GLOBAL CCS INSTITUTE

Carbon Capture & Storage in the Middle East & Africa

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GLOBAL CCS INSTITUTE

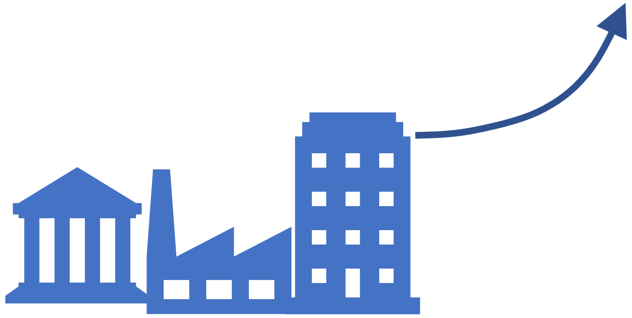
November 2025

THE GLOBAL CCS INSTITUTE

- International, non-profit climate change think tank, limited by guarantee, incorporated in Australia, headquartered in Melbourne
- Locations in Washington D.C., Houston, London, Abu Dhabi, Beijing, and Tokyo
- Member-driven organisation focused on CCS advocacy, thought leadership, and knowledge sharing
- Diverse membership consisting of governments, global corporations, large and small companies, and NGOs

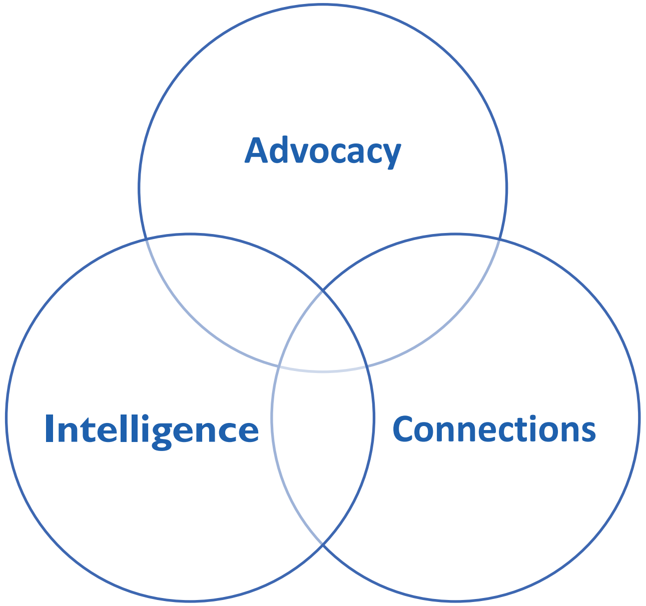
200+ MEMBERS

Backed by governments, businesses and NGOs



Mission: To accelerate deployment of CCS

8 locations



209 Diverse Members

Government & Pseudo-Govt.

- Australia
- Japan
- Kingdom of Saudi Arabia
- Northern Territory
- People’s Republic of China
- Province of Alberta
- State of Victoria
- United Kingdom
- United States
- EBN

Academic & Research Institutions, Associations, NGOs

- ABS
- ClassNK
- ClearPath
- CNPC RISE
- CO2CRC Limited
- Council for Geoscience
- CSIRO
- EPRI
- Global Carbon Council
- CERI
- ITRI
- IBB
- JCOAL
- Minerals Council of Australia
- RITE
- CNOOC Energy and Economy
- SINPOEC NR Institute
- JOGMEC
- KHK
- TNO
- UK-China CCS Centre

Financial, Legal, Consulting, & Insurance

- Carbon Direct
- Chabina Energy Partners
- CRC-IB
- DeGolyer & MacNaughton
- Grey Rock Investment Partners
- HSBC Holdings plc
- JBIC
- LET Australia
- Macquarie Group
- Mizuho Financial Group
- MUFG Bank
- Ramboll

Transport, Infrastructure, Shipping, & Maritime

- Enbridge
- Ecolog
- K-LINE
- Mitsui O.S.K. Lines (MOL)
- NYK Line
- Port of Antwerp-Burges
- Prime Marine
- Stena Bulk
- TC Energy
- Vopak New Energies
- Wolf Carbon Solutions

Industrial

- Air Liquide
- Air Products
- ArcelorMittal
- ADM
- Asahi Kasei
- BASF
- Carmeuse
- CEMEX
- CF Industries
- CRH
- Eastman
- Graymont
- Heidelberg Materials
- Holcim
- Kobe Steel
- Linde
- Stelco
- Titan Cement
- WesCEF

Energy (Oil & Gas, Utilities)

- ADNOC
- Bapco Energies
- BKV Corporation
- BP
- CRC
- Cenovus Energy
- Chevron
- Chubu Electric Power Co.
- CPV
- ConocoPhillips
- Drax Group, PLC
- J-POWER
- ENEOS Xplora
- Energean
- Equinor
- EQT
- ExxonMobil
- HellenIQ Upstream
- Hess
- INPEX
- JAPEX
- Marubeni
- Mitsui E&P Australia
- Motor Oil Hellas SA
- Occidental
- OMV Petrom S.A.
- Osaka Gas Co., Ltd.
- Petrobras
- Petroleum Development Oman
- Petronas
- PTT
- Repsol
- RWE
- Santos Ltd.
- Shell
- SK E&S
- SoCalGas
- Southern Company
- Suncor Energy
- TAQA - KSA
- Tenaska
- TotalEnergies
- Whitecap Resources
- Williams
- Woodside Energy Ltd.

Technology Providers

- 8 Rivers
- ATOCO
- Axens
- Bloom Energy
- Capsol Technologies
- Carbon Clean
- Carbon Engineering
- Carbon GeoCapture
- C-Capture Limited
- Chart Industries
- Cool Planet Technologies Limited
- Dotz Nano Ltd.
- Entropy, Inc.
- Fluor Corporation
- Heirloom
- ION Engineering
- K2-CO2
- Karbon CCS Global
- KC8
- Leilac Ltd
- Mantel Capture
- MHI
- NET Power
- NOV
- Nuada
- Rockwell Automation
- Svante
- SLB-Capturi

Technical Service Providers

- Bryan Research & Engineering
- Computer Modelling Group
- DigiKerma
- DNV GL
- Expro
- Independent Project Analysis
- Quorum Software
- Mangrove Systems
- Shearwater GeoServices
- Stratum Reservoir

Engineering, Procurement, & Construction

- Black & Veatch
- Brevik
- Burns & McDonnell
- Chiyoda Corporation
- Coffman Engineers
- Doris Group
- Equinox Engineering
- IHI Corporation
- JOE
- Kiewit Engineering Group
- McDermott
- Petrofac
- Saipem
- Subsea7
- Taisei Corporation
- Technip Energies
- TechnipFMC
- Tecnicas Reunidas
- Worley

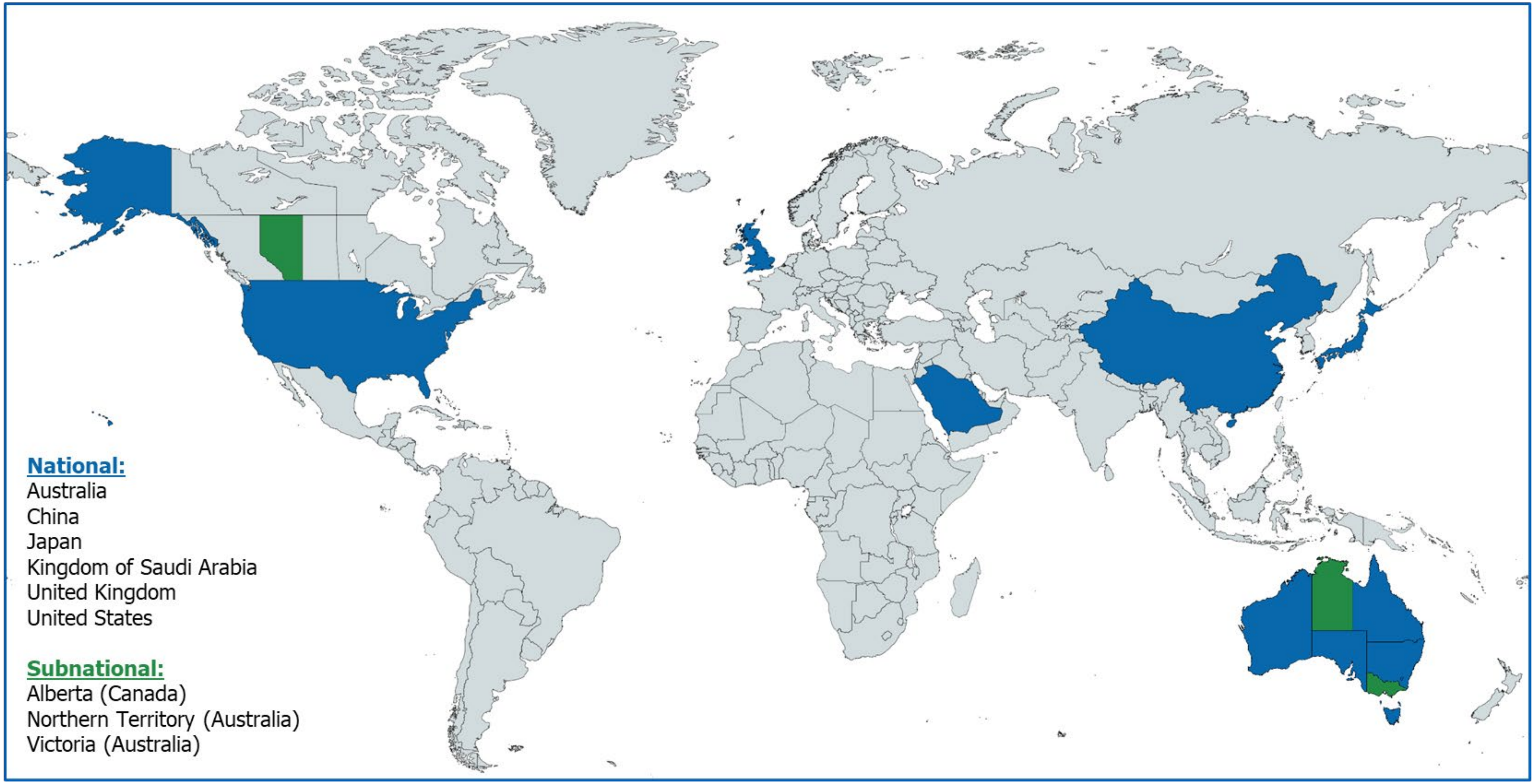
Equipment Manufacturers, Distributors, & Suppliers

