

Position Statement #45

Nuclear Fuel Recycling

