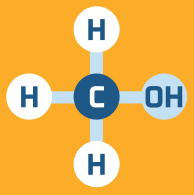
Green Methanol (CH_3OH)

Green methanol can be made by combining sustainably produced hydrogen and CO_2 captured from renewable sources. Limited availability of sustainable CO_2 and huge potential demand from aviation make green methanol less financially attractive for shipping.

Chemistry

Methanol (CH_3OH), also called methyl alcohol amongst others, is the simplest alcohol, consisting of a methyl group (CH_3) linked with a hydroxy group (OH).



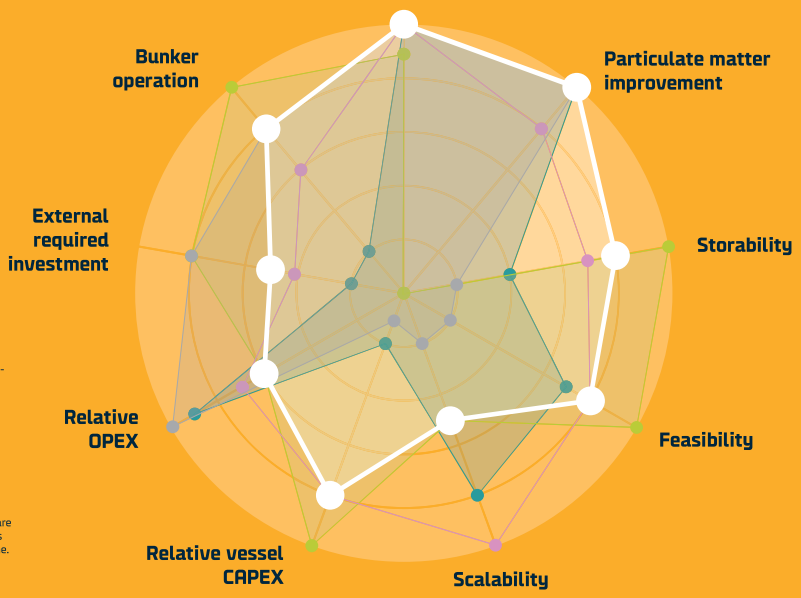
Characteristics

A poisonous, light, volatile, colourless, flammable liquid with a distinctive alcoholic odour similar to that of ethanol (drinking alcohol) in ambient environments.

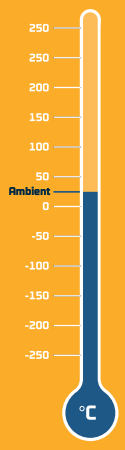
Potential for explosion hazard, equipped with provisions for pressure relief in order to accommodate thermal expansion.

Methanol is highly flammable. Its vapours are heavier than air. It forms explosive mixtures with air and burns with a nonluminous flame. It is completely miscible in water.

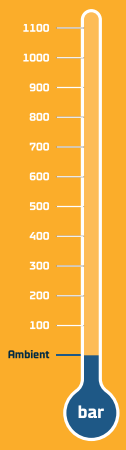
Greenhouse gas improvement



Storage Temperature



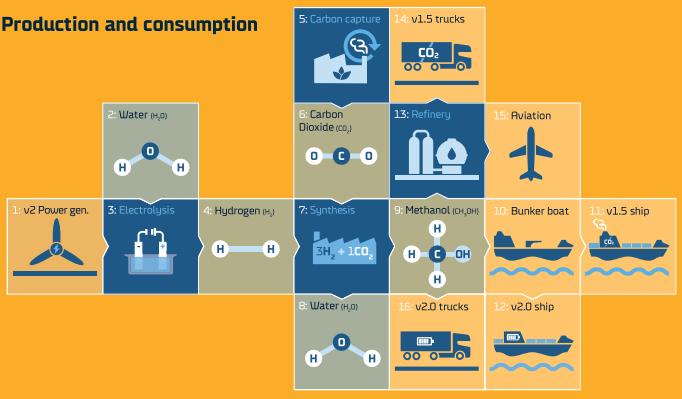
Storage Pressure



Energy density

	MJ/L	MJ/kg
Hydrogen (pressure)	4.7	120
Hydrogen (cryogenic)	9.7	120
Ammonia	11.3	18.4
Ammonia -33°	11.3	18.4
Methanol	15.6	19.7
Pyrolysis (MASH)	35.8	36.5
Electricity	3.6	0.7
HFO	42.1	42.6
LNG -162°	20.3	48

Production and consumption



Green methanol is made by using renewable electricity [1] to split water [2] into hydrogen and oxygen in an electrolysis process [3]. The hydrogen, combined with short-cycle CO_2 captured from renewable sources such as flue gas from biomass combustion [5], is synthesised into methanol [9] and water [8]. Methanol is a proven fuel for normal dual-fuel ship engines [11], but it can also be used as fuel for fuel cells, which can be used for new generations of very simple ships [12] and trucks [16].

By processing the methanol at an oil refinery [13], it is possible to make sustainable diesel for trucks [14] and sustainable jet fuel for aviation [15].

Learn more online about green methanol, check out relevant DFDS projects and join the dialogue.

Magnolia Seaways

Gothenburg – Immingham

	M³	Tons
Hydrogen (pressure)	707	28
Hydrogen (cryogenic)	343	28
Ammonia	294	181
Ammonia -33°	294	181
Methanol	213	169
Pyrolysis (MASH)	93	91
Electricity	923	4747
HFO	79	78
LNG -162°	164	69

DFDS