Research on Nonconventional Gases at CSIR-CIMFR, India

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Abstract

Reduction in anthropogenic methane emissions is critical to limit warming to 1.5˚C alongside the ambitious efforts to decarbonise the economies. Methane from human activity falls into three main sectors: agriculture (40%), fossil fuels (35%) and waste (20%). Fugitive emissions are the intentional or unintentional release of greenhouse gases that may occur during the extraction, processing and delivery of fossil fuels to the point of final use. India stands as distant 6th in fugitive emissions among the countries reported for 2016 inventory under the convention. India is a developing nation with a growing demand for energy to achieve the sustainable development goals while meeting the emission reduction targets. Hence, the country is focusing on the gas based economy and import substitution to meet the domestic demand while effecting smoother coal transition. It is in this context, the nonconventional resources should be fully tapped with added environmental benefits. Coalbed methane (CBM) is one such nonconventional hydrocarbon resource associated with coal deposits. On the other hand, underground coal gasification (UCG) provides the technology option to produce clean energy from the domestic coal resources, including those currently unmineable.

Pradhan Mantri Urja Ganga project, implemented by state-run gas utility GAIL, will provide a major boost to the CBM industry apart of connecting the eastern India to the gas grid with an aim to enhance the share of gas in the energy mix. Research on UCG is also imperative as it provides unmanned access to gasify coal to produce syngas for efficient power generation and feedstock for petrochemical industry. It also offers options for efficient CO_2 capture and accessible and affordable carbon sinks while eliminates the health and safety hazards of conventional mining. Carbon capture utilization and storage (CCUS) has an important role to play in decarbonizing the hard decarbonize sectors. According to an theoretical estimate by NITI Aayog, India has total CO_2 geologic storage capacity of 400-600 Gt with a share of 3.4 Gt, 3.5-3.7 Gt, 291 Gt, 97-315 Gt in depleted oil and gas reservoirs, unmineable coal seams, saline aquifers, and basalts, respectively. The paper discusses the challenges and opportunities in CBM/shale gas, UCG and geo-sequestration technologies for a seamless energy transition in Indian context and the need to refine the emission factors for fugitive methane emissions from fossil fuels.

References/ Publications

Sinha A., Mohanty D. (2022). Chapter-5: Coalbed methane (CBM) and underground coal gasification (UCG) in the evolving energy landscape of India. In Book: Sain K., Roy S., Gupta H. K. (eds.) Emerging Energy Resources in India (x+222), Geological Society of India, Bangalore, pp.105-133. ISBN No: 978-93-80998-48-0

Access to relevant information

https://di.unfccc.int/detailed_data_by_party

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