

POLICIES FOR THE DEPLOYMENT OF CCS

Providing Policy Confidence: The Role of the LCFS CCS Protocol and
45Q

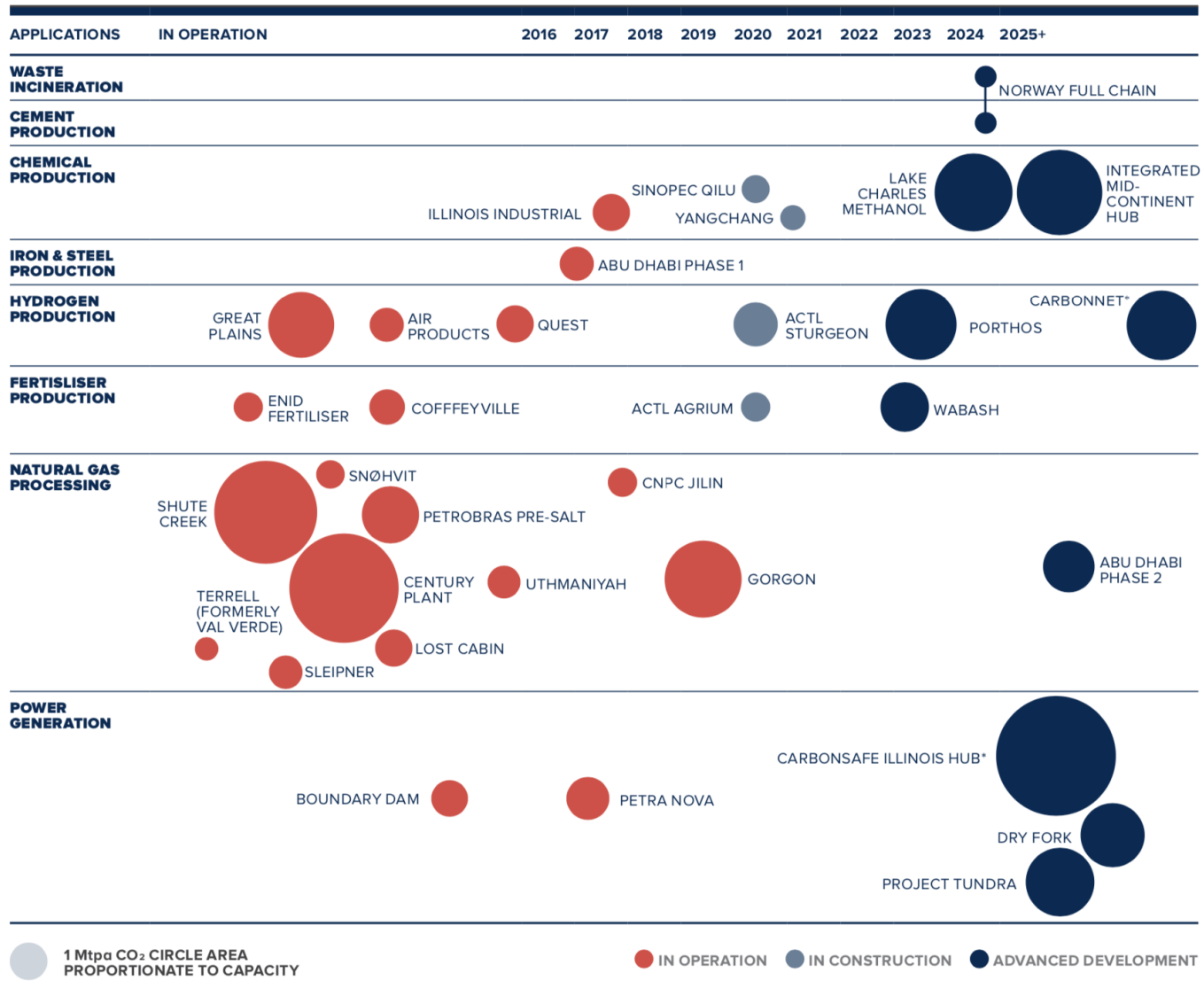
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Senior Advisor



