Onboard Carbon Capture and Usage (OCCU) for PtX fuels

Maritime transport plays a central role in the global supply of goods and raw materials. Despite its low greenhouse gas emission intensity, it poses a major challenge for international climate protection, accounting for around three per cent of total global greenhouse gas emissions – comparable to the aviation sector. To achieve the agreed global climate goal, it is necessary to ramp up the production for low- and zero-carbon fuels as soon and fast as possible. Power-to-X (PtX) fuels represent the scalable path to the future in this regard, but most options require carbon sources in addition to green hydrogen, like eMethanol. If biofuels or PtX fuels derived from sustainable carbon sources (like direct air capture and from residual biomass) are used on ships, OCCU could possibly be part of a sustainable carbon circular economy. The presentation will focus on the techno-economic framework conditions of existing onboard carbon capture systems, possible hurdles in implementation and an outline of possible circular value chains, taking into account sustainable fuels in aviation and maritime transport. The International Maritime Organisation has initiated the development of a regulatory framework for Onboard Carbon Capture and Storage (OCCS), and the EU has incorporated CCS and CCU into the EU ETS under specific conditions. The key question to be considered in the current discussion is whether OCCS and OCCU are useful bridging technologies, permanent solutions or should be rejected from a climate protection perspective.