

CCUS Regulation in the GCC Countries: Present & Future Perspectives

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the Energy System in a Carbon Constrained Development Context



CCUS in GCC

- Potential Benefits
 - Enhance hydrocarbon production
 - Substitute gas for EOR
 - Reduce GHG emissions
 - Diversify economy
 - Sustain global use of hydrocarbon as clean source of energy
- Engagement already started
- Challenges
 - Technology
 - Regulation

CCS as CDM projects

- Decision 10/CMP.7 (UNFCCC, 2012) adopts CCS as Clean Development Mechanism (CDM) project activities.
- Stricter regulation for CCS projects:
 - Life cycle includes capture, transportation, storage, closure, and post-closure
 - Provide remedial measures for seepage
 - Provide measures to address liability arrangements
 - Fulfill obligations on net reversal of storage
 - More thorough Environmental Impact Assessment (EIA) with frequent updates

CCS in International Regulation (cont'd)

- As non-Annex I countries to host CCS projects, GCC countries have to:
 - Submit agreements to the UNFCCC on implementing CCS in their territories.
 - Pass CCS related laws and regulations:
 - Site selection criteria
 - CO₂ ownership, rights of CCS activities, and access rights to infrastructure
 - Compensation and remediation measures
 - liability arrangements for permanent storage
 - Obligation to address a net reversal of storage
- Issues not yet settled:
 - CCS-EOR
 - Transboundary CCS

IEA CCS Model Regulatory Framework

- CO2 classification	The classification of CO2 as hazardous, waste, pollutant, or commodity affects what regulatory system may apply to CCUS operations.
- Property rights	Ownerships of captured and stored CO2, surface facility, subsurface pore spaces, intellectual property rights of CCUS technology, access to CCUS facilities for CCUS operators and third parties.
- Co-authorizations and preferential rights	Interactions between CCUS regulation and the regulations on CCUS-related activities such as EOR.
- Transboundary CCS	Regulations that deal with (1) CO2 capture and storage in different jurisdictions; (2) transit of CO2 crosses a third country; (3) cross border storages; (4) unintended cross border CO2 migration; and (5) cross-border secondary effects from storage activities.
- Incentives	Incentive to mobilize CCUS deployment as part of an integrated climate change mitigation policy.
- Environmental risk, health, and public engagement	Incorporation of environmental, health, and safety regulation of CCUS operations and public engagement of CCUS deployment under existing regulations.

IEA CCS Model Regulatory Framework (cont'd)

- CO ₂ impurity	Regulation of CO ₂ stream from different sources for share use of transportation facility and better prediction of CO ₂ migration in storage.
- CO ₂ capture specific regulation	Incorporation of CO ₂ capture in industrial process, the permitting of capture facility, and the liability of damage
- CO ₂ transportation specific regulation	Regulations on the liability of leaking as well as pipeline re-use, routing, corridor requirements, and the acquisition of right-of-way.
- CO ₂ storage specific regulation	<ul style="list-style-type: none"> - Authorization of storage site exploration activities - Regulating site selection and characterization activities - Project inspections - Monitoring, reporting, and verification requirements - Corrective measures and remediation measures - Liability during the project period - Authorization for storage site closure - Liability during the post-closure period - Financial contributions to post-closure stewardship - Regulation for CCS with EOR
- Knowledge transfer and data sharing	Exchange of knowledge on CCUS technology and regulation, as well as the sharing of geological and other data that are relevant to CCUS.

Key Regulatory Issues for CCS in GCC

- CCS-EOR
 - Interactions with existing oil and gas agreements
- Transboundary CCUS
 - Potential post-closure CO₂ migration
 - Uncertainty from unpublicized border agreements
- Incentive
 - Economy dominated by public/semi-public entities
 - Linkage with International carbon regulation

