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# Decarbonizing industry with scalable carbon capture, utilization and storage solution

AVEVA software helps Airbridge transform CO<sub>2</sub> emissions into high-value commodities

Stephen McGurk (Airbridge) and Jay Howarth (AVEVA) with Cal Depew (AVEVA)

**AVEVA**



# Airbridge



## AVEVA solutions support CCUS pilot project

- Airbridge is a privately owned Australian company with a globally patented, revolutionary technology that transforms carbon emissions before they enter the atmosphere and repurposes them into valuable, essential global commodities.
- Eliminating emissions, creating new Carbon Fed Supply Chains and accelerating towards Net Zero.
- Airbridge was recently selected as a finalist for the ONS Innovation Award SME for 2022.



# Carbon Capture Utilization and Storage



## Challenge

Airbridge's patented technology and process safely captures CO<sub>2</sub> before it enters the atmosphere.

This process requires monitoring, analyzing, and a means of accurately simulating the process to better understand how it could be scaled from pilot to commercial.

## Solution

AVEVA™ Process Simulation, AVEVA™ Edge, and AVEVA™ Insight solutions were deployed to capture, organize and visualize the data, and simulate the chemical process cycles to predict CO<sub>2</sub> recovery at larger scale.

Plant operations can be monitored and analyzed from both on premises and from the cloud.

## Benefits

Detailed modelling of the process enables Airbridge to run various scenarios, including how the process can be scaled up.

Assists Airbridge in discussions with potential investors and industrial emitters interested in their technology.



Making a global impact on  
the health of our planet

More than just a carbon-capture company

AVEVA



# Stephen McGurk

Airbridge CEO





## Fertiliser production



The beginning of  
carbon-negative  
supply chains







# Scalable technology that works

Production costs are lowered

Climate targets are met

Countries secure domestic supply

Replenished soils feed our planet





# The Airbridge impact at an industrial scale – Western Australia

## Pilbara

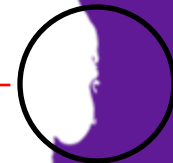
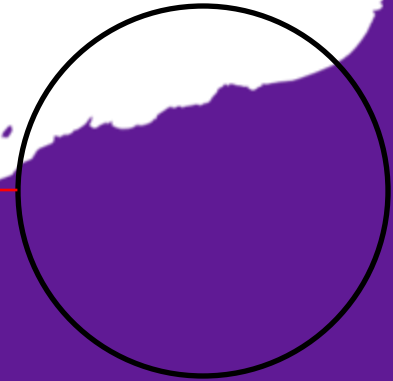
TOTAL ABATEMENT  
POTENTIAL

