Creating the Value Chain for Biobased Aromatics

By the Biorizon Program

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Today’s agenda

1 Lux Research Overview
2 Lux Bio-based Materials and Chemicals Overview
3 Bio-based Aromatics Landscape
4 Challenges to Commercialization
Drive Growth Through Tech Innovation

Analysis you trust.
Opinions you rely on.
Make better decisions, faster.
Driving growth starts with understanding

Technology innovation is crucial – but requires a strategic approach

Take action today

Prepare for tomorrow

Own the future
Making decisions about tech innovation is complicated

An informed decision requires an understanding of:

- Market landscape
- In-depth analysis of technology
- Opportunity assessment
- Risk identification
- Value chain and competitive analysis
- Unbiased, outside perspectives

That’s where we come in.
The Lux difference

- TECHNICAL EXPERTISE
- PRIMARY RESEARCH
- ADVANCED ANALYTICS

We tell it like it is.
It might not be what you want to hear... but it’ll always be what you need to know.
Lux by the numbers

300+ CLIENTS on 5 CONTINENTS

100+ EMPLOYEES in 5 OFFICES

>75% of the largest chemical companies

>75% of the largest oil & gas companies

>65% of the largest CPG companies

>50% of the largest IT companies

>50% of the largest diversified industrial companies

multinational corporations
investors
governments

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New York
Amsterdam
Singapore
Tokyo

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Partner with Lux to make more informed decisions
Lux BBMC Overview
Bio-based Materials and Chemicals

**COVERAGE INCLUDES**

Innovations in technologies spanning the entire bio-based value chain, from renewable feedstocks to end materials and products, including tools to improve conversion technologies and materials with novel properties.

**FEATURED TOPICS & TECHNOLOGIES**

C1 feedstocks | bio-oils | lignocellulosic feedstocks | sugar/starch | algae | biomass pretreatment | biomimicry | fermentation | synthetic biology | digital tools | spider silk | nanocellulose | bio-based polymers | drop-in chemicals | natural ingredients
Bio-based Materials and Chemicals

SAMPLE COMPANIES COVERED
Bio-based Aromatics Landscape
Bio-based aromatics fall under two categories

**DROP-IN REPLACEMENTS**
- Chemically equivalent to petroleum-based aromatics
- Examples: Benzene, Toluene, Xylenes, Aniline, Terephthalic acid
- Key Developers: Origin Materials, Anellotech, BioBTX, Covestro

**NOVEL AROMATICS**
- Chemically distinct from established petroleum-based aromatics
- Examples: HMF, CMF, FDCA/FDME, lignin-based aromatics
- Key Developers: Avantium, DuPont, Corbion, Origin Materials
Major downstream corporations represent the biggest driver for the commercialization of bio-based aromatics

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Challenges to commercialization
Chemically speaking, drop-in bio-based aromatics are the exact same as their petroleum-based counterparts

Drop-ins can be directly incorporated into existing product streams, providing a seemingly low barrier to commercialization
However, drop-in aromatics MUST compete on cost and largely fail to do so today.
Novel aromatics lack established downstream pathways

Even if end-products have been identified, conversions to other molecules and materials, as well as processing to final form factors have to be developed and scaled
KEY EXCEPTION: AVANTIUM

Technology

Joint Venture

Industry Partners

avantium

BASF

SYNVINA

ALPLA

TOYOBOTI

MITSUI & CO.

CRODA

polytype
The value chain for bio-based aromatics pales in comparison to that of petroleum-based incumbents
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