Carbon Capture Utilization & Storage

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“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**

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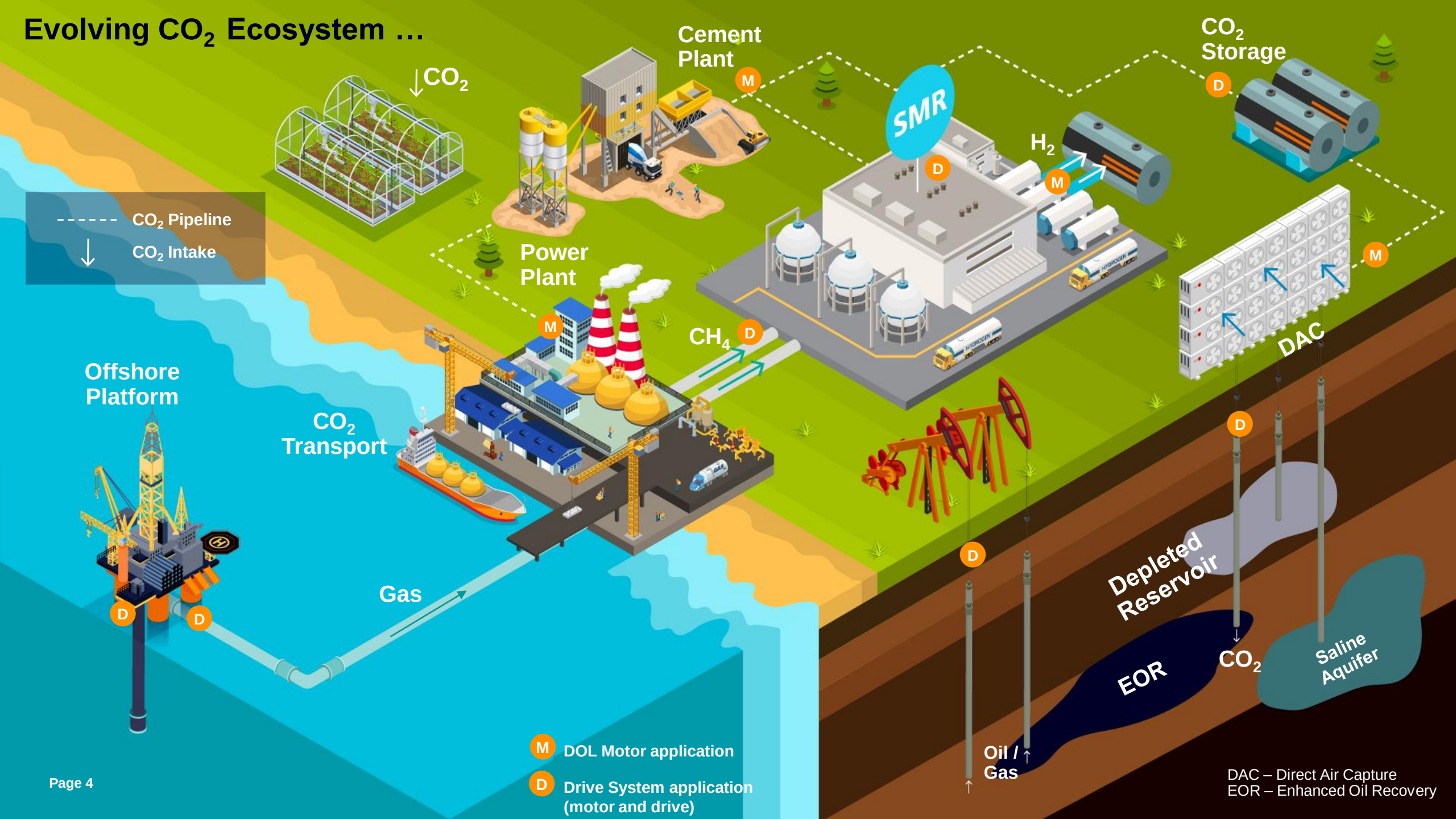
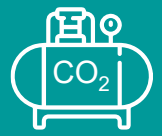
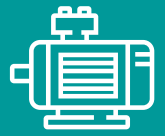
Evolving CO_2 Ecosystem …



DAC – Direct Air Capture
EOR – Enhanced Oil Recovery

CCUS projects – Siemens Large Drives Applications and involved Products

CO2 Compressors 	Screw / Recip / Centrifugal depending upon storage option and CO_2 capture volumes, water content etc.
Multistage Centrifugal Pumps 	Applicable for CO_2 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

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First use of Carbon Capture Technology in Fossil Power Plants

Customer profile	• End User: Power Station, Canada • OEM: Compressor manufacturer from Europe
Customer objectives	• Fossil fuels continue to play a significant role in the global energy portfolio as a bridging technology before green power will be fully available • Securing the viability of sustainable fossil fuel plants
Siemens solution	**Siemens Drive Train** • 1 x Siemens Synchronous Motor H-Modyn 15 MW, 13,2 kV, 60 Hz, Water cooling • 1 x Siemens Excitation Unit • 1 x Siemens Converter SINAMICS GL150 (LCI Drive) • 2 x Transformers GEAFOL (Step-down, Step-up)
Customer value	• Reduction of CO_2 emissions of 115 MW power block by 90% • Reduction of SO_2 emissions by 100% • First power station block in the world to use Carbon Capture Technology
Why Siemens?	• Siemens wide portfolio of solutions, expert knowledge, reputation and reliability made it trusted partner of choice • Siemens Drive Train Solution applicable on majority of the world's fossil power plants • Siemens access to System Safety Certifications (here: CSA)

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

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First use of Carbon Capture Technology in LNG Plants

Customer profile	• End User: LNG plant in Australia • OEM: Compressor manufacturer from Europe
Customer objectives	• Reduce CO_2 emissions in order to achieve net-zero targets
Siemens solution	**Siemens Drive Train** • 6 x Siemens Synchronous Motor H-Modyn, 14.6 MW, 11 kV, 50 Hz, Water cooling • 6 x Siemens Excitation Unit • 6 x Siemens Converter SINAMICS PERFECT HARMONY GH180 VFD (VSI)
Customer value	• To become one of the most greenhouse-gas efficient liquefied natural gas (LNG) developments in the world (when built).
Why Siemens?	• Siemens wide portfolio of solutions, expert knowledge, reputation and reliability made it trusted partner of choice • Siemens Drive Train Solution applicable on majority of the world's LNG plants • Siemens local technical and service support

Reduction of CO_2 emissions by capturing and reutilizing or storing is a key milestone to achieve net-zero targets

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First Carbon midstream company using Siemens VFD Technology

Customer profile	• End User: Carbon transport company in Canada • EPC: Based in Canada
Customer objectives	• Provide carbon transport infrastructure to facilitate CCUS for network of carbon polluters

Siemens solution	• Siemens Drives:
	  • 1 x 5000 HP Siemens SINAMICS PERFECT HARMONY GH180 VFD with Synchronous transfer for 15000 HP pipeline compressor
	  • 1 x 3000 HP Siemens SINAMICS PERFECT HARMONY GH180 VFD with Synchronous transfer for 3x pipeline compressor motors

Customer value	• No pollution, no tax!
Why Siemens?	• Siemens wide portfolio of solutions, high reliability and local expert knowledge made it partner of choice • Superior harmonics performance and savings on carbon Tax due to Sinamics GH180 VFDs • Siemens local technical and service support

Transporting CO_2 to ensure safe storage allows to savings without Carbone Taxes and without pollution

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