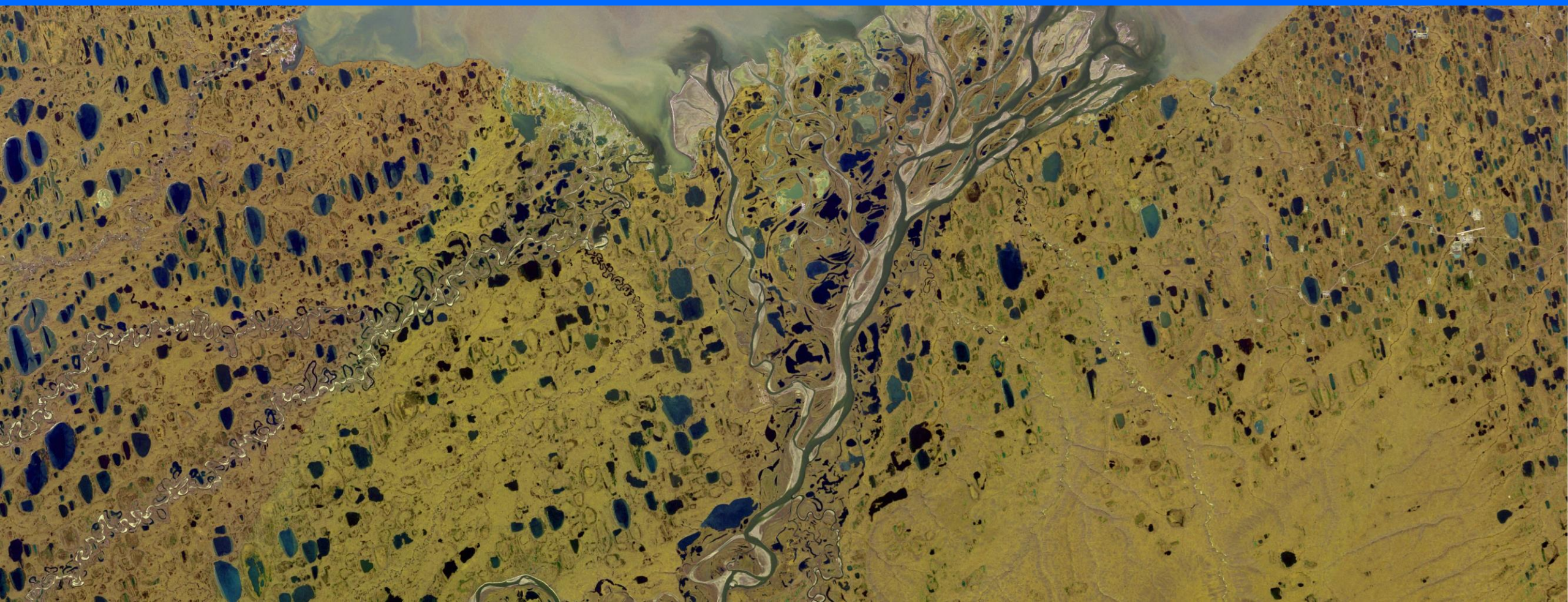


# Santos

## **AN EMERGING MARKET – PERSPECTIVES ON CARBON CAPTURE & STORAGE POTENTIAL IN ALASKA**

LEGISLATIVE LUNCH & LEARN  
FEBRUARY 2024

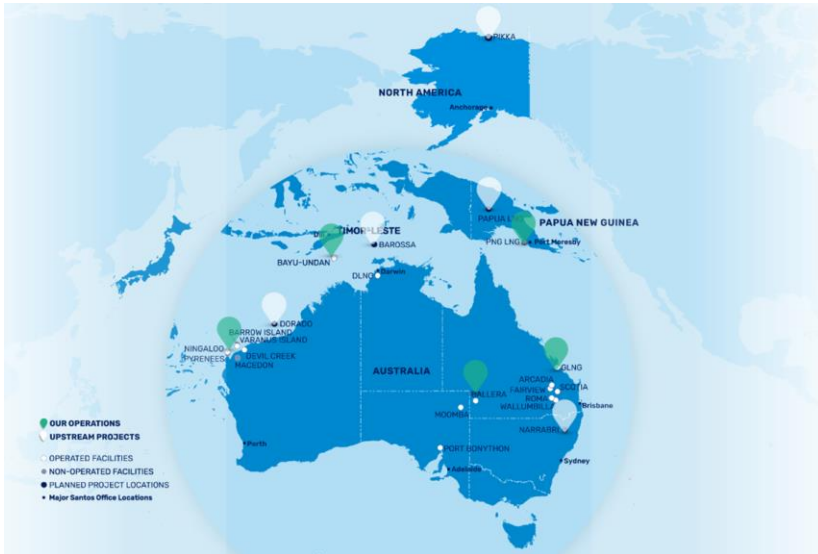




# Santos is a Global Energy Company

## About Santos

- Founded in 1954 and headquartered in Adelaide, Australia
- One of Australia's largest domestic gas suppliers and a leading LNG supplier in the Asia Pacific region
- Global footprint with assets in Australia, Papua New Guinea, Timor-Leste and the United States (Alaska)
- About 4,000 employees globally



## About Santos in Alaska

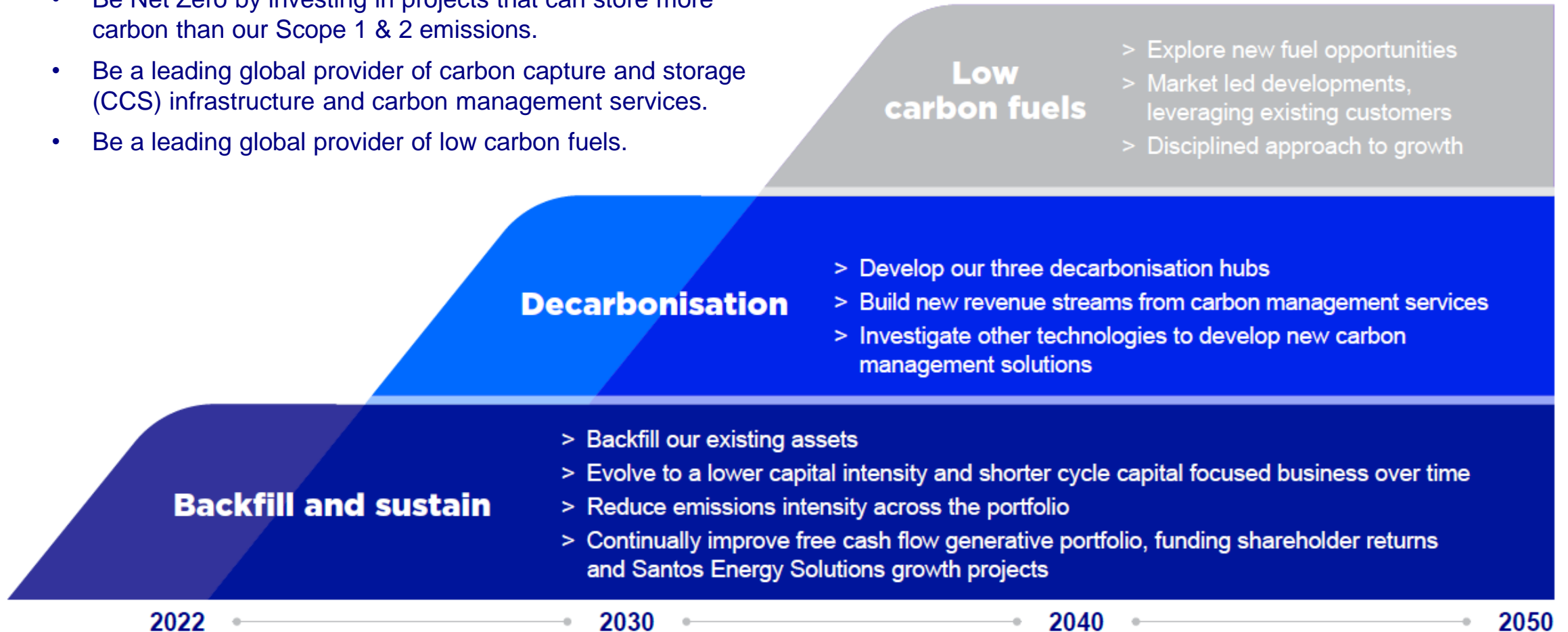
- Alaska's second largest oil and gas lease holder
- 51% owner & operator of Pikka, with Repsol partnership 49%
- Current Alaska workforce of 259; growing to ~430 by year-end 2024
- Moving to new downtown Anchorage office this year



