



avantium

Investor Presentation

February 2022

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Today's speakers



Tom van Aken

CEO

 Since 2002

25y of industry experience

Selected previous experience:



Bart Welten

CFO

 Since 2020

30+y of industry experience

Selected previous experience:



Introduction



Avantium at a glance: a pioneer in renewable chemistry



**Who
we are**

A pioneer in the emerging industry of renewable chemistry

**Our
mission**

Create disruptive technologies to accelerate transition from fossil-based to renewable and circular plastics

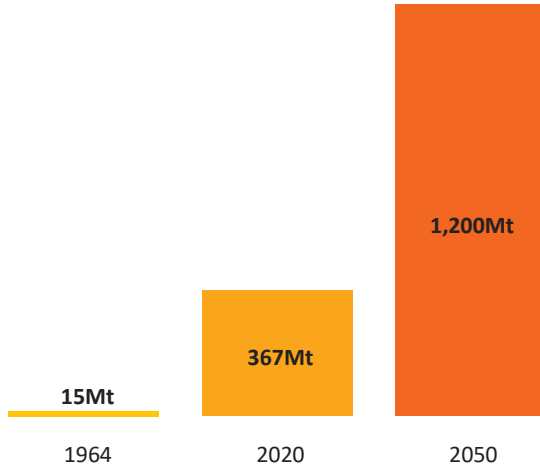
**Our
ambition**

A fossil-free chemical industry by 2050

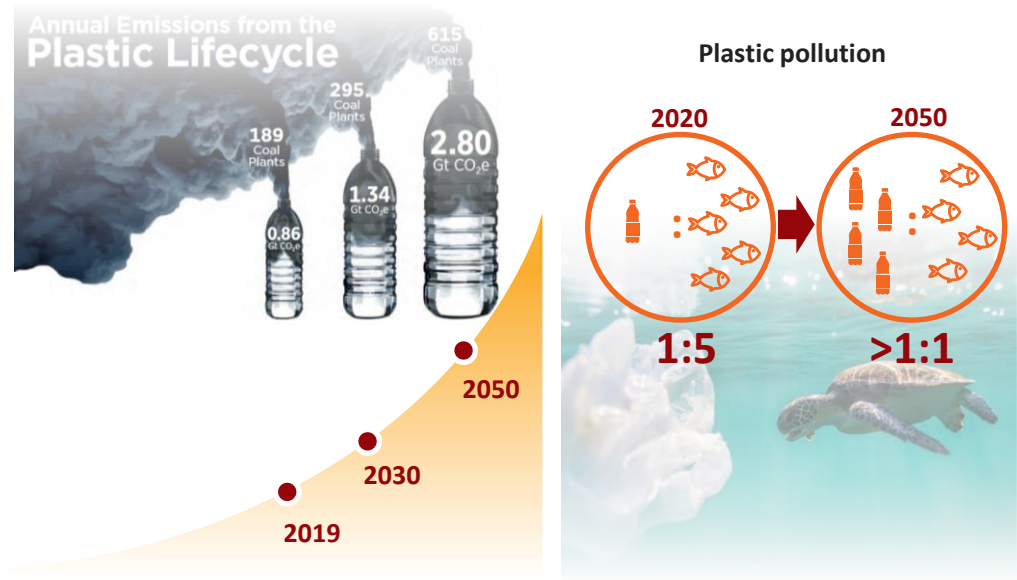


Increasing worldwide use of plastics causes major environmental challenges

Global plastics production will triple by 2050



Plastic production and waste cause major environmental problems





Next generation consumers calling for action



85%

of global respondents among millennials feel strongly that companies should help improve the environment

Governments putting regulatory targets & frameworks in place



“Single-use plastics are now forbidden in the EU when an affordable alternative exists”



“By 2025, all plastic packaging is 100% reusable, recyclable or compostable”

Companies throughout the value chain are shifting towards sustainable and carbon neutral plastics



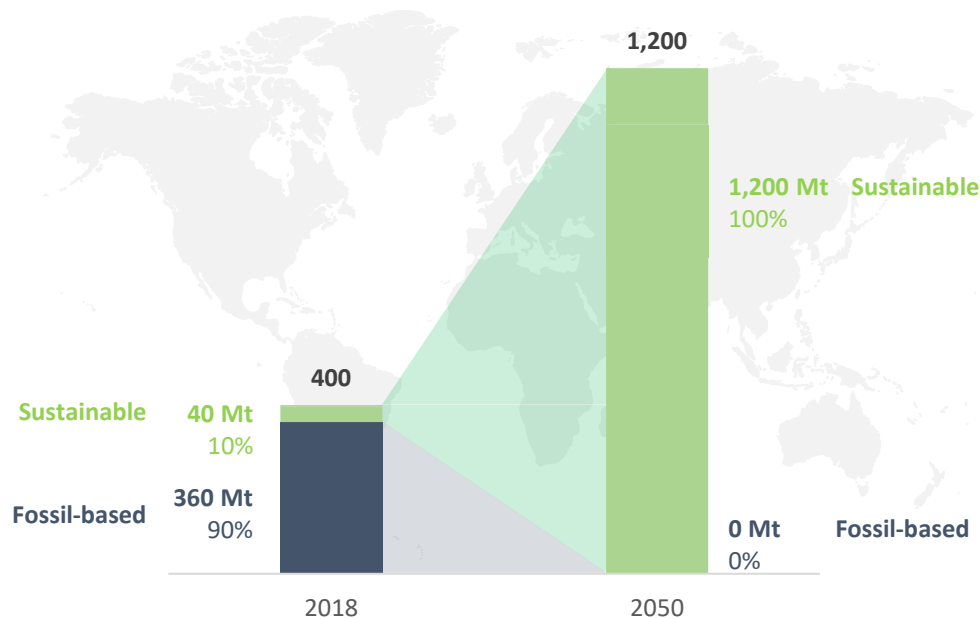
“By 2025, all of our plastic packaging will be 100% reusable, recyclable or compostable to help build a circular economy for plastic”





Fossil-based products are expected to phase out

World plastic and chemicals production (in Mt)



Key market drivers



Demographic growth and increasing purchase power of a **growing worldwide middle class**



Tougher regulations geared towards **recycling** and/or **bio-based feedstock**, combined with neutral carbon footprint via **CO2 taxation**

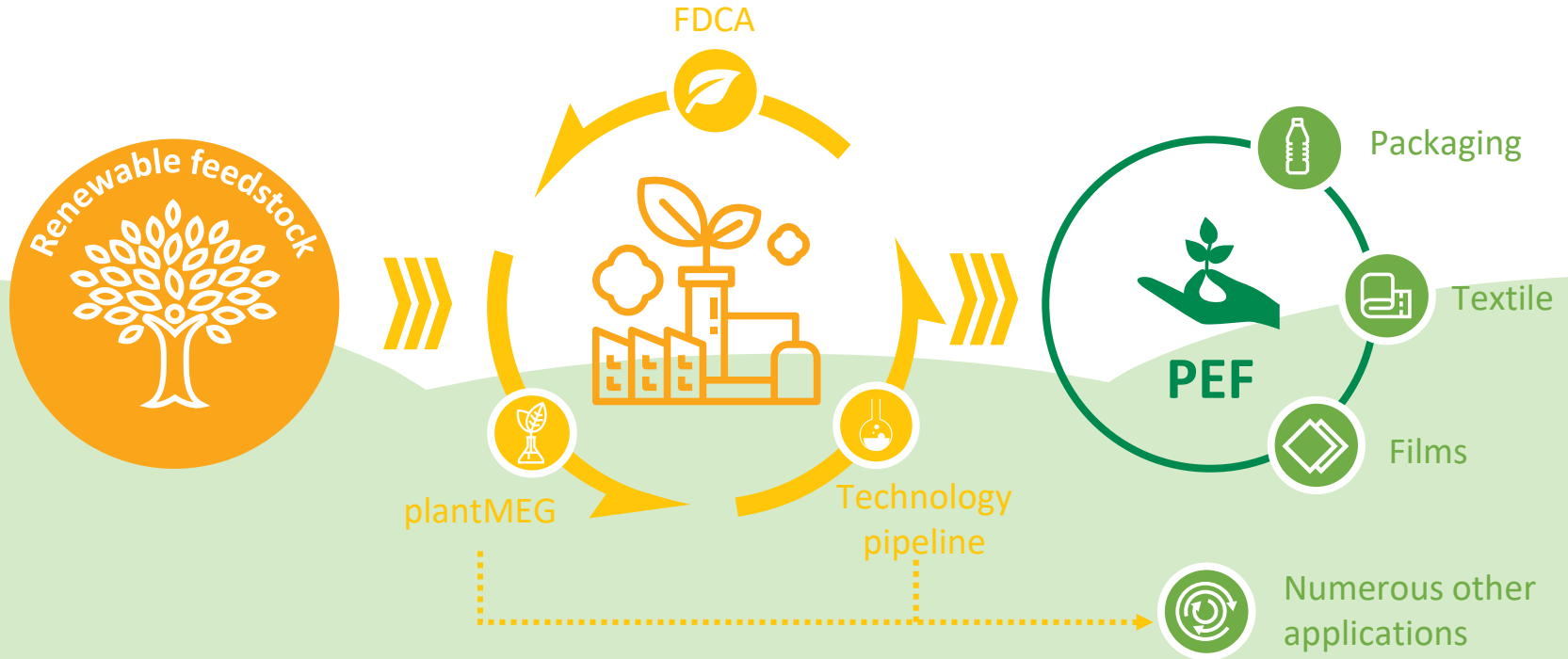


Increasing industry commitment towards sustainable products



Product performance determines size of market, speeds of adoption and price level

