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# Isoprene Process Summary

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### Abstract

In this process summary, we review isoprene production processes and present key features and production economics for them. The processes covered include isoprene production from (1) C<sub>5</sub> fraction by dimethylformamide (DMF) extractive distillation, (2) isobutylene and formaldehyde two-step process, (3) acetone and acetylene, (4) amylenes, (5) C<sub>5</sub> stream by distillation, (6) Kuraray one-step process, (7) pygas C<sub>5</sub> cut by solvent extraction (GTC process), and (8) biobased isoprene. We look at these processes for four major global regions. The process economics include estimated capital costs, variable costs, direct costs, plant cash costs, and full production costs in third quarter 2016 (snapshot economics). We also present carbon footprint and water consumption comparison data for the all these competing processes. A brief market overview summarizes the global supply and demand and end-use markets and demand drivers.

The third quarter 2016 snapshot economics are obtained by using unit price of raw materials, by-products, utilities, labor, and construction cost at the time. To take into account of the fluctuation of prices, this review highlights a new iPEP Spectra™ cost module, developed by the IHS Chemical Process Economics Program (PEP), in which production economics are presented in a time series from 2000 to third quarter 2016, quarterly. The iPEP Spectra™ data module is written in Microsoft Excel pivot tables, which provides a powerful interactive tool to allow our clients maximum flexibility in selecting competing technology and production location and comparing production cost at various levels, such as variable costs, cash costs, or full production costs, as well as margins. The cost module is included with the full process summary on the PEP website. An iPEP Spectra™ historical economics comparison provides a more comprehensive way to compare the economics of competing technologies over a long period of time, leading to a more valid investment decision.

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