CCUS-related International Conventions for GCC Countries

International Convention	
- Kyoto Protocol	- Applies to estimating and reporting of emissions at the capture, transport and injection phases of CCS, with transboundary CCS included.
- London Convention	<ul style="list-style-type: none"> - Regulates offshore CO2 transport and deposit. - Annex I amended in 2006 to permit offshore CCS. - Article 6 was amended in 2009 to permit transboundary CO2. - The 2009 amendment has not entered into force.
- Basel Convention	<ul style="list-style-type: none"> - Regulates international trade in hazardous and other waste. - Amended in 1995 to ban exports of hazardous waste from OECD countries to non-OECD countries for final disposal. - The 1995 amendment has not entered into force.
- UNCLOS	<ul style="list-style-type: none"> - Governs world's ocean and marine environment, including the seabed and subsoil. - Limits the ability to explore for sub-seabed geological storage sites and prohibits the injection and permanent storage of CO2 in international waters.
- MARPOL	<ul style="list-style-type: none"> - Regulates the pollution by ships - Transboundary CO2 shipment of CO2 in gas cylinders or in liquefied form may be subject to regulation.
Regional Convention	
- GCC Custom Union	- Enables free movement of goods among GCC states without customs
- Kuwait Convention	<ul style="list-style-type: none"> - Regulates common marine environment of GCC + Iran and Iraq - Does not explicitly prohibits dumping of waste in the seabed and subsoil - Parties are to ensure effective compliance with relevant international rules

Convention	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
International Convention						
Kyoto Protocol	X 2006	X 2005	X 2005	X 2005	X 2005	X 2005
2009 Amended London Convention						
Basel Convention	X 1992	X 1993	X 1995	X 1996	X 1990	X 1992
UNCLOS	X 1985	X 1986	X 1989	X 2002	X 1996	X 1993
MARPOL	X Annex I/II & V	X Annex I - VI	X Annex I - V	X Annex I - V	X Annex I - VI	X Annex I - V
Regional Convention						
GCC Custom Union	X 2003	X 2003	X 2003	X 2003	X 2003	X 2003
Kuwait Convention	X 1978	X 1978	X 1978	X 1978	X 1978	X 1978

MARPOL:

Annex I: Prevention of pollution by oil

Annex II: Control of pollution by noxious liquid substances

Annex III: Prevention of pollution by harmful substances in packaged form

Annex IV: Prevention of pollution by sewage from ships

Annex V: Prevention of pollution by garbage from ships

Annex VI: Prevention of air pollution from ships

Domestic Regulation

- Review:
 - CCUS specific regulation (if any)
 - CCUS related regulation
 - CO2 classification
 - Environmental impact assessment
 - Property rights regulation
 - Incentives for climate change mitigation
- Source of Data
 - National Communication to the UNFCCC: CCUS specific regulation; incentives
 - National Environmental Law: EIA and CO2 classification
 - National Petroleum Law & Land Use Law: property rights regulation
 - Ongoing CCUS activities: Incentives

Present Domestic Regulation

- No GCC country has CCUS specific regulation
- No GCC country has regulation on CO2 specification
- Environmental Impact Assessment:
 - Bahrain: Articles 20-22 of Decree No. 21, 1996
 - Kuwait: Bylaw No. 210, 2001
 - KSA: Article 5 of General Environmental Law 28 Rajab 1422 H, 2001
 - Oman: RD 63/85 & RD 71/89 of Royal Decree No. 114/01, 2001
 - Qatar: Law No. 30, 2002
 - UAE: Federal Law No. 24

Present Domestic Regulation (cont'd)

Property Rights

Bahrain	<ul style="list-style-type: none"> - The National Oil and Gas Authority (NOGA) is the regulatory body for hydrocarbon production. - Property rights are generally agreed on concession. - No specific regulations in relation to the construction and operation of pipelines. - No specific regulations for third party access to pipelines and other hydrocarbon infrastructure. Special permission is required from NOGA for such access.
Kuwait	<ul style="list-style-type: none"> - The Kuwait Petroleum Company (KPC) owns and operates all oil and gas production facilities, transportation pipelines, storages, and associated infrastructure. - No scope for private sector access to such pipelines and infrastructure.
Oman	<ul style="list-style-type: none"> - The Oil and Gas Law (amended of the Petroleum Law in 2011) regulates hydrocarbon production. - Article 14 states no ownership for concessionaire. - Article 29 specifies pipelines as well as pipeline corridors as public utility projects. - Article 30 restricts pipelines for oil and gas use.
Qatar	<ul style="list-style-type: none"> - Qatar Petroleum (QP) operates and owns all oil and gas production related facilities. - No mechanism to grant third party access to pipelines.
Saudi Arabia	<ul style="list-style-type: none"> - Saudi Aramco has the sole concession to develop the kingdom's hydrocarbon - Subcontract services may be granted by Saudi Aramco to foreign companies.
UAE	<ul style="list-style-type: none"> - No explicit petroleum law in Abu Dhabi. - The ownership, organization and regulation of oil and gas transmission and distribution infrastructure are overseen at individual emirate level. - No explicit regulation that permits third party access to pipelines and other infrastructure. - Parties are free to negotiate the terms on which the oil or gas is to be transported, including fees charged for accessing the distribution network. - Third-party access rights or rights to expand capacity may be granted as a matter of contract.