# Vision 2040: Purpose and Plan

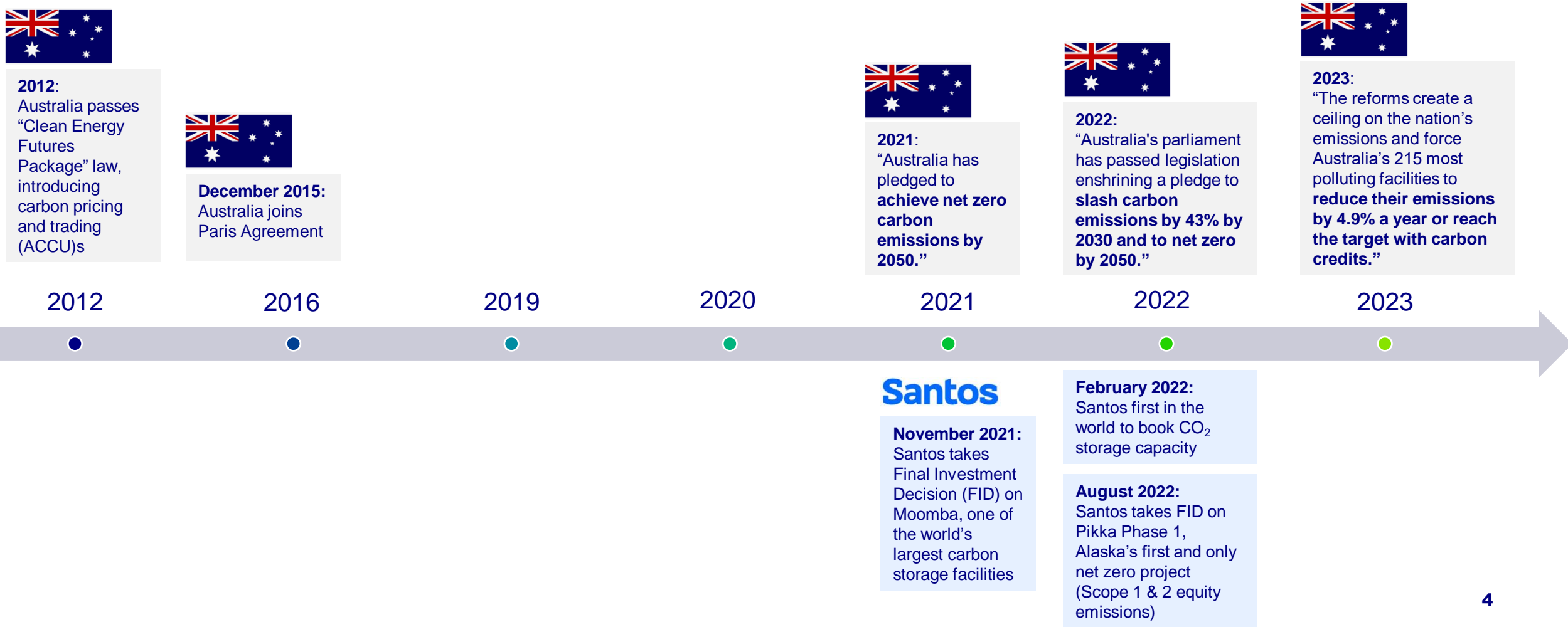
## To Deliver on our Purpose and Vision is to:

- Be Net Zero by investing in projects that can store more carbon than our Scope 1 & 2 emissions.
- Be a leading global provider of carbon capture and storage (CCS) infrastructure and carbon management services.
- Be a leading global provider of low carbon fuels.



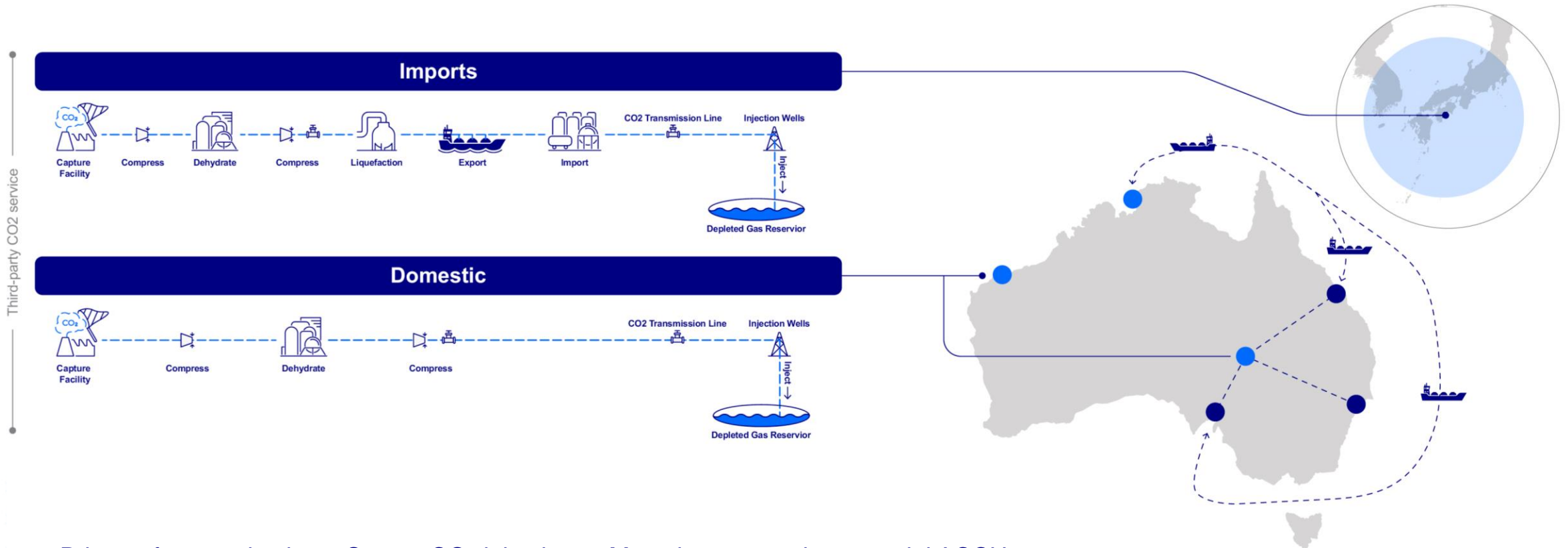
# Net Zero Timeline

Australia's regulatory environment has led Santos to develop experience and expertise operating in a decarbonized environment



# Decarbonization

Our three depleted reservoir CCS hubs offer low-cost solutions for Santos and third party emissions



- > Primary focus today is on Santos CO<sub>2</sub> injection at Moomba, generating material ACCUs
- > MOUs signed for potential domestic and international supply of third party CO<sub>2</sub> to Santos hubs
- > Direct air capture technology trials ongoing in Cooper Basin targeting <A\$100/t CO<sub>2</sub> capture costs

