



# Carbon Capture Utilization & Storage

**SIEMENS**



**“We create best-in-class  
sustainable value for you.”**

Hermann Kleinod,  
CEO of Large Drives Applications, Siemens AG





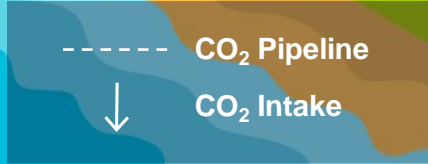
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“To keep temperature rise within 1.5°C as outlined in the Paris Agreement and prevent the worst impacts of climate change, the world will need to reach net-zero carbon emissions by around midcentury, removing and storing as much carbon dioxide from the air as we put into the atmosphere.”

– hence **CCUS**



# Evolving CO<sub>2</sub> Ecosystem ...



Offshore Platform

CO<sub>2</sub> Transport

Gas

Cement Plant

Power Plant

SMR

H<sub>2</sub>

CO<sub>2</sub> Storage

DAC

Depleted Reservoir

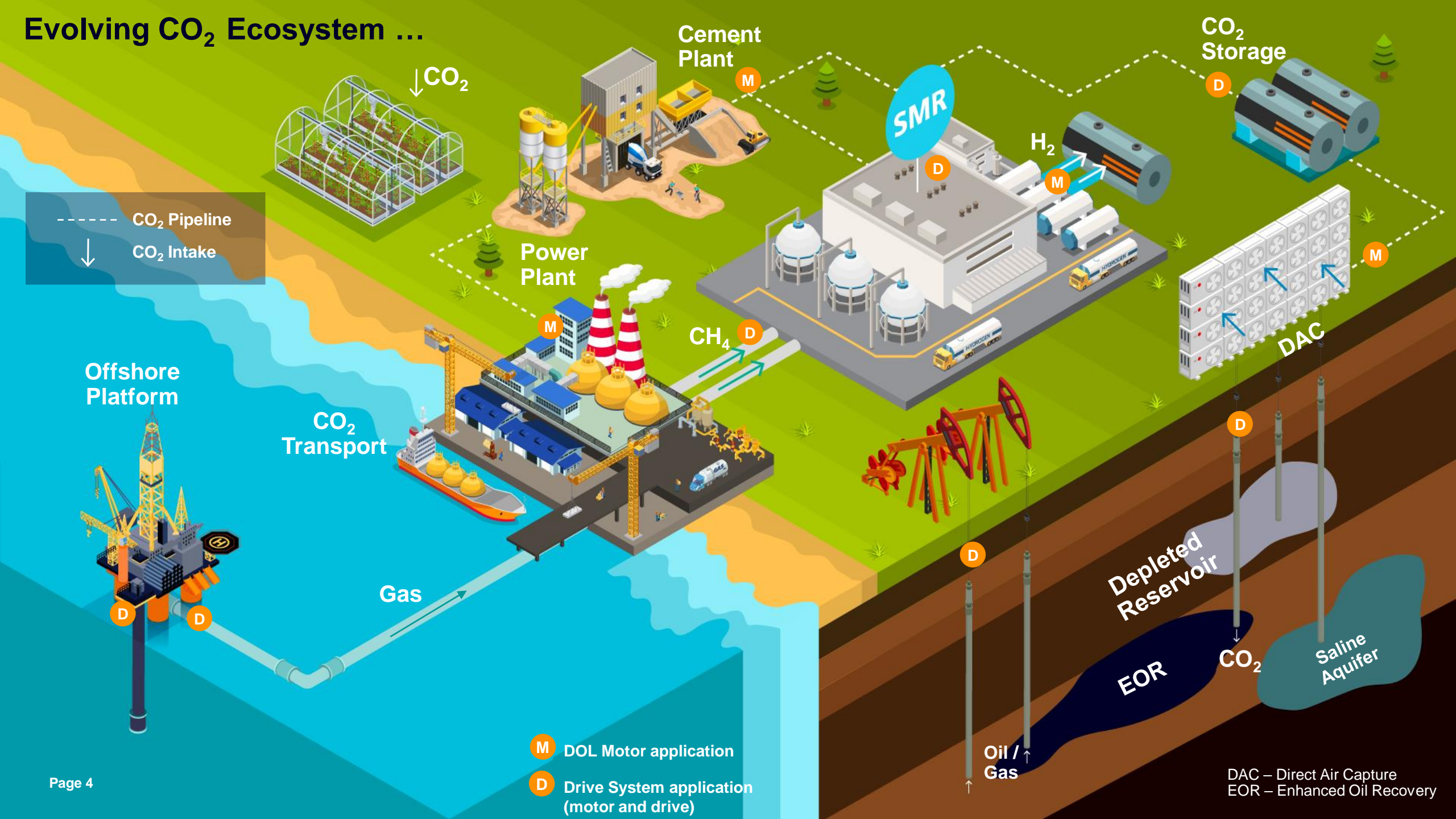
EOR

Saline Aquifer

Oil / Gas

DAC – Direct Air Capture  
 EOR – Enhanced Oil Recovery

- M** DOL Motor application
- D** Drive System application (motor and drive)



# CCUS projects – Siemens Large Drives Applications and involved Products

## CO2 Compressors



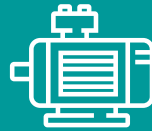
Screw / Recip / Centrifugal depending upon storage option and CO<sub>2</sub> capture volumes, water content etc.