Avantium offers disruptive technologies for the production of PEF



Avantium's cutting-edge PEF led to numerous strategic collaborations & recent offtake agreements





High performance



Fully sustainable



Cost competitive





R&D collaborations



Long-term offtake agreements

Development of PEF for beverage applications






"We highly value the many performance and sustainability features of PEF"




PEference aims to establish an innovative supply chain for FDCA & PEF











"We strongly believe that PEF improves the barrier properties of packaging materials and extends shelf life"

"PEF will allow us to offer sustainable solutions in special, high-end applications"





"With PEF, we will be able to offer another sustainable and renewable packaging solution"

"Toyobo believes PEF is the only bio-based polymer which has superior properties compared to its closest fossil-based equivalent"

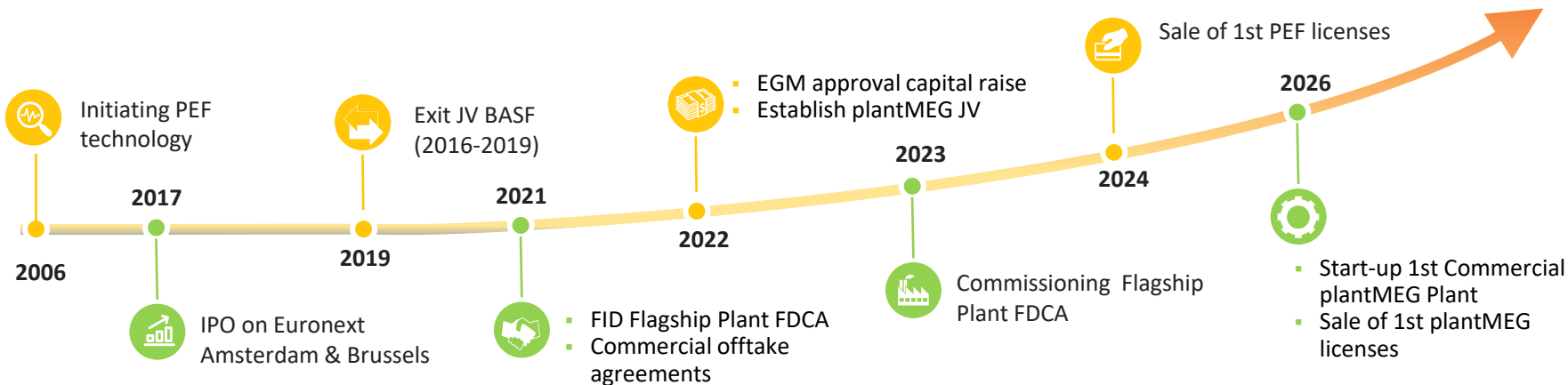




Major food & beverage brand owner



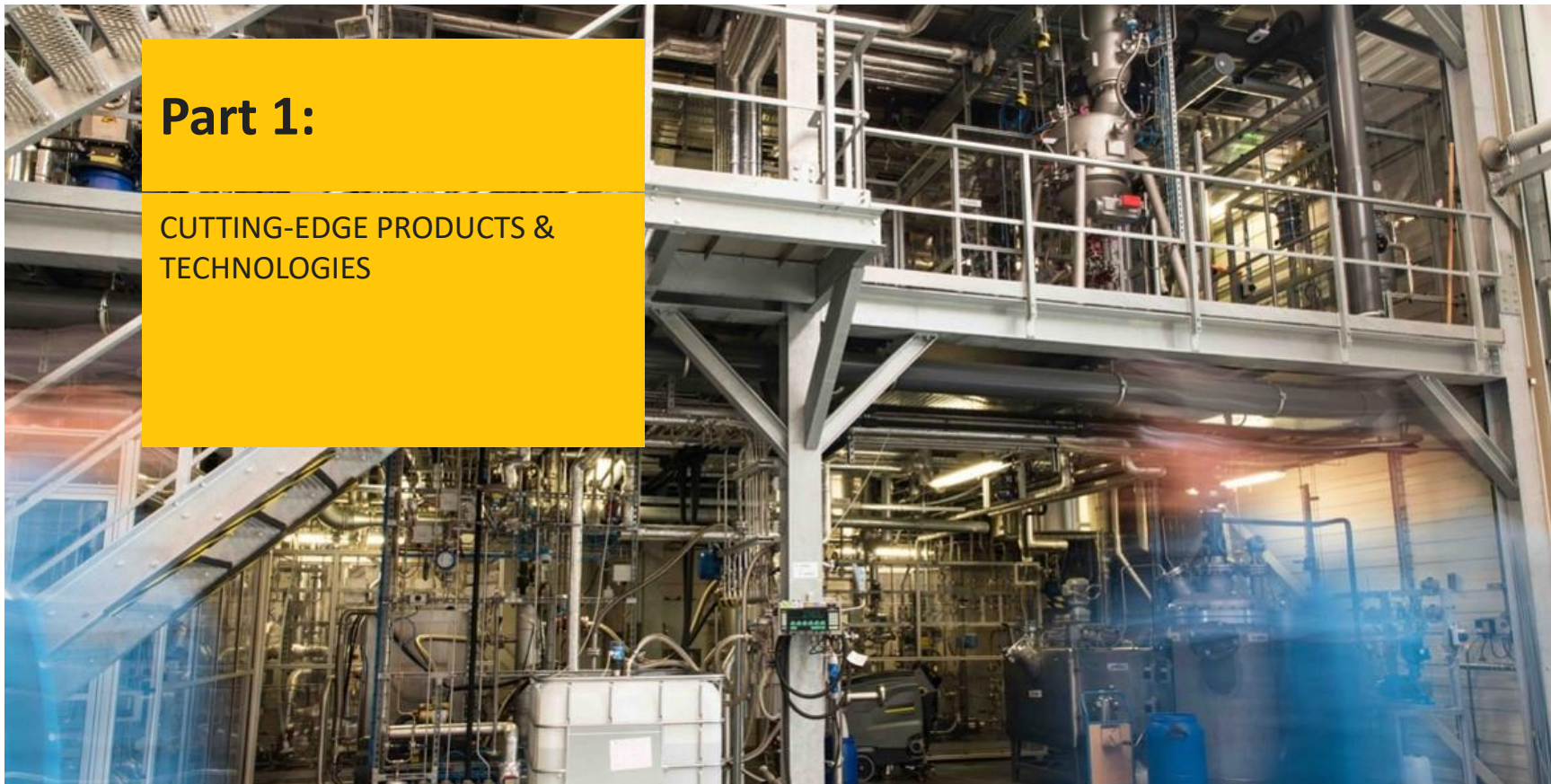
Avantium's successful trajectory towards growth



Note: (1) Avantium 2019 results

Key investment highlights





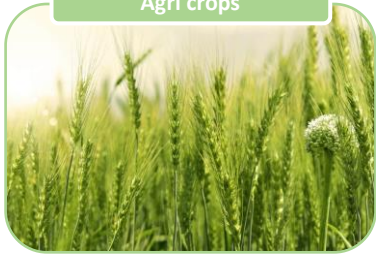
Part 1:

CUTTING-EDGE PRODUCTS & TECHNOLOGIES

PEF is a 100% plant-based plastic made from FDCA and plantMEG

Feedstock flexible

Agri crops



Agri & forestry residue



Forest residues:
softwood and hardwood chips



Corn stover



Bagasse

Unique technological platform centered around catalysis process

Plant-based sugar



FDCA



plantMEG



Broad range of applications

Packaging



Film



Textile



PEF

Furniture

Textile

Automotive

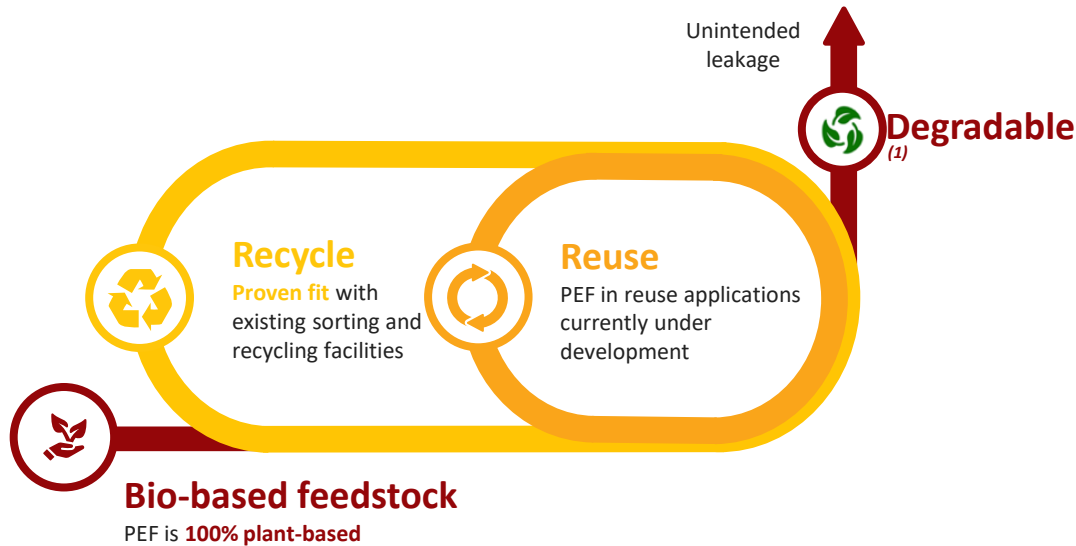
Packaging

Solvent & Coolants



Avantium's PEF addresses the need for a circular new plastics economy

PEF solves the challenges of today's conventional plastics



Challenges cannot be solved by recycling only

“ America simply **does not have enough recycled PET** supply or processing capacity to satisfy commitments being made by brand owners to increase recaptured resin content in their bottles. ”