# Three Operated CCS and Low Carbon Fuels Hubs

Repurposing existing infrastructure and depleted reservoirs



Eastern Australia Hub



Moomba

Northern Hub



Darwin and Bayu-Undan

Western Australia Hub

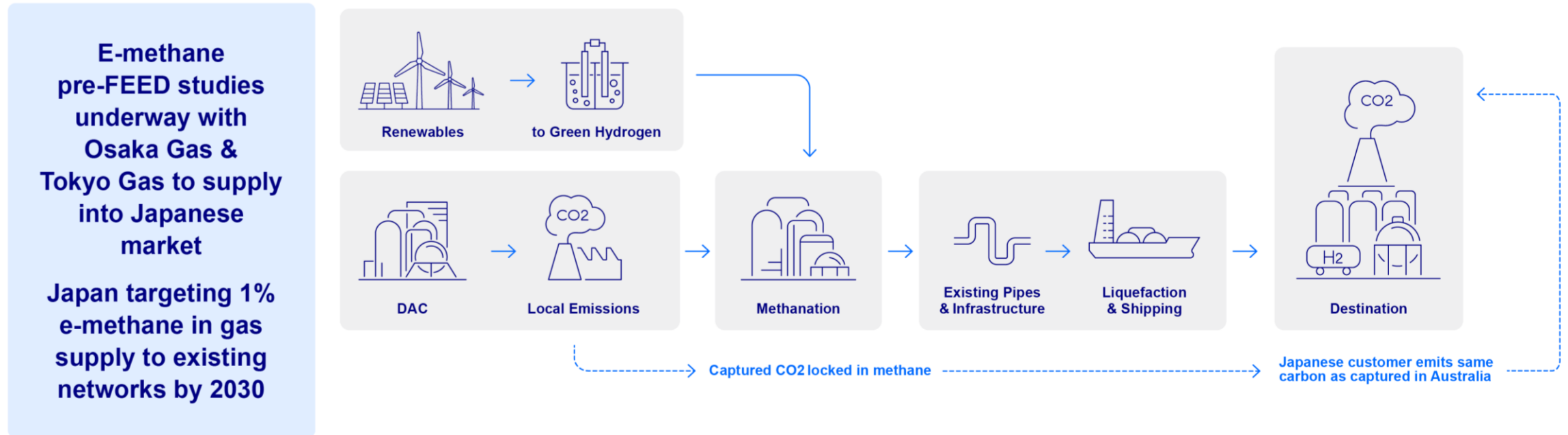


Reindeer

Status	Construction more than >75% complete	FEED nearing completion Targeting FID 2025	Targeting FEED entry 2024 Targeting FID 2025
Annual CO2 storage potential, MtCO2e	~20Mt	~10Mt	>2Mt
First injection timing estimate	2024	2028	2028
Santos CO2 storage	✓	✓	✗
Third-party CO2 storage	✓	✓	✓
Status of third-party discussions	Phase 1 SACB JV Phase 2 Marketing commenced	Four relevant MOUs	Two Customer MOUs
MOU counterparties	APA (Infrastructure)	Timor Gap and others	Not disclosed
Low carbon fuels opportunity	✓	✓	✗
Gas Storage Licenses	GSL Blocks	G-11-AP	G-9-AP

# Low Carbon Fuels

Demand from existing and new customers is forecast to increase materially by 2030 and beyond



E-methane, Ammonia, Hydrogen, others over time

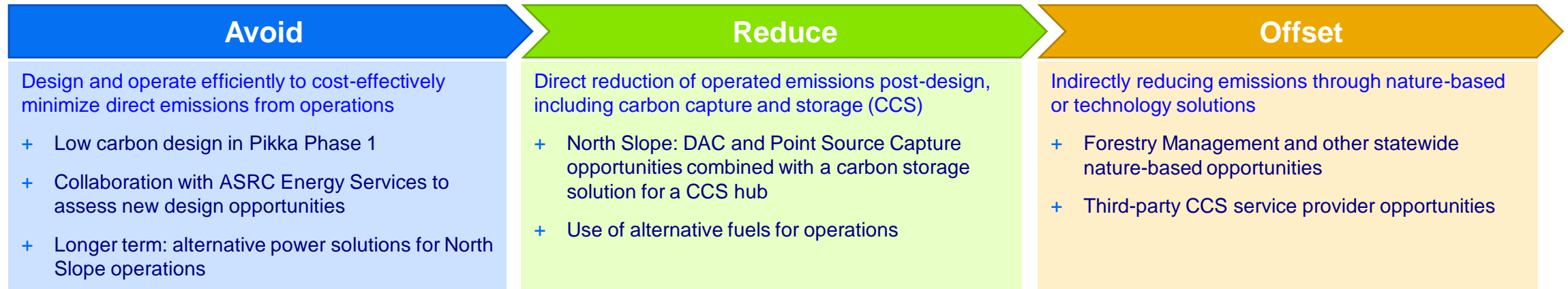


# Decarbonization in Alaska



# Alaska Decarbonization

## Net zero philosophy, approach, and plan



# Alaska CCS Consortium

Formed in 2022 to pursue CCS projects in Alaska

Focus: Carbon Capture & Storage (CCS) Projects in Alaska

## Shared Interests & Alignment

- Existing operations in Alaska
- Unique interest in Arctic-capable CCS technology
- Extensive project execution, stakeholder engagement, technical, and regulatory experience
- Pursuing equity ownership of CCS projects
- Interest in utilizing Department of Energy (DOE) funding opportunities to accelerate project development