- Alfa Laval
- Baker Hughes
- Baltimore Aircoil Co.
- DistributionNOW
- Dril-Quip
- Elessent Clean Tech
- MAN Energy Solutions
- GE Vernova
- Halliburton
- Hitachi Industrial Products
- Hunting International
- Kawasaki Heavy Industries
- Ljungström
- Maxtube
- SICK
- Sumitomo Heavy Industries
- Toshiba Energy Systems
- Vaisala

Project Developers

- Carbfix
- Carbonvert
- Cozairo
- Elysian
- Frontier Carbon Solutions
- Japan CCS Company Ltd.
- Milestone Carbon
- NEXT Carbon Solutions
- Pilot Energy
- STOREGGA

Government Members



THE INSTITUTE'S FOUNDATION FOR CATALYSING CCS GLOBALLY

Engagement & Networking

- Annual Member Meetings
- Annual Forums
- Member-to-Member Introductions
- In-country Member Meetings (Region-Specific)
- Speaking Opportunities at Institute & External Events (Subject to Availability)
- Technical event participation

Knowledge Sharing & Capacity Building

- CCS Highlights
- Quarterly Reports
- Quarterly Meetings
- On-demand Technical Advisory
- Customised Capacity Building
- Monthly Member Webinars (B1*)
- Tailored Technical Reports (B1)

Authoritative Thought Leadership & Strategic Consulting

- Thought Leadership
- Board/Client Presentations
- Consulting Projects and Member services
  - **Policy, Legal Regulatory & Commercial Analysis**
  - **Economics, techno-economic analysis**
  - **Storage / Geology**
  - **Technology**
  - **Finance**
- CO_2RE Database

Advocacy & Policy Influence

- Policymaker Engagement
- Multi-Gov Working Group
- CCS Policy Analysis & Response
- Strategic Stakeholder Partnerships
- Media Advocacy
- Institute Representation at External Events
- Government Consultation Submissions

GLOBAL STATUS OF CCS

Number of facilities in operation rises 54%

77

Number of facilities in operation rises 54% year on year

64 Mtpa

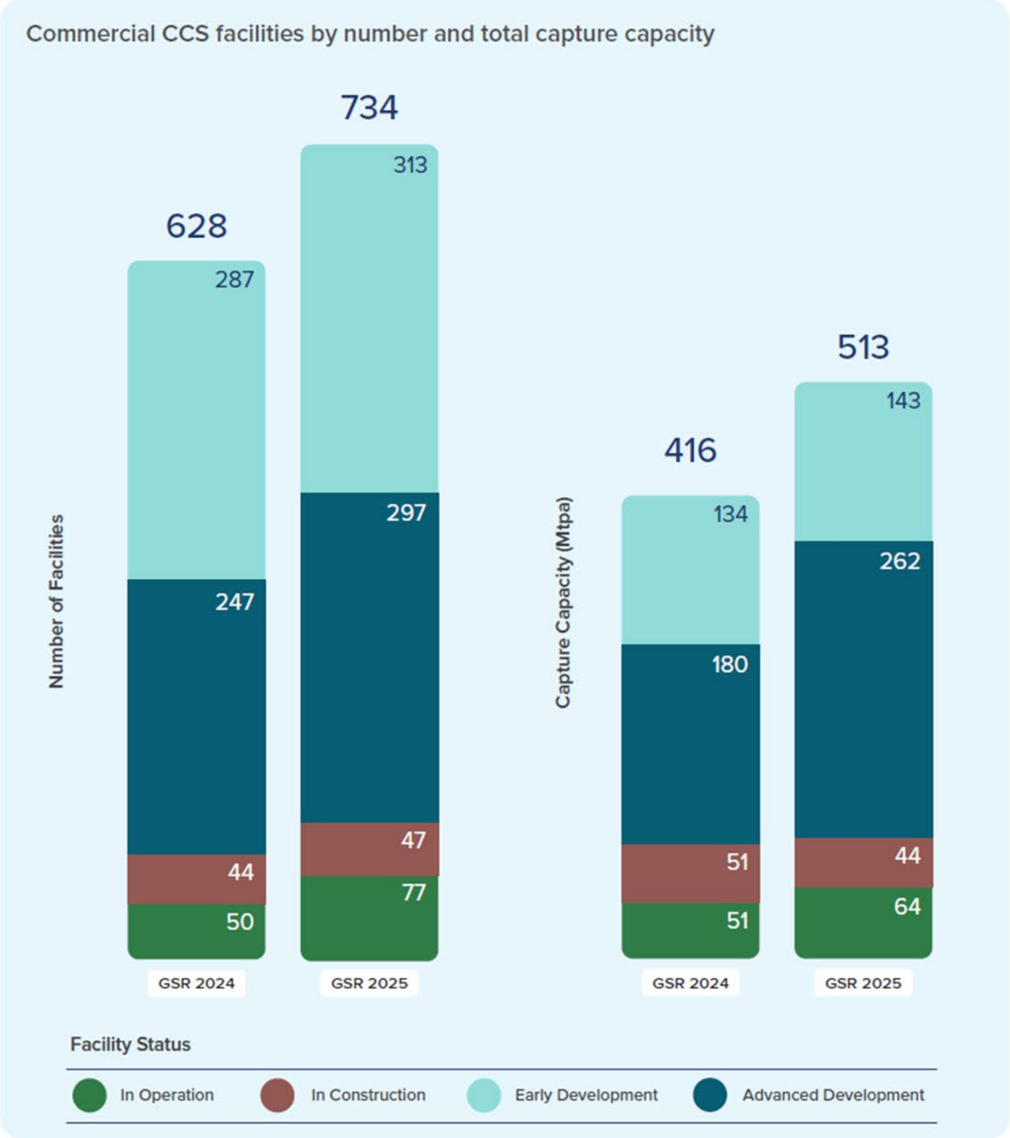
Capture capacity in operation rises 25% year on year

513 Mtpa

Total capture capacity rises 23% year on year

44 Mtpa

Capture capacity in construction in July 2025



Global Snapshot

GLOBAL CCS INSTITUTE

WHERE THERE'S POLICY, THERE'S PROJECTS

Notable policy advances over the past 12 months are providing greater certainty for investors