30.6 MtCO<sub>2</sub>e

## Kwinana

TOTAL ABATEMENT  
POTENTIAL

2.1 MtCO<sub>2</sub>e





A desire to rapidly reduce the risk of climate change

Changing the face of carbon



AVEVA



# Why AVEVA?





# Utilizing AVEVA Solutions

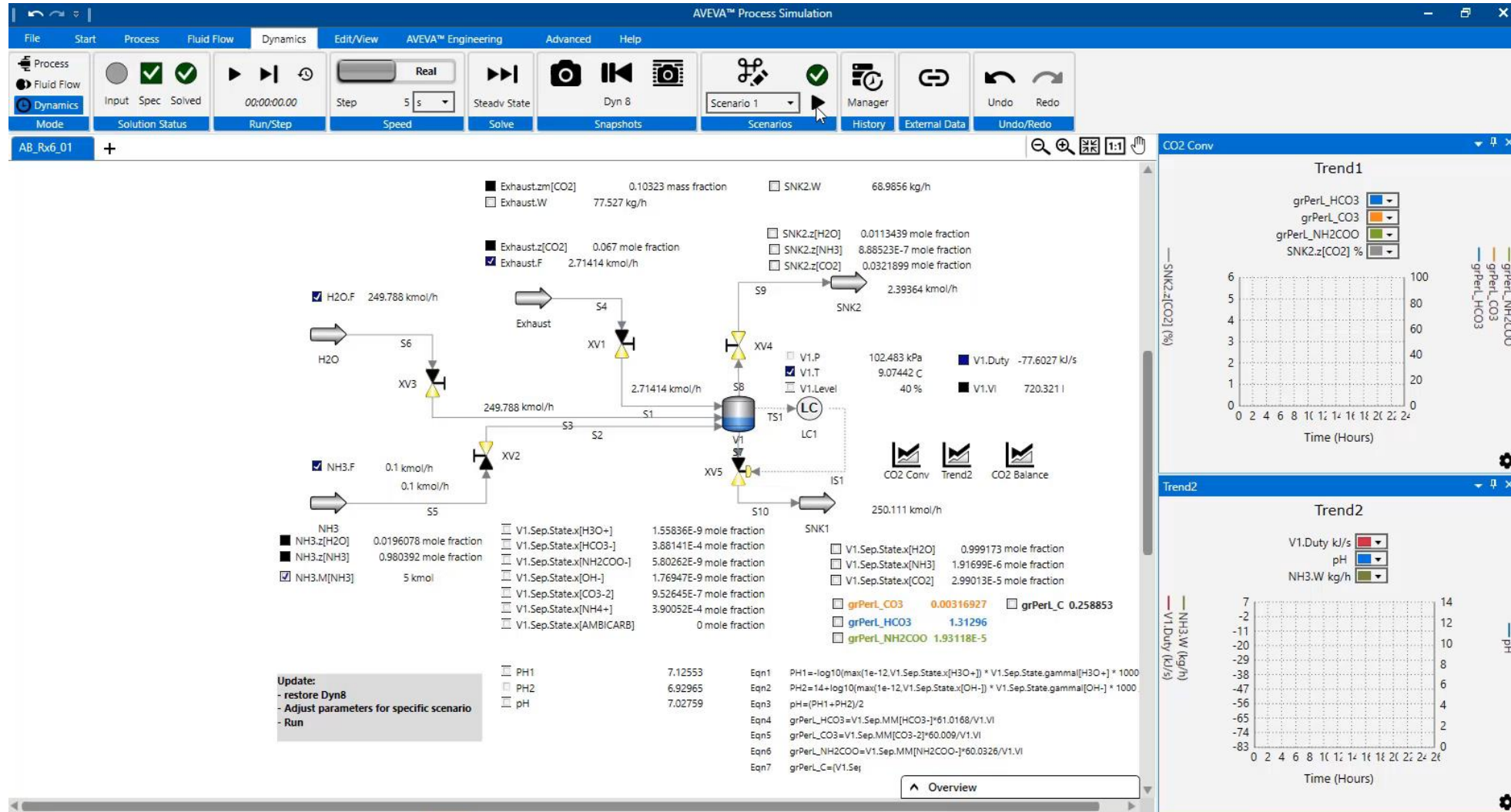
## Process Simulation

- AVEVA Process Simulation has been implemented in a pilot project for Airbridge's patented CCUS technology.
- AVEVA software is used to create an accurate pilot data-model of Airbridge's new carbon conversion facility, including a detailed electrolyte thermodynamic feature that enables its team to predict chemical reactions accurately.
- Airbridge can also simulate the chemical process cycles to predict CO<sub>2</sub> recovery.
- This CO<sub>2</sub> can then be repurposed into high-demand, high-value commoditized products for use in industries such as agriculture, mining, construction, manufacturing and pharmaceuticals.