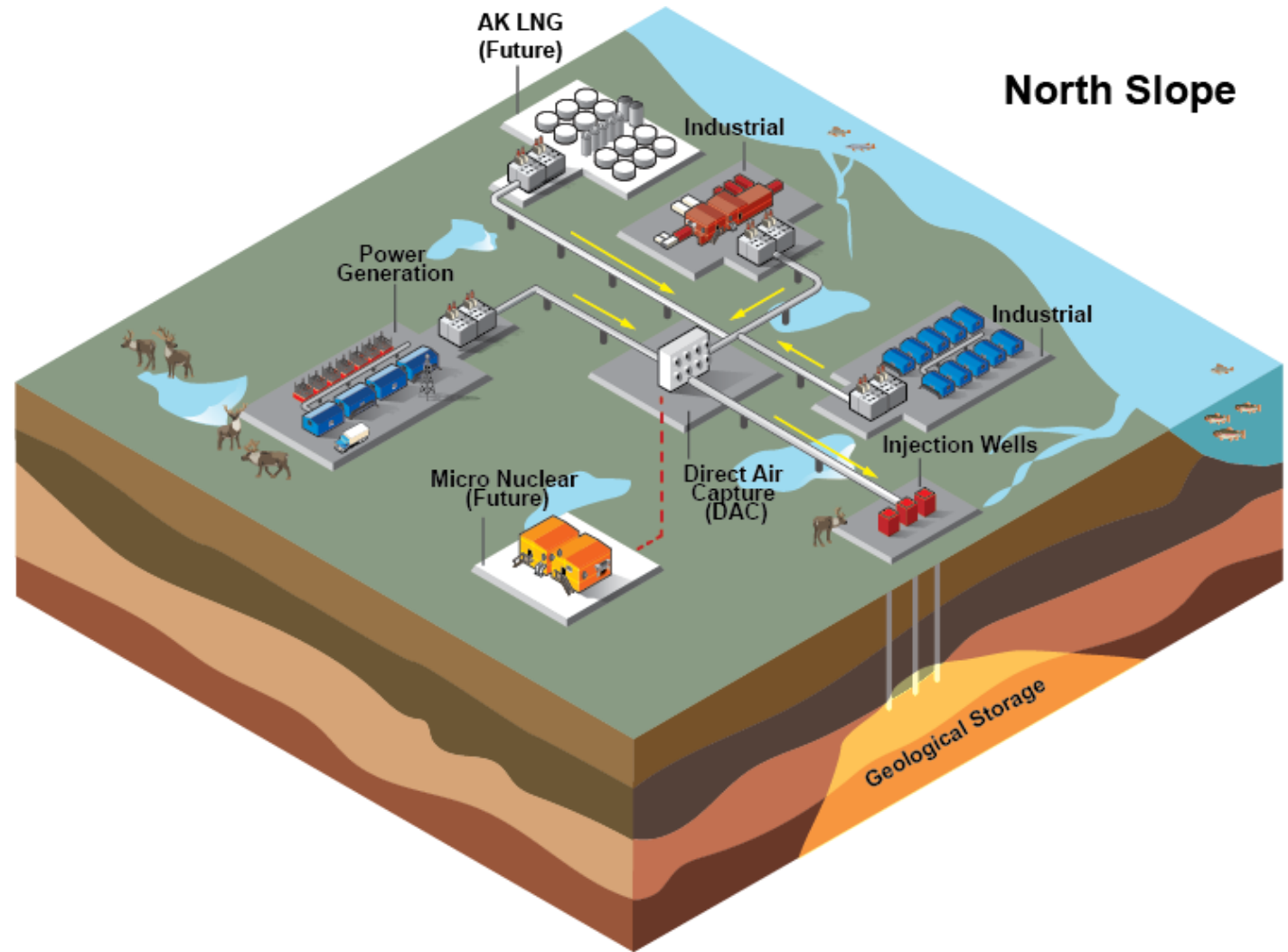


Alaska CCS Consortium

# Long-Term Vision: North Slope Hub

## North Slope Attributes

- Favorable geology with extensive subsurface data and understanding
- Point Source Capture from Industrial Emitters with net-zero commitments
- Direct Air Capture located proximal to storage
- Large scale use of North Slope gas will require treatment plant and opportunity for carbon storage
- Energy sources could be from stranded gas or micronuclear

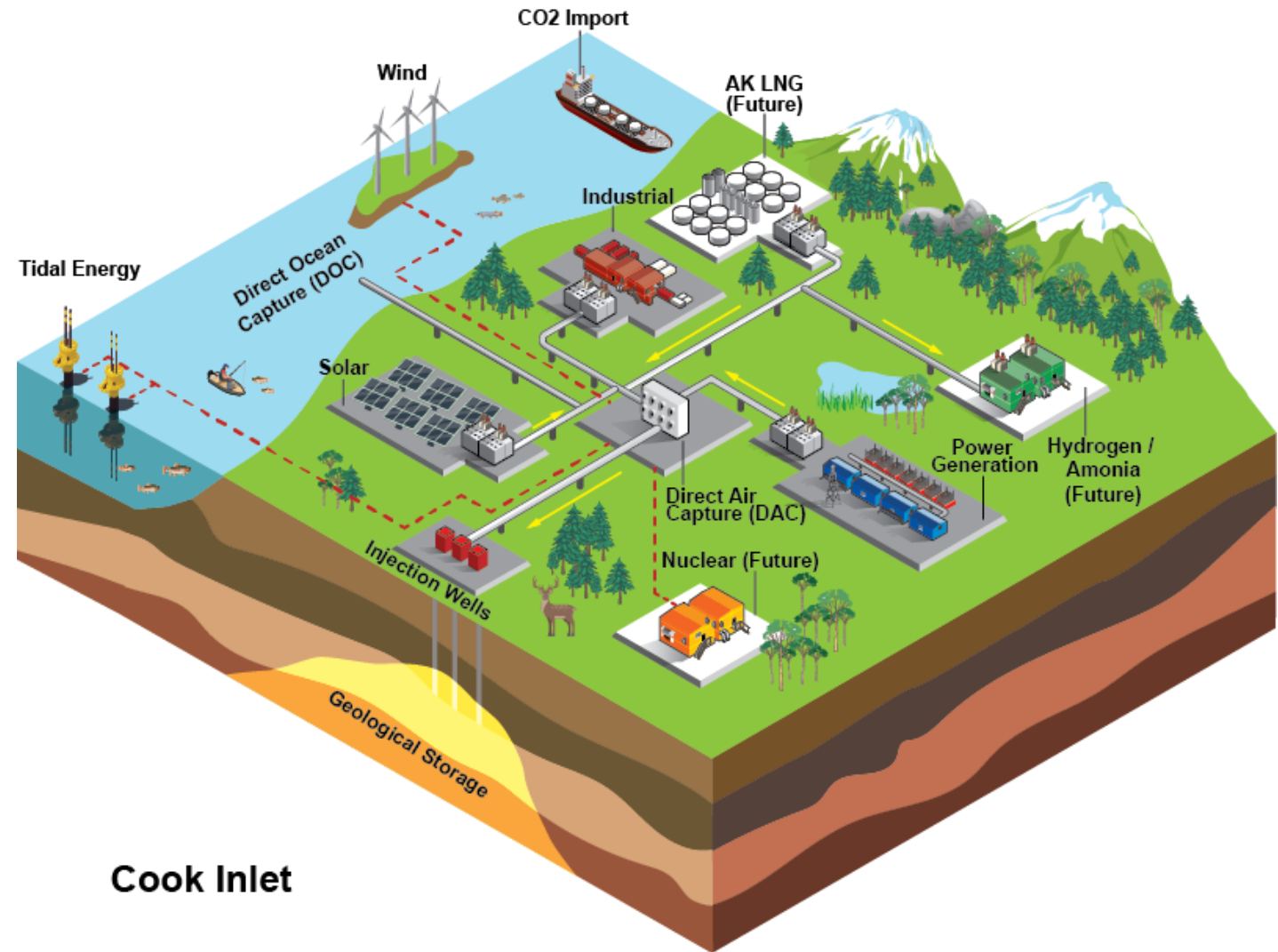




# Long-Term Vision: Cook Inlet Hub

## Cook Inlet Attributes

- Favorable geology with extensive subsurface data and understanding
- Point Source Capture from Railbelt
- Direct Air Capture located proximal to storage
- LNG / Ammonia / Hydrogen
- Carbon Import
- Direct Ocean Capture
- Green Energy Options:
  - Tidal
  - Geothermal
  - Solar
  - Wind

