

Assessing the Role
of Carbon Capture
Utilisation and
Storage (CCUS)

CEO ROUND-
TABLE SERIES



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AGENDA

Wednesday 8th June 2022

10:00 AM Coffee and Networking

10:30 AM Special Speakers

10:40 AM Moderated Discussion

12:15 PM Closing Comments

12:35 PM Lunch



CEO Roundtable Series

His Excellency Abdullah Bin Hamad Al-Attiyah, Chairman of the Al-Attiyah Foundation, launched the CEO Roundtable Series and Dialogues to provide a platform for knowledge exchange and support for the global community in the quest towards a sustainable energy future. All guests have the opportunity to share their opinions and insights in what is always a lively and thought-provoking discussion.

** The meeting takes place under the Chatham House Rule whereby participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.*



BACKGROUND

Carbon capture and storage (CCS), or carbon capture, utilisation, and storage (CCUS), is a suite of technologies to capture CO₂ from carbon-emitting processes and to store it safely for the long term in underground rock formations or convert it into useful products or stable minerals. CCUS involves three steps aimed at reducing the release of anthropogenic CO₂ emissions into the atmosphere. Carbon dioxide is captured from anthropogenic sources; it is transported to the injection site; and permanently stored in geological storage or utilised.

The Paris Agreement on climate action, and the Intergovernmental Panel on Climate Change (IPCC) report on the impacts of global warming of 1.5°C above pre-industrial levels, emphasise the importance of a range of different low carbon approaches in limiting dangerous climate change. CCUS is growing in importance, as one of the technologies to mitigate the emissions of carbon dioxide into the atmosphere. CCUS features widely in the Nationally Determined Contributions (NDCs) submitted in terms of the Paris Agreement by several countries. More than 13 countries, plus the European Union (EU), mentioned it in their submissions, including major oil producers (Iran, Iraq, Saudi Arabia, UAE, Norway, Mexico) and major emitters (China, EU, Japan, South Africa).

There have been several initiatives and projects aimed at demonstrating the application of CCUS technology under various conditions and to build technical capacity, especially in developing countries. The World Bank CCUS Trust Fund and the Asian Development CCUS Fund are just two notable examples that aim to provide sustained financial flow for CCUS demonstration projects.

- The CCUS Trust Fund was set up by the World Bank in 2009, with an initial US\$8 million joint contribution from the Global CCUS Institute and the Norwegian Government. Norway has since contributed a further US\$3 million. The Fund has supported seven country programmes, to date, in Botswana, China, Egypt, Jordan, Kosovo, South Africa, and the Maghreb region (Algeria, Morocco and Tunisia). Programmes are also under development in India and Indonesia.
- The Asian Development Bank (ADB) Carbon Capture and Storage Fund, a multi-partner trust fund, was established in July 2009, with the initial support of Australia under the Clean Energy Financing Partnership Facility. The fund aims to: "accelerate the demonstration of carbon capture and storage (CCUS) technologies; identify, lower and/or eliminate general and country-specific technical, regulatory, institutional, financial, economic, environmental, and/or social barriers to CCUS technology demonstration; and identify, eliminate, or mitigate real or perceived risks in CCUS capture, transport or storage technology demonstration."

CCUS, although often still described as an "unproven" technology, is quite mature in its typical applications, with separation of CO₂ from other gases, its transport by pipeline, and injection into the subsurface all being widely used standard processes since the 1970s. However, a combination of three factors is still required to ensure that CCUS achieves its potential, and at the scale needed to be an effective approach for climate change mitigation.

1. The first is an enabling market framework, encapsulated by a global carbon pricing mechanism. Article 6 of the Paris Agreement (governing international cooperation on cutting emissions, including carbon trading), could provide scope for implementation of joint CCUS projects, by countries.
2. The second is a pipeline of large-scale projects, including hubs and transport systems, that will demonstrate and implement CCUS on all key high CO₂ emitting sectors, such as gas and coal power, aluminium, cement, hydrogen production, oil refinery, etc.
3. The third is focused investment on technology development and deployment to reduce capture costs and to prove the beneficial uses of CO₂.

