



Biorenewable Insights: Biodegradable Polymers

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

Overview

- Significant effort is ongoing to develop cost-competitive biodegradable polymers, functionally suitable for widespread use. Small volumes of these polymers are already on the market, albeit at a higher cost than the non-degrading polymers they seek to displace. As sustainability and end-of-life of single use plastics becomes increasingly important in the future (as is the current trend), NexantECA expects biodegradable polymers will have significant market advantages.
- Plastic producers are actively investing in technologies under the pressure of stricter government regulations (such as plastic bag bans), and end users increased preference for sustainable materials. At the same time, consumer brands are making pledges to increase recycled and biodegradable materials content to address growing public awareness. Consumers favor environmentally friendly alternatives, resulting in bold sustainability commitments.
- Sophisticated formulations are marketed for specific applications, but these are generally applications in which the biodegradability or renewable origins of the material are a vital marketing attribute. These niche markets tend to pay higher prices for real or perceived environmental benefits, and they are growing rapidly but are orders of magnitude smaller than demand for conventional plastics.

Technologies

This report covers all currently biodegradable polymers, segregated by chemistry including:

- Polylactic Acid (PLA)
- Polybutylene adipate terephthalate (PBAT)
- Polyhydroxyalkanoate (PHA)
- Thermoplastic starch (TPS)
- Polyvinyl alcohol (PVOH)
- Polybutylene succinate (PBS)

This section will provide backgrounds, product descriptions (i.e., properties, applications, etc.), chemistry

and process descriptions (based on bio-renewable sources) for selected monomers of polyamides.

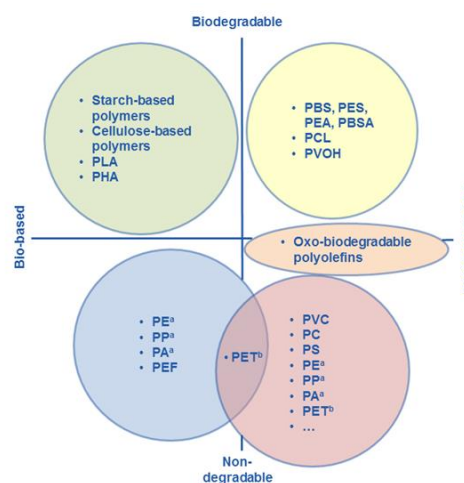
Process Economics

Biodegradable economics are based on the competitiveness of their monomers vis-à-vis conventionally produced alternatives, if applicable. Economics are presented using likely cost of production location scenarios from three major locations (US, Western Europe and China), with regional pricing, on a Q1 2021 basis. Coverage includes:

- | | |
|--------|------|
| ▪ PLA | PVOH |
| ▪ PBAT | PBS |
| ▪ PHA | TPS |

Commercial Impact

This report assesses global capacity of the relevant biodegradable polymers and assesses current impacts on conventional polymer markets where appropriate.





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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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- Cost of production tables in spreadsheet format (as requested)
- Consultation time with the project team

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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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