# THORIUM AND LFTR TOP TEN ATTRIBUTES

The abundance of the element thorium throughout the Earth's crust promises widespread energy independence through Liquid Fluoride Thorium Reactor (LFTR) technology. With LFTR, a small handful of thorium can supply an individual's lifetime energy needs; a small grain silo full could power North America for a year; and known thorium reserves could power society for thousands of years.

LFTR is walk-away safe. LFTR operates at low pressure and is chemically and operationally stable. It shuts down passively and removes decay heat without human intervention or mechanical backup cooling systems, eliminating the possibility of overheating accident scenarios like those seen at Fukushima. Low pressures eliminate the need for massive pressure containment vessels and alleviate safety concerns of regulators and the public about high-pressure releases to the atmosphere.

LFTR can produce not only safe, sustainable, carbon-free electricity, but life-saving medical radioisotopes, desalinated water and ammonia for agriculture, RTG radioisotopes for NASA, and synthesized fuels in the process.

LFTR is more efficient, extracting significantly more energy from abundant, inexpensive thorium than solid-fuelled reactors can from more scarce and costly uranium. Conventional reactors consume less than one percent of their solid uranium fuel, leaving the rest of the fuel as waste. LFTR consumes 99% of its liquid thorium derived fuel, and the remaining one percent is even useful for space exploration.

LFTR can fully consume long-lived plutonium and uranium fissile materials remaining in spent solid nuclear fuel stockpiles while bringing many gigawatts of LFTR power generation online, with thorium as the sole input thereafter. Most LFTR byproducts are stable within a decade and have commercial value; the remaining have a half-life of 30 years, decaying to stability within hundreds rather than tens of thousands of years.

LFTR is a demonstrated technology, the physics and operational fundamentals of which were proven at Oak Ridge National Laboratory's pilot plant in the late 1960's. Despite compelling advantages, LFTR development stalled when political and financial capital were concentrated instead on fast-spectrum plutonium breeding reactors.

LFTR is proliferation resistant. Thorium and its derivative fuel, uranium-233, are highly unsuitable for nuclear weapons due to inherent production of other undesirable isotopes. Thus, none of the thousands of warheads in the world's arsenals are based on the thorium fuel cycle. LFTR is unique in its ability to meet both energy generation and non-proliferation mandates.

LFTRs can be mass produced in a factory and then delivered and reclaimed from utility sites as modular units. Factory LFTR module production offers reduced capital costs and rapid deployment to sites near the point of need, obviating long transmission lines.

Liquid fuels cannot fail or meltdown. The liquid fuel form is LFTR's key differentiator from conventional nuclear energy production. LFTR uses liquid FLiBe salts as both a fuel carrier and reactor coolant. The salts are chemically inert and will not react with flood waters, ground water or the atmosphere. Fuel can be added to the liquid salts and byproducts removed at any time, even while the reactor remains online.

LFTR can provide both base power and peak power, following the demand for electricity imparted on it by the grid. LFTR's responsiveness to energy demand makes it highly complementary to alternative energy sources.

Learn more at www.flibe-energy.com/media and www.energyfromthorium.com.

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