



Polyolefins Technology Report -2020

Polyolefins Technology Report - 2020 is one in a series of reports published as part of Nexant's Sector Technology Analysis program.

Overview

Polyethylene and polypropylene are the most common polyolefins that are commodity and specialty plastics, which are used globally in a wide range of market segments, including packaging, consumer products, agriculture, pipe and conduit, storage containers, building and construction, and automotive.

Three primary forces drive technology development: product performance (improved properties, new applications), process technology (increased plant scale, simplified design), and process chemistry (new catalysts, increased yield). This report provides an updated overview of the technological and economic aspects of the technologies used to produce low density polyethylene (LDPE), linear low density polyethylene (LLDPE), high density polyethylene (HDPE) and polypropylene (PP), covering more than 30 technologies.

Commercial Technologies

The report covers all major licensed technologies as well as technologies that are not licensed but are important to the polyolefins industry. Profiles, covering recent developments, background (including lists of plants employing the technology), and process description, are presented for technologies developed by:

- LDPE – Tubular – ExxonMobil, LyondellBasell, SABIC, Versalis
- LDPE – Autoclave – ExxonMobil, ECI Group (formerly ICI/Simon Carves), LyondellBasell, Versalis
- LLDPE and Swing – Gas Phase – INEOS, LyondellBasell, Mitsui, Univation
- LLDPE and Swing – Solution – Borealis, Dow, NOVA
- HDPE (Dedicated) – Ziegler Slurry – LyondellBasell, Mitsui
- HDPE (Dedicated) – Slurry Loop – Borealis, Chevron Phillips, INEOS
- HDPE (Dedicated) – Gas Phase – LyondellBasell, Univation
- Polypropylene – Gas Phase – Grace, INEOS, Japan Polypropylene, Lummus Novolen Technology, LyondellBasell, Sumitomo
- Polypropylene – Bulk – Borealis, ExxonMobil, LyondellBasell, Mitsui

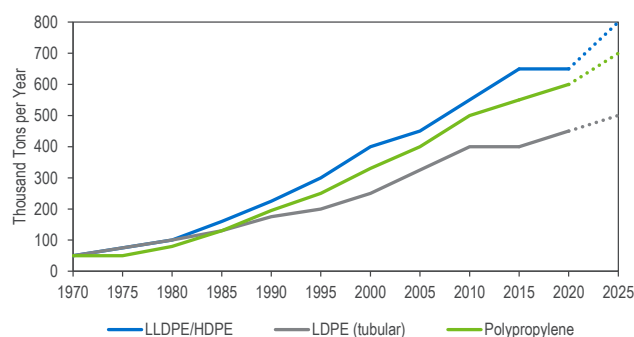
Process Economics

Detailed cost of production estimates are developed on a 1Q20 basis for plants located in the United States Gulf Coast (USGC), coastal China, and the Middle East for various technologies for the following resin types:

- LDPE – homopolymer LDPE, EVA (18% VA), EVA (28% VA)
- LLDPE – conventional LLDPE film (butene-1, hexene-1, octene-1), second generation (metallocene/single site and easy processing) LLDPE film (butene-1, hexene-1, octene-1)
- HDPE – homopolymer injection molding grade, copolymer bimodal film grade, copolymer bimodal pipe grade
- Polypropylene – homopolymer injection molding grade, impact copolymer automotive grade

Estimates reflect the current capital cost environment and state-of-the-art plant scale.

Typical Single Line Plant Capacity





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Technology and Costs Programs

Nexant's Technology and Costs Programs examine the impact of new, emerging and improved industrial technologies on the comparative economics of different process routes in various geographic regions, as well as the cost competitiveness of individual production plants.

These include:

- Technoeconomics – Energy & Chemicals (TECH)
- Biorenewable Insights
- Cost Curves: COMING SOON!
- Sector Technology Analysis

Sector Technology Analysis

As part of the Technology and Costs Programs, Nexant issues regularly a series of reports focusing on the technology developments and comparative economics within a particular industry sector.

The Polyolefins Technology Report, formerly known as the POPS Technology Report, is published on a biennial schedule and provides technology analysis for all polyethylene resins (LDPE, LLDPE and HDPE) and polypropylene in a single study. The report includes comparative process economics for all major licensed technologies, as well as technologies not licensed but important to the polyolefins industry. Factors within the industry and the external market that shape technology development and competitive positioning are also examined.

For more information please contact
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Nexant Subscriptions and 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, Nexant provides solutions that our clients have relied upon for over 50 years.

Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program (formerly known as PERP), the Biorenewable Insights program (BI), the Sector Technology Analysis, 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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