46%

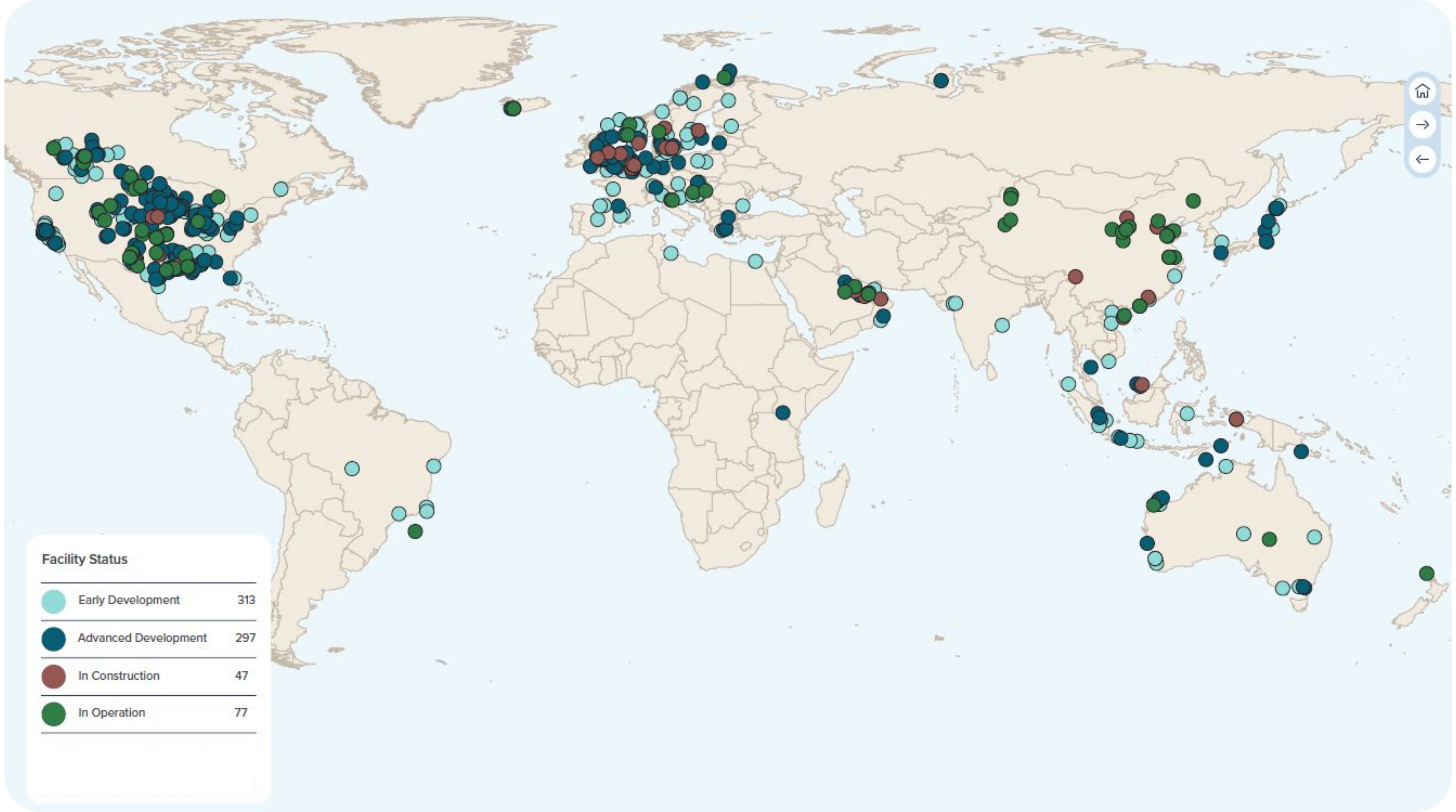
Increase in the capture capacity of facilities in advanced development (FEED) from 180 to 262 Mtpa.

734

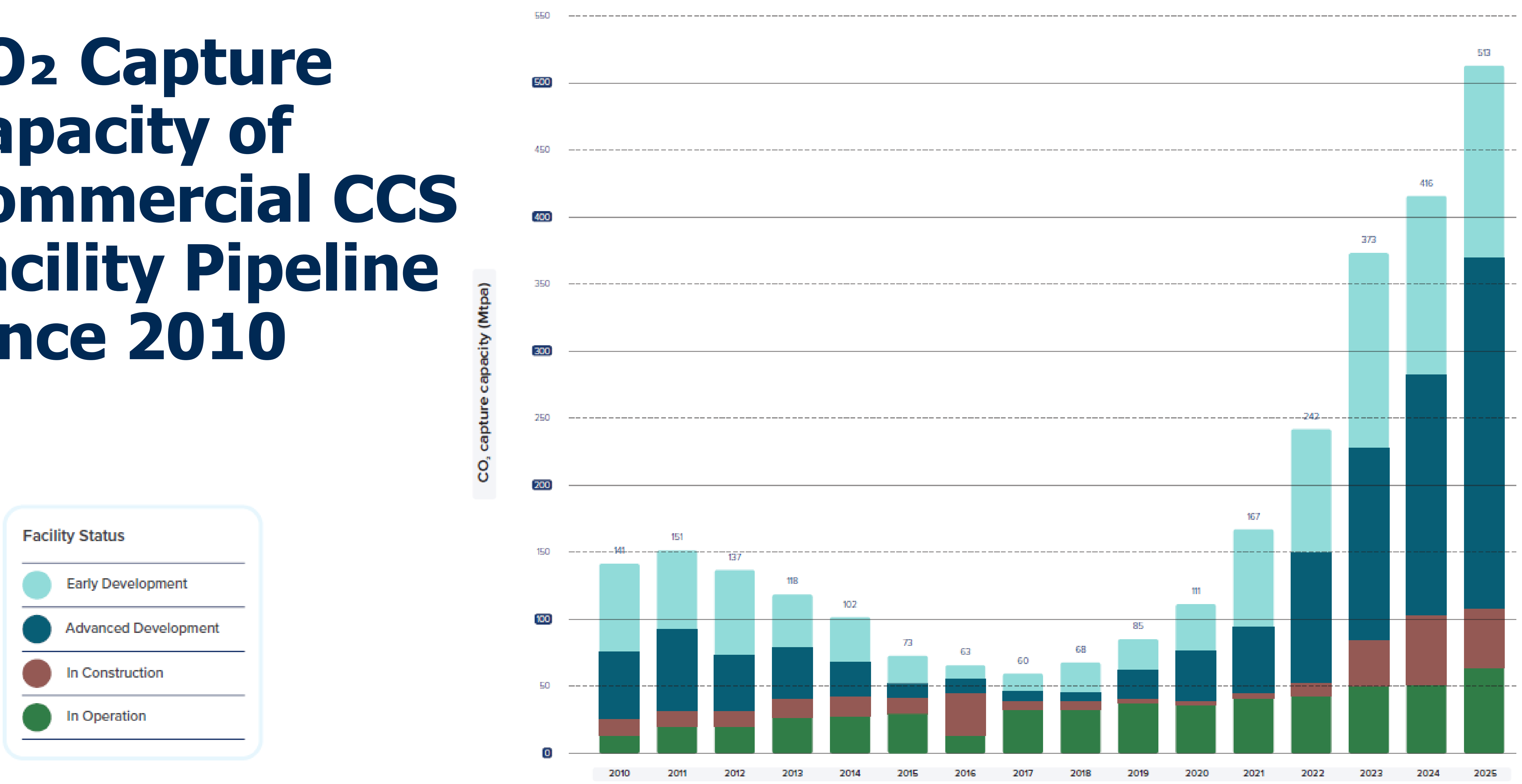
Total number of facilities rises 17% year on year

