

Status of CCS in the MENA Region

Japan CCS Forum 2022

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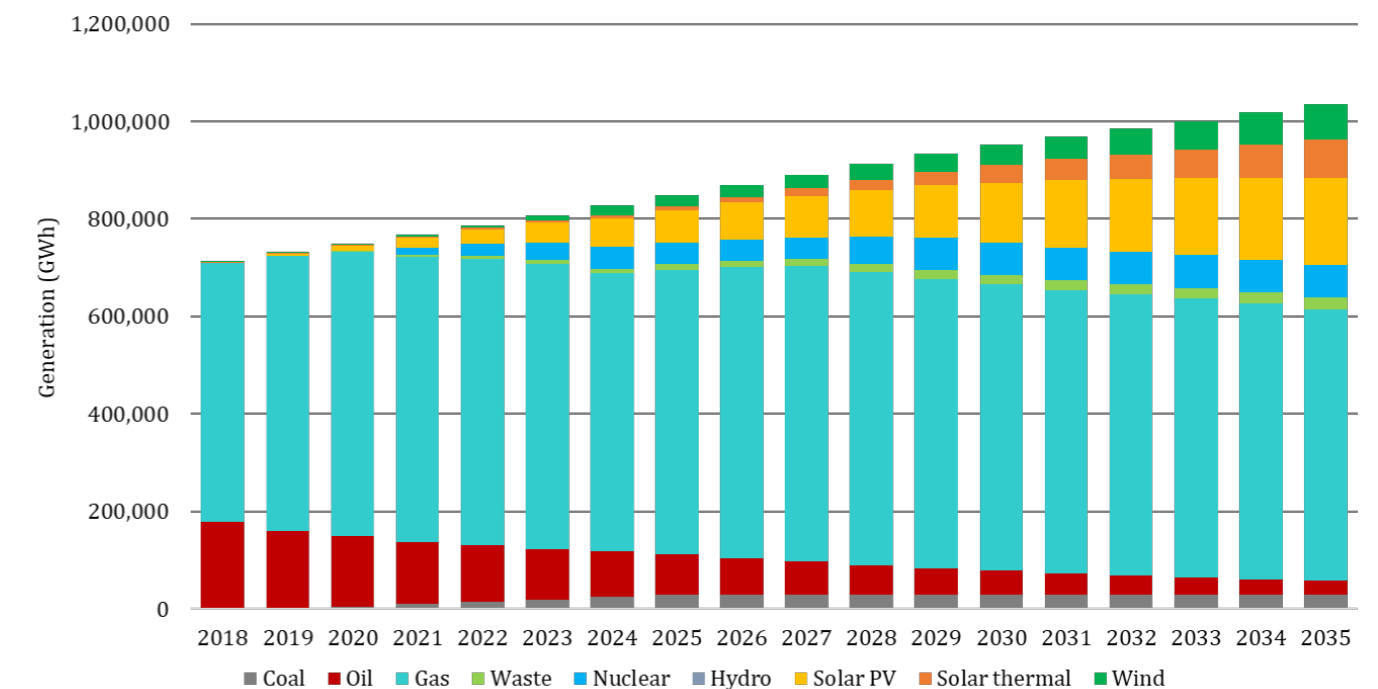
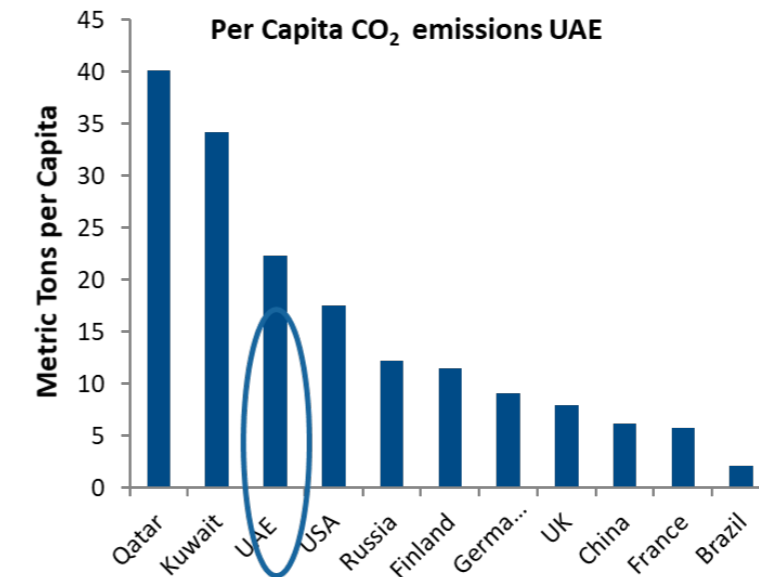
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DRIVERS FOR CCUS IN THE REGION

