

Introduction

Johnson Matthey and NextChem, by means of its subsidiary MyRechemical, have commercially developed an integrated 'waste to methanol' technology. This cooperation allows the provision of a single license for the overall 'waste to methanol' process and related services, starting from feasibility studies to full EPC.

The process scheme includes the following steps:

- High temperature partial oxidation of the waste feedstock to generate a pre-cleaned syngas
- Additional syngas purification to meet requirements for catalysts of the downstream sections
- Syngas conditioning to achieve the correct syngas module value for methanol production
- Methanol synthesis loop
- Methanol distillation in order to produce the desired grade for the final product

Typical capacity

'Waste to methanol' process is currently tailored to convert 200 kton waste per year leading to production of over 100 kton per year of methanol.

Benefits

Environment

The flowsheet is a perfect fit to the principles of the circular economy, with the high temperature partial oxidation technology allowing the conversion of waste and biomass that would otherwise be sent to landfill or incineration, into fuel or new chemicals, safely and efficiently.

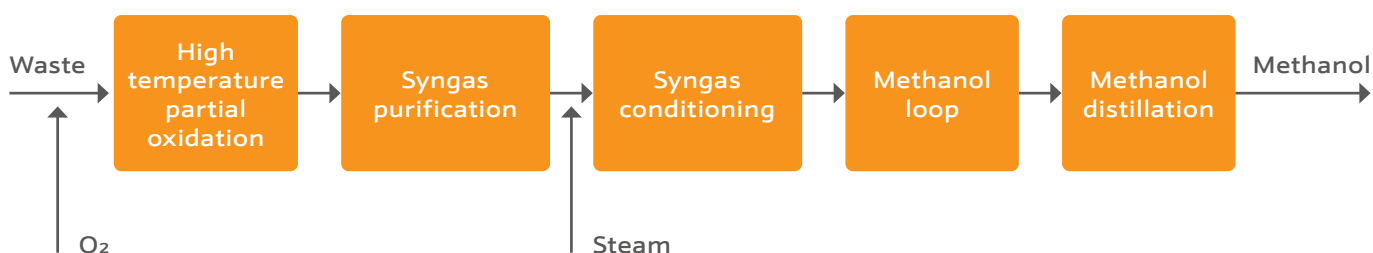
This combined approach generates less than half the CO₂ related to conventional approach, contributing to the goals of companies and governments around the world.

Economics

'Waste to methanol' provides a competitive cost of production. In addition, the methanol derived from Municipal Solid Waste (MSW) is eligible, pursuant to RED European Directive, to be classified as a recycled carbon fuel or advanced biofuel, depending on the origins of carbon in the feedstock - fossil or biogenic.

Reliability

While the integrated 'waste to methanol' flowsheet is innovative in its structure, each section of the flowsheet uses industrially-proven technology to ensure the high reliability of the flowsheet.



About Johnson Matthey

Johnson Matthey is a global leader in science that enables a cleaner and healthier world. With over 200 years of sustained commitment to innovation and technological breakthroughs, we improve the performance, function and safety of our customers' products. Our science has a global impact in areas such as low emission transport, pharmaceuticals, chemical processing and making the most efficient use of the planet's natural resources. Today more than 15,000 Johnson Matthey professionals collaborate with our network of customers and partners to make a real difference to the world around us. For more information, visit www.matthey.com Inspiring science, enhancing life.

About NextChem

NextChem is Maire Tecnimont Group's company for the development of technologies for green chemistry and energy transition. NextChem's roadmap is focused on three clusters: Greening the Brown, for the reduction of emissions; Circular Economy, for mechanical and chemical recycling; Green-Green, for biofuels and bioplastics. NextChem portfolio includes also different technologies to produce low carbon hydrogen: Electric Blue™ hydrogen, produced using traditional technologies but with CO₂ capture and electrified process; Green Hydrogen, produced by electrolysis using renewable energy sources; Circular Hydrogen™, produced by chemical conversion of waste. NextChem has developed the Green Circular District Model in which integrates Upcycling technology and chemical recycling of plastic waste and dry waste into syngas and 'circular' chemicals with technologies for the production of hydrogen from renewable sources by electrolysis. This model integrates proprietary and licensed technology already proven, available and ready to be industrially implemented, and it allows to realize industrial projects which are environmentally, socially and economically sustainable.

About MyRechemical

MyRechemical is NextChem's company for waste to chemical technologies. MyRechemical is entirely dedicated to the technologies for chemical conversion of non recyclable waste for the production of circular hydrogen, methanol, ethanol and other low carbon derivatives. MyRechemical's technological portfolio allows to produce different chemical products and circular fuels, low carbon and high value added. Circular products, obtained by chemical conversion of waste, allow to reduce CO₂ emissions when used in place of products derived from hydrocarbons and to avoid emissions generated by waste incineration, increasing the recycling rate.



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