513 Mtpa

Total capture capacity rises 23% year on year

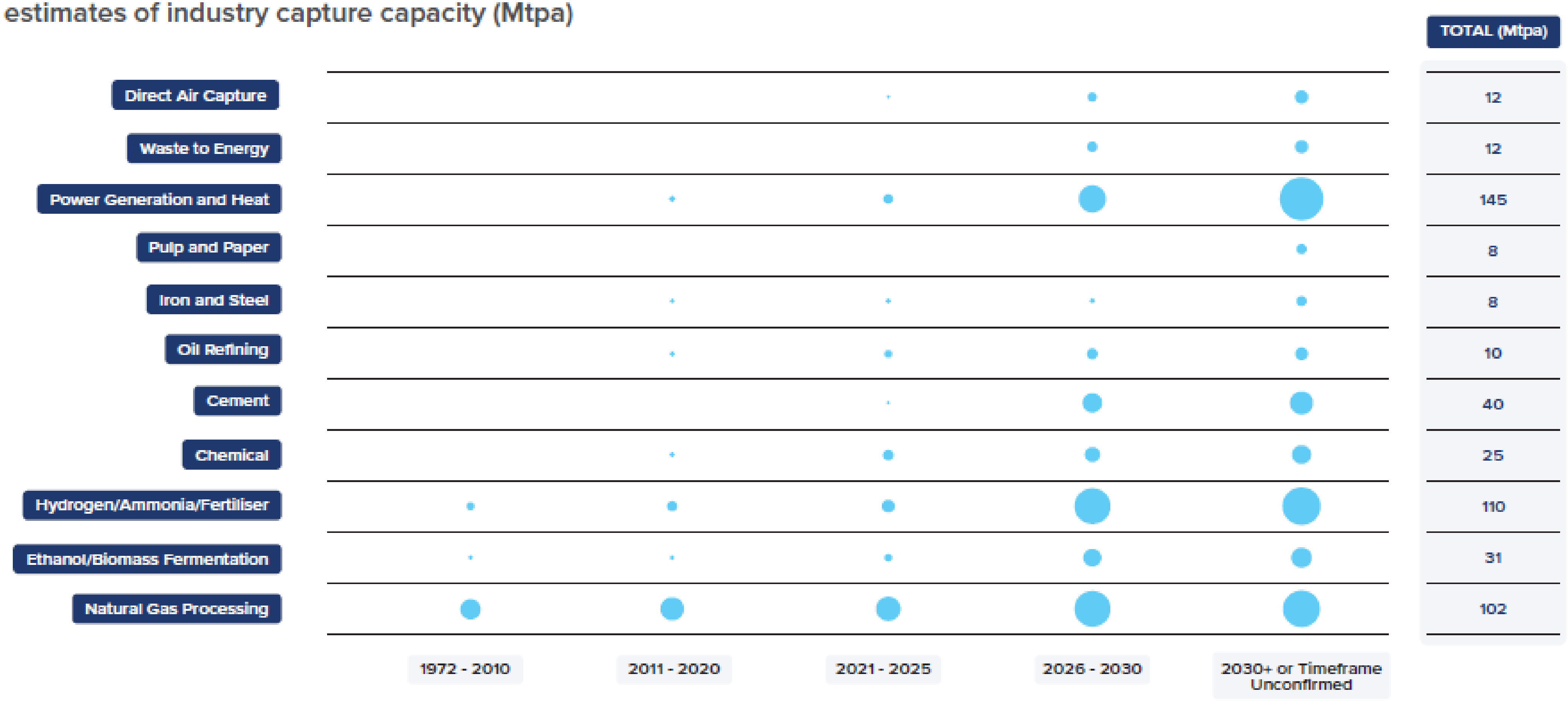


CO_2 Capture Capacity of Commercial CCS Facility Pipeline Since 2010



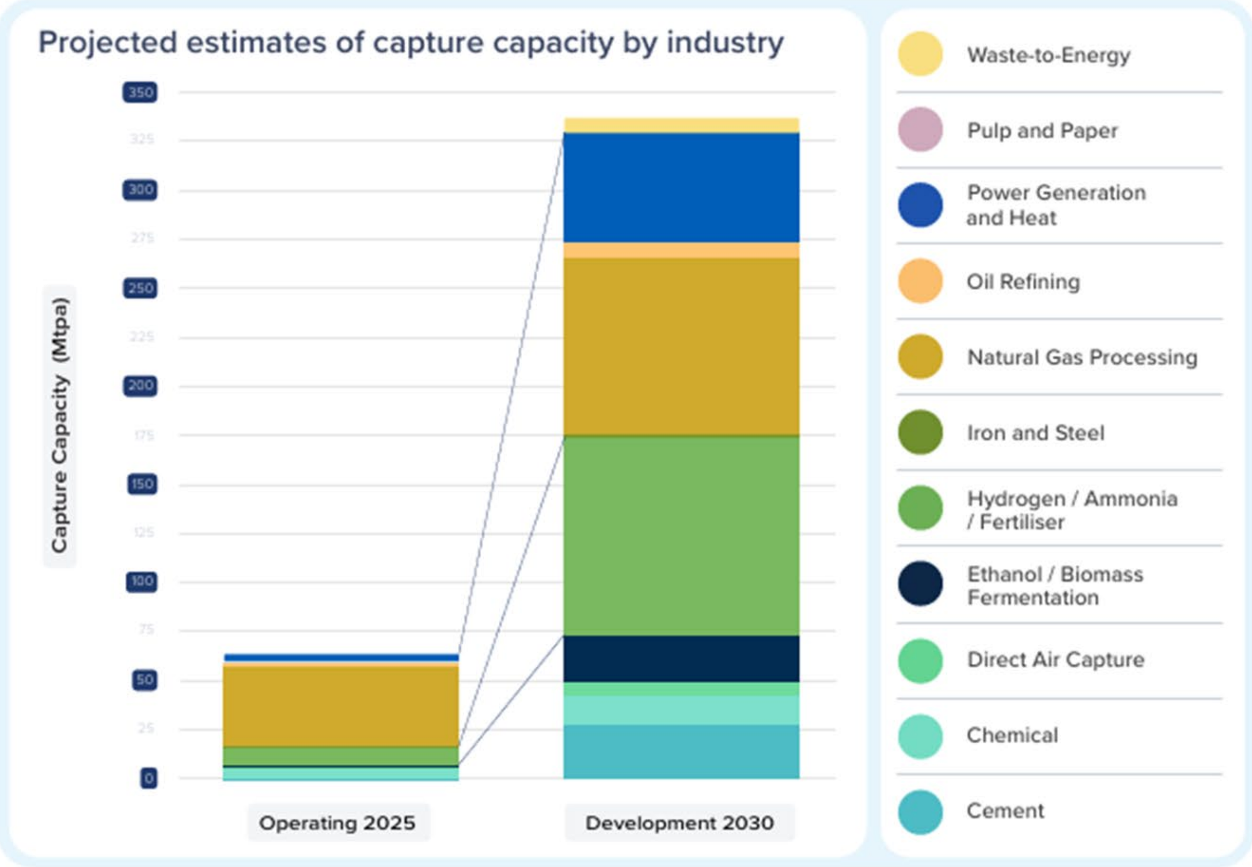
Projected Estimates of Industry Capture Capacity (Mtpa)

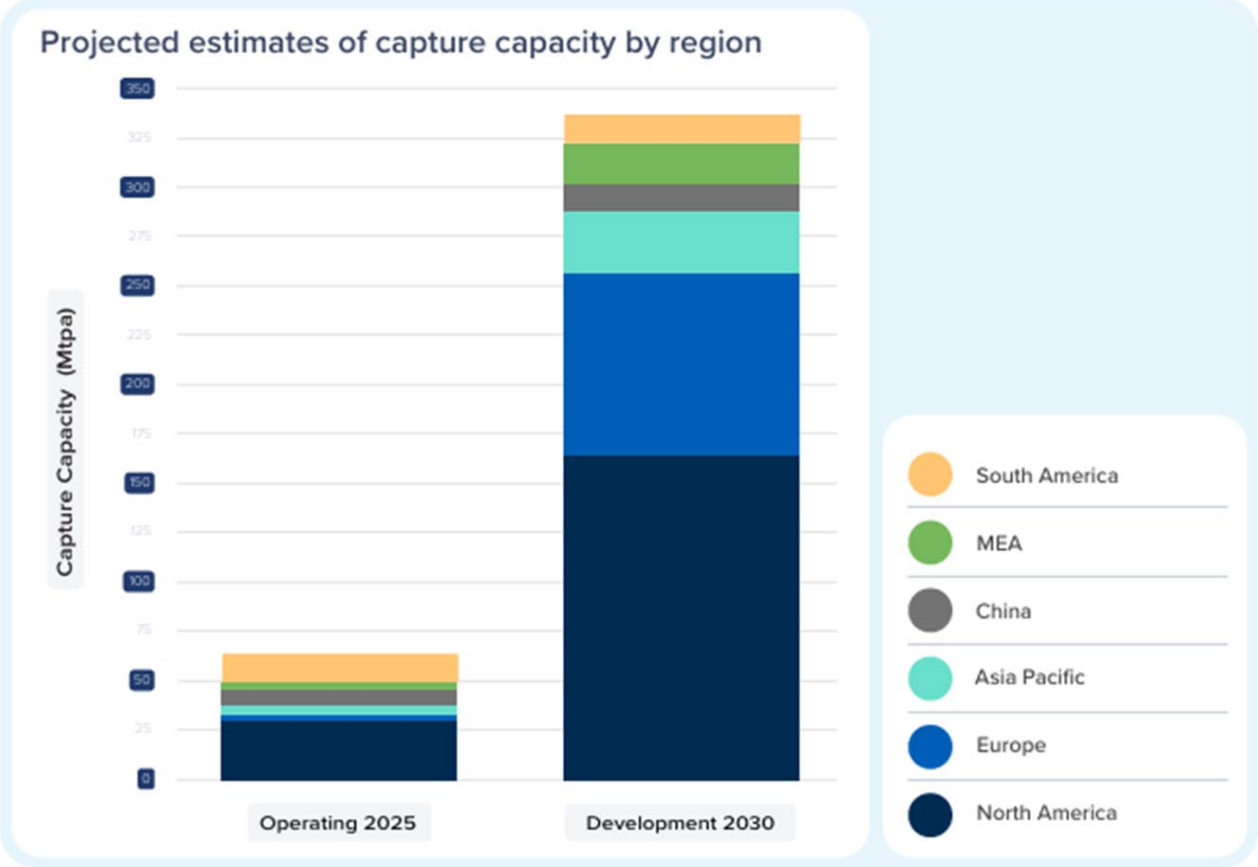
Projected estimates of industry capture capacity (Mtpa)



