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LNG COLD VALORIZATION FOR LIQUID CO₂ PRODUCTION

Carbon capture usage and storage (CCUS) projects are increasingly emerging to decarbonate industries. In the CCUS chain, CO₂ transportation conditions sometimes requires a liquefaction step, especially for maritime transportation. Therefore as part of the global chain, ENGIE Lab CRIGEN studied CO₂ liquefaction through process review and model the different existing processes under Aspen Hysys®. As LNG terminals are located in port and industrial areas, synergies between CO₂ capture at emissions sites, its liquefaction for maritime export at LNG terminal is possible. Indeed frigorities may be recovered from LNG regasification in order to provide the necessary cold to liquefy CO₂. LNG boil-of-gas may also be used as cold source for CO₂ liquefaction.

A liquefaction process with LNG as only source of cold was design and its technical performance assessed. The study showed that the use of LNG allows to reduce CO₂ liquefaction energetic consumption. The variations of LNG/BOG flowrates and of the available cold on terminal may be compensated by adapting the compression power of the CO₂ inlet. Finally, a techno-economic analysis of CO₂ liquefaction different processes was made to compare them with "free-cold" process thank to LNG cold. It highlighted that the use of LNG can lead to costs reduction in CO₂ the liquefaction step.

To view the full conference agenda, visit <https://www.lng2023.org/lng-programme-overview>