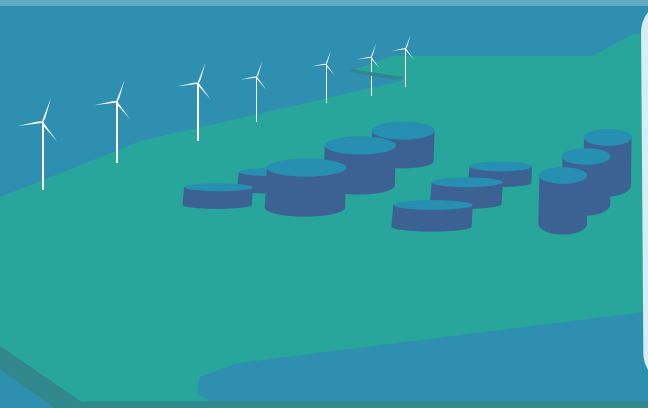
MAGPiE
SMART GREEN PORTS

E-METHANOL PRODUCTION

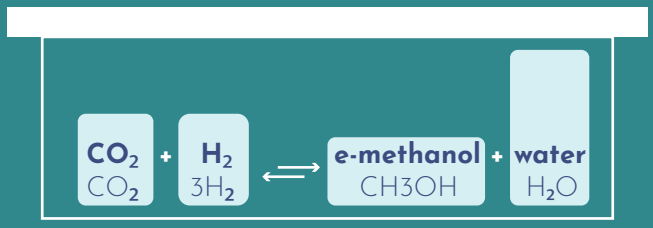
This technology showcases e-methanol production uses from CO_2 and H_2. The use of EMM/SIENNA technology to synthesize e-methanol directly is not competitive with state-of-the-art methanol production. Therefore this technology uses methanol synthesis via separation-enhanced reverse water-gas-shift reaction (R-WGS), using the EMM/SIENNA technologies.



Value proposition

- *By selective removal of reaction products via membrane, the conversion per pass can be increased significantly, hence decreasing energy demand for recycling and reducing CAPEX and OPEX*
- *Create e-methanol via R-WGS using separation-enhanced separation (EMM or SIENNA)*
- *Additional advantage of the R-WGS route is the much lower temperature (<275°C)*

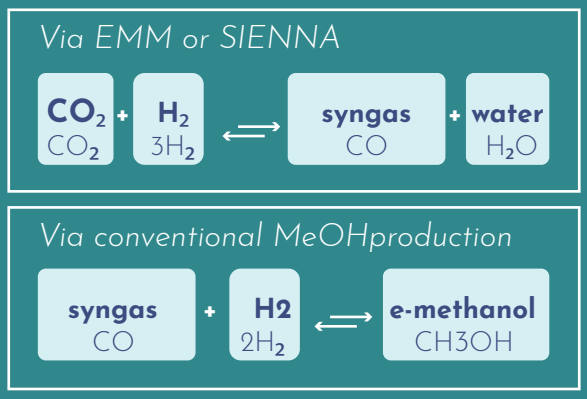
Current production of e-methanol



Current production of e-methanol has thermodynamic limitations:

- **Reaches its equilibrium before there is much methanol**
- **Methanol formation is reduced**
- **Not efficient in methanol production**

Reverse water-gas-shift reaction to produce e-methanol

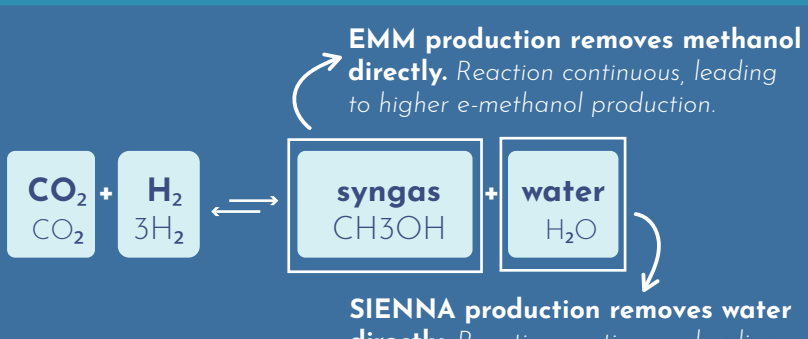


Use seperation-enhanced technologies to:

- **Overcome thermodynamic limitations**
- **Improve syngas conversion efficiency**

Current Progress Status

1. Launch of demonstrator; 2. Elaboration of KPIs, Operation characterization and modelling, and ongoing studies; 3. Testing phase in lab and data collection; *4. Simulations and testing phase in pilot area; 5. Results and commercially available; 6. Ready to scale up*



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Partners involved: TNO innovation for life