OUTLOOK TO 2030

Expansion across all industries gaining pace, led by low-carbon hydrogen





Drivers for CCUS in the MEA Region

- Net-zero commitments or NDC targets requiring deep industrial decarbonisation
- Exposure to trade risks under international carbon pricing (e.g. EU CBAM)
- Ensuring market access for carbon exposed exports (e.g. ammonia, steel, fertilisers)
- Developing low-carbon export vectors (e.g. ammonia, SAF, derivatives)
- Limited mitigation alternatives for hard to-abate sectors (e.g. cement, refining, petrochemicals, steel)
- Unlocking value from CO_2 storage capacity (regional CO_2 hub, cross-border storage services)
- Positioning for global clean energy value chains (hydrogen, SAF, green shipping fuels)
- Building domestic low-carbon industrial ecosystems (foreign direct investment, technology transfer, workforce localisation)
- Scaling domestic low-carbon tech manufacturing (innovation, localisation)

Key Drivers and Enablers of CCS in MEA

Saudi Arabia

- CCE framework
- 44 Mtpa CCS target by 2035
- Aramco CCS target of 14 Mtpa by 2035
- Strong Aramco & MoE support for CCUS hubs (Jubail, Yanbu)
- R&D and pilots: DAC, CO_2 mineralisation
- CCS in national power decarbonisation (CCS-ready gas plants)
- Regional voluntary carbon market launched
- Co-lead: CEM CCUS, MI CDR Mission and CMC

UAE

- 10 Mtpa ADNOC CCS target by 2030
- 43.5 Mtpa National CCS target
- CCS codified in Federal Climate Law No. 11 as mitigation technology
- Mandated national carbon registry
- EAD-led MRV programme
- DNV-certified CO_2 storage site
- CCS legally creditable (Law No. 67, Art. 10)
- Planned Cap-and-trade system, Carbon Contracts for Difference (CCfDs) and CO_2 transport & storage regulations

Qatar

- QatarEnergy CCS target of 11 Mtpa by 2035
- QatarEnergy CCS roadmap
- CCS required by Qatar Environment and Energy Commission Qatar
- Financial Centre's tokenised carbon market ecosystem Low-carbon
- Hydrogen development

Oman

- Planned CCS legal and regulatory framework
- Oman Net Zero Centre
- CO_2 transport infrastructure planning
- Low-carbon hydrogen development

Egypt

- Development of CO_2 storage hubs
- Cross-border CO_2 storage
- Proximity to Europe and the Eastern Mediterranean
- Access to Suez Canal infrastructure and port facilities
- Development of storage-linked carbon credit systems

Nigeria

- Climate Change Act (2021) and Petroleum Industry Act (2021) provide legal CCS foundation
- Nigeria Energy Transition Plan (ETP) includes CCS as a key mitigation tool
- IFC-supported CO_2 Storage Atlas and diagnostic assessments (2023–2025)
- Identification of 15 potential CCS projects; pilot designs (20 ktpa) under consideration
- Institutional partnerships with UNDP, SEforALL for MRV and capacity building
- Due diligence protocols under development to align with ICVCM/VCMI integrity standards

Kenya

- National CCS assessment for Kenya Rift underway (basalt storage potential)
- DAC pilot projects targeting mineral storage
- Climate Change (Carbon Markets) Regulations (2024) codify industrial emissions reductions, enabling CCS as non-land carbon project
- Private sector mobilisation through KEPSA–WBG carbon market guidance for enterprises
- World Bank and IFC building local carbon market infrastructure to mobilise private climate capital

South Africa

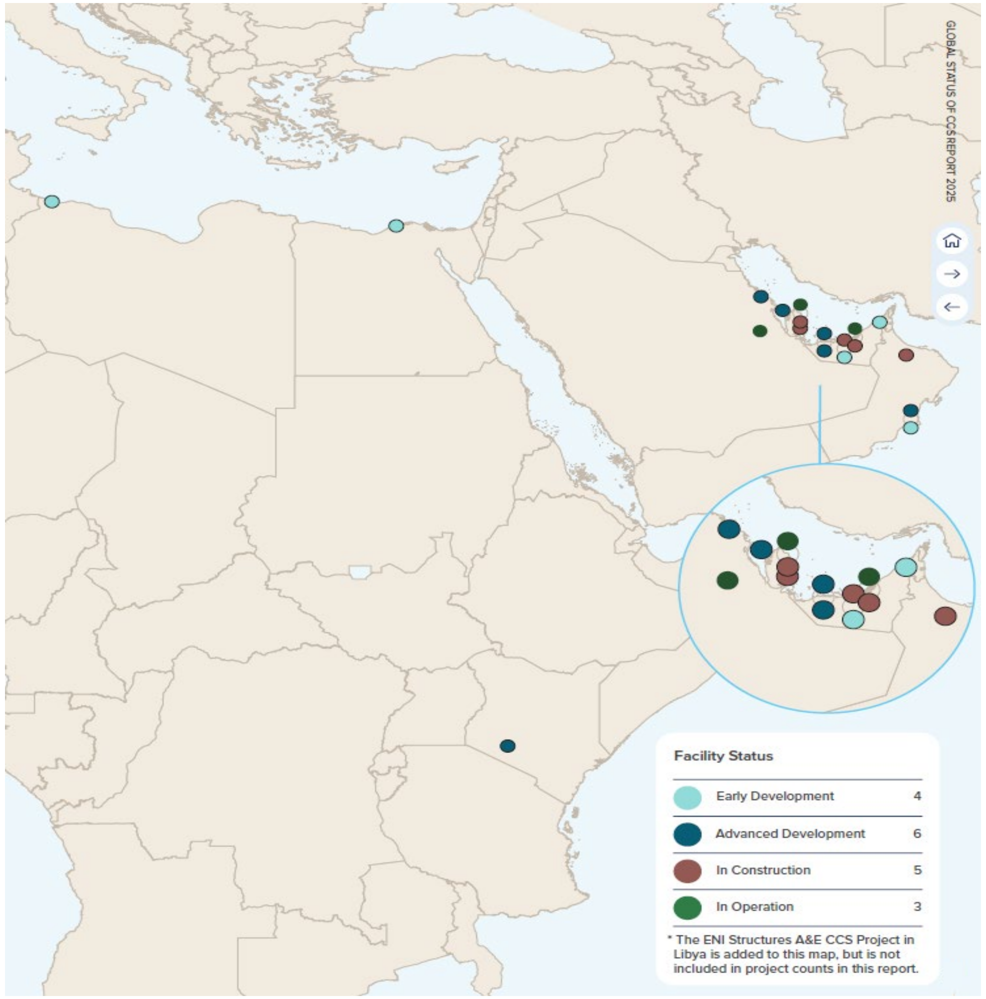
- Climate Change Act (2024) sets carbon budgets and mitigation plans that allow CCS integration
- Council for Geoscience (CGS) leading site mapping and storage readiness in Mpumalanga
- World Bank-funded pilot storage project launching 2025 with regulatory support
- SACCCS under SANEDI driving national CCS capacity and coordination
- Article 6 carbon credits permitted against carbon tax liabilities

MEA Countries Net zero and CCS Targets

Country	Net-zero	CCS in NDC	CCUS targets / plans	Emissions reduction targets
UAE	2050	Yes	10 Mtpa by 2030	CCS contributing 32% to the country's industrial sector's carbon neutrality target ADNOC net-zero by 2045
Saudi Arabia	2060	Yes	44 Mtpa by 2035	Reduction of 278 Mtpa by 2030 Aramco net-zero by 2050
Qatar	2050	Yes	11 Mtpa by 2035	Reducing emissions to 206 MtCO2e by 2030
Oman	2050	Yes	16.3 Mtpa by 2050	Reducing GHG emissions by 17% by 2030
Bahrain	2060	Yes	10-12 Mtpa	Reducing emissions by 30% by 2035
Kuwait	2060	Yes	26 Mtpa by 2050	Reducing GHG emissions by 7.4% by 2035
Egypt	N/A	No	MPMR & MoE push for CCUS/ IOCs conducting studies	20% below BAU (250 Mt) by 2030
Jordan	N/A	No	N/A	Reducing GHG emissions by 31% by 2030 compared to BAU
Morocco	N/A	No	Plans for DAC/BECCS for PtX	Reducing GHG emissions by 45.5% by 2030 compared to BAU
Mauritania	N/A	No	N/A	Reducing emissions by 11% by 2030 compared to BAU
Kenya	2050	No	2 DAC projects; carbon credits	Reduce emissions by 32% compared to 2010 level by 2030
Nigeria	2060	No	Blue H2 & CCUS Centre of Excellence	Reduce emissions by 20% by 2030
South Africa	2050	No	CCUS, among other tech, to reduce CO_2 emissions by 50%	Reduce emission to 350–420 MtCO2e by 2030

MIDDLE EAST & AFRICA Spotlight

- **Focus**: Region prioritising CCS hubs & value chains for decarbonisation & low-carbon exports.
- **Drivers**: Net zero targets, industrial mandates & carbon rules driving policy shifts, private engagement & global partnerships.
- **Progress**: First hub emerging in Saudi; DAC/modular pilots in Saudi, UAE & Kenya; frameworks advancing region-wide.
- **Challenges**: Regulatory gaps, high costs, limited finance & weak carbon markets limit scale-up.