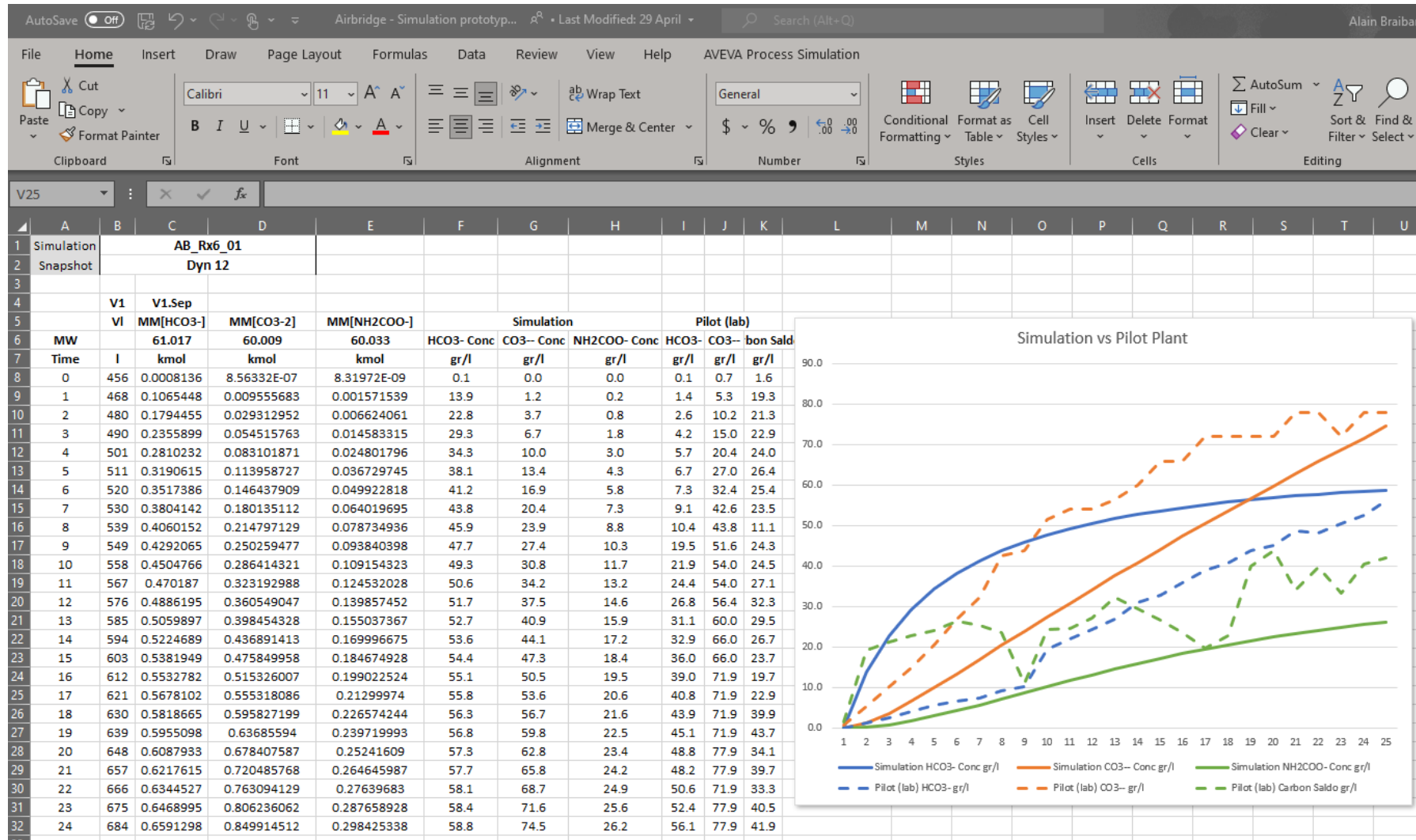


# Pilot Plant Modelling - Dynamic mode





# Pilot Plant Results vs Simulation Results



# Utilizing AVEVA Solutions

## AVEVA Edge & AVEVA Insight

- AVEVA Edge unifies project process data at scale from multiple sources, enabling Airbridge to cost-effectively monitor operations of its patented reactor.
- This data is organized and visualized in AVEVA Insight, where Airbridge's teams can monitor and analyze asset performance , collaborating in real-time in the cloud.
- AVEVA Insight will support Airbridge in sharing data and demonstrating its capabilities to investors, industrial partners and government organizations.



AVEVA





## Impact – Pilot Plant



Monitored and  
analyzed from  
cloud

Process simulation  
against actual  
results

Detailed modelling  
allows accurate  
scaling forecast



# The future – scaling with the AVEVA Cloud





# Business Challenge

## Opportunity

- According to the International Energy Agency (IEA), CCUS is vital to the transition to a carbon-free future
- Australian Government \$US30M (2021)
- US \$224M (2021)
- Since 2017 - 30 new CCUS facilities announced Globally
- US, Europe, Australia, Middle East and China
- 1300 Mt per year by 2030



<https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage>

AVEVA





# Kwinana – Western Australia



# What could one state look like?

- Centralized processing plant located at strategic locations, ideally with access to rail and port for global export
- Each plant can be scaled to process emissions captured from each geographical location with a series of satellite capture plants

Western Australia

Capture 500 Mt  
CO<sub>2</sub> per plant

Process 2.5M Mt  
CO<sub>2</sub>

Produce 5.5M  
Mt commodities

AVEVA



# Commoditization of CO<sub>2</sub> via Hydrogen Process

By the numbers

1 Mt of  
Hydrogen  
production  
emits 9 Mt of  
CO<sub>2</sub>

For every tonne  
of CO<sub>2</sub> captured,  
we produce 2.2  
Mt of  
commodities