NAPCOR⁽²⁾

“ We won't recycle or dispose our way out of plastic pollution... Future scenarios focused on collection, recycling, and disposal alone have been shown to fall short, with high ocean leakage and GHG emissions... **Upstream innovation offers opportunities** to rethink how products can be delivered to users without the need for single-use packaging. ”

The global commitment 2021 Progress Report

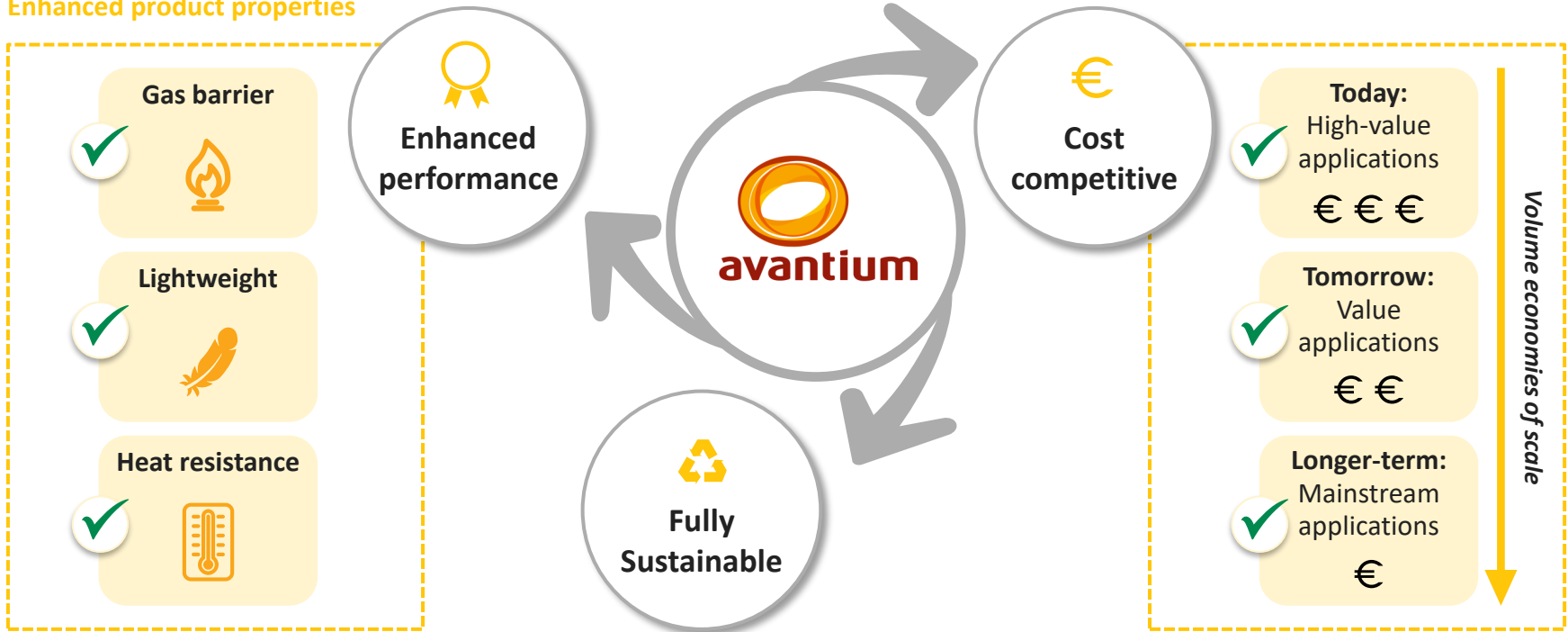


Notes: (1) Trial by Avantium and University of Amsterdam; (2) National Association for PET Container Resources



Showing enhanced performance while being cost competitive

Enhanced product properties



plantMEG is a key drop-in ingredient for large end-markets

Avantium value proposition

plantMEG will provide brands with a sustainable & innovative ingredient



Part 2:

