

New Nuclear Technology to Produce Inexpensive Diesel Fuel from Natural Gas and Renewable Carbon

The long-range goal of this project is to sell intrinsically safe and versatile nuclear reactors to address world energy needs. The first application is an Accelerator-Driven Subcritical Reactor that burns non-enriched Uranium, Thorium, or spent fuel from conventional nuclear reactors in a molten salt fuel to produce high-temperature heat to convert Natural Gas and Carbon into liquid fuel for vehicles. This green technology uses only domestic sources and reduces the carbon footprint of all vehicles, where construction and operating expenses imply diesel fuel production at \$2/gallon. The project involves the development and interfacing between known technologies that 1) use a superconducting RF accelerator to produce an intense source of neutrons to 2) generate process heat in a molten-salt-fueled subcritical nuclear reactor to 3) prepare natural gas and renewable carbon for the Fischer-Tropsch generation of petroleum products. The project includes 1) reducing accelerator construction and operating expenses, 2) integration of the molten-salt reactor technology developed at ORNL with an internal spallation neutron target, 3) construction and test of a molten-salt to gas process heat transfer model device and 4) attracting private funding and DOD interest to build the first plant.

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