- High CO₂ emissions per capita.
- Expected increase of emissions due to economic and industrial development
- Countries goals for zero emissions, targets for emissions reductions and NDCs.
- Current and future interest in EOR
- Natural gas availability
- Plans for industrialization
- Blue hydrogen potential
- Potential for circular carbon economy
- In general, high-energy demand for power, desalination, domestic and industrial sectors.
- Fossil fuel remains the main source of energy.



CURRENT PROJECTS AND STATUS

- 3 CCS facilities in operation in the GCC States, capturing 3.7 Mtpa of carbon dioxide, equivalent to 10% global capture capacity.
- Bahrain, Qatar, Saudi Arabia and UAE include CCS in their NDCs* under the Paris Agreement.
- Power generation and blue hydrogen are expected to emerge as new CCS drivers in the region.
- The Global CCS Institute is opening its inaugural GCC office in Abu Dhabi.
- COP 27 in Egypt and COP 28 in UAE



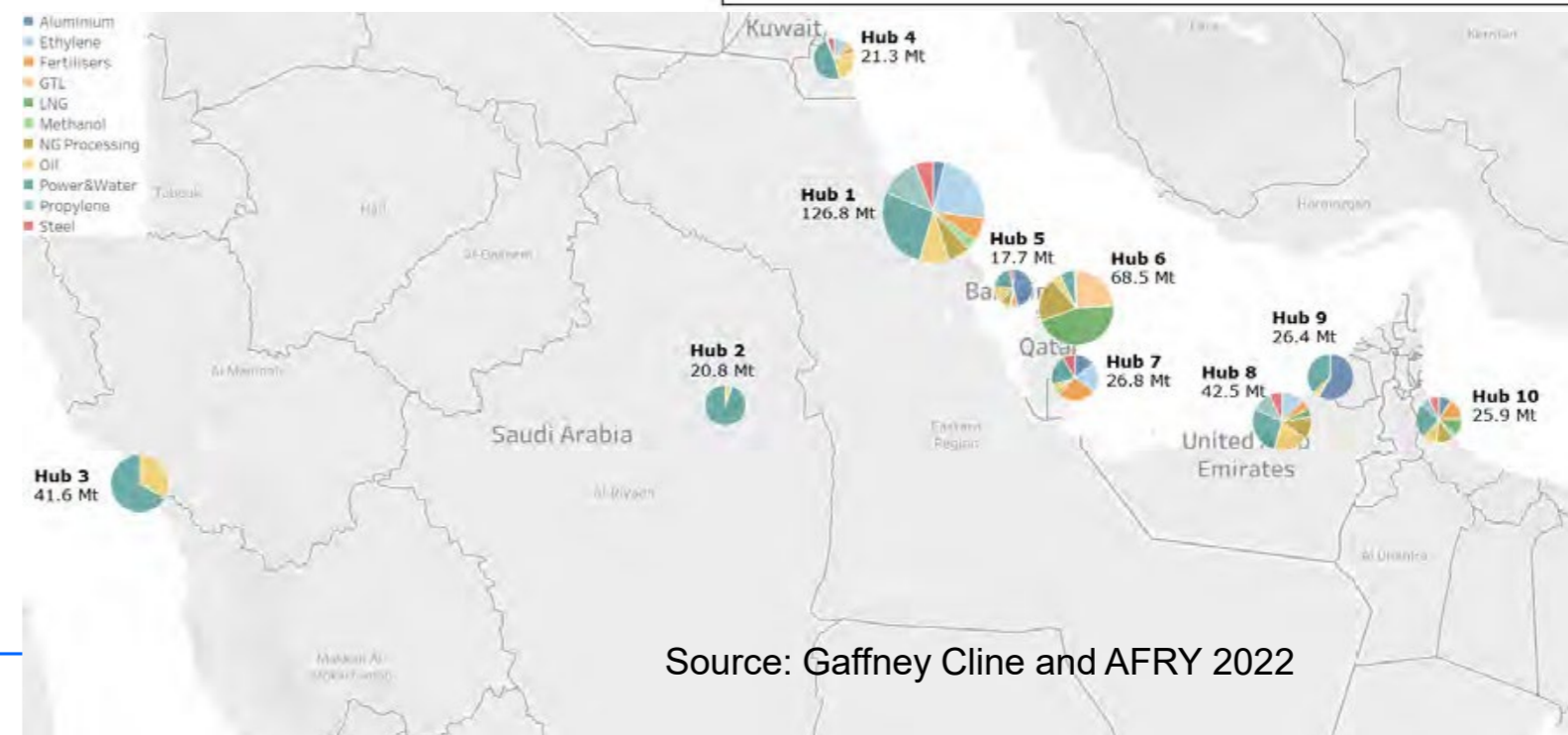
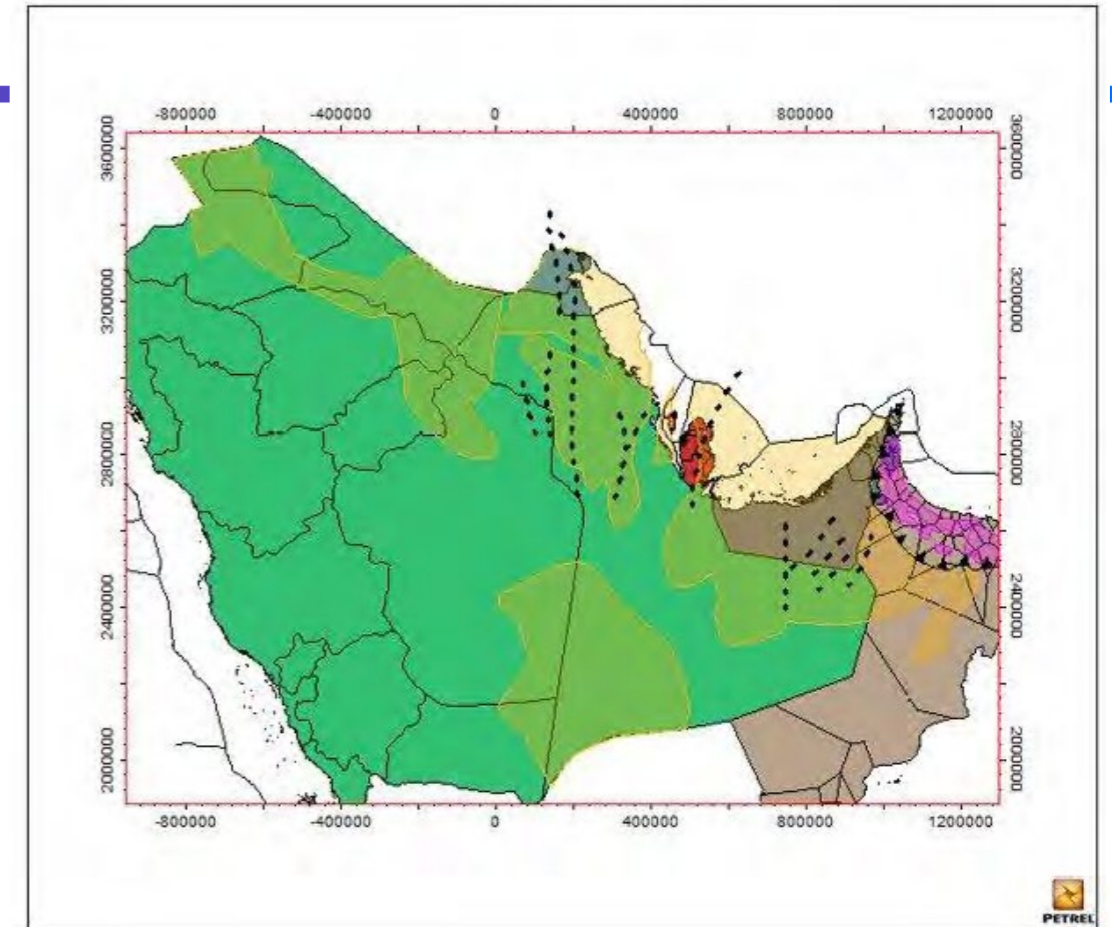
* Nationally Determined Contributions: climate plans of signatory countries to the Paris Agreement.

