NexantECA

Technology and Costs

Biorenewable Insights: Biomethanol as a Platform Chemical

Biomethanol as a Platform Chemical is one in a series of reports published as part of NexantECA's 2021 Biorenewable Insights program.

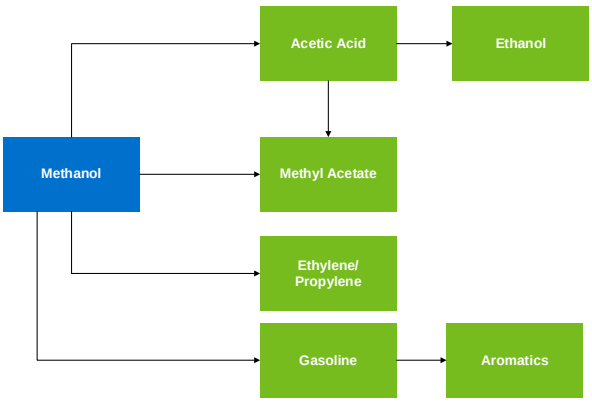
Overview

Sometimes referred to as the "Swiss army knife of the chemical industry" or "liquid syngas," methanol can be transformed into almost any other carbon-containing petrochemical or fuel via (mostly) commercially proven and proliferated technologies. Low carbon intensity production of biomethanol can therefore be used to lower the carbon intensity of all the existing downstream petrochemical value chains as well. This fact, combined with its potential as a biofuel—particularly for marine applications, is driving interest and capacity developments in the space.

Many chemical and energy companies have committed to carbon neutrality by 2050. Renewable feedstocks and energy (along with carbon capture) are expected to play a large role in meeting these goals.

Technologies

Biomethanol can be commercially produced via feedstock switching of conventional natural gas-based technologies to biogas, biomass (including MSW) gasification, or so-called power-to-methanol technologies involving green hydrogen and carbon dioxide. Each has a different outlook, different carbon intensity, and different profile. In turn, methanol currently is commercially used to produce a variety of derivatives. molecules that have significant potential to transform the chemicals industry.



Process Economics

Cost of production models for USGC, Western Europe and China are shown for:

- Methanol via:
  - Biogas
  - MSW Gasification
  - Power + CO_2
- Methanol Derivatives:
  - Acetic Acid
  - Ethanol
  - Ethylene
  - Propylene
  - Gasoline
  - Aromatics

Carbon Intensity

NexantECA has developed a methodology for estimating production carbon intensity (Scope 1 and Scope 2 carbon dioxide equivalent emissions) that involves using:

- The consumption factors for raw materials, byproducts, and utilities from our cost of production models
- Regionally/Country-specific emission factors for the different raw materials and utilities

Emissions for raw materials and utilities are divided equally onto all products and byproducts, either by mass or by energy content, depending upon the technology and the product type (e.g., chemical or fuel). These are then compared to other routes and benchmarks, as well as investigated in various carbon credit value scenarios.

Carbon intensity calculations are shown for all technologies covered at the cost of production level.

Capacity

NexantECA has cataloged all existing renewable methanol capacity and announcements of planned capacity (by technology type) out to 2030 and provides project profiles.

For more information. please contact
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Subscribe to BI

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.

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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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