



# US NUCLEAR ENERGY FOUNDATION

“Nuclear Advocacy through Grassroots Education”

A Non-Profit 501(C)(3) Nevada Foundation

PO Box 2867, Sparks, NV 89432 (775) 224-2089

[www.usnuclearenergy.org](http://www.usnuclearenergy.org) / Email: [comments@usnuclearenergy.org](mailto:comments@usnuclearenergy.org)

## USED FUEL AND DEPLETED URANIUM WORTH TRILLIONS

Kenneth D. Kok, PE, Paper No. ICEM2013-96001, 7-pages, 08-12-13.

Link to complete paper:

<http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=1832623>



**American Society of Mechanical Engineers:** 2013 15th International Conference on Environmental Remediation and Radioactive Waste Mgmt. Brussels, Belgium, September 8–12, 2013, Copyright © 2013 by ASME.

**ABSTRACT:** The purpose of this paper is to examine the energy and economic value of used nuclear fuel and depleted uranium. In the USA these materials are considered to be wastes. As such they are candidates for permanent disposal. The disposal of these materials in a manner that isolates them from human contact is a scientific, engineering, economic and political problem. Isolation can be defined requiring no potential human contact during a stated period of time due to failed containment. The period of isolation is to be in excess of one million years.

The uranium in the used fuel and the depleted uranium left over from the enrichment process represent about 99.5 percent of the uranium that was removed from the ground by mining uranium ores. If these materials can be utilized they would not be considered to be wastes. In addition, they would carry a positive economic value. The value of these materials, based on the energy that can be extracted from the uranium, (*the worldwide inventory*) exceeds \$100 trillion dollars. (*The U.S. 77,000 metric tons is valued at \$14 Trillion dollars*). Based on this, the conclusion is that the material is a very valuable resource and **definitely is not a waste**.

**REPROCESSING TECHNOLOGY:** The reprocessing technology developed in the IFR program is also unique. Reprocessing of commercial reactor fuels currently uses a wet chemical process which produces large volumes of waste. It also separates the plutonium in the used fuel as an independent product leading to safeguards related concerns.

**LOGICAL PATH FORWARD:** With current reactor technologies in service, worldwide reasonably assured uranium ore supply can sustain nuclear fleets for approximately 80 years. 4 Using the considerable value remaining in existing depleted uranium resources, otherwise discarded, the domestic U.S. nuclear fuel supply would then be at least 1000 years. When the IFR program was terminated in the 1990's, the next proposed step was the construction and operation of a demonstration scale reactor and fuel processing facility, as authorized in the Energy Policy Act of 1992. Licensing and building such a demonstration is the logical next step. A corporate entity or entities should be formed that takes title to both the depleted uranium and the available used fuel. The asset value of these materials would provide a basis for raising the funds required for such a venture without the need for government funding. The NRC should be charged with licensing the required facilities with the national laboratories supplying any special assistance to expedite the licensing process. Use of private funding will allow this to be accomplished with little or no new federal funding obligations.

**When does science, engineering, safety and business make more common sense than not in my backyard politics?**

Doc: KOK-Used-Fuel-2013-Paper-Exerpt