Abstract

American University Physics 336 Class Seminar

Recycling Slightly Used Nuclear Fuel for Electricity "Too Cheap to Meter"

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The next generation of electricity production will certainly favor clean energy sources. Nuclear power has provided 20% of all electricity (and, currently, 55% of all clean energy) in the United States for three decades. It has commercially produced electricity for the last 6 decades in the United States without a single incidence of death or injury to workers or the public. Yet, a great deal of popular media content is against continuing nuclear power in the US. The major detrimental comments are about Slightly Used Nuclear Fuel (SUNF), or what some people call "nuclear waste". However, the energy remaining in this material is equivalent to 250 years of all electricity demand currently in this country. Recycling SUNF in fast reactors (molten salt reactors specifically, but other fast reactor designs would work) offers the United States 100% domestic, 100% clean (already mined fuel), and 100% baseload power. Given that we really only need current methods of power production for about 100 years (space-based power, fusion power or an unknown even better method of power production will take over then), we will need to use up SUNF as fast as we can, leading to "power too cheap to meter", probably marketed as a single low price for "all you can use". This talk will deal with the current situation of power delivery and make the case for a State to see the advantage of "consenting to accept" SUNF. This will lead to the public acceptance of nuclear power to soar and allow private companies to reestablish the nuclear power industry in the US, mostly with next-generation reactors.