It is important to note that CCUS is forming part of the centre stage of ongoing discourse on global transition to a future low-carbon energy economy. In particular, the increasing interest on hydrogen as a low-carbon energy carrier for industry, heating, and long-distance transport, is propelling further interest on CCUS, since hydrogen made from steam reforming of natural gas with CCUS is expected to be significantly cheaper than that made from electrolysis of water with low-carbon electricity. This is of particular interest for countries (especially in the Middle East) that have substantial sub surface assets in the form of fossil fuels. One of the ways to monetise these assets is to convert those fossil fuels (especially natural gas) into hydrogen. The existing mature technologies to convert natural gas into hydrogen, simultaneously produce

carbon dioxide. CCUS is therefore an essential technology to enable those subsurface assets to be monetised, in a climate friendly manner.

CCUS is now widely supported by a few major international organisations who see it as a key technology that can be applied to diverse and hard-to-abate industries. With the adoption of the rulebook for Article 6 of the Paris Agreement, it is expected that experts will intensify the development of methodologies for projects applying CCUS technology for removal of CO₂ emissions.

The Foundation has brought together a team of internationally renowned experts, to share their insights and perspectives on the current state of play for CCUS, latest and most promising developments, some glimpses into what the future may hold, and key issues and opportunities that Article 6 of the Paris Agreement may present for wider adoption of CCUS technology.



OVERALL OBJECTIVES

- To deliberate on an emission reduction concept that has been debated, experimented, and tested for a long time, but has only recently gained some traction and serious consideration in the growing international discourse on energy transition.
- To provide up-to-date information on key initiatives and CCUS projects around the world.
- To explore how the experiences from numerous pilot-scale projects could be translated into large projects that enable CCUS technology to contribute, at the maximum potential of emission reductions, to the achievement of the goal of the Paris Agreement.
- To explore the potential for CCUS to contribute to enhanced Nationally Determined Contributions (NDCs) of the State of Qatar and other countries, aligned with the global expectations, in terms of the requirement of the Paris Agreement.
- To assess how the existing technical expertise in Qatar, and the country's geological formation, could be leveraged for deployment of a large CCUS project, that contributes to climate-friendly, cost-effective and prudent monetisation of the substantial subsurface assets of the country.

WEBINAR SPEAKERS

Moderator:



Nawied Jabarkhyl,
News Anchor &
Correspondent, CGTN.

Speaker



Braulio Pikman,
Technical Director at
ERM – Sustainability,
Energy and Climate
Change.

Speaker



Ian Kuwahara
Director, Energy and
Industrial Innovation,
VERRA.

Speaker



Martina Lyons,
Associate Programme
Officer – Innovation
and End-use sectors,
IRENA.

Speaker



Andrea Zambianco,
Commercial, Energy
Carriers Commercial
Fertilizer & Syngas
Business Manager.

DISCUSSION POINTS

At the CEO Roundtable, international experts will share insights on recent and ongoing developments with regards to the application of CCUS for reducing carbon dioxide emissions. The moderated discussion will cover, but is not limited to, the following aspects:

- 01.** The role ascribed to CCUS in the various scenarios and assessments of the pathways to net-zero carbon emissions.
- 02.** Lessons from CCUS pilot projects, including experiences that demonstrate good safety and permanency of storage sites.
- 03.** The trends for providing finance for CCUS projects.
- 04.** The regions/countries that are best positioned to apply CCUS technology at scale.
- 05.** Examples of countries, organisation and companies that are leading pioneers in the promotion and development of CCUS.
- 06.** The potential for the use of CCUS in the production of hydrogen, and in hard to decarbonise sectors, such as metal smelting, cement production, fossil fuel-based power generation plants.
- 07.** Comparative analysis of CCUS to other methods for reducing carbon dioxide emissions, such as energy efficiency, renewables, nuclear and land-use change.
- 08.** Identifying and engaging the entire stock of knowledge available globally to achieve the potential for CCUS to be one of the crucial mitigation methods in the unstoppable race towards net-zero by mid-century.
- 09.** The policy and regulatory framework necessary for global largescale application of CCUS, and the role that a global carbon price could play.
- 10.** The scope for bilateral, regional, and international collaborations in support of the development of large-scale CCUS projects.