Scaling CCS Across MEA

- Operational & developing projects: Jubail (9 Mtpa) and Yanbu (2 Mtpa) hubs; Oman, Qatar, UAE, Nigeria, Kenya, South Africa advancing pilots and early-stage facilities.
- Policy & investment: Governments embedding CCS in national strategies; regulations, MRV frameworks, and carbon markets evolving to enable investment.
- Collaboration & technology: Cross-border MoUs, CO_2 transport networks, DAC, modular capture, and mineralisation pilots driving regional deployment and export potential.

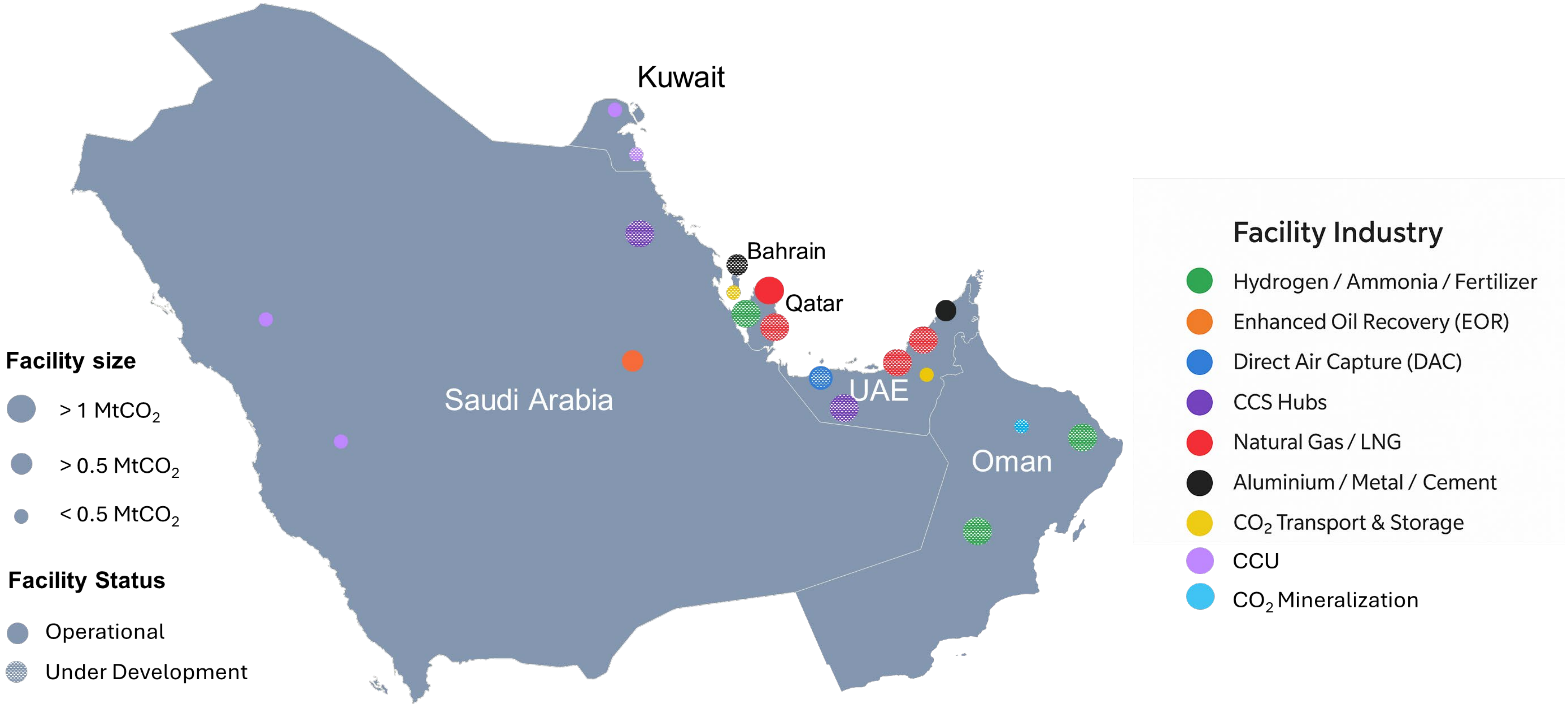
Full List of MEA CCUS Facilities

Project Name	Category	Status	Country	Operational Date	Industry	Capture Capacity (Mtpa)
Gulf Cryo CO2 Recovery Plant	Utilisation Facilities	Operational	Kuwait	2016	Chemical	0.1022
QatarEnergy LNG	Commercial CCS Facility	Operational	Qatar	2019	Natural Gas / LNG	2.2
Saudi Aramco Uthmaniyah	Commercial CCS Facility	Operational	Saudi Arabia	2015	Natural Gas / LNG	0.8
Gulf Cryo MEG Plant	Utilisation Facilities	Operational	Saudi Arabia	2023	Chemical	0.11
SABIC Jubail United CCU	Utilisation Facilities	Operational	Saudi Arabia	2015	Chemical	0.5
ADNOC Al-Reyadah	Commercial CCS Facility	Operational	United Arab Emirates	2016	Iron and Steel	0.8
44.01 Project Hajar	Commercial CCS Facility	In Construction	Oman	2025	Direct Air Capture	0.001
Qatar Petroleum North Field East	Commercial CCS Facility	In Construction	Qatar	2025	Natural Gas / LNG	2.1
QAFCO Ammonia-7 Blue Ammonia Facility	Commercial CCS Facility	In Construction	Qatar	2026	Hydrogen / Ammonia / Fertiliser	1.5
ADNOC Hail & Ghasha Concession Fields	Commercial CCS Facility	In Construction	United Arab Emirates	2028	Natural Gas / LNG	1.5
ADNOC Habshan	Commercial CCS Facility	In Construction	United Arab Emirates	2026	Natural Gas / LNG	1.5
Alba Aluminium Bahrain	Commercial CCS Facility	Advanced Development	Bahrain	Under Evaluation	Aluminum	
Direct Air Capture and Storage (DAC+S) Kenya	Commercial CCS Facility	Advanced Development	Kenya	2028	Direct Air Capture	1
Blue Horizons	Commercial CCS Facility	Advanced Development	Oman	2025	Hydrogen / Ammonia / Fertiliser	
Saudi Aramco Jubail Hub	Commercial CCS Facility	Advanced Development	Saudi Arabia	2027	Natural Gas / LNG	9
ADNOC Rabdan Blue Ammonia	Commercial CCS Facility	Advanced Development	United Arab Emirates	2027	Hydrogen / Ammonia / Fertiliser	
ADNOC West Aquifer	Commercial CCS Facility	Advanced Development	United Arab Emirates	Under Evaluation	CO2 Transport / Storage	
Idku Egypt	Commercial CCS Facility	Early Development	Egypt	Under Evaluation	Natural Gas / LNG	
Equate Petrochemical Kuwait	Utilisation Facilities	Early Development	Kuwait		Chemical	
OQGN CO2 TransportÂ	Commercial CCS Facility	Early Development	Oman		CO2 Transport / Storage	
SNOC Sharjah	Commercial CCS Facility	Early Development	United Arab Emirates	Under Evaluation	CO2 Transport / Storage	
ADNOC DAC	Commercial CCS Facility	Early Development	United Arab Emirates	Under Evaluation	Direct Air Capture	1
MOL (Mitsui O.S.K. Lines)-Bapco Energies Transport and Storage	Commercial CCS Facility	Announced	Bahrain	Under Evaluation	CO2 Transport / Storage	
Eni Structures A&E	Commercial CCS Facility	Announced	Libya	2027	Natural Gas / LNG	
Omifco Ammonia	Commercial CCS Facility	Announced	Oman	Under Evaluation	Hydrogen / Ammonia / Fertiliser	
In Salah CO2 Storage	Commercial CCS Facility	Completed	Algeria	2004	Natural Gas / LNG	1.2

MEA Region Current Projects and Status

- 4 CCUS facilities in operation in the GCC States, capturing 4.2 Mtpa of carbon dioxide.
- KSA announced Al Jubail CCUS hub of 9 Mtpa by 2028, part of the kingdom overall target of 44 Mtpa by 2035.
- Saudi Aramco announced in their sustainability report 2023, a commitment of 14 Mtpa by 2035.
- Qatar Energy expects to expand its capture rate to 11 Mtpa by 2035. This carbon capture new phase is expected to be accelerated after the announcement of the North Field expansion is the world largest liquefied natural gas (LNG) project.
- ADNOC double their CCUS deployment commitment to 10 mtpa by 2030. Two CCS projects are under construction with 1.5 mtpa capacity each.

