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Carbon Dioxide Capture, Utilization, and Storage: Sequestration

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Abstract : Carbon dioxide being the most anthropogenic greenhouse gas,it needs to be isolated from entering into atmosphere. Carbon capture and storage is process that captures CO2 emitted from various sources, separates it from other gases and stores it in a safe place preferably in underground geological formations for large period of time. It is then purified and monitored so that can be made to reuse. Monoethanolamine, zeolitic imidazolate framework, microalgae, membranes etc are utilized to capture CO2. Post-combustion, pre-combustion and oxyfuel combustion along with chemical looping combustion are technologies for scrubbing CO2. The properties of CO2 being easily miscible and readily dissolving in oil with impurities makes it capable for numerous applications such as in producing oil by enhanced oil recovery (EOR), Bio CCS Algal Synthesis etc. CO2-EOR operation is capable to produce million barrels of oil and extend the field's lifetime as in case of Weyburn Oil Field in Canada. The physical storage of CO2 is technically the most feasible direction provided that the associated safety and sustainability issues can be met and new materials for CCUS process at low cost are urgently found so that so that fossil based systems with carbon capture are cost competitive.

Keywords : carbon capture, CCUS, sustainability, oil
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