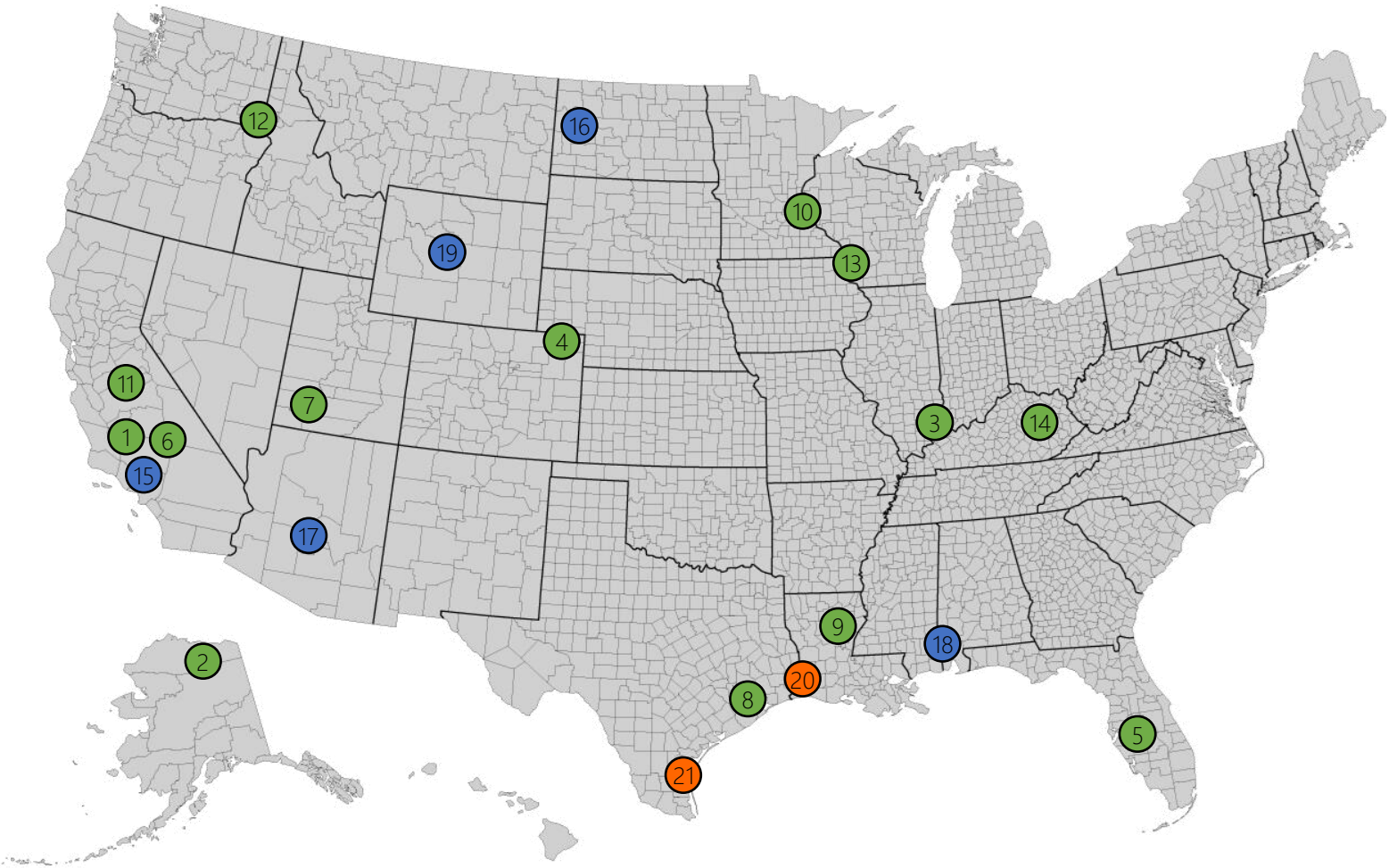


# Direct Air Capture (DAC)

- August 2023: Consortium awarded match funding for Regional Direct Air Capture Hubs
- Evaluating DAC technologies and suitability for Arctic operations, winterization design, and locations
- Building on Santos experience in Australia with DAC technologies
- Potential to attract over \$550M in federal funding ~50% share toward DAC CCS Hub development through subsequent funding rounds