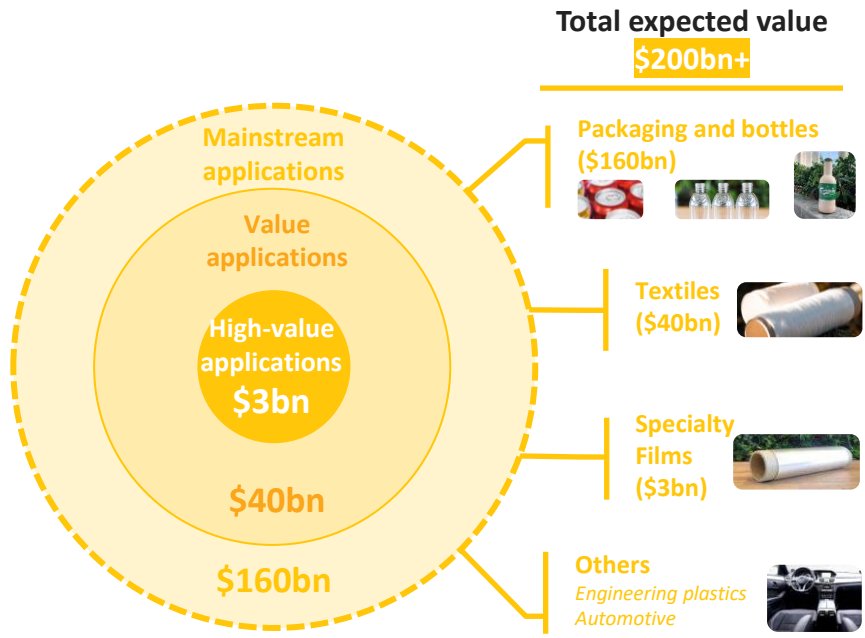
ATTRACTIVE ADDRESSABLE MARKETS



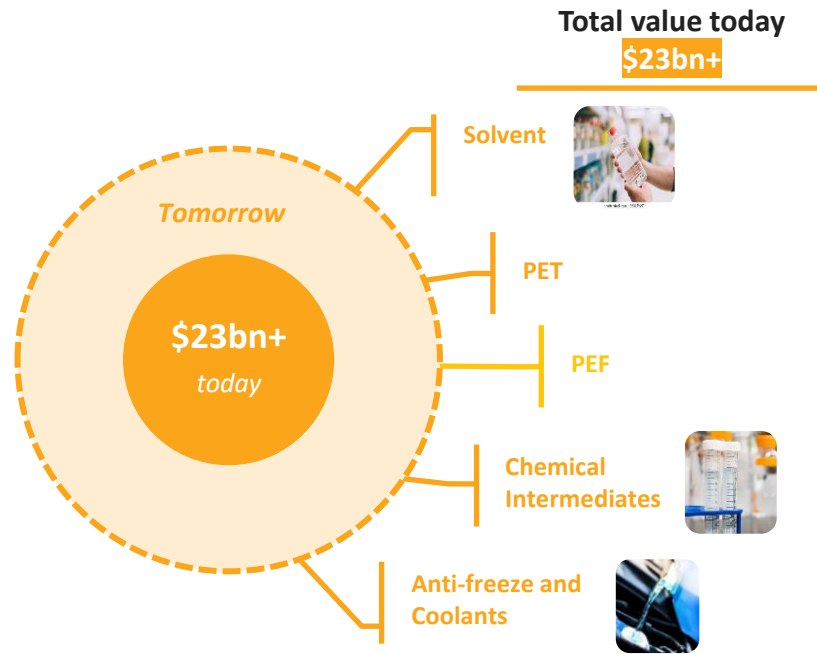


Avantium targets large and diverse PEF and MEG markets

PEF addressable market – 100mt+

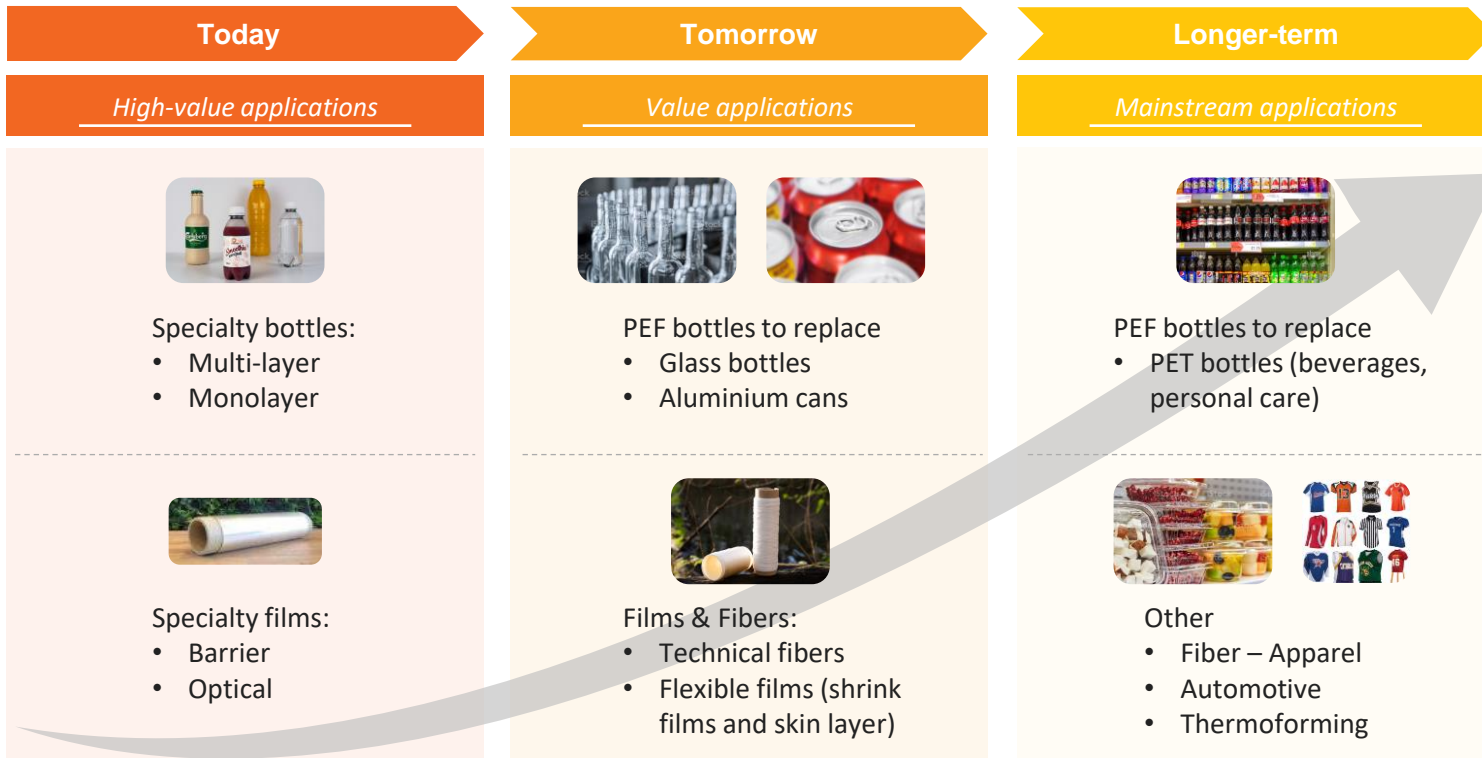


MEG addressable market – 35mt+



Sources: Chapter 12 Avantium IPO prospectus (March 2017); MEG values calculated based on market data of Wood Mackenzie (2021), Nexant (2020) and Tecnon Orbichem (2022)

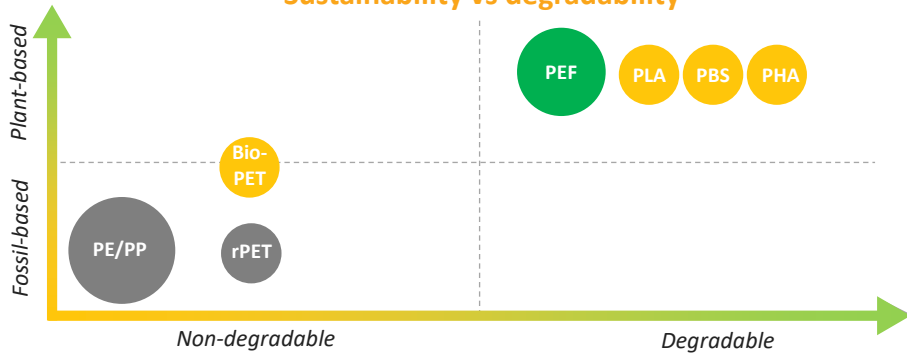
Addressing an extensive number of end-markets over time



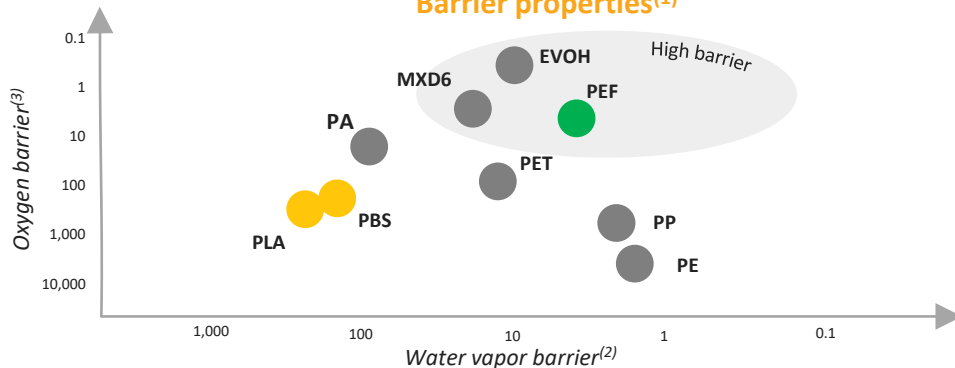


PEF has enhanced product performance

Sustainability vs degradability



Barrier properties⁽¹⁾



Selected companies

PEF	 <i>Most mature PEF player</i>	
PLA	 	
PHA	 	
PBS	 <i>Optimizing the best of nature</i>	 <i>Optimizing the best of nature</i>
BioPET		
rPET		

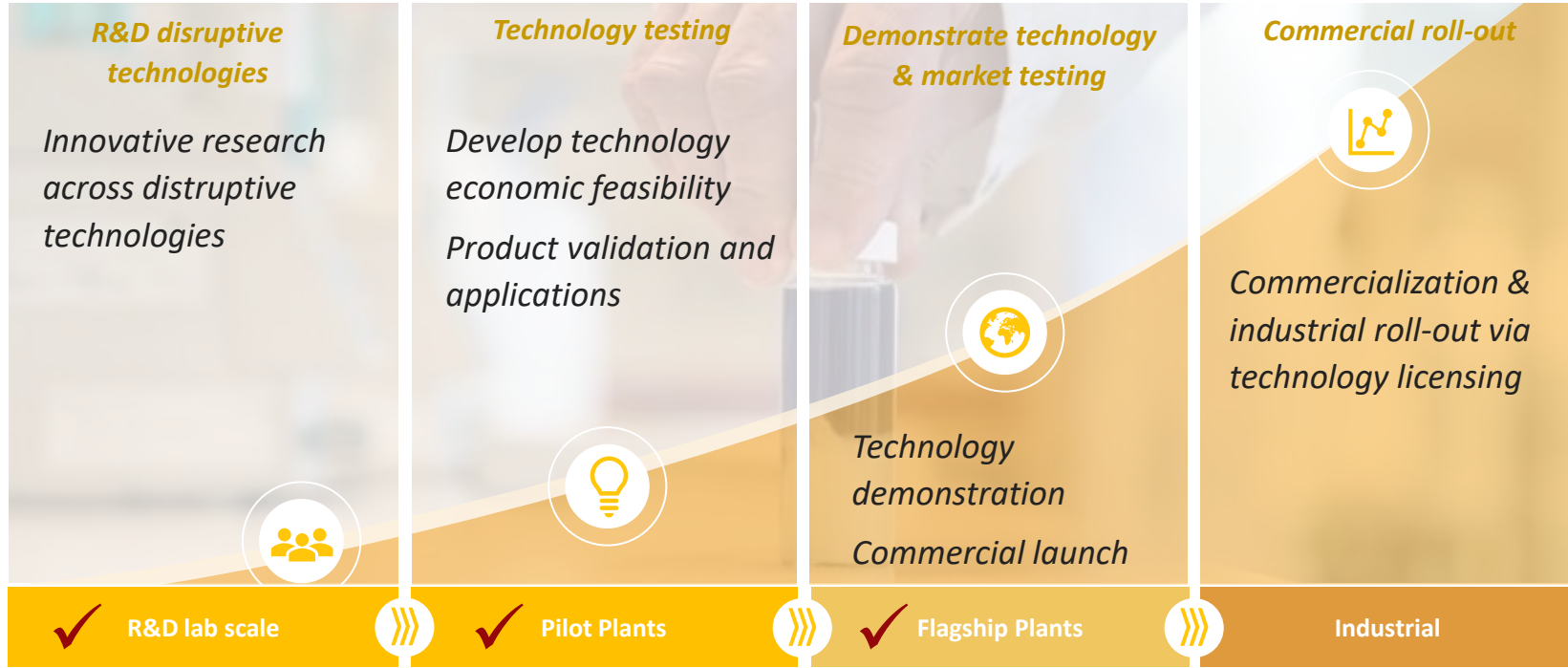
Source: European Bioplastics; Company Assessment based on: Markus Schmidt et al, Properties of Whey-Protein-Coated Films and Laminates as Novel Recyclable Food Packaging Materials with Excellent Barrier Properties (International Journal of Polymer Science, Volume 2012), <https://www.mgc.co.jp/eng/products/ac/nmx66/barrier.html>, <http://asuka-platech.com/wp/wp-content/uploads/2013/12/BIOPBS.pdf>
 Note: (1) Barrier properties for 50µm film; (2) Water vapor barrier: WTR at (39 dC 85 %RH) [mL/(m²-day)]; (3) Oxygen barrier: OTR (23, 0%RH) [mL/(m²-day-atm)]