COMMITMENTS AND PROJECTS ANNOUNCEMENT

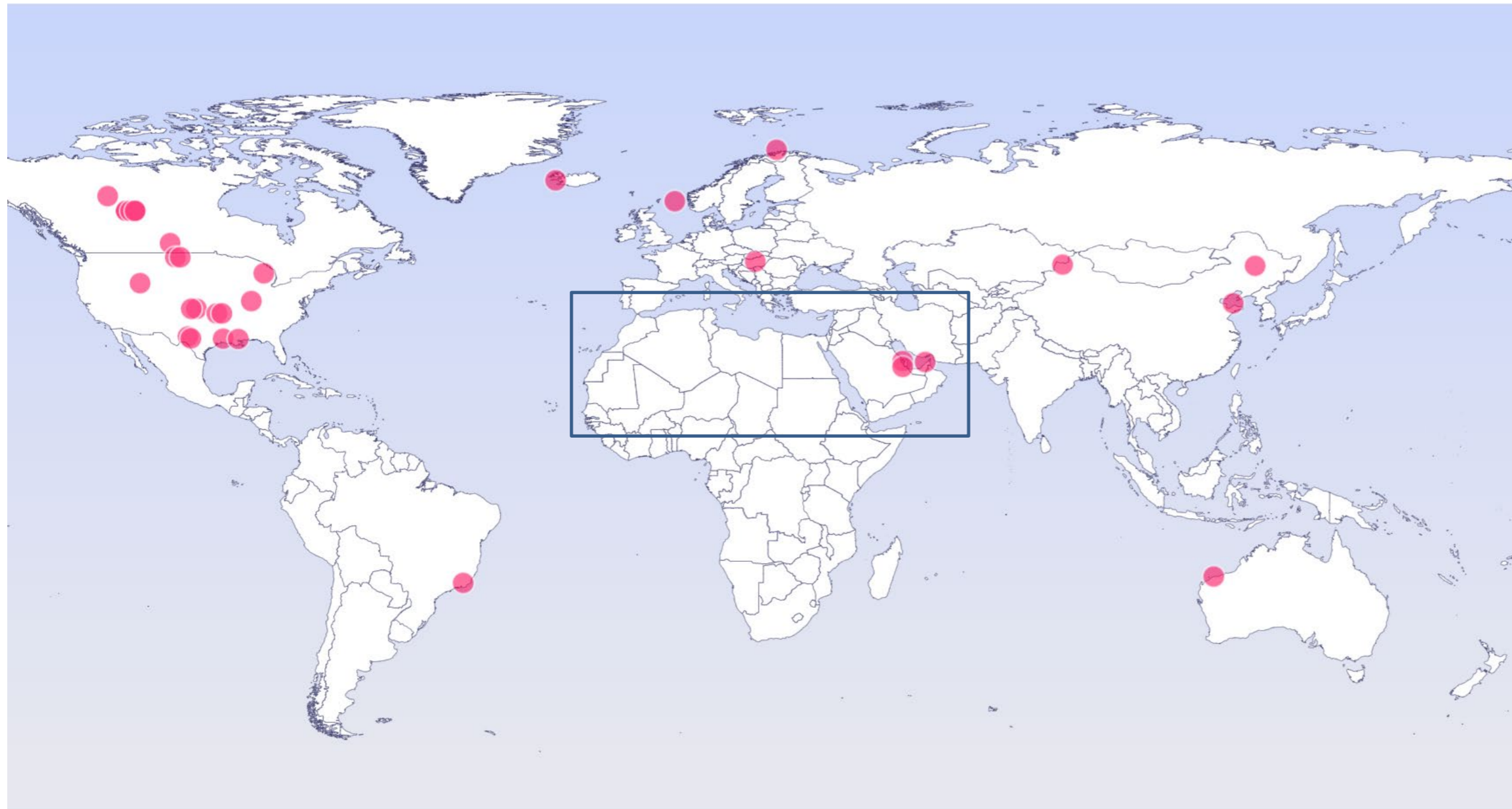
- KSA announced Al Jubail CCUS hub of 9 Mtpa by 2027, 44 Mtpa by 2035.
- Saudi Aramco announced in their sustainability report 2022, a commitment of 11 Mtpa by 2035.
- Qatar Gas expects to expand its capture rate to 5 Mtpa by 2025. This carbon capture new phase is expected to be accelerated after the announcement of the North Field expansion is the world largest liquefied natural gas (LNG) project.
- ADNOC estimates that Phase II and Phase III to capture about 5 Mtpa CO₂ before 2030. This is expected to be captured from two sources: 2.3 Mtpa from Shah sour gas plant and another 1.9 Mtpa of CO₂ from the Habshan and Bab gas processing facility.

