

Webinar Talk on Natural Hydrogen Exploration – Viable Option for the Future of Energy

CPD Hours: 2 CPD Ref No: IEM23/HQ/454/T (w)

Organised by: Oil, Gas and Mining Technical Division

SYNOPSIS

Hydrogen gas (H2) promises to be a clean energy source of the future. H2 can be produced by electrolysis of water using electricity derived from renewable or industrial process using coal or natural gas. Hydrogen derived from methane or coal produces CO2 which requires a carbon capture and storge (CCS) strategy to avoid release into the atmosphere. Another option is the use of natural H2 generated by geological processes. Surface seeps of H2 gas have been observed in many locations around the world and the occurrence of subsurface accumulations are likely. The "Hydrogen System" in terms of source, migration, reservoir, trap, and seal (analogous to the Hydrocarbon System) needs to be understood to assess the location of significant subsurface accumulations that can be targeted during hydrogen exploration and the chance factors associated with the "Hydrogen System" elements.

A proof of concept was demonstrated by the discovery of subsurface natural H2 in Mali Block 25 (North Africa) in the Taoudeni Basin near the town of Bourakebougou. The Bougou-1 well, originally drilled as water well in 1987, confirmed the presence of almost pure H2 gas (98%) at depths of 100 to 1800 m. Data indicates a significant accumulation with production costs estimated to be < 1 USD per kg as compared to the cost of H2 produced by industrial processes of 1 USD to > 6 USD per kg.The likely source is the oxidation of iron (Fe 2+) in mafic and ultramafic igneous rocks during low temperature metamorphism (serpentinization) that produces H2 as a reaction product. The "Hydrogen System" can be found associated with Precambrian formations located on continental cratons of North and South America, Africa, Russia, and Australia and natural hydrogen may be a commercial resource in those areas.

Questions remain regarding: 1) the volume of the resource, 2) the generation, migration, and preservation of H2 in the subsurface, and 3) the appropriate technologies that can be used to evaluate and de-risk the "Hydrogen System" elements during exploration.

SPEAKER

Mr. Ernest Jones

Mr. Ernest Jones has over 35 years of experience in the oil and gas business and has been with PETRONAS for almost 20 years. He has held various positions of responsibility in Exploration and Research and Development. Recent positions have included Head of Geoimaging R&D and Head of Natural Hydrogen Exploration R&D. Previously, he held positions with ExxonMobil and Texaco in Upstream and R&D. He holds a BA from Princeton University, an MA and PhD from Harvard University and an MBA from the Ross School of Business, University of Michigan.



Thursday I 26 October 2023 I 3PM – 5PM Registration Fee: Student Member: Free | IEM Member: RM15 | Non-Member: RM70

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