MOX Misses the Mark

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Despite the ever-increasing price tag, incessant delays in progress, and known safety risks, the Department of Energy continues to pour federal subsidies into the Mixed Oxide Fuel (MOX) program year after year. In 2012, the program received more than $500 million[1] toward the development of a now $7.7 billion production facility[2]– only the first step in a program that is expected to cost nearly $20 billion over the lifespan of the project.

The MOX program is part of the United States' strategy to dispose of 34 metric tons of plutonium-based nuclear weapons materials as required by the Plutonium Management and Disposition Agreement of 2000.[3] The weapons-grade plutonium is blended with depleted uranium, creating MOX fuel, which can then be used by nuclear reactors. On the surface, it seems like a win-win: we can dispose of plutonium while simultaneously supporting domestic energy production.

Photo Courtesy of DOE's NNSA Public Affairs

Unfortunately, the MOX program is riddled with chronic economic and logistical problems. For example:

- The cost of the MOX program is not worth the energy derived. Converting weapons-grade plutonium to usable nuclear fuel requires the construction of a special facility, and once the MOX fuel is produced, existing nuclear facilities will need to be updated in order to handle MOX fuel because the actual processing breaks down reactors much more quickly than conventional nuclear fuel.[4]
- The MOX program requires heightened safety and security to prevent nuclear proliferation because of the inherent danger in transporting and processing weapons-grade plutonium – further adding to the overall cost.
- MOX technology has not been properly tested. The design of the program is based on similar technology already in place in Europe and Japan, but the MOX fuel they process uses a plutonium byproduct of conventional reactors, as opposed to the weapons-grade plutonium that DOE plans to use.[5] Accordingly, if and when the facility is completed, its first few operational years will be spent merely running tests.

The MOX program has been repeatedly delayed as its cost continues to rise.[6] The Savannah River Site, where MOX fuel would be produced, was originally projected to be operational by 2007 at a cost of $1.6 billion; today the plant's completion is expected in 2019 at a cost of $7.7 billion, plus annual operation costs of approximately $500 million, up from an estimated $156 million in just 2010.[7] Over the 20 years the plant will be licensed,[8] these annual operation costs would add up to nearly $10 billion.

In late 2008, the contract between Duke Energy and MOX Services committing Duke to buying the MOX fuel produced at the Savannah River Site was terminated, leaving the DOE without a buyer for the fuel.[9] Since MOX will carry a much higher price tag than conventional fuel, the DOE will have to pay companies to take the fuel off their hands—if they can find any companies interested in processing the volatile substance.

Here's how it all adds up:

1 production facility	**$7.7 billion**
20 years of operational costs	**$10 billion**
Years and years of subsidized MOX sales	**$$$**
Updates to the facilities that agree to buy it	**+ $$$**
The Total Cost of MOX	**$Too much for taxpayers**

MOX carries a hefty price tag, especially considering that safer disposal alternatives exist. We could reach the same ends in terms of both disposal and energy production in easier and less risky ways. The costs are already high and only getting higher, so the threshold at which this program became fiscally irresponsible was crossed long ago. It's time to end the MOX handouts.

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[1] Senate Energy and Water Development Appropriations Bill 2012. http://www.gpo.gov/fdsys/pkg/CRPT-112srpt75/pdf/CRPT-112srpt75.pdf
[2] *Government Accountability Office*. "Concerns with Major Construction Projects at the Office of Environmental Management and NNSA." March 2013. http://www.gao.gov/products/GAO-13-484T
[3] *U.S. Department of State*. "2000 Plutonium Management and Disposition Agreement." April 2010. http://www.state.gov/r/pa/prs/ps/2010/04/140097.htm
[4] *Nuclear Decommissioning Authority.* "NDA Plutonium Options." 2008. http://www.nda.gov.uk/documents/upload/Plutonium-Options-for-Comment-August-2008.pdf
[5] *Nuclear Regulatory Commission*. "Frequently Asked Questions About Mixed Oxide Fuel." http://www.nrc.gov/materials/fuel-cycle-fac/mox/faq.html
[6] Senate Energy and Water Development Appropriations Bill 2012. http://www.gpo.gov/fdsys/pkg/CRPT-112srpt75/pdf/CRPT-112srpt75.pdf
[7] Senate Energy and Water Development Appropriations Bill 2012. http://www.gpo.gov/fdsys/pkg/CRPT-112srpt75/pdf/CRPT-112srpt75.pdf
[8] *Shaw AREVA MOX Services, LLC.* "About the Mox Project." http://www.moxproject.com/about/
[9] Duke Energy. Form 10-K. February 2009. http://www.duke-energy.com/pdfs/DukeEnergy10K.pdf