NexantECA

Technology and Costs

Biorenewable Insights: Bio-Based Polyamides

Bio-Based Polyamides is one in a series of reports published as part of NexantECA's 2021 Biorenewable Insights program.

Overview

Several key monomers for renewable, bio-based polyamides (PA) are already commercial and available on the market. However, the largest volume monomers (adipic acid, HMDA, and caprolactam) are the feedstocks to the largest volume polyamides (PA 6 and PA 6,6 better known as Nylon™ 6 and Nylon™ 6,6) and have remained solely petroleum-derived. Recent developments by Genomatica indicate that they are nearing commercialization of one or more of these key monomers required for large-scale polyamides supplementation with biofeedstocks.

The monomers for polyamides production are derived from bio-renewable resources such as castor oil, palm kernel oil, starch, sugar, and tallow.

The primary environmental benefits of using bio-renewable resources for the production of chemicals are:

- Reduce CO_2 and other GHG emissions related to climate change
- Reducing other pollutant emissions from the supply, processing, and use of petroleum, natural gas, coal, and petrochemicals
- If biodegradable products are produced (some types of polyamides are (e.g., PA 4)), the risks to animals, especially marine and riparian, but also terrestrial, of plastics littler hazards is reduced.
- If durable products are produced and are used indefinitely or buried in landfill, this serves to remove carbon from the atmosphere.

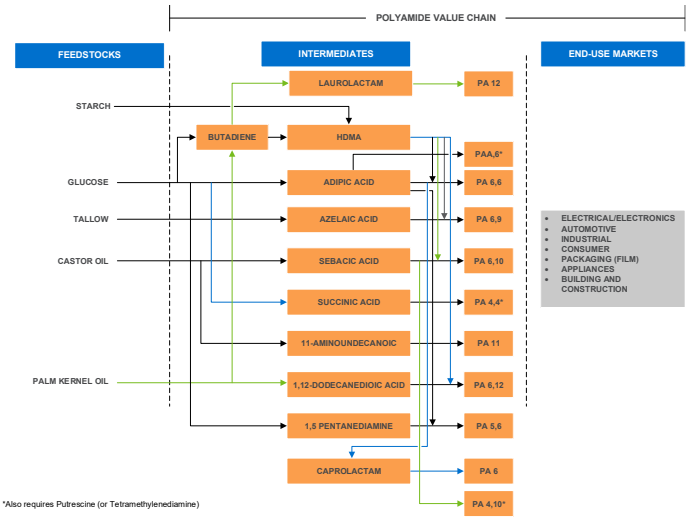
This report aims to answer the following strategic questions:

- What are the major existing technologies for bio-based PA production? Who are the key technology holders? What are some of the developing technologies?
- Are these existing and developing bio-based PA technologies competitive in terms of costs relative to fossil-based polymers?

Technologies

This report covers biotechnologies for the production of the following PA intermediates:

- Adipic Acid
- Caprolactam
- Hexamethylene Diamine (HMDA)
- Azelaic Acid
- Sebacic Acid
- 1,5-pentamethylene diamine (1,5-PDA)
- 11-Aminoundecanoic Acid and PA 11 (Rislan™)
- Additionally, others, such as succinic acid, 1,12 dodecanedioic acid, other long chain diacids, and Laurolactam are included.



Process Economics

Estimates of overall competitiveness for various leading technologies are presented for four locations (US, Brazil, Western Europe, China). Regional pricing is set on a Q1 2021 basis.

For more information. please contact
Technology@NexantECA.com or www.NexantECA.com

NexantECA

Technology and Costs

Biorenewable Insights: Bio-Based Polyamides

Subscribe to Biorenewable Insights

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

Subscription Options

A subscription to BI comprises:

- PDF reports including detailed technology analyses, process economics, as well as commercial overviews and industry trends
- Cost of production tables in spreadsheet format (as requested)
- Consultation time with the project team

An annual subscription to BI includes 10 reports published in a given program year. Reports can also be purchased on an individual basis, including reports from previous program years.

For more information, please contact
Technology@NexantECA.com or www.NexantECA.com

NexantECA

NexantECA Subscriptions & Reports provide clients with comprehensive analytics, forecasts and insights for the chemicals, polymers, energy and cleantech industries. Using a combination of business and technical expertise, with deep and broad understanding of markets, technologies and economics, NexantECA provides solutions that our clients have relied upon for over 50 years.

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.

NexantECA serves its clients from over 10 offices located throughout the Americas, Europe, the Middle East, Africa, and Asia.

Americas
Tel: +1 914 609 0300
44 S Broadway,
5th Floor White Plains
NY 10601-4425
USA

Europe, Middle East & Africa
Tel: +44 20 7950 1600
110 Cannon Street
London EC4N 6EU
United Kingdom

Asia Pacific
Tel: +662 793 4600
22nd Floor, Rasa Tower I
555 Phahonyothin Road
Kwaeng Chatuchak
Khet Chatuchak
Bangkok 10900
Thailand

For more information. please contact
Technology@NexantECA.com or www.NexantECA.com