Part 3:

SUCCESSFUL EXECUTION OF STRATEGY



From technology development to commercialization



Mission: create & commercialize disruptive technologies & products to accelerate the transition to renewable & circular plastics





The world's first plant producing FDCA on a commercial scale



Location
Chemie Park
Delfzijl (NL)



Timing
Construction
completion 2023
& operational
2024



Scale
5 kilotonnes of
FDCA p/a



Objective
Prove technology
at scale:
Sales PEF &
Unlock licensing
business



Commercialisation
Over 50% offtake capacity committed

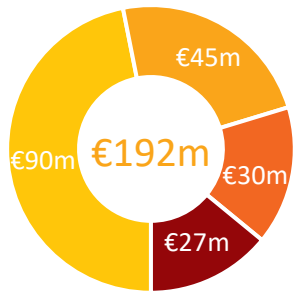


Funding
Plant financing secured



FDCA Flagship Plant secured financing breakdown

Funding sources



Funding uses

- CAPEX: €115m
- Running cost (OPEX): €65m
- Interest, other: €12m

Grants (€27m):

- €20m PEference grant⁽¹⁾
- €7.5m grant from the National Programme Groningen



Third Party Equity (€30m):

- €20m equity from Groningen consortium
- €10 million equity from Worley
- Represents 22.6% of the Renewable Business equity



Avantium Equity (€45m):

- €45m investment by Avantium (increased from €35m)
- Represents 77.4% of the Renewable Business equity



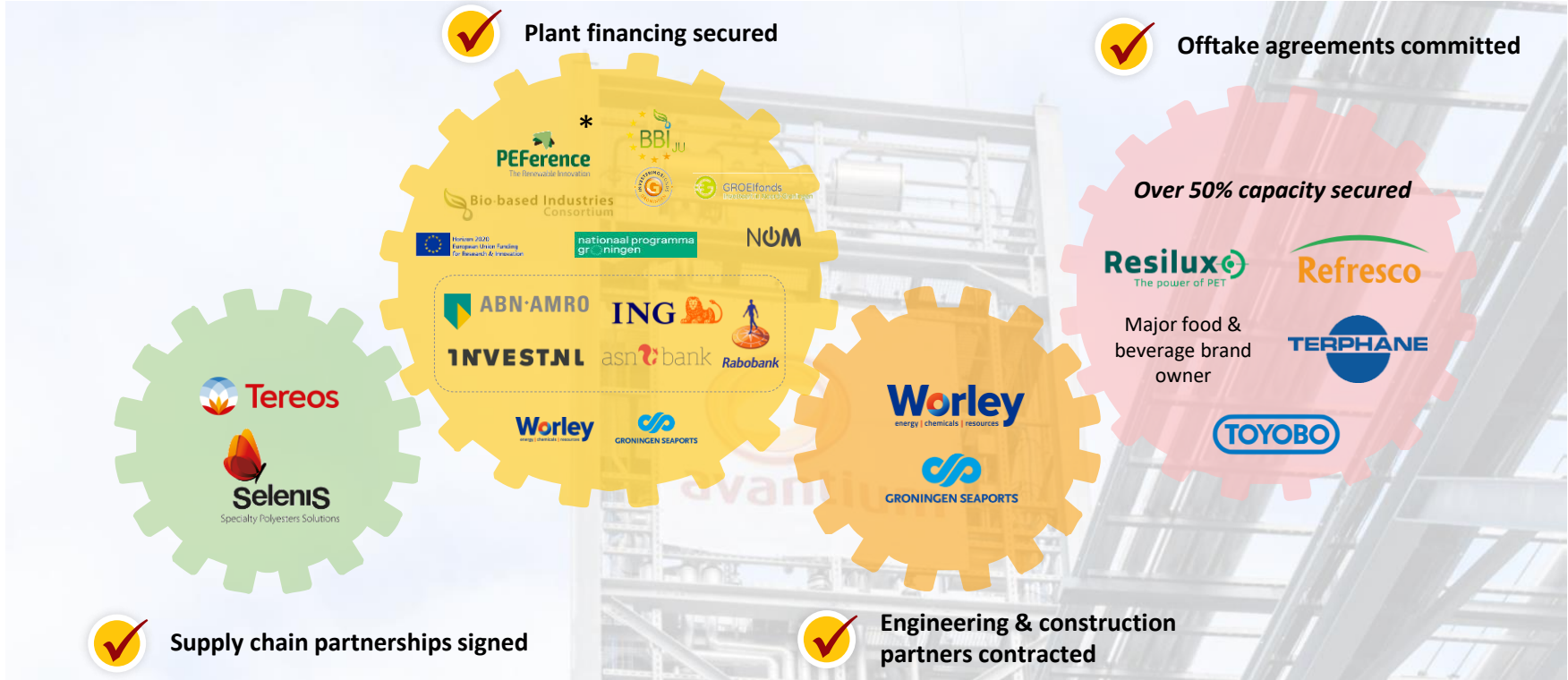
Debt Financing (€90m):

- Each bank has committed €15m
- Invest-NL, government backed Dutch impact investment fund, has committed €30m
- Interest consists of three components: cash interest, accrued interest and warrants



Note: (1) This project has received funding from the Bio-based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation program under grant agreement No744409. The JU receives support from the European Union's Horizon 2020 research and innovation program and the Bio-based Industries Consortium.

Successfully de-risked across the entire value chain

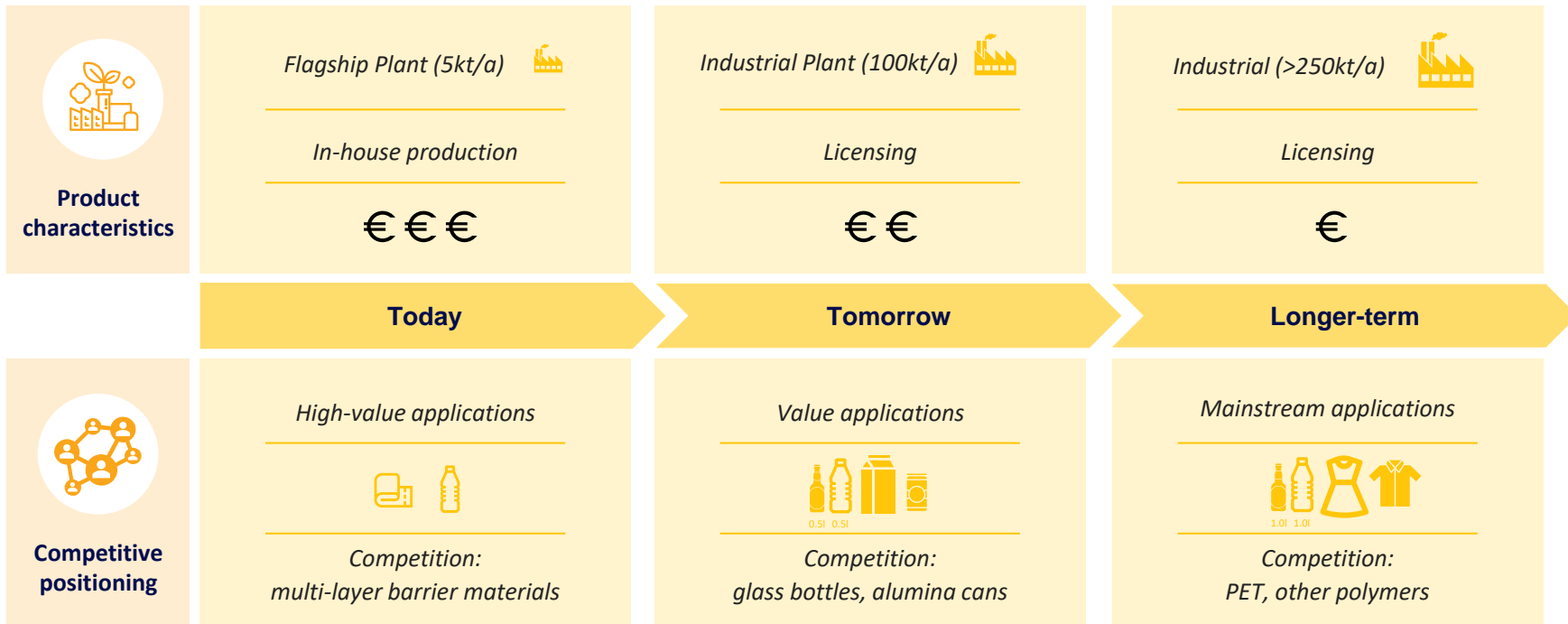


Note: (*) This project has received funding from the Bio-based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation program under grant agreement No744409. The JU receives support from the European Union's Horizon 2020 research and innovation program and the Bio-based Industries Consortium.





