

CCS and CDR across the fossil fuel value chains

Introduction

Carbon capture and storage (CCS) and carbon dioxide removal (CDR) are both essential to progress to net-zero globally, with between 15 and 18 gigatonnes of CO₂ to be stored to avoid release to the climate system or to be removed from the climate system globally by 2050, and to form part of the GHG avoidance and removal strategies of countries as they seek to implement their NDCs, along with reduction strategies manifest by increased electrification and ever increasing development of renewable energy capacity, and the use of alternative fuel and feedstock sources.

The presentation will consider the roles of CCS and CDR, and a price on carbon (carbon tax or emissions trading schemes), to avoid and to remove CO₂. The presentation will be divided into three parts:

1. The first part of the presentation will consider CCS and CDR, and the application of each, across fossil fuel value chains, including in the context of the Paris Agreement – NDCs and ITMOS. This part of the presentation will consider CCS and CDR technologies, and a number of examples of the deployment of each: North America (Canada and US), Europe, GCC, and East and South East Asia, and across Africa and South America in respect of CDR.

During the first part of the presentation, we will define CCS and CDR, and explain, at a high level, the importance of each to progress to net-zero GHG emissions. Also, we will outline the potential for each of CCS and CDR to be deployed, and the policy settings and laws and regulations, and bilateral agreements necessary to maximize the potential of each of CCS and CDR, noting the need for G-to-G, and conferring rights and obligations at a G-to-B level as well. To some, this requires a new paradigm.

2. The second part of the presentation will consider the range of policy settings and laws and regulations necessary to enable the development of CCS projects and CDR projects, including licensing and regulation, again considering North America, Europe, GCC and East and South East Asia, and across Africa and South America in respect of CDR.
3. The third part of the presentation will bring together the first and second part of the presentation, to provide a road map for the accelerated development of CCS and CDR globally, and across Africa, GCC and East and South East Asia.

The presentation will combine an assessment of that which is working and that what is likely to work. This is a region by region, and country by country assessment, applying a practical approach rather than an aspirational approach. This said, there are common themes and approaches that will allow fossil fuels to continue to be used which negate their ongoing impact on the climate system. This means that CCS and CDR solutions are near, medium, and long-term solutions to progressing to and then achieving and then maintaining net-zero GHG emissions.

Conclusions

The conclusion will reference the long-standing belief of the author of natural gas as a transition fuel, and the need for the development of more natural gas resources.

However, while natural gas is essential, so is the capture of CO₂ along the production, transportation, and storage chain, and at the point of combustion. To illustrate the conclusion, the author will state the GHG emission profile without CO₂ capture and storage, and with CO₂ capture and storage.