



TECH 2023-2: VCM/EDC

VCM/EDC is one in a series of reports published as part of NexantECA's 2023 Technoeconomics – Energy & Chemicals (TECH) program.

Overview

Ethylene dichloride (EDC), also known as 1,2-dichloroethane, is a clear colorless liquid used in the manufacturing of vinyl chloride monomer (VCM) which is further polymerized to polyvinyl chloride (PVC), a major commodity thermoplastic. The properties of PVC make it an ideal construction material for pipes, fittings and flooring applications. Other PVC uses include packaging, medical, furniture and automotive applications.

VCM production by the mercury chloride catalyzed reaction of acetylene with hydrogen chloride (HCl) was the dominant route until the early 1950s. Ethylene-based routes have become more prevalent in subsequent decades. Due to technological advancement discussed in this report, acetylene routes are now seeing increased growth especially in China.

This report provides a detailed description of both ethylene and acetylene route technologies and presents an in-depth analysis of the process economics for each technology. This addresses key issues such as:

- What are the major technologies for ethylene dichloride and vinyl chloride monomer production and who are the licensors?
- What are the business considerations in building an EDC or VCM plant?
- What is the cost competitiveness for each of the technology routes and how regions effects investment decisions?
- How have historical price changes affected profitability of each technology in different parts of the world?
- How clean is each of the technologies and what is the carbon intensity associated with production through each technology?
- What are the current green developments or decarbonization efforts in the industry? And how sustainable are they?

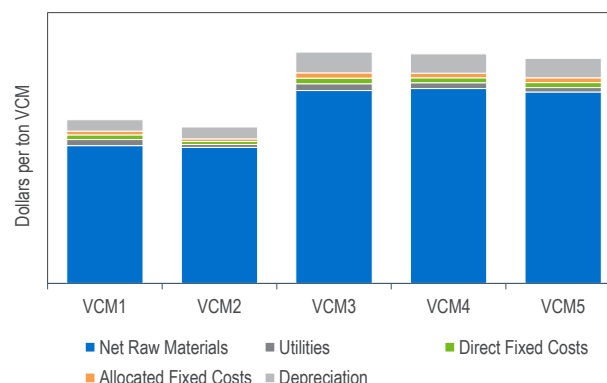
Commercial Technologies

This report covers major commercially available EDC production technologies and both ethylene and acetylene route VCM production technologies. Main licensors included in the analysis are Westlake Vinnolit, INEOS and Johnson Matthey along with generic assessment for both EDC and VCM productions.

Process Economics

Detailed cost of production estimates for the major EDC and VCM processes are presented in this report under a typical world scale design basis. Regional production economics and investment analysis are provided for United States, Western Europe, China and Middle East.

Regional Cost of Production Comparisons



Commercial Overview

Global VCM capacity reached 53.6 million tons per year in 2022, an increase of 2.4 million tons per year compared to 2021. The proportion of VCM produced from acetylene globally has started to decrease as there has been greater focus on ethylene-based developments and investments in China.

In the longer term, capacity development will continue to be driven principally by China. Developments in other regions are expected to be limited over the near term due to the significant capacity additions in China.



TECH 2023-2: VCM/EDC

Subscribe to TECH

The TECH program (formerly known as PERP) is globally recognized as the industry standard source of process evaluations of existing, new and emerging technologies of interest to the energy and chemical industries.

TECH's comprehensive studies include detailed technology analyses, process economics, as well as commercial overviews and industry trends. Reports typically cover:

- Trends in chemical technology
- Strategic/business overviews
- 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
- Overview of product applications and markets for new as well as established products
- Regional supply and demand balances for product, including capacity tables of plants in each region
- Regulatory and environmental issues where relevant

Subscription Options

A subscription to TECH comprises:

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

An annual subscription to TECH includes twenty 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 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