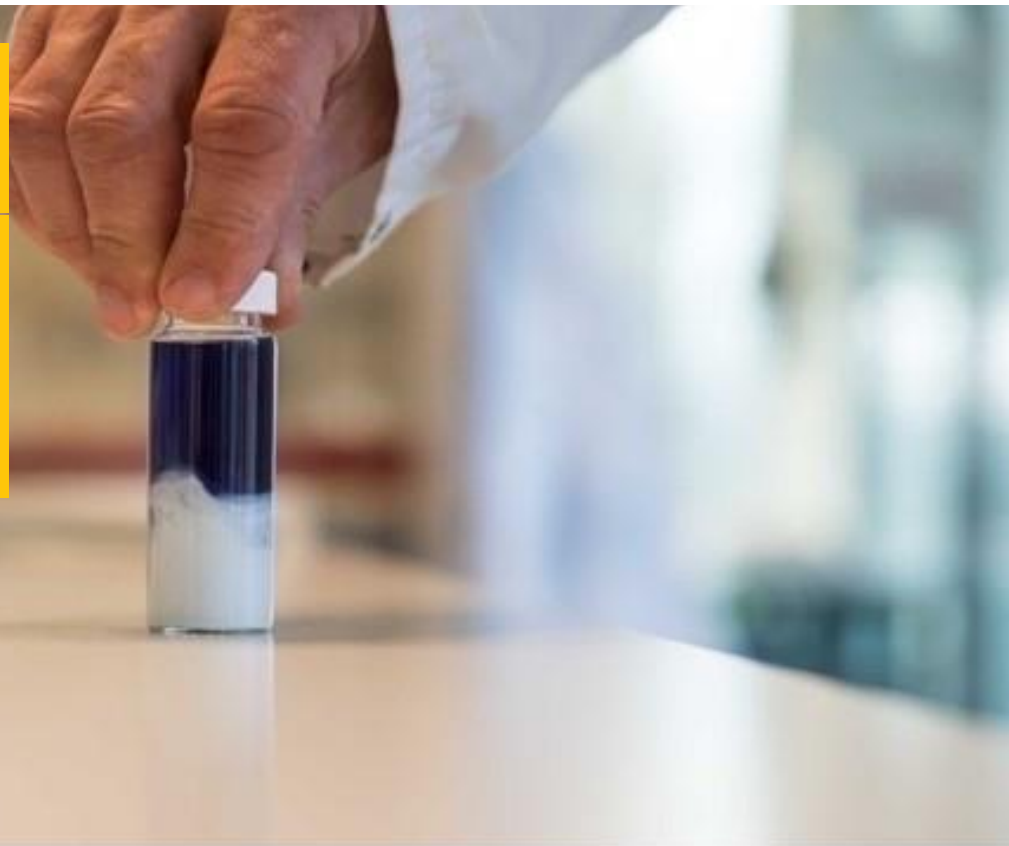
Avantium has a well-defined and scalable go-to-market strategy for PEF/FDCA



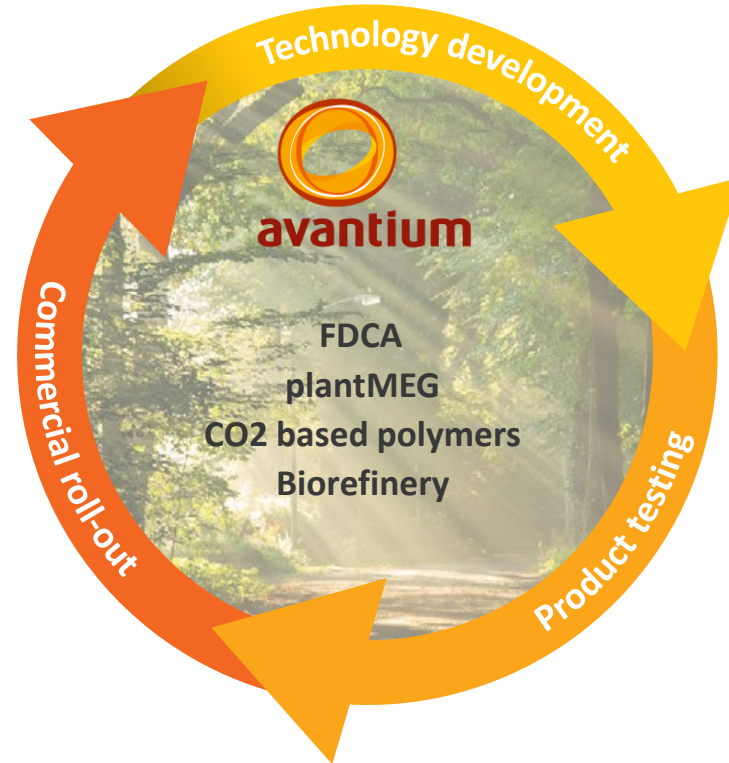
Initial focus on high-value applications with further volume growth to result in cost reduction, leading to a competitive offering across high volume end-markets

Part 4:

CLEAR PATH TO GROWTH



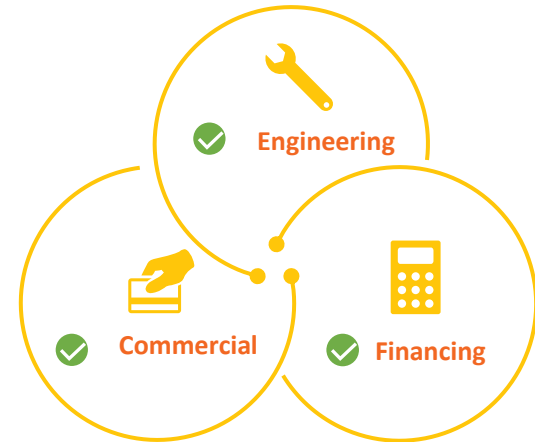
Avantium tomorrow: further develop & commercialize its innovative technologies



Construction of its plantMEG Commercial Plant, leveraging on the succesful experience in FDCA

 <p>Location Northwestern Europe</p>	 <p>Joint venture Jointly owned by Cosun Beet Co & Avantium</p>	 <p>Size >100kt per annum (expected)</p>
 <p>Applications Wide range: packaging, fibers & other</p>		 <p>Timing FID 2023/2024 Operational in 2026</p>
 <p>Technology plantMEG license sale from Avantium to JV</p>	 <p>Feedstock Beet sugar from Cosun Beet Co.</p>	 <p>Objective Commercial launch plantMEG</p>

Success of FDCA strategy execution will accelerate plantMEG execution





Momentum to accelerate in 2022 driven by increasing PEF adoption

2022

2023-2024



Commercial

- Further broaden PEF use beyond packaging applications
- Additional offtake agreements PEF/FDCA Flagship Plant
- Development PEF partnerships

First LOIs plantMEG

Finalise JV with Cosun Beet Company



Operational

Start construction FDCA Flagship Plant

Final Investment Decision Commercial Plant plantMEG

- First Pile in the Ground ceremony for Flagship Plant (Spring 2022)
- Strengthen senior operational team with new hires