KEY QUESTIONS



1. Does the IPCC report see a major role for CCUS?
2. What is the global status of research, development, and deployment of CCUS technologies?
3. What role does CCUS have for countries with abundant natural resources and countries that are heavily reliant on fossil fuels for energy generation?
4. How economically viable are CCUS technologies?
5. How far are we from enabling cost competitive deployment of CCUS technologies in coal-fired power plants?
6. What is the potential to further develop CCUS technologies for their subsequent widespread use in all carbon-intensive industrial sectors?
7. What have we learned from the numerous pilot projects on how to encourage, and possibly accelerate, the processes of deployment of large CCUS projects?
8. How far have we come in ensuring that all the major concerns relating to safety and leakage are addressed?
9. What are the remaining gaps to be addressed by further deployment of demonstration projects?
10. At what price for carbon does CCUS become a viable technology for cost-effective method of emission reduction?

11. Will Article 6 of the Paris Agreement spur the efforts on the development of methodologies for projects applying CCUS technology for removal of CO₂ emissions?

12. Will the introduction of carbon market mechanisms by major emitters help to move CCUS towards widespread economic viability?

13. Which countries reflect the deployment of CCUS in their NDCs as one of the means of achieving the pledges submitted in terms of the Paris Agreement?

FURTHER READING AND VIDEO MATERIALS

(Scan to Download)	LINK
	<p>If you would like to learn more on CCUS, you may refer to the below publications from the Foundation:</p> <p>01 - Carbon Capture and Storage: What is its role in climate mitigation? https://www.abhafoundation.org/media-uploads/reports/Webinar-WhitePaper--09-2020-September-Print.pdf</p>
	<p>02 - Carbon Capture, Use and Storage. https://www.abhafoundation.org/media-uploads/reports/Energy_Report_Issue_55_03_2021_March_Print1.pdf</p>

ABOUT THE FOUNDATION

The Abdullah bin Hamad Al-Attiyah International Foundation for Energy and Sustainable Development is a non-profit think tank inaugurated by His Highness the Father Emir, Sheikh Hamad Bin Khalifa Al Thani, in 2015. The Foundation works closely with its members, academia, and a wide network of international experts, to provide independent insights, in-depth-research and informed debate on critical energy and sustainable development topics.

Mission: To provide robust and practical knowledge and insights on global energy and sustainable development topics and communicate these for the benefit of the Foundation's members and the community.

Vision: To be an internationally respected independent think tank that is a thought leader focused on global energy and sustainable development topics.

Research Reports & Publications

- Daily News Flash
- Weekly Energy Market Review
- Monthly Energy Research Report
- Monthly Sustainability Research Report
- Monthly News Articles
- Special Industry Reports
- Webinar Whitepapers
- CEO Roundtable Whitepapers
- Annual Sustainable Development Book




Podcasts, Webinars & Videos

- Bi-monthly Podcast Interviews
- Monthly Energy Educational Video
- Monthly Sustainability Educational Video
- Monthly Webinars
- Annual High-Profile Webinar

Events & Activities

- The Al-Attiyah International Energy Awards
- Quarterly CEO Roundtable Series
- Qatar Sustainability Week
- The ICP Bosphorus Summit

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OUR PARTNERS

The Al-Attiyah Foundation collaborates with its partners on various projects and research within the themes of energy and sustainable development.






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