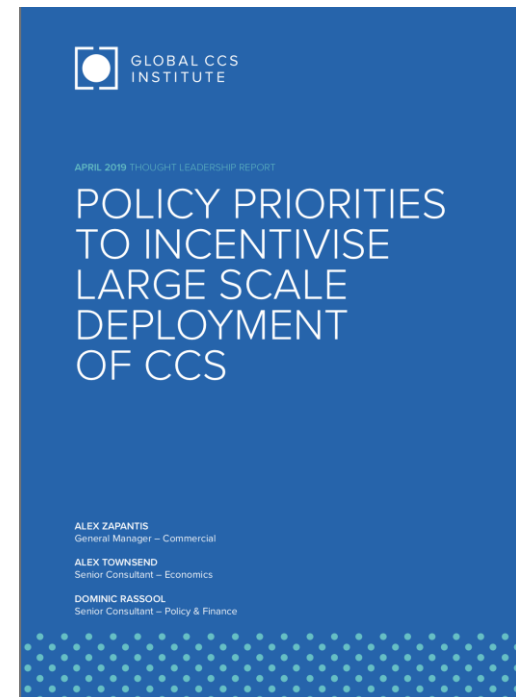
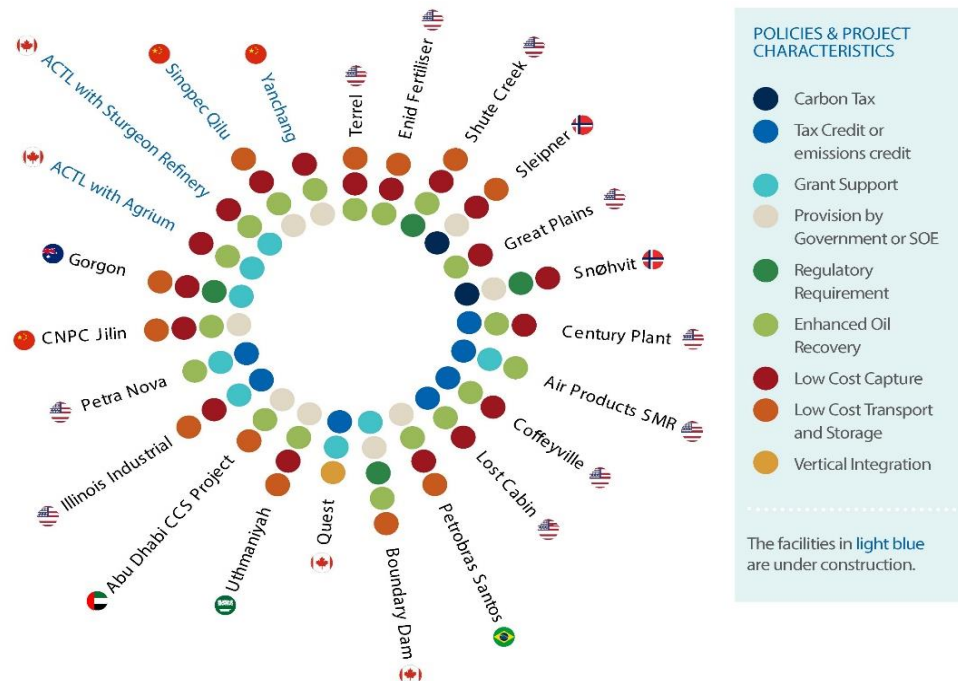
GLOBAL CCS
INSTITUTE

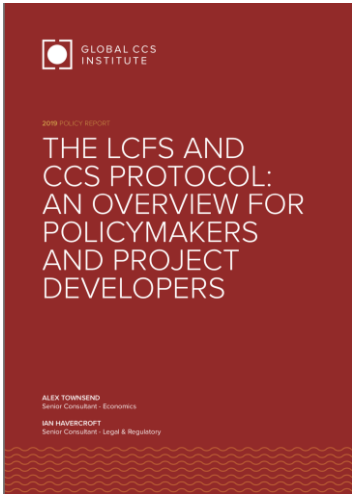
THE GLOBAL CCS PIPELINE IS GROWING...



... BUT POLICY PRESENCE IS KEY.