OTHER ANNOUNCEMENT AND STUDIES

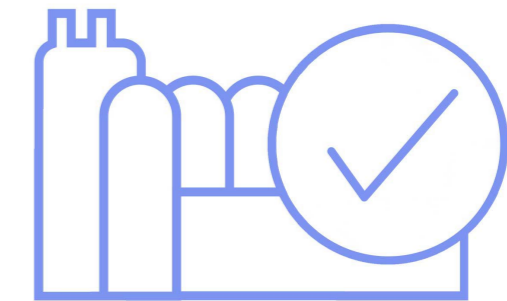
- Mediterranean energy partners (MEP) has signed a MOU with Egyptian gas holding company (EGAS) to assess CCS potential in the Nile Delta in Egypt.
- The global CCS institute is currently conducting a study for OGCI to evaluate the potential of CCUS hubs in Egypt.
- Gaffney Cline and AFRY conducted a study on the CCUS deployment challenges and opportunities in the GCC. The study highlighted the potential of CO₂ storage and CCUS hubs in the region.



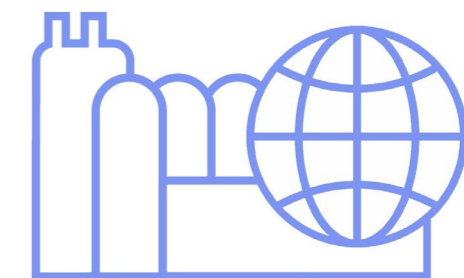
CCS FACILITIES - OPERATING



● Operational



**30 CCS FACILITIES
OPERATIONAL**



**20+ COUNTRIES WITH
COMMERCIAL CCS &
DACCS FACILITIES
IN OPERATION OR UNDER DEVELOPMENT**

OPERATIONAL CCUS PROJECT IN UAE

PROJECT	Al Reyadah / Emirates Steel	
STATUS	Operational	
INDUSTRY	Iron and Steel	
TRANSPORT TYPE	Pipeline	
PARTNERS	ADNOC (100%) – bought Masdar’s 49% share in 2018	
LOCATION	Abu Dhabi, Emirates Steel facility	
ONLINE	2016	
CAPTURE CAPACITY	0.8 Mt/year	
DESCRIPTION	Capture, compress, and dehydrate 0.8 Mtpa of CO ₂ from Emirates Steel	Pipe captured CO ₂ to ADNOC Onshore for EOR at Bab and Rumaitha oilfields
CCUS APPROACH	Amine solvent-based absorption	Regeneration system
OFFTAKER	ADNOC Onshore	