## Multistage Centrifugal Pumps



Applicable for CO<sub>2</sub> pipeline as boosters

## Motors








SIMOTICS HV C, SIMOTICS HV M, SIMOTICS HV HP

## Drives



SINAMICS PERFECT HARMONY GH180 & SINAMICS PERFECT HARMONY GH150 as continuous and starting converters






# First use of Carbon Capture Technology in Fossil Power Plants

<b>Customer profile</b> 	<ul style="list-style-type: none"> <li>• End User: Power Station, Canada</li> <li>• OEM: Compressor manufacturer from Europe</li> </ul>
<b>Customer objectives</b> 	<ul style="list-style-type: none"> <li>• Fossil fuels continue to play a significant role in the global energy portfolio as a bridging technology before green power will be fully available</li> <li>• Securing the viability of sustainable fossil fuel plants</li> </ul>
<b>Siemens solution</b> 	<p><b>Siemens Drive Train</b></p> <ul style="list-style-type: none"> <li>• 1 x Siemens Synchronous Motor H-Modyn 15 MW, 13,2 kV, 60 Hz, Water cooling</li> <li>• 1 x Siemens Excitation Unit</li> <li>• 1 x Siemens Converter SINAMICS GL150 (LCI Drive)</li> <li>• 2 x Transformers GEAFOL (Step-down, Step-up)</li> </ul>
<b>Customer value</b> 	<ul style="list-style-type: none"> <li>• Reduction of CO<sub>2</sub> emissions of 115 MW power block by 90%</li> <li>• Reduction of SO<sub>2</sub> emissions by 100%</li> <li>• First power station block in the world to use Carbon Capture Technology</li> </ul>
<b>Why Siemens?</b> 	<ul style="list-style-type: none"> <li>• Siemens wide portfolio of solutions, expert knowledge, reputation and reliability made it trusted partner of choice</li> <li>• Siemens Drive Train Solution applicable on majority of the world's fossil power plants</li> <li>• Siemens access to System Safety Certifications (here: CSA)</li> </ul>

**Carbon Capture and Storage (CCS) technology is critical to securing the viability of sustainable fossil fuel plants in the country and around the world**








# First use of Carbon Capture Technology in LNG Plants

<b>Customer profile</b> 	<ul style="list-style-type: none"><li>• End User: LNG plant in Australia</li><li>• OEM: Compressor manufacturer from Europe</li></ul>
<b>Customer objectives</b> 	<ul style="list-style-type: none"><li>• Reduce CO<sub>2</sub> emissions in order to achieve net-zero targets</li></ul>
<b>Siemens solution</b> 	<p><b>Siemens Drive Train</b></p> <ul style="list-style-type: none"><li>• 6 x Siemens Synchronous Motor H-Modyn, 14.6 MW, 11 kV, 50 Hz, Water cooling</li><li>• 6 x Siemens Excitation Unit</li><li>• 6 x Siemens Converter SINAMICS PERFECT HARMONY GH180 VFD (VSI)</li></ul>
<b>Customer value</b> 	<ul style="list-style-type: none"><li>• To become one of the most greenhouse-gas efficient liquefied natural gas (LNG) developments in the world (when built).</li></ul>
<b>Why Siemens?</b> 	<ul style="list-style-type: none"><li>• Siemens wide portfolio of solutions, expert knowledge, reputation and reliability made it trusted partner of choice</li><li>• Siemens Drive Train Solution applicable on majority of the world's LNG plants</li><li>• Siemens local technical and service support</li></ul>

Reduction of CO<sub>2</sub> emissions by capturing and reutilizing or storing is a key milestone to achieve net-zero targets



# First Carbon midstream company using Siemens VFD Technology

<b>Customer profile</b> 	<ul style="list-style-type: none"><li>• End User: Carbon transport company in Canada</li><li>• EPC: Based in Canada</li></ul>
<b>Customer objectives</b> 	<ul style="list-style-type: none"><li>• Provide carbon transport infrastructure to facilitate CCUS for network of carbon polluters</li></ul>
<b>Siemens solution</b> 	<ul style="list-style-type: none"><li>• Siemens Drives:<ul style="list-style-type: none"><li>• 1 x 5000 HP Siemens SINAMICS PERFECT HARMONY GH180 VFD with Synchronous transfer for 15000 HP pipeline compressor</li><li>• 1 x 3000 HP Siemens SINAMICS PERFECT HARMONY GH180 VFD with Synchronous transfer for 3x pipeline compressor motors</li></ul></li></ul>
<b>Customer value</b> 	<ul style="list-style-type: none"><li>• No pollution, no tax!</li></ul>
<b>Why Siemens?</b> 	<ul style="list-style-type: none"><li>• Siemens wide portfolio of solutions, high reliability and local expert knowledge made it partner of choice</li><li>• Superior harmonics performance and savings on carbon Tax due to Sinamics GH180 VFDs</li><li>• Siemens local technical and service support</li></ul>

**Transporting CO<sub>2</sub> to ensure safe storage allows to savings without Carbone Taxes and without pollution**





# Disclaimer

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