Biofuels & e-Fuels

Consultant / Trainer:
Dr. Colin Schaverien

The **Petrogenium.** Biofuels & e-Fuels course provides a comprehensive overview of both first generation, and especially, advanced biofuels, and the processes for producing them. It also gives an overview of e-fuels or synthetic fuels technologies & technology routes starting from renewable electricity to make green hydrogen and conversion to e-fuels by the FischerTropsch process, to e-based methanol and e-based ammonia. The course can be five half-days or 2-3 full days dependent on the client.

Participants

This **Petrogenium.** course can be tailored for awareness/inexperienced staff, for intermediate and for experienced personnel. Furthermore the course can be customized to your specific requirements and interests. The option for post-course consultancy/help-desk support is also available.

Participants may include: scientists and technologists from oil & gas, petrochemical and pulp & paper or other bio/e-fuel industries; business managers; government departments interested in renewables; investors from venture capitalists and financial institutions will also highly benefit from this course.

Learning Objectives

The course participant will gain a deep and thorough understanding and critical comprehension of biofuels and e-fuels, their promise for the future as well as an appreciation of the technical and economic challenges and the role of government legislation, mandates & subsidies and feedstocks. In particular the pros and cons of the various biofuels and e-fuels processes, their scaling up towards commercialisation, their chances of success looking to 2025, 2030 and beyond, are presented.

Programme

1st half day: Introduction to biofuels

- 1st generation biofuels such as ethanol and FAME, the current default solutions for blending in gasoline and diesel.
- Hydrotreated Vegetable Oils (HVO) for diesel
- Coprocessing of vegetable oils in refinery units such as HDS units

2nd half day: Advanced biofuels

Practical and technology aspects of the hydrotreating processes and coprocessing of VO

- Cellulosic ethanol and butanol, asification of biomass to methanol
- Gasification Fischer Tropsch to BTL
- Introduction to e-fuels from FischerTropsch processes, to methanol, and to ammonia
- Renewables legislation and subsidies, especially in USA and EU

3rd half day: Advanced biofuels (cont.)

- Sustainable Aviation Fuels, Lanzatech's conversion process, alcohol routes to renewable jet and diesel, pyrolysis oil from biomass and from waste plastics, hydrothermal liquefaction and algae as a CO2 sink to produce lipids
    - Practical examples

4th half day: E-fuels - in depth discussion of the various e-fuels and routes

- Technology maturity assessment, scale-up risks, TRL
- Integration of technologies into existing production routes
- Green electricity: basic options, cost projections, associated risks & uncertainties
- Sourcing of (green) CO2 feedstocks (options, issues & technologies)
- Basic economic assessments, projections and costs
- Projected market potential of products in e-fuels

5th half day:

Mandates and biofuels incentives

Feedstock availability

Technology readiness levels (TRL)

Carbon intensity of routes