

Abstract Submitted
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Nuclear Energy and Synthetic Liquid Transportation Fuels

RICHARD MCDONALD¹, Retired LBNL — This talk will propose a plan to combine nuclear reactors with the Fischer-Tropsch (F-T) process to produce synthetic carbon-neutral liquid transportation fuels from sea water. These fuels can be formed from the hydrogen and carbon dioxide in sea water and will burn to water and carbon dioxide in a cycle powered by nuclear reactors. The F-T process was developed nearly 100 years ago as a method of synthesizing liquid fuels from coal. This process presently provides commercial liquid fuels in South Africa, Malaysia, and Qatar, mainly using natural gas as a feedstock. Nuclear energy can be used to separate water into hydrogen and oxygen as well as to extract carbon dioxide from sea water using ion exchange technology. The carbon dioxide and hydrogen react to form synthesis gas, the mixture needed at the beginning of the F-T process. Following further refining, the products, typically diesel and Jet-A, can use existing infrastructure and can power conventional engines with little or no modification. We can then use these carbon-neutral liquid fuels conveniently long into the future with few adverse environmental impacts.

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