# Direct Air Capture (DAC)

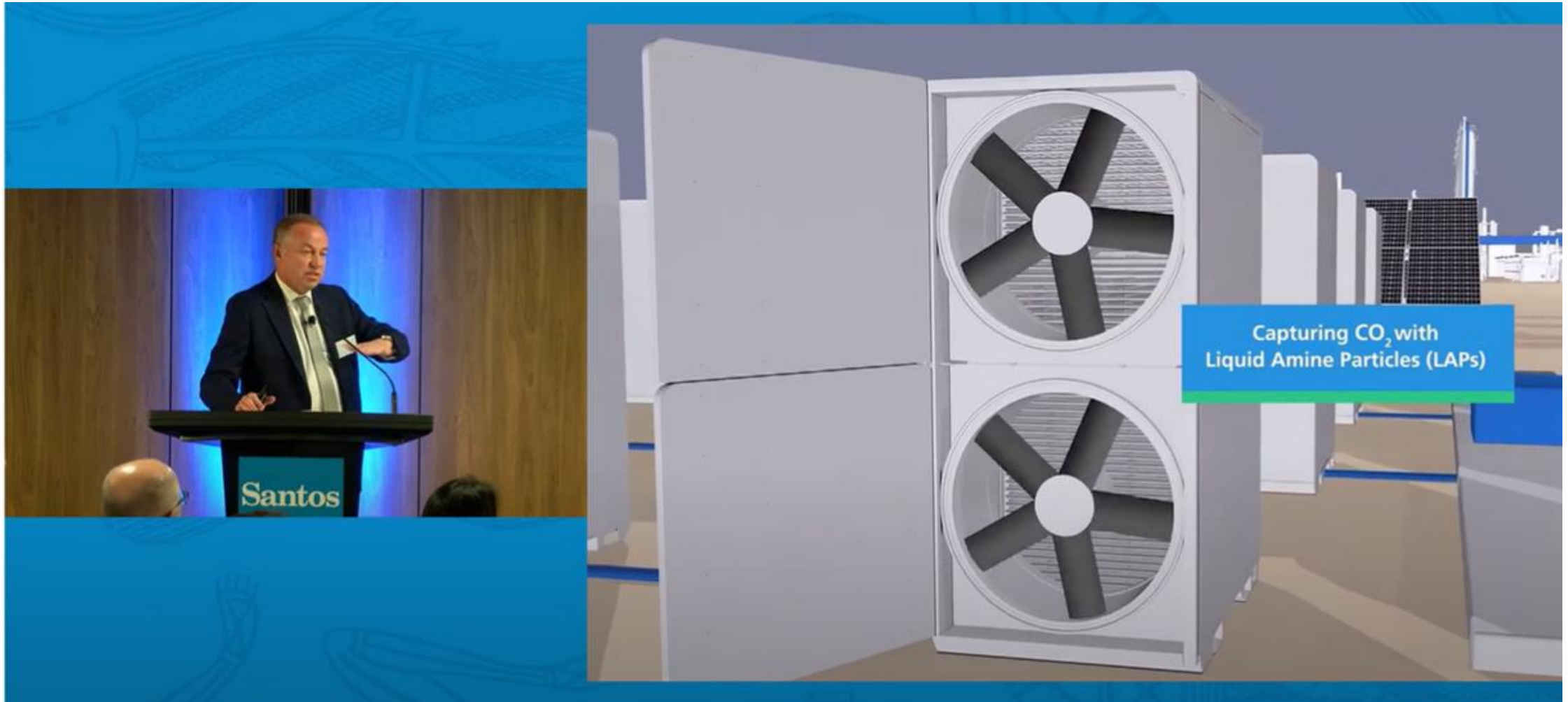


DOE DAC Hub Locations

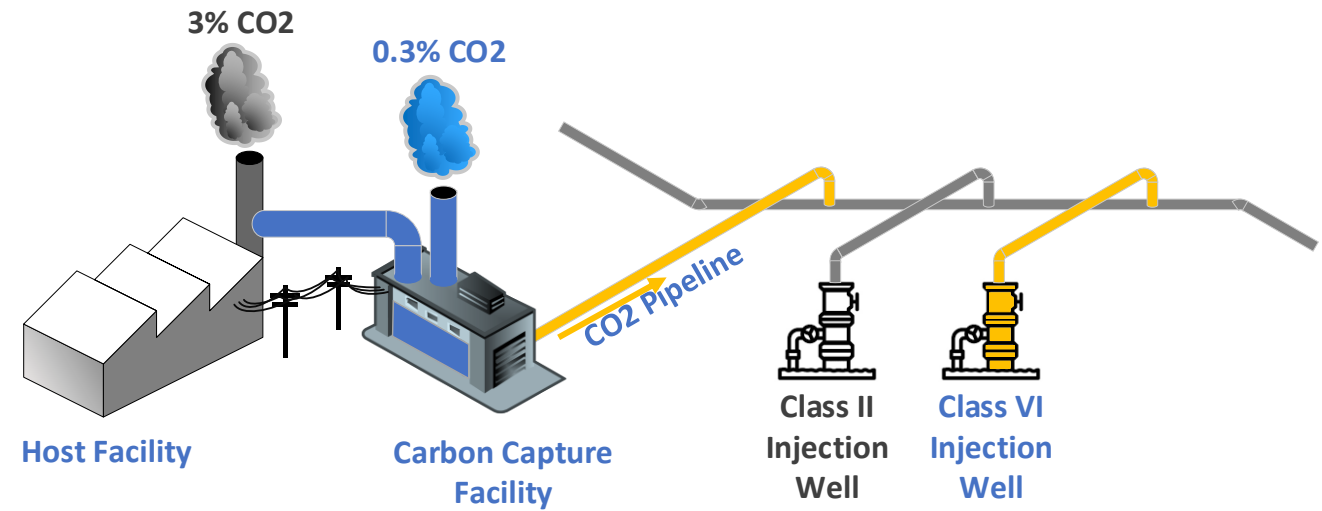
	Name	Prime Lead	Phase	Max Funding
1	Aera DAC Hub	Aera Federal	Feasibility	\$3M / 80%
2	Arctic DAC Hub	ASRC Energy	Feasibility	\$3M / 80%
3	Illinois Basin DAC Hub	BoT of Univ. of Illinois	Feasibility	\$3M / 80%
4	Colorado Regional DAC Hub	BoT of Univ. of Illinois	Feasibility	\$3M / 80%
5	Florida Regional DAC Hub	BoT of Univ. of Illinois	Feasibility	\$3M / 80%
6	Western Regional DAC Hub	Chevron New Energies	Feasibility	\$3M / 80%
7	Red Rocks DAC Hub	Fervo Energy	Feasibility	\$3M / 80%
8	Houston Area DAC Hub	General Electric	Feasibility	\$3M / 80%
9	Pelican-Gulf Coast Carbon Removal	LSU	Feasibility	\$3M / 80%
10	Midwest Nuclear DAC Hub	Northwestern University	Feasibility	\$3M / 80%
11	Community Alliance for DAC	Regents of Univ. of California	Feasibility	\$3M / 80%
12	Ankeron Carbon Management Hub	Rocky Mountain Institute	Feasibility	\$3M / 80%
13	Tera DAC	Siemens Energy	Feasibility	\$3M / 80%
14	DAC Hub for Appalachian Prosperity	Univ. of Kentucky Research	Feasibility	\$3M / 80%
15	California DAC Hub	Electric Power Research Institute	FEED	\$12.5M / 50%
16	Prairie Compass DAC Hub	EERC	FEED	\$12.5M / 50%
17	Southwest Regional DAC Hub	Arizona Board of Regents	FEED	\$12.5M / 50%
18	Southeast DAC Hub	SSEB	FEED	\$12.5M / 50%
19	Wyoming Regional DAC Hub	Carbon Capture	FEED	\$12.5M / 50%
20	Project Cypress	Battelle	Build	\$550M / 50%
21	South Texas DAC Hub	1PointFive	Build	\$550M / 50%



# Direct Air Capture (DAC)



# Point Source Capture (PSC)



- Consortium to provide opportunity for third-party Point Source Capture service to Prudhoe Bay Unit (PBU) for tolling fee
- Host site to provide exhaust gas, power, and injection well
- Opportunities allow for phasing, de-risking, and capital management
- Pilot to capture 300 tpd carbon

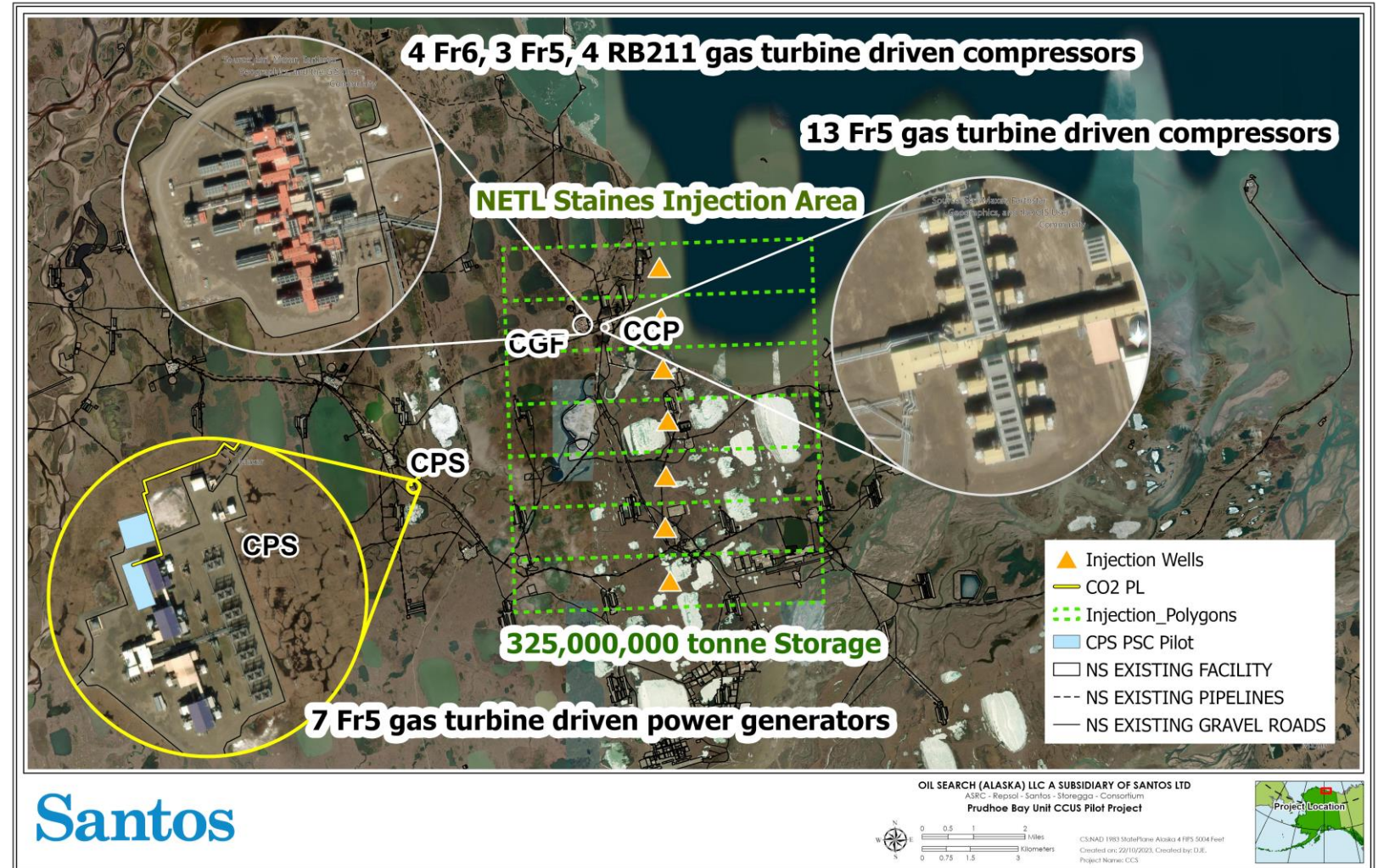


# Point Source Capture (PSC)

Potential to scale quickly

## Key Considerations

- Design one, build many
- Over 20 Frame 5 turbines within 5 mi
- Injection area identified by National Energy Technology Lab (NETL)
- Potential for phased execution
- Greater than 5 million tonnes CO<sub>2</sub> per year
- Could eliminate ~35% of State's stationary emissions