Present Domestic Regulation (cont'd)

Incentives	
Bahrain	<ul style="list-style-type: none"> - Plan to develop investment institutions for low carbon initiatives. - Interested in fee based mechanism (i.e. utility subsidy reduction) but carbon price is not on the agenda. - Initiated CO2 capture demonstration projects with public funding.
Kuwait	<ul style="list-style-type: none"> - Focused on district cooling, green building, fuel switching, development of solar and wind power (Kuwait Environmental Public Authority, 2012). - No plan to introduce market deregulation or tax based options to reduce CO2 emissions. - Initiated CO2 capture projects for demonstration with public funding.
Oman	<ul style="list-style-type: none"> - In the process of identifying the country's greenhouse gas mitigation strategies.
Qatar	<ul style="list-style-type: none"> - Plan to focus on reducing non-productive combustion emissions from the oil and gas sector, as well as improving energy efficiency in the water and electricity sector. - No plan to introduce market deregulation or tax based options to reduce CO2 emissions. - Initiated CO2 capture projects for demonstration with public funding.
Saudi Arabia	<ul style="list-style-type: none"> - Intent to deploy CCUS as one of its key measures in mitigating greenhouse emissions. - No plan to introduce market deregulation or tax based options to reduce CO2 emissions. - Development of a carbon price is not on the policy agenda. - Initiated CO2 -EOR projects for demonstration with public funding.
UAE	<ul style="list-style-type: none"> - Identified alternative energy, energy efficiency, and CO2-EOR as key work areas for GHG mitigation. - Initiated CO2 -EOR projects for demonstration with public funding.

Regulatory Gaps (x: major gap; -: minor gap; blank: no gap)

Regulatory domain	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
CO ₂ classification	X	X	X	X	X	X
Ownership of surface facility	-	X		X	X	-
Transboundary CO ₂	X	X	X	X	X	X
EIA						
CO ₂ impurity	X	X	X	X	X	X
CO ₂ capture regulation	-	X		X	X	-
CO ₂ transportation regulation	-	X		X	X	-
CO ₂ storage regulation*	X	X	X	X	X	X
Liability during the post-closure period	X	X	X	X	X	X
Regulation for CCS with EOR	X	X	X	X	X	X
Incentives	-	-	X	-	-	-

Note: CO₂ storage regulation include regulating site selection and characterization activities; project inspections; monitoring, reporting, and verification requirements; Corrective measures and remediation measures; authorization for storage site closure; liability during the project period; Financial contributions to post-closure stewardship

Conclusions

- Environmental regulations related to CO₂ capture and transportation are covered by existing regulations
- New regulation for permanent storage needs to be developed to align CCUS with the Clean Development Mechanism (CDM)
- The integration of CCUS regulation with oil and gas regulation can be challenging due to:
 - Potential transboundary CO₂-EOR
 - Lack of explicit oil and gas regulation for highly nationalized industries
- Effective incentive mechanisms can be explored with early stage pilot projects
- Regional collaboration of CCUS may start from capacity development and knowledge sharing.

Remarks

- Need to get the economics right to get policy & regulation right.
- Questions to ask:
 - Will GCC be interested in aligning CCUS with CDM in GCC?
 - How may transboundary CCUS regulation integrate with oil & gas agreements?
- Factors to monitor:
 - International carbon price
 - Oil and gas nationalization



- Opportunities
 - Enhance hydrocarbon production
 - Substitute gas for EOR
 - Reduce GHG emissions
 - Diversify economy
 - Sustain global use of hydrocarbon as clean energy source

Thank you