

Dominic C Y Foo

University of Nottingham Malaysia, Malaysia

Optimal Planning of Unconventional Gas Field Development

In recent years, the oil and gas industry has been moving to develop unconventional gas fields, which include those contaminated with high carbon dioxide (CO₂) content. Typically, the CO₂ has to be separated from the “sour” natural gas (NG) in offshore processing facilities (in situ) before the NG can be sent for processing at the gas plant onshore. To date, commercial-scale CO₂ capture and storage (CCS) has proven to be viable, mainly for CO₂ that is separated from NG and subsequently injected at or near the gas field itself for permanent storage (CO₂ sequestration), or utilized for the purpose of Enhanced Oil Recovery (EOR). In the case of multiple adjacent reservoirs exhibiting variations in NG quality and CO₂ content, it may be necessary to have in-situ CO₂ removal using NG sweetening processes (e.g. membrane or amine absorption) to achieve a quality level such that the pooled NG streams meets the specification required for further processing at the onshore facility for sales. Some recent works based on process integration approaches, including graphical, algebraic and optimization techniques have been developed to aid the integrated planning of such field development projects. The main purpose of the work is to rationalize the development of the sour CO₂ gas fields together with conventional “sweet” gas fields (i.e. low CO₂) in meeting the required CO₂ content in sales gas specifications. Case studies are used to illustrate how insight-based policies can be drawn for the use in sour gas field development projects.

Biography

Dr. Dominic Foo is a Professor of Process Design and Integration at the University of Nottingham Malaysia Campus and is the Founding Director for the Centre of Excellence for Green Technologies. He is the Vice President for the Asia Pacific Confederation of Chemical Engineering (APCCHE). Professor Foo is an active author, with five books and more than 140 journal papers. Professor Foo is the Editor-in-Chief for Process Integration and Optimization for Sustainability (Springer Nature), Subject Editor for Process Safety & Environmental Protection, Elsevier, among others. He is the Innovator of the Year 2009 of IChemE, as well as the SCEJ Award for Outstanding Asian Researcher and Engineer 2013 and Top Research Scientist Malaysia 2016.