- FDCA Flagship Plant on stream
- Start construction Commercial Plant plantMEG



Technological

LCAs (Life Cycle Analysis) PEF applications and plantMEG

Securing of new grants

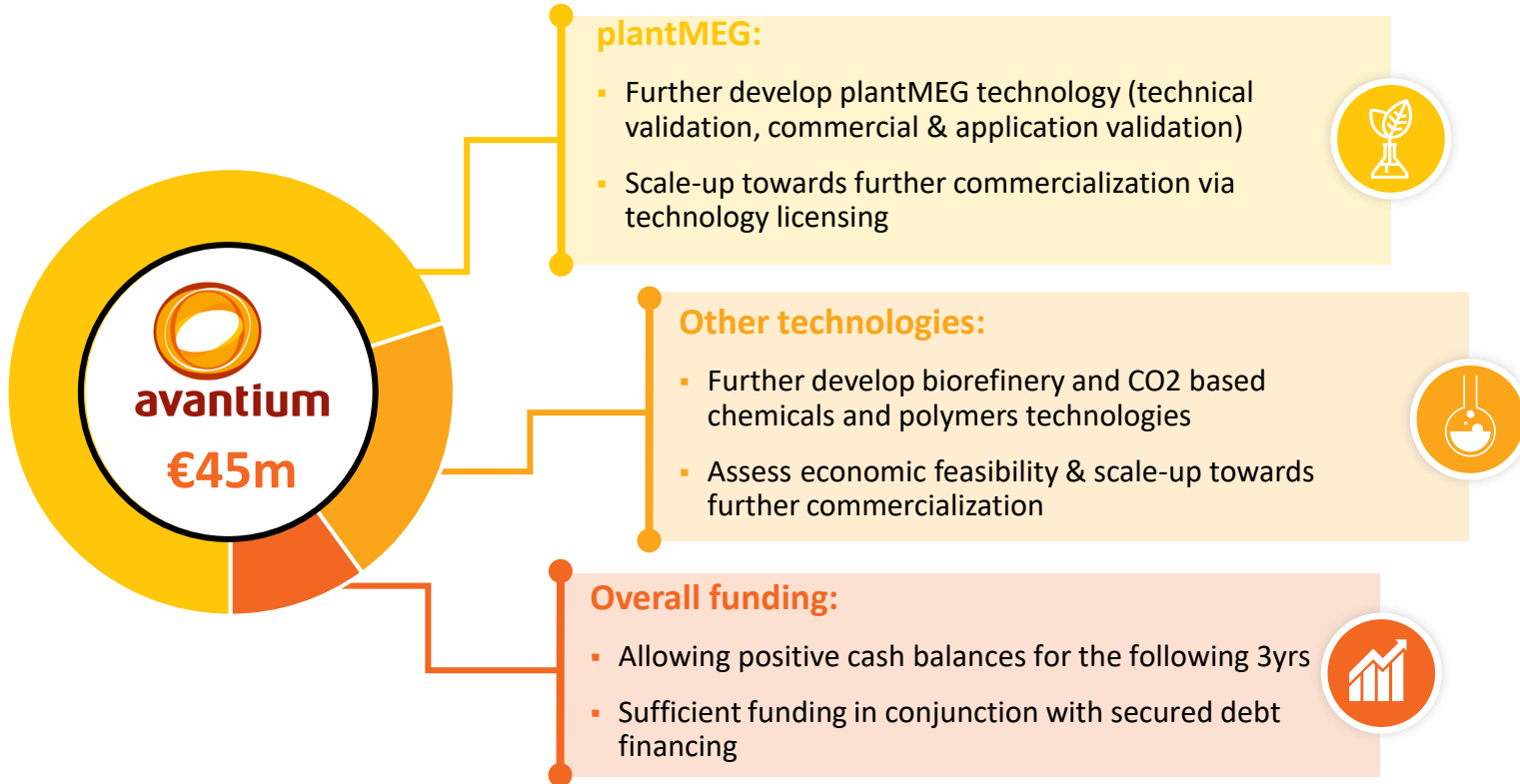
Application validation plantMEG (bottles, fibers, films)

Scale-up CO2 based polymers to Pilot Plant

Key drivers supporting Avantium's market potential



Use of proceeds from future capital raise



Key takeaways

Key milestones successfully achieved...

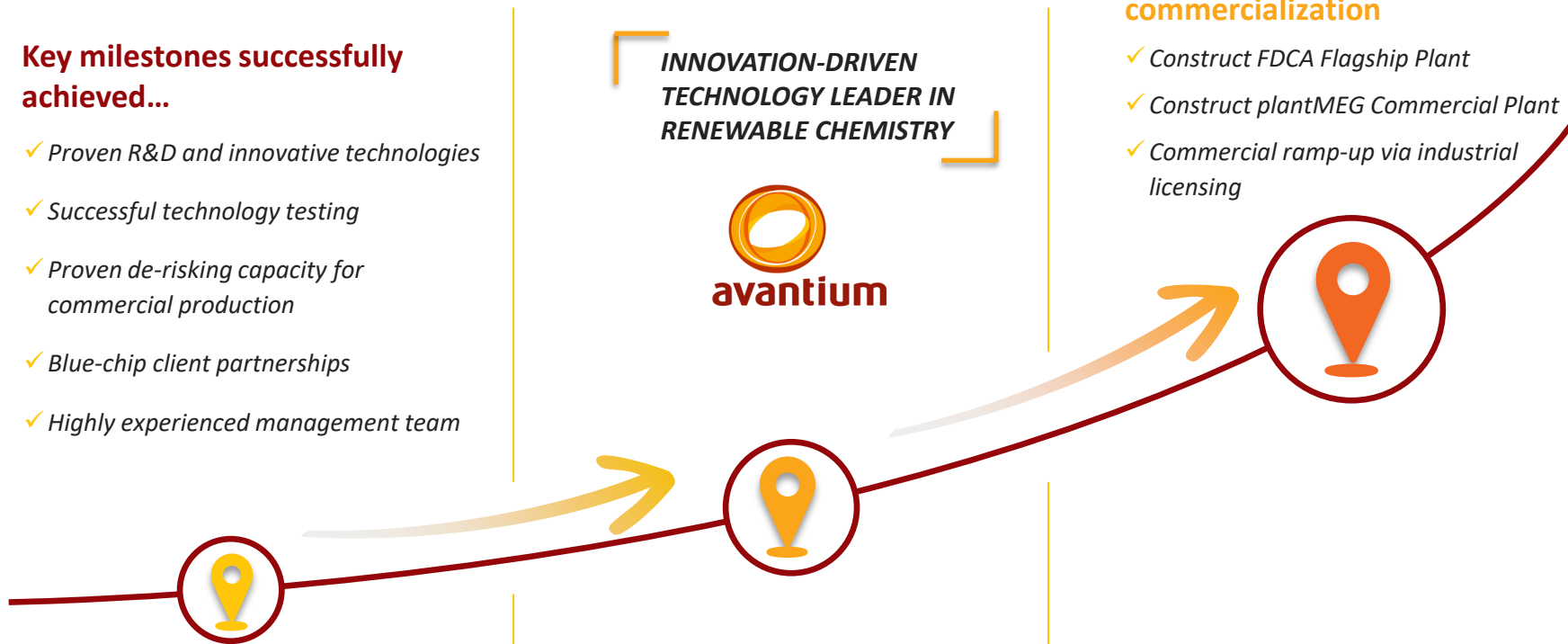
- ✓ Proven R&D and innovative technologies
- ✓ Successful technology testing
- ✓ Proven de-risking capacity for commercial production
- ✓ Blue-chip client partnerships
- ✓ Highly experienced management team

INNOVATION-DRIVEN
TECHNOLOGY LEADER IN
RENEWABLE CHEMISTRY

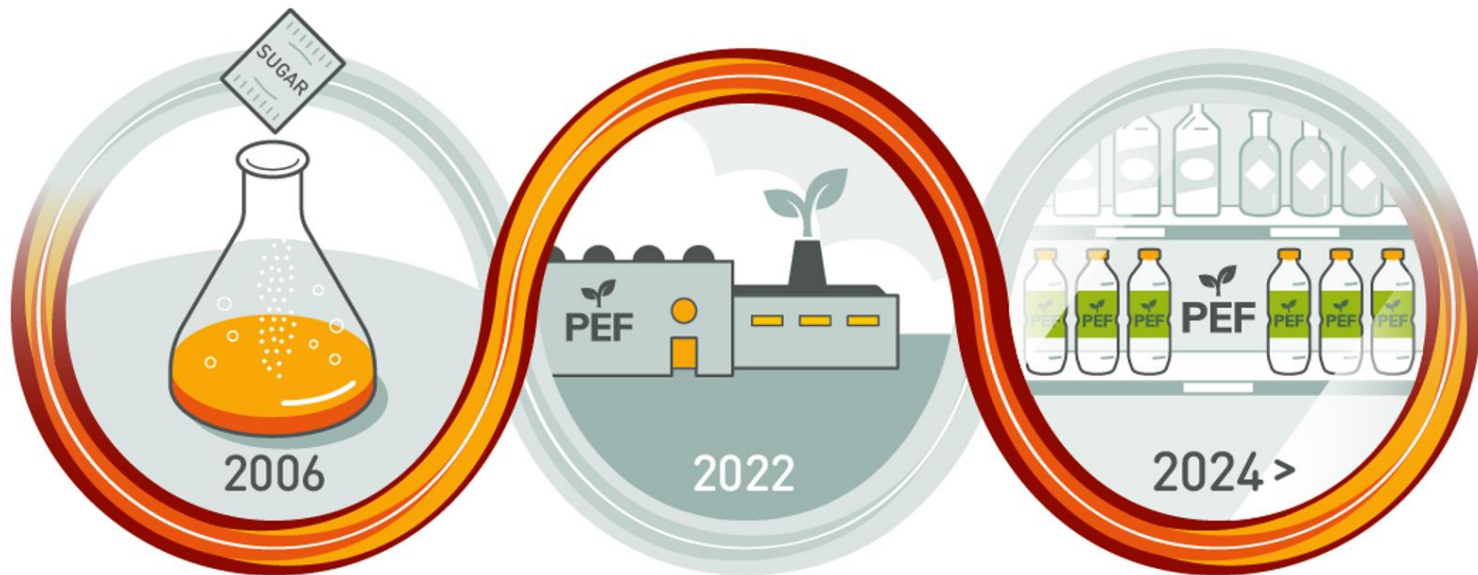


...Forming the foundation for commercialization

- ✓ Construct FDCA Flagship Plant
- ✓ Construct plantMEG Commercial Plant
- ✓ Commercial ramp-up via industrial licensing



Q&A



A photograph of a sunlit forest path. Sunbeams (crepuscular rays) are visible, filtering through the dense green foliage. The path is covered with fallen leaves and leads into the distance. A large yellow rectangular box is overlaid on the left side of the image, containing the word 'Appendix' in black text.