# CCS Consortium Additional Efforts

**Participant in State of Alaska's CCUS Workgroup**

**Continuing to examine other federal CCS-related funding opportunities**

- Geologic assessment (CarbonSAFE)
- Technology assessments
- Transportation

**AGDC Hydrogen Hub application support**

**Alaska Tech Hub Consortium (+ Strategy Development Grant) support**



**Alaska CCS Consortium**

# Wrap Up

## Alaska Can Compete

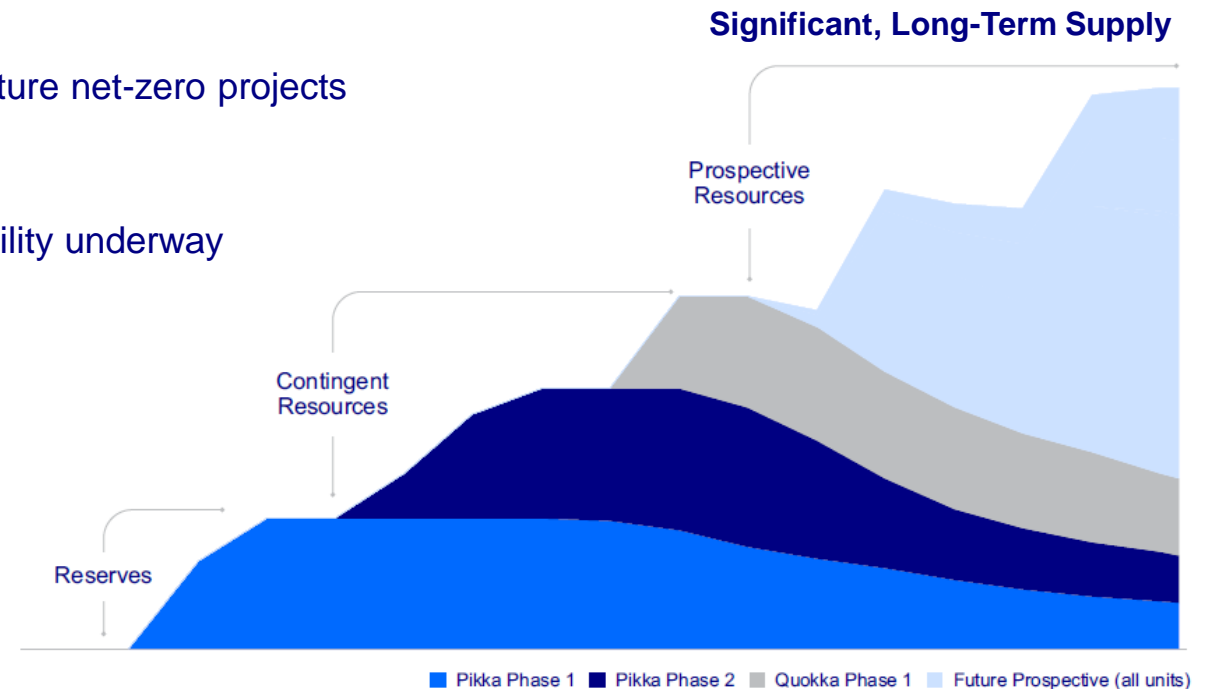
- Geological and technical advantages
- Great potential for alignment of resources, technology, expertise, investment, and policy

## Market (& Benefits) are Real

- CCS market is rapidly expanding, both in US and globally
- Budding industry offers diversification; increases likelihood of future net-zero projects
- Tangible environmental and economic benefits
- Substantial investments in technology, scalability, and marketability underway

## Experienced, Capable, and Committed Operators interested in Alaska

- Part of globally capable Consortium with vested interest and experience in Alaska
- Committed to increasing opportunity for carbon offsets to develop significant, long-term supply portfolio



# Thank You

## Santos



**Santos**

# **Appendix**



# CCS Consortium Membership

## ASRC Energy Services, LLC

- AES, is a subsidiary of Arctic Slope Regional Corporation, the Alaska Native Regional Corp. on the North Slope
- Engineering & Construction Co. with history of executing large Alaska projects, including for DOE
- CCS extends the life of existing operations near ASRC land, providing economic benefit to Indigenous shareholders

## Santos

- Santos is a global energy company helping the world to decarbonize in an affordable & sustainable way
- Alaska key for Santos' activities: Pikka Project, net-zero commitment and extend Santos Energy Solutions
- Expertise in CCS projects in Australia; ambition to grow worldwide

## Repsol

- Repsol is a global multi-energy provider motivated to drive the evolution of decarbonizing energy
- Alaska is in Repsol's core strategic plan with capital flexibility and growth potential
- Operational excellence and CCS experience (Indonesia, southern Europe, offshore Texas)

# What are Scope 1, 2 & 3 Emissions?

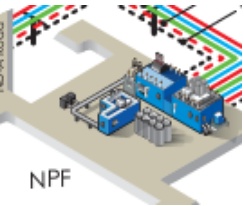
## Pikka Emissions Examples of EPA Classifications

Pikka Net Zero Commitment: Scope 1 and Scope 2

### Scope 1

#### How we produce our products and services

Direct emissions from sources that Santos owns or controls, due to fuel combustion, flaring, venting, CO2 removal and fugitive emissions



Company vehicles

### Scope 2

#### How we power our operations

Indirect emissions from the generation of energy that Santos purchases for our operations including electricity purchased for our operations including ancillary activities such as our office buildings

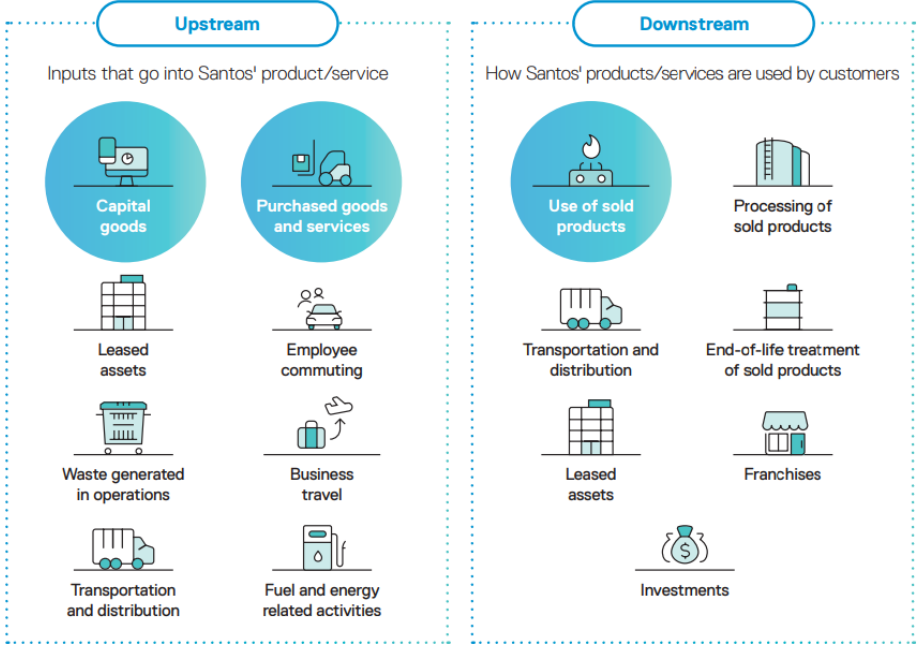


Purchased heating and cooling

### Scope 3

Everything else upstream/downstream in Santos' value chain, all indirect emissions not included in Scope 2

The vast majority of Scope 3 emissions from Santos' activities are emissions from the Use of Sold Products