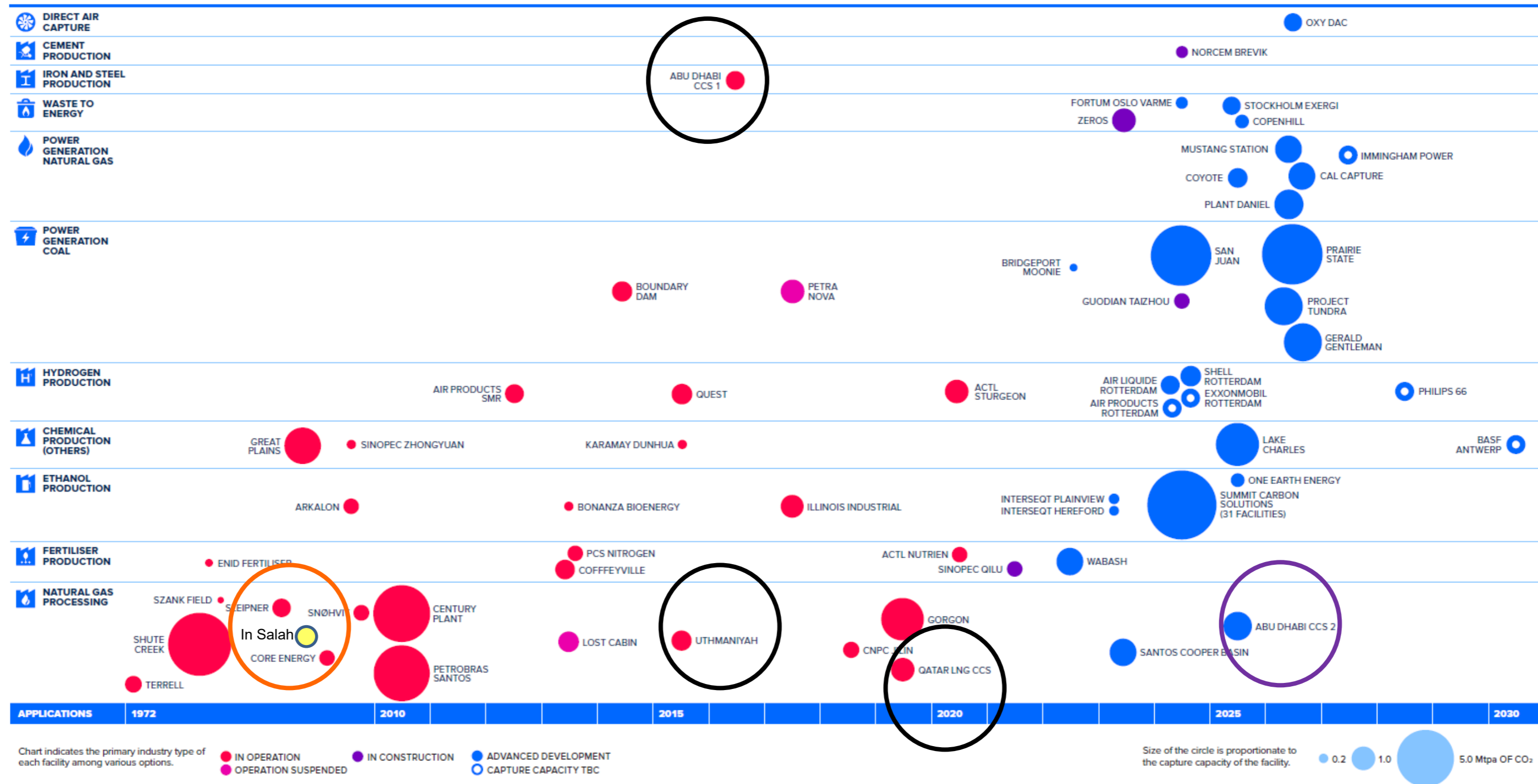
OPERATIONAL CCUS PROJECTS IN KSA

PROJECT	Aramco's Uthmaniyah CO ₂ EOR Project	SABIC Carbon Capture & Utilisation Project
STATUS	Operational	Operational
INDUSTRY	EOR-IOR	Industry
SOURCE	Natural Gas Processing	Oil products refining
TRANSPORT TYPE	Pipeline	Pipeline
LOCATION	Uthmaniyah	Jubail
ONLINE	2015	2015
CAPTURE CAPACITY	0.8 Mt/year	0.5 Mt/year
DESCRIPTION	<ul style="list-style-type: none"> • Capturing CO₂ from Hawiyah NGL plant for injection into the Uthmaniyah in the Ghawar oilfield • Oil recovery between 7-9% and permanently sequester roughly 40% of injected CO₂ 	<ul style="list-style-type: none"> • More than 1,500 t/d of CO₂ will be captured from ethylene glycol facility and transported via pipeline, for production of methanol, urea, oxy-alcohols, and polycarbonates • Food-grade CO₂ is also a product

OPERATIONAL CCUS PROJECT IN QATAR

PROJECT	Qatar Gas
STATUS	Operational
INDUSTRY	Petroleum
SOURCE	Natural gas processing
TRANSPORT TYPE	Pipeline
PARTNERS	Qatar Gas; QP
LOCATION	Dukhan, Qatar
ONLINE	2021
CAPTURE CAPACITY	1.18 Mt/year
DESCRIPTION	• Capture of CO ₂ and H ₂ S from gas processing; re-injected into Dukhan oilfield
CCUS APPROACH	Acid gas injection

GLOBAL SNAPSHOT – DIVERSITY





THANK YOU

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