CCS Projects in the Middle East



UAE's CCS Projects and Initiatives

Al Reyadah CCS Project

- **Developer**: ADNOC
- **Industry**: Iron and Steel
- **Capacity**: 0.8 Mtpa
- **Status**: Operational since 2016

Bab / Habshan Project

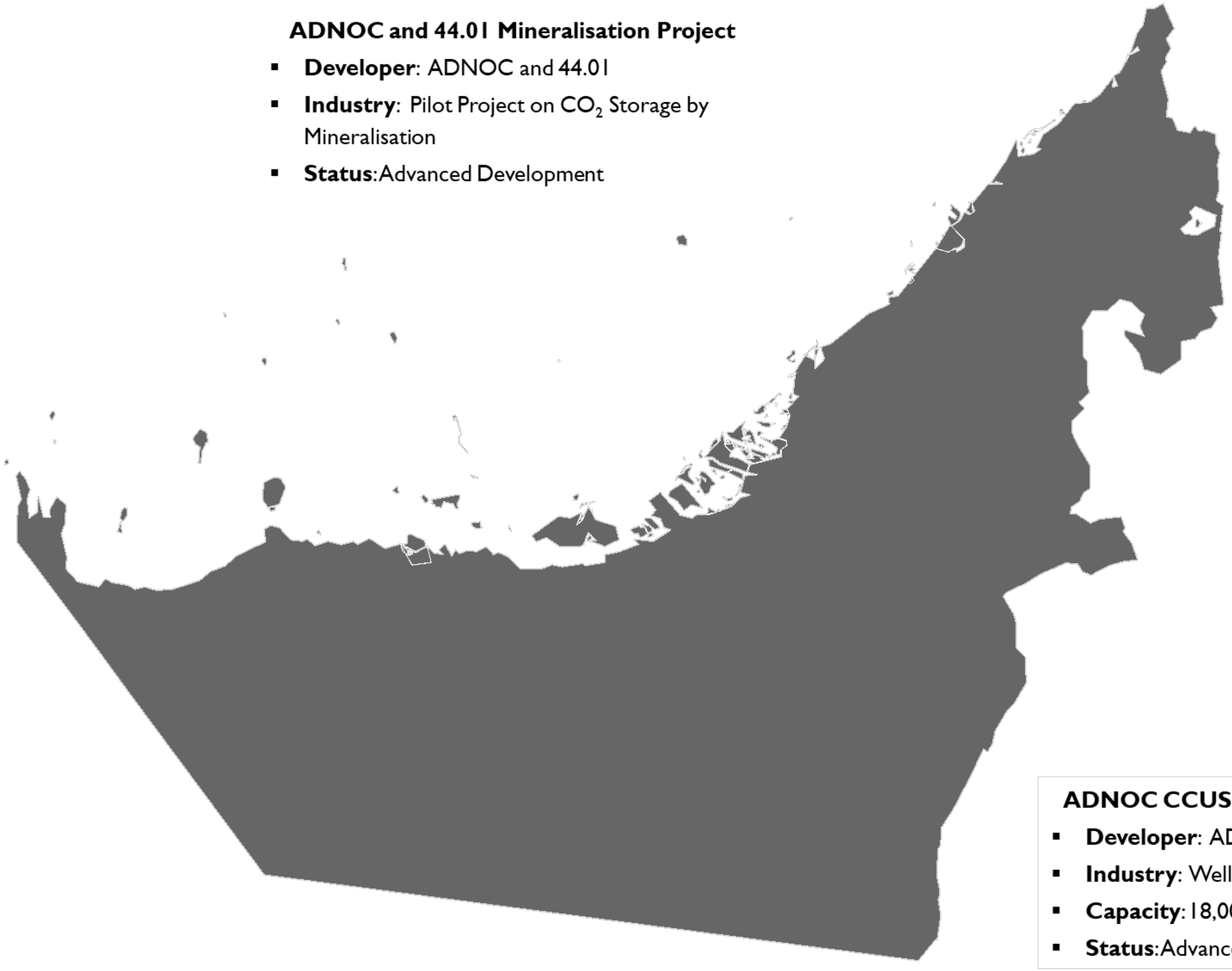
- **Developer**: ADNOC
- **Industry**: Gas Processing
- **Capacity**: 1.5 Mtpa
- **Status**: Under Construction

Low-carbon ammonia project

- **Developer**: ADNOC
- **Industry**: Petrochemicals
- **Capacity**: 3 Mtpa
- **Status**: Operational in 2026

ADNOC and 44.01 Mineralisation Project

- **Developer**: ADNOC and 44.01
- **Industry**: Pilot Project on CO_2 Storage by Mineralisation
- **Status**: Advanced Development



Sharjah CCS Hub

- **Developer**: SNOC, Sumitomo Corp.
- **Industry**: CCS Hub
- **Capacity**: Under evaluation
- **Status**: Early development

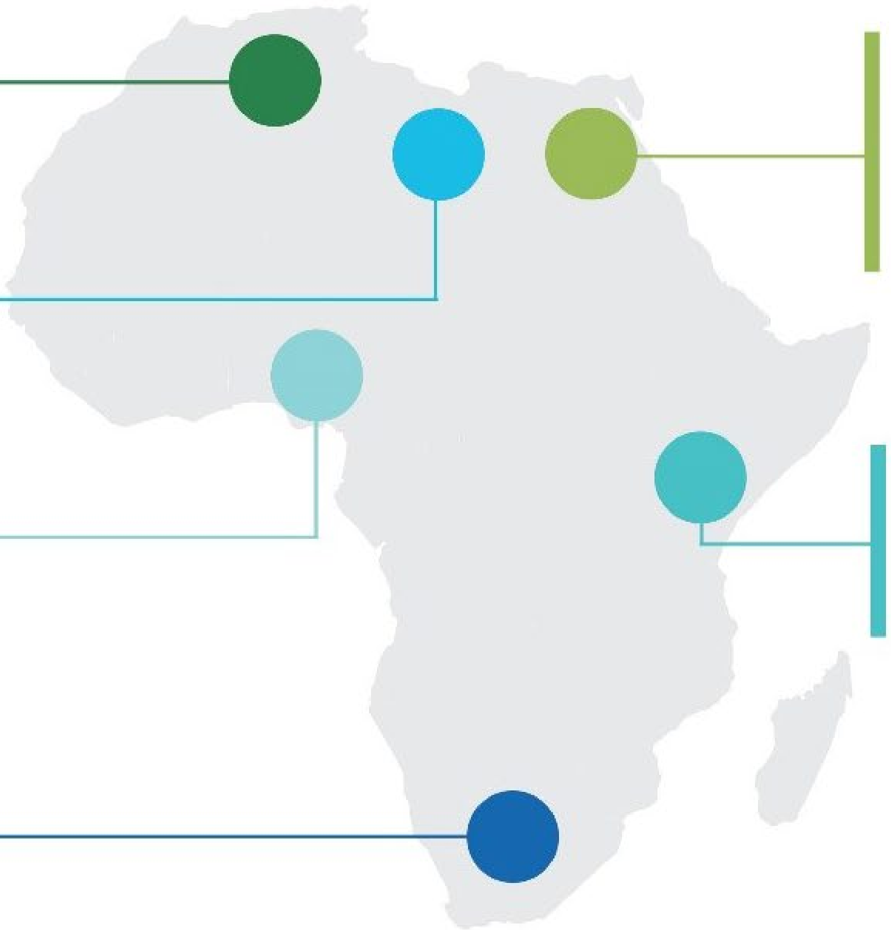
Hail / Ghasha Project

- **Developer**: ADNOC
- **Industry**: Gas Processing
- **Capacity**: 1.5 Mtpa
- **Status**: Under Construction

ADNOC CCUS – Injections in Carbonate Saline Aquifer

- **Developer**: ADNOC and Fertiglobe
- **Industry**: Well Injections
- **Capacity**: 18,000 tonnes / year of CO_2 sequestration
- **Status**: Advanced Development

Key CCS Plans and Initiatives in Africa



ALGERIA

Algeria hosted the pioneering In Salah CCS project, which successfully injected over 3 million tonnes of CO_2 into a deep saline formation.

