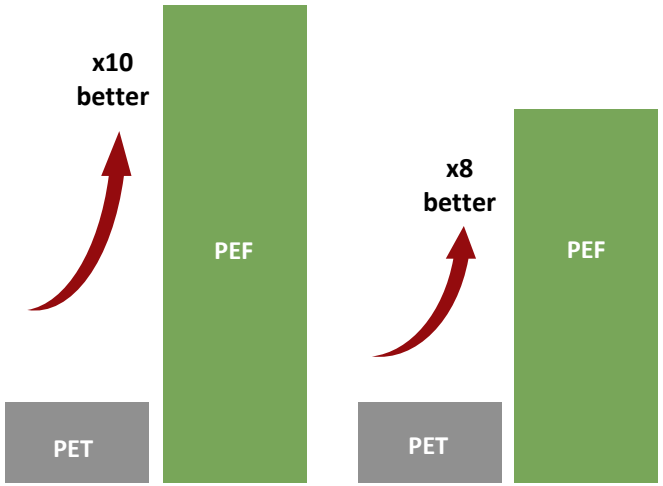
PEF sustainable and superior alternative for PET

A more sustainable product…



…with superior properties…



…providing distinctive value proposition

>20% weight reduction
as less material required for same properties

Longer shelf life
leading to food waste reduction

Larger range of applications
Ability to replace glass, aluminium, etc.

Enhanced recyclability
as mono-material packaging or by replacing hard-to-recycle polymers *(e.g. nylon)* in multi-material packaging

✓ *APR[2] Critical Guidance Recognition on compatibility with standard PET recycling practices*

✓ *RecyClass validates Avantium's PET/PEF bottle as fully recyclable in PET stream*

✓ *EPBP[1] interim approval on multilayer PET/PEF and monolayer PEF bottles in the PET recycling stream*

Notes: (1) The European PET Bottle Platform is a voluntary initiative of industry organisations representing waste collectors, plastic recyclers, PET material producers and brand owners; (2) The Association of Plastic Recyclers, non-profit organisation focused exclusively on improving recycling for plastics

Sources: Avantium and Nova Institute, *PEF – A Sustainable Packaging Material for Bottles - ISO Certified LCA of Avantium's PEF products*, 2022; University of Aberdeen, *PEF plastic synthesised from industrial carbon dioxide and biowaste,* 2020; Journal of Ecological Engineering, *Energy Inputs on the Production of Plastic Products*, 2022; RECORD, *Chemical and physico-chemical recycling of plastic waste*, 2022, 177 p, n°21-0919/1A; Avantium, *The Journey of Avantium's PEF towards Commercialisation*, 2021

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PEF can be used in a very broad range of applications

	Key applications	Competing materials	Addressable market[1]	Avantium's partners
Bottles	**Beer, Juices, Waters, Soft Drinks**	Glass, Aluminium, PET, Multi-layer	**>50 million ton/year** **>€100bn TAM**	Carlsberg Group, AB InBev, Refresco, Resilux, UNDISCLOSED, Logoplaste, Plastipak, HOOGESTEGER partner in premium freshness
Fibers	**Textile, Upholstery, Car Tires, Industrial Fibers**	PET, Nylon, Cotton	**>40 million ton/year** **>€80bn TAM**	PANGAIA, kvadrat, monosuisse
Packaging & More	**Food Packaging, Non-Food Packaging**	Glass, Aluminium, PET, Multi-layer	**>25 million ton/year** **>€50bn TAM**	KA SU NO, Henkel, LVMH Perfumes & Cosmetics, vezet, ORIGIN, HELIOS, Christian Dior PARFUMS, TERPHANE, UNDISCLOSED, TOYOBO, amcor

Notes: (1) estimated volume reflects Total Addressable Market (TAM) in 2035 with PEF at *2€/kg*

Sources: Smithers, *The future of high barrier packaging films to 2024,* 2021; Smithers, *The future of global flexible packaging to 2026*, 2021; Smithers, *The future of rigid plastic packaging to 2026*, 2021; Thermoformed Packaging Market to 2025, 2018 ; PCI Wood Mackenzie, *Abstract report global Multilayer PET bottles industry to 2024*, 2016 ; Allied Market Research

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FDCA Flagship Plant

FDCA Flagship Plant

- **First-of-a-kind** plant
- Proving technology at **5kta scale**
- Team of **70 people**
- Located in **Delfzijl, The Netherlands**
- Critical for a **successful licensing strategy**

Laboratory — 2006

FDCA Pilot Plant — 2011

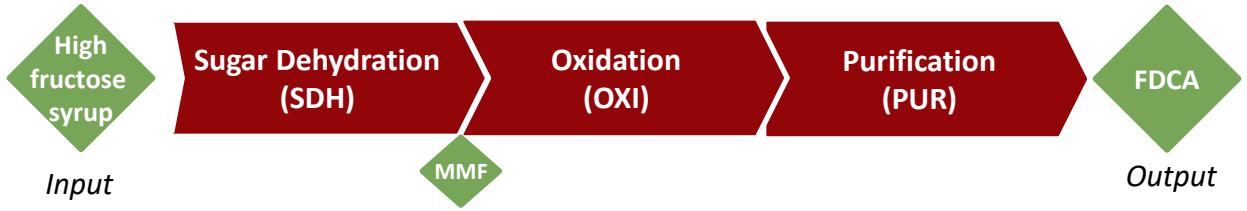
First piling — 2022

Construction completed — 2024

Start-up — 2025 – Q1 2026

Commercial production — 2026>

Core processes



Commissioning & Start-Up status

- ✓ Utilities — Started-up
- ✓ Sugar Dehydration — Started-up
- Oxidation — Start-up ongoing
- Purification — Start-up ongoing

Planned completion of start-up : Q1 2026

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Discussion points

- Share FOAK experiences

- Government options to stimulate new industrial players in the biobased and circular sector:
  - Demand creation
  - Access to risk capital
  - Permitting (in particular for FOAK)
  - Regulations for innovative materials

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Thank you!

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Stelling #2:

De huidige neergang van de petrochemische industrie in Europa gaat so snel dat het de groeimogelijkheden gaat schaden van hernieuwbare, circulaire industrie

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NPVI Nationaal Programma Verduurzaming Industrie

Bedankt voor je aandacht !

Op de hoogte blijven?

- Bezoek onze website: www.verduurzamingindustrie.nl
- Volg onze LinkedIn: programma-verduurzaming-industrie

Direct contact opnemen?

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