Appendix



Avantium: experienced leadership team

Management Team



Tom van Aken
CEO
(@Avantium since 2002)

Education:

Chemistry (Utrecht) and Economics (Amsterdam)

Selected previous / other positions:

- Now: several advisory positions, such as Top Team Chemie
- 1999-2002: Director Business development at DSM
- 1997-1999: Sales manager at DSM



Bart Welten
CFO
(@Avantium since 2020)

Education:

Law (Leiden) and MBA (Boston)

Selected previous / other positions:

- Now: Supervisory Board Sanquin
- 2012-2019: CFO at Centrient Pharmaceuticals
- 2003-2012: CFO at DSM Resins
- 2002-2003: CFO at Kiadis Pharma



Gert-Jan Gruter
CTO
(@Avantium since 2000)



Carmen Portocarero
General Counsel
(@Avantium since 2012)



Bas Blom
Managing Director Renewable
Polymers
(@Avantium since 2021)



Eelco Blum
Managing Director Renewable
Chemistries a.i.
(@Avantium since 2017)



Steven Olivier
Managing Director
Catalysis
(@Avantium since 2015)

Supervisory Board

- Edwin Moses**, Chairman Former CEO Ablynx NV and Oxford Asymmetry International
- Margret Kleinsman** CFO Agrifirm
- Michelle Jou** President Covestro Polycarbonates Business

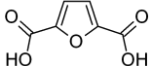
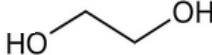


- Cynthia Arnold**
- Trudy Schooleberg**
- Nils Björkman**

Former CTO Sun Chemical and Valspar
Held various senior management positions at Shell and AkzoNobel
Worked for 33 years in various senior management positions at Tetra Pak Group





Avantium tomorrow: Successfully delivering the next biochemicals from disruptive technologies

	Today	Tomorrow		
	PEF Building blocks			
	FDCA  Catalytic conversion of plant-based sugars into FDCA	plantMEG  Conversion of sugars into plantMEG	CO2 based polymers  Conversion of CO2 into high-value chemicals & polymers	Biorefinery  Conversion of biomass via a biorefinery into industrial sugars
Avantium value proposition	<ul style="list-style-type: none"> ✓ 100% renewable & recyclable ✓ Superior performance ✓ Feedstock flexibility ✓ Initially serving value applications then volume 	<ul style="list-style-type: none"> ✓ Improved sustainability credentials ✓ Market competitive ✓ Drop-in 	<ul style="list-style-type: none"> ✓ Valorizes waste carbon ✓ Clean conversion process using renewable energy ✓ Proprietary electro-chemistry platform for carbon capture and utilization 	<ul style="list-style-type: none"> ✓ Valorizes biomass into valuable feedstock ✓ Clean and efficient conversion technology ✓ Significantly lower energy
Status	Operational Pilot Plant Flagship Plant operational by 2024	Operational Pilot Plant Commercial Plant expected to be operational by 2026	Prepilot units being tested	Operational Pilot Plant

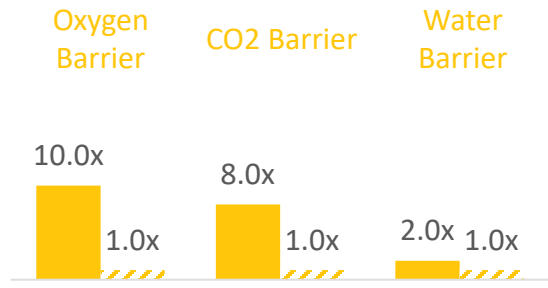
Avantium's expertise in catalysis processes as development platform of disrupting biochemical technologies



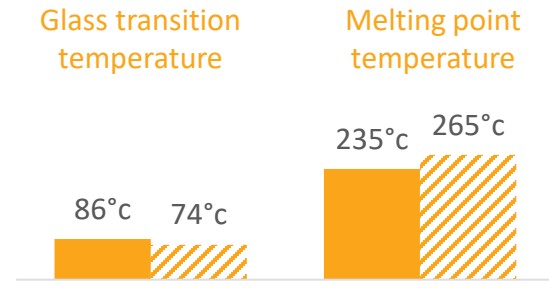
PEF is able to address value-added markets thanks to enhanced performance



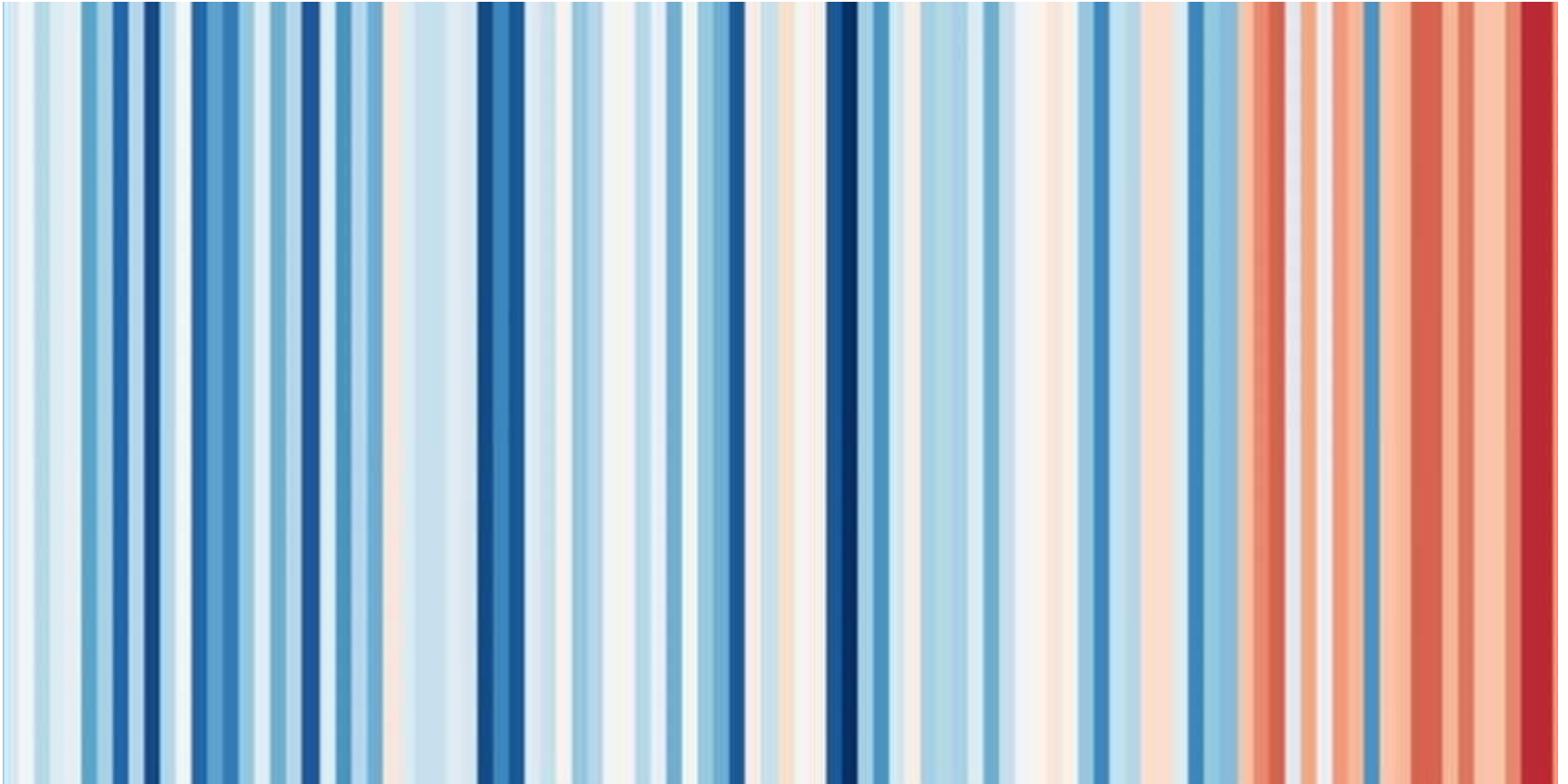
Barrier Properties



Thermal Properties



PEF PET



Global warming stripes by climate scientist Ed Hawkins