LIBYA

Libya is planning a CCS facility at the Mellitah Complex to manage emissions from gas production, which will be led by Eni and the National Oil Corporation.

NIGERIA

Nigeria, with IFC support, released a CO_2 storage atlas highlighting its subsurface potential.

SOUTH AFRICA

South Africa developed a national CO_2 storage atlas and conducted a pilot project with World Bank support.

EGYPT

With support from the Institute and the Oil and Gas Climate Initiative (OGCI), Egypt assessed potential CCS hubs in the north. Eni launched the country's first capture project at the Meleiha field. Separately, SLB identified over 600 Mt of storage potential in the Western Desert and Nile Delta.

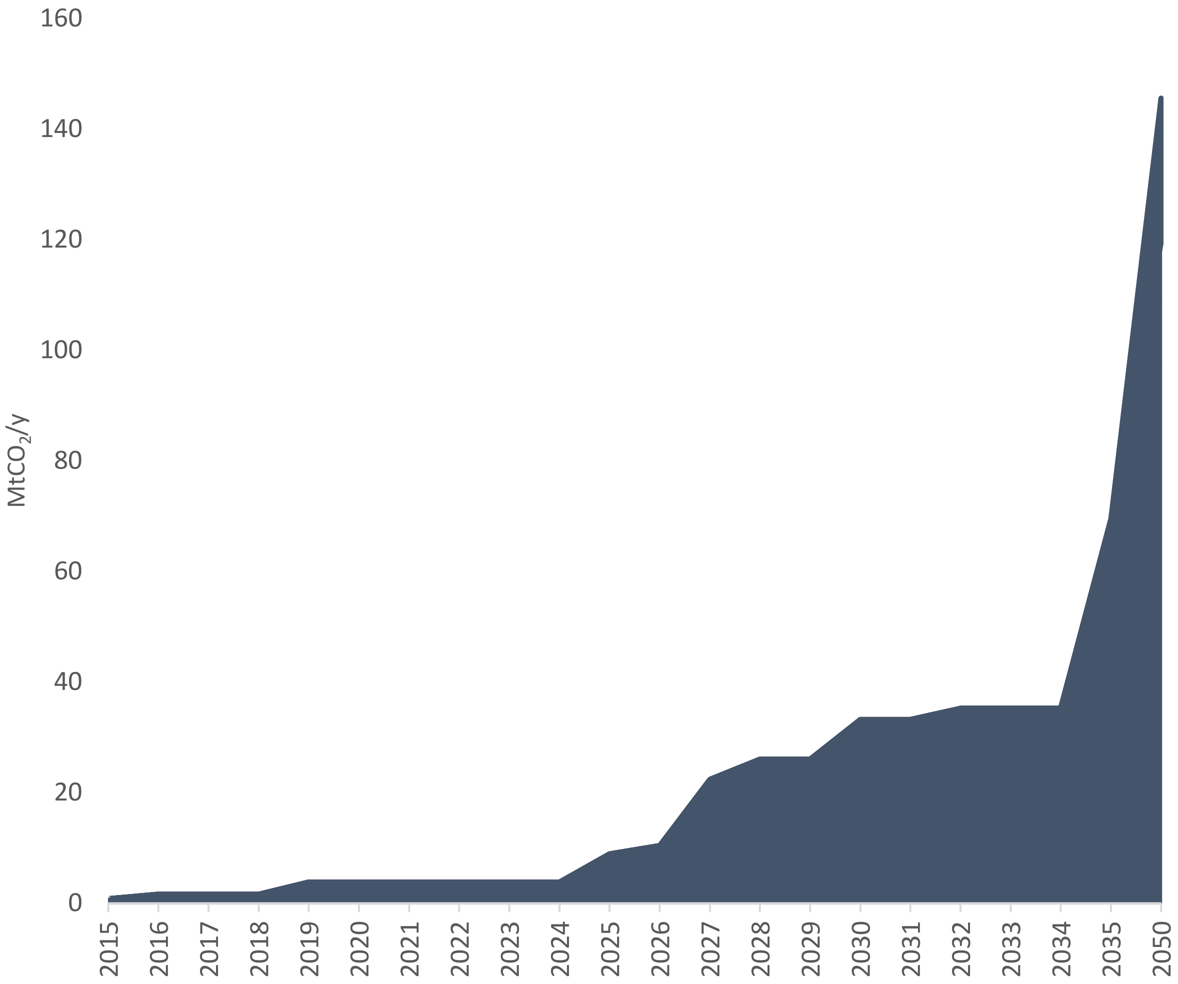
KENYA

Kenya is exploring basalt formations for CO_2 storage. Climeworks and Great Carbon Valley are developing projects in the Rift Valley targeting 1 million tonnes of removals annually by 2028.

Regional CCUS Projects Updates

- GCC Countries Leading: Saudi Arabia, UAE, and Qatar are at the forefront, showcasing large-scale operational CCS projects and setting net-zero and climate goals.
- Saudi Investments: Saudi Aramco is investing in CCS and DAC technologies, including partnerships with Siemens AG and Spiritus, and developing synthetic e-fuel and CCS facilities.
- UAE Initiatives: ADNOC is advancing CCS projects like the Habshan CCUS and collaborating with Posco on blue hydrogen production and with Carbon Clean on modular CCS technology.
- Oman's Efforts: Oman is progressing with projects such as 44.01's DAC and mineralization pilot, PDO's CO_2 EOR pilot, and Sohar Net Zero Alliance's CCUS facility.
- Egypt: Egypt has made progress in identifying potential carbon storage sites, with SLB ranking CO_2 storage sites for Cheiron in Egypt's Western Desert, thus aiding Cheiron and its partners in reaching a 2040 net-zero target.
- Regional Expansion: Additional projects are emerging in Bahrain, South Africa, and Kenya, highlighting the region's expanding CCS pipeline, expected to reach at least 65 Mtpa by 2035.

Outlook of CCS in the MEA region



Regional Spotlight

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MIDDLE EAST & AFRICA

MEA leading cross border CCS cooperation

- CO_2 export and storage
- CCUS in hard-to-abate sectors (cement, aviation, marine, petrochemicals)
- CO_2 export & shared infrastructure
- CO_2 export and storage
- Industrial Transition Accelerator (ITA)
- Hydrogen & CO_2 corridor
- Carbon capture cooperation
- Industrial decarbonization, tech transfer, CCUS pilots

Regional Spotlight

MIDDLE EAST & AFRICA

MEA leading cross border CCS cooperation

ADNOC

- Low Carbon H_2 & CCS, **USA** — ExxonMobil
- Offshore CO_2 Storage, **Malaysia** — PETRONAS
- DAC JV – STRATOS, **USA** — OXY

- aramco ventures — DAC Technology Scale up, **Germany** — UCANEO
- OQGN — Carbon capture technology, **Netherlands** — gasunie
- العمانية للغاز الطبيعي المسال Oman LNG — Methanation pilot, CCU and green H_2, **Japan** — Kanadevia Technology for people and planet

MIDDLE EAST & AFRICA

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Key takeaways: Opportunities & Challenges

Opportunities	Challenges
✓ Vast geological storage potential in KSA, UAE, Nigeria, Egypt, and South Africa positions MEA as a global CCS hub.	➢ Limited regulatory frameworks for CO_2 storage, transport, and liability slow project deployment.
✓ CCS can safeguard market access amid carbon border adjustments and rising global demand for low-carbon products.	➢ High capital costs and weak carbon pricing signals constrain bankability and scale-up.
✓ Emerging technology leadership in DAC, mineralisation, and modular capture systems (e.g. NEOM, Octavia Carbon).	➢ Most projects remain at pilot or demonstration stage; transition to commercial scale is limited.
✓ Expanding private sector and cross-border investment link CCS with hydrogen and CO_2 trade.	➢ Financing gaps persist; de-risking and concessional models needed for investment confidence.
✓ Regional cooperation and innovation position MEA to move from strategy to execution.	➢ Institutional gaps—slow permitting, fragmented governance, and limited regional alignment—impede momentum.
✓ Strategic autonomy and industrial demand make CCS central to the region's energy transition.	➢ Execution challenges and infrastructure constraints may delay large-scale deployment.
✓ Growing international partnerships can anchor MEA's emergence as a global CCS leader.	➢ Sustained coordination and policy clarity are vital to maintain progress.

Thank you!