1. A value on carbon
2. Reducing risk and enabling investment
3. Infrastructure and geologic storage





LCFS CCS PROTOCOL



DIRECT AIR CAPTURE PROJECTS



CCS AT OIL & GAS PRODUCTION FACILITIES



CCS AT REFINERIES PROJECTS



ALL OTHER CCS PROJECTS (E.G. CCS WITH ETHANOL)

Location of CCS project	Anywhere in the world	Anywhere, provided they sell the transportation fuel in California	Anywhere, provided they sell the transportation fuel in California	Anywhere, provided they sell the transportation fuel in California
Storage site	Onshore saline or depleted oil and gas reservoirs, or oil and gas reservoirs used for CO ₂ -EOR			
Credit method	Project-based	Project-based, under the Innovative Crude Provision	Project-based, under the Refinery Investment Credit Program	Project-based or fuel pathway
Earliest date which existing projects eligible	Any	2010	2016	Any
Requirements	Project must meet requirements specified in the CCS Protocol			
Additional restrictions	None	Must achieve minimum CI or emission reduction	None	None

INNOVATIVE, BUT LIMITED TO TRANSPORTATION.



45Q TAX CREDITS

- Enacted in 2008 under the Energy Improvement and Extension Act in the US
- Provides capture operators with credits for each tonne of CO₂ stored or utilised that can be used to reduce their tax liability
- Reformed under the Bipartisan Budget Act in 2018, which included an increase to the tax credit value
- IRS guidance and rule pending
- Can be combined with the LCFS

Tax credit value (\$/tCO ₂)	2019	...	2026	2026 onwards
Dedicated geological storage	31	...	50	Indexed to inflation
CO ₂ -EOR	19	...	35	
Other CO ₂ utilisation	19	...	35	



A COMPARISON OF THE LCFS AND 45Q ELIGIBILITY REQUIREMENTS

	LCFS	45Q
GEOGRAPHIC SCOPE	Anywhere provided they sell fuel into California (with exception for DAC projects)	Anywhere in the US
TYPES OF CCS PROJECT	Any fuel production facility or DAC facility that captures and either stores CO ₂ or injects for CO ₂ -EOR onshore	Any industrial or DAC facility that stores CO ₂ or uses it for EOR or other utilisation purposes
MINIMUM PROJECT SIZE	None	Minimum thresholds for all projects exist
EMISSIONS COVERED	CO ₂ , CH ₄ , N ₂ O, VOCs and CO	Carbon oxide*
QUALIFICATION PERIOD RESTRICTIONS	None	Construction must begin by 1 Jan 2024
CREDIT GENERATION DURATION	Duration of injection	12 years
CREDIT BUFFER & INVALIDATION	CCS projects must contribute to the Buffer Account	IRS is currently consulting on the approach to the recapture of tax credits in the event of leakage
PERMANENCE REQUIREMENTS	Demonstrated through receiving and maintaining Permanence Certification under the LCFS	IRS is currently consulting on the permanence requirements



*Carbon oxide refers to any of the three oxides of carbon: carbon dioxide, carbon monoxide, and carbon suboxide

POLICY CONFIDENCE LEADS TO PROJECTS

- Added 10 projects to the Global CCS Institute database recently
- 8 projects are in the US, and include projects with different feedstocks and technologies, driven by 45Q and the LCFS including
 - First large-scale DAC Facility – negative emissions technology
 - Ethanol facilities – fuel emission reduction
 - Industrial carbon capture
 - Hubs & clusters
- Further project intentions have been announced and are expected

Wabash CO₂ Sequestration

Dry Fork Integrated Commercial Carbon Capture and Storage (CCS)

CarbonSAFE Illinois – Macon County

Project Tundra

Integrated Mid-Continent Stacked Carbon Storage Hub

OXY and White Energy Ethanol EOR Facility

OXY and Carbon Engineering Direct Air Capture and EOR Facility

Project ECO₂S: Early CO₂ Storage Complex in Kemper County



POLICY OPTIONS

- Policies covering the industrial sector and incentivizing innovation
 - Global need for CCS technology deployment at large-scale facilities in cement, steel, natural gas & coal-fired power
 - Eligibility of CCS under the Cap-and-Trade System
 - IEA: “As much as 450 Mt of CO₂ could be captured, utilized and storage globally with a commercial incentive as low as US\$40 per tonne of CO₂”
 - Demand-side policies e.g. buy clean
 - No new, unabated sources of emissions & regulation of emissions
- Investment support mechanisms: Grants, investment tax credits
- Support for hubs & clusters



Policies for the Deployment of CCS

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