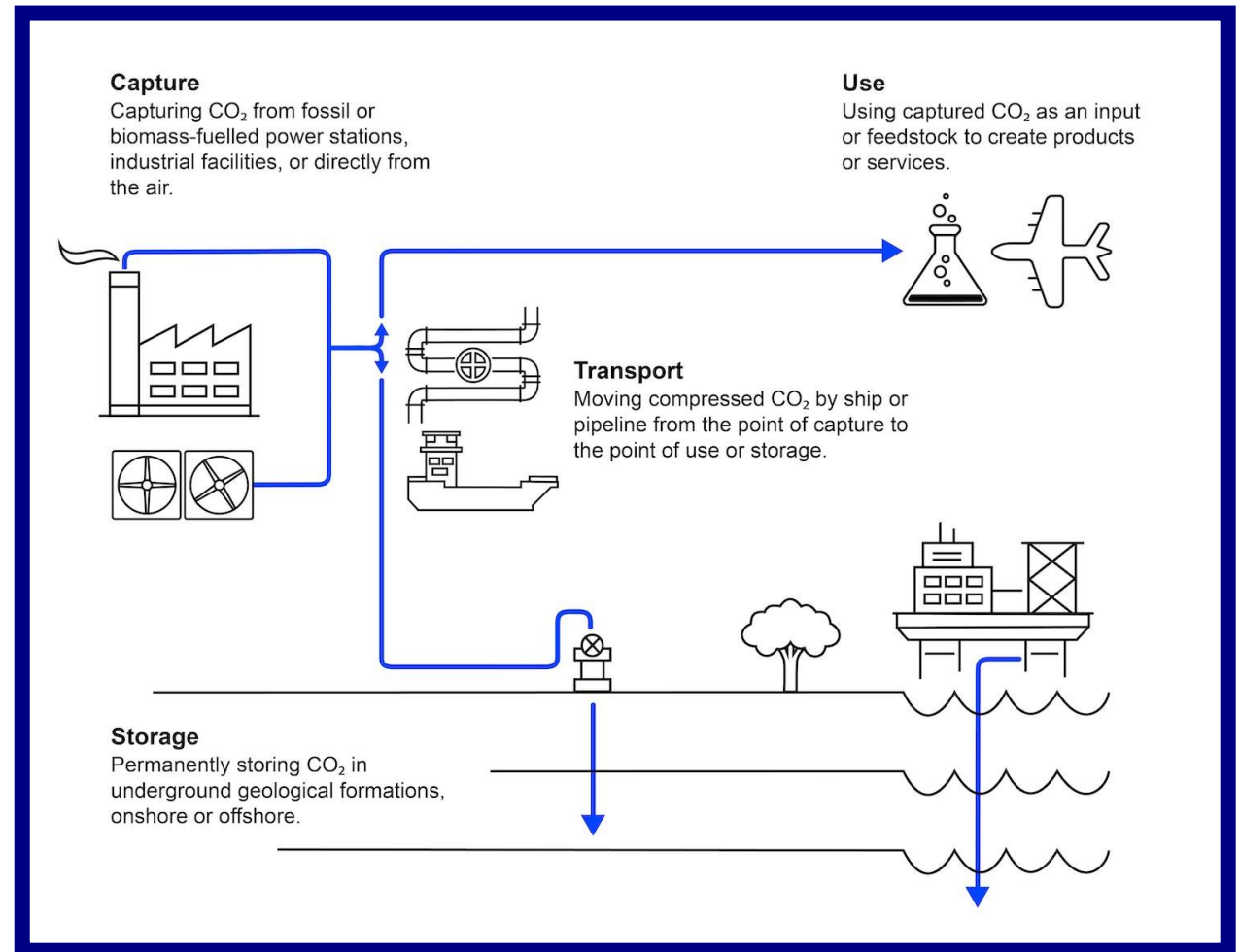
Greenhouse Gas Protocol (2004), A Corporate Accounting and Reporting Standard (Revised Edition): <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

[Climate-Change-Report-2023.pdf \(santos.com\)](#)

# What is CCUS?

## Carbon Capture, Utilization and Storage (CCUS)

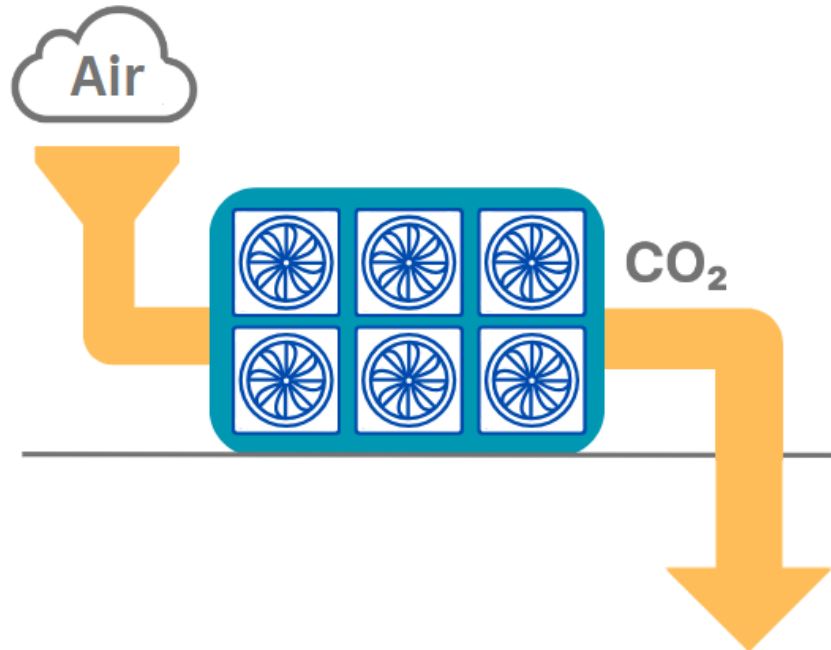
- “Carbon Capture, Utilization, and Storage” (CCUS) is a technical process that captures carbon dioxide (CO<sub>2</sub>) and either utilizes it in the manufacturing or recovery of product – or – safely stores it underground, reducing greenhouse gas emissions that contribute to climate change
- Can be deployed in various economic sectors, including: cement, steel, coal and natural gas power plants, fertilizers, oil and gas production and processing, and the production of clean hydrogen



# Carbon Capture, Utilization and Storage (CCUS)

## Direct Air Capture (DAC)

Capturing historic CO<sub>2</sub> emissions directly from the atmosphere (carbon-neutral to negative)



## Point-Source Capture (PSC)

Capturing CO<sub>2</sub> directly from large emission sources, such as industrial facilities, before it's released into the atmosphere (carbon-neutral)

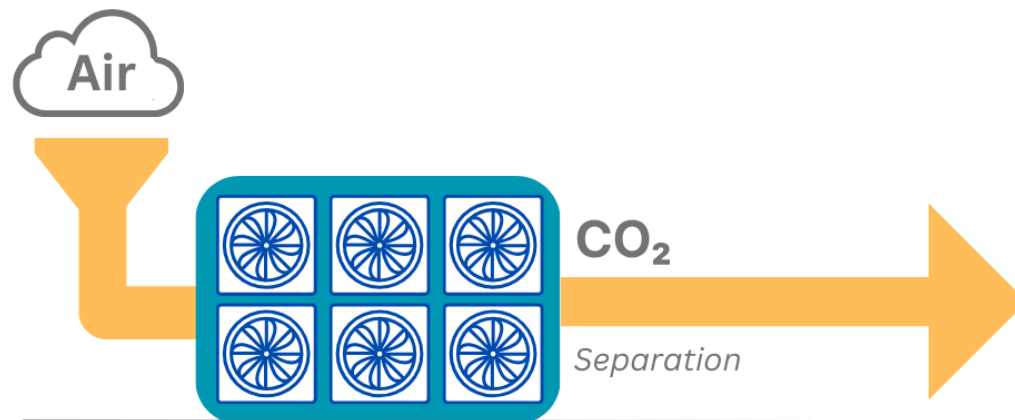




# Carbon Capture, Utilization and Storage (CCUS)

## Carbon Utilization

If not being stored, CO<sub>2</sub> can be used directly or indirectly in the process of manufacturing various products



**Low Carbon Fuels**



**Food & Beverage**



**Chemicals**



**Cements & Aggregates**



**Enhanced Oil Recovery**



**Carbon Fiber**



**Feed & Fertilizers**

# Carbon Capture, Utilization and Storage (CCUS)

## Carbon Storage

CO<sub>2</sub> is safely and permanently stored thousands of feet below surface

