



Biorenewable Insights: Biobased Polycarbonates

Biobased Polycarbonates is one in a series of reports published as part of NexantECA's 2021 Biorenewable Insights program.

Overview

Conventional polycarbonates are petrochemical products that are derived from crude oil. Conversely, biobased polycarbonates are typically driven by sustainability concerns associated with the use and depletion of fossil resources and are made from biobased resources.

At present, 100 percent biobased polycarbonate is unavailable in the market. Existing commercially available biobased polycarbonates typically only have a theoretical maximum biomass content of around 60 to 70 percent.

This report aims to answer the following strategic questions:

- What are the commercially available technologies to produce biobased polycarbonates? Who are the key technology holders? What are some of the developing or alternative technologies?
- What are the recent industry developments in biobased polycarbonates?
- Is the commercially available biobased polycarbonate economically competitive versus its fossil fuel counterpart?
- What are the strategic and commercial implications of biobased polycarbonates on the industry as a whole?

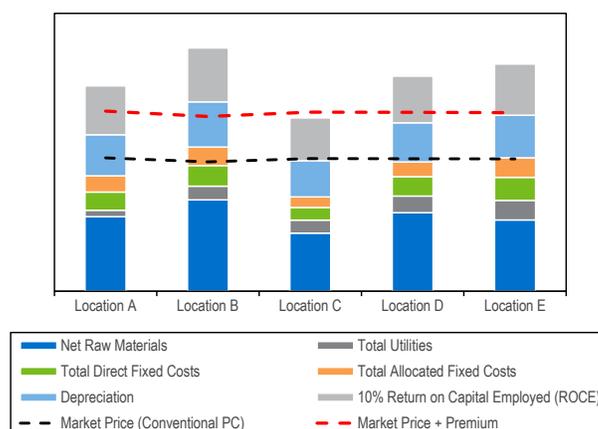
Technologies

This report covers existing and developing technologies:

- Biobased alternatives to BPA, such as isosorbide, diphenolic acid (DPA), curcumin (CM) and tetrahydro-curcumin (THCM), citric acid-derived spiro diols, eugenol
- Bio-phenol and bio-acetone
- Bio-dimethyl carbonate (DMC) and bio-diphenyl carbonate (DPC)
- Copolymerization of biobased epoxides and carbon dioxide

Process Economics

Estimates of overall competitiveness for isosorbide polycarbonate technology are presented for five locations (USGC, Western Europe, China, South Korea, Japan). Regional pricing is set on Q3 2021 basis. A qualitative discussion on the economics of mass-balance approach for the bio-phenol/bio-acetone route has also been included in this report.



Commercial Impact

The commercial impact of biobased polycarbonates on the overall industry are analyzed across four aspects: scale of production, market pull, feedstock, prices, and margins. Based on these aspects, the report examines the key consumption drivers and implications of biobased polycarbonates on the conventional polycarbonates industry in light of recent business developments.



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The BI program (sister program to the world renowned TECH program, formerly known as PERP) is globally recognized as the industry standard source of process evaluations of existing, new and emerging of interest to the renewable energy and chemical industries.

BI's comprehensive studies include detailed technology analyses, process economics, as well as capacity analysis and impacts on conventional industry. Reports typically cover:

- Trends in technology
- Strategic/business overviews and/or developer profiles
- Process Technology:
- Chemistry
- Process flow diagrams and descriptions of established/conventional, new and emerging processes
- Process economics – comparative costs of production estimates for different technologies across various geographic regions
- Capacity tables of plants and analysis of announced capacities
- Regulatory and environmental issues where relevant

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Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program, the Biorenewable Insights program (BI), and the new Cost Curve Analysis. These programs provide comparative economics of different process routes and technologies in various geographic regions.

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