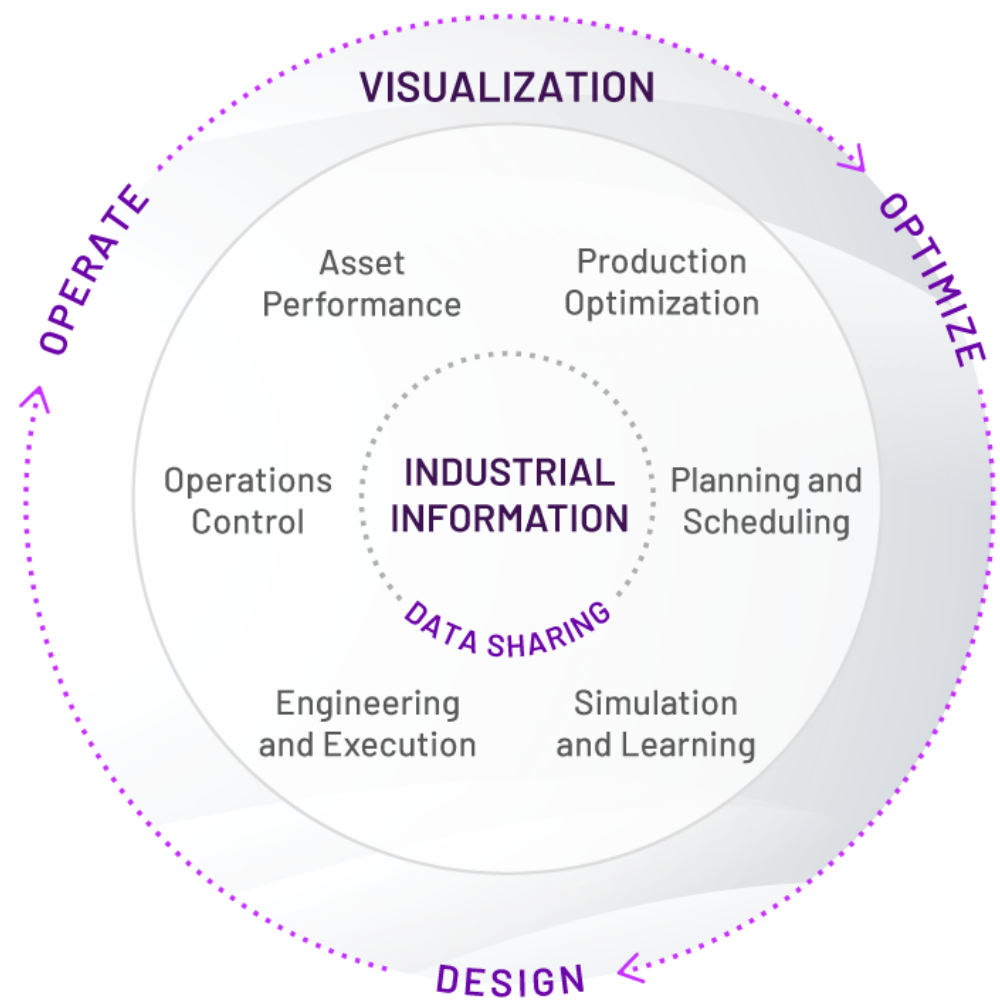
So, for every  
Mt of Hydrogen,  
we produce 19.8  
Mt of  
commodities

Ammonium Chloride  
Sodium Bicarbonate  
Calcium Carbonate  
Ammonium Sulphate  
Ammonium Nitrate





# AVEVA's comprehensive software portfolio



**AVEVA Flex**  
subscription program

Unlock flexible access to any mix of AVEVA software both on-premise and cloud.

**AVEVA Connect**  
our common cloud platform

Transform faster, reduce IT costs, scale with flexibility and securely consume our portfolio.

Conceptual Design	Front End Engineering Design
Detailed Design	Procurement and Construction
Operator Training	Project Handover
Operations Control	Operations Visualization
Operations Information	Operations Execution
Supply Chain	Production Optimization
Asset Strategy	Asset Performance





Want to know more?



**LIVE WEBCAST:**  
November 16, 2022 | 10 a.m. CST / 4 p.m. UTC

**REGISTER NOW:**  
Innovative CCUS technology  
– A case study in sustainable  
process engineering

**AVEVA** **HYDROCARBON  
PROCESSING\***



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# Quotes



“With the help of AVEVA’s software portfolio, Airbridge technology is making a global impact on the health of our planet at both an industrial and cultural scale. Our solution prevents CO<sub>2</sub> from entering our vulnerable atmosphere and creates essential commodities such as fertilizer to better feed the world. We also set aside a portion of each project to create world-first, carbon-negative products and share those stories with the public.”

**Stephen McGurk, Chief Executive Officer**



“We are pleased to be partnering with Airbridge and extending CCUS capabilities by using our software to help commercialize innovation and make decarbonization a reality for many industries. The business world has a responsibility to work towards achieving net-zero carbon emissions and we have the technology to do so. Our partnership enables Airbridge to share its CCUS capabilities with a wide array of industries and to accelerate business efforts towards achieving net-zero emissions, while paving the way for deeper research and development in sustainable applications .”

**Emon Zaman, Asia Pacific Senior Vice President, AVEVA**



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app to complete the survey.




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#### ABOUT AVEVA

AVEVA is a global leader in industrial software, sparking ingenuity to drive responsible use of the world's resources. The company's secure industrial cloud platform and applications enable businesses to harness the power of their information and improve collaboration with customers, suppliers and partners.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. With operations around the globe, we are headquartered in Cambridge, UK and listed on the London Stock Exchange's FTSE 100.

Learn more at [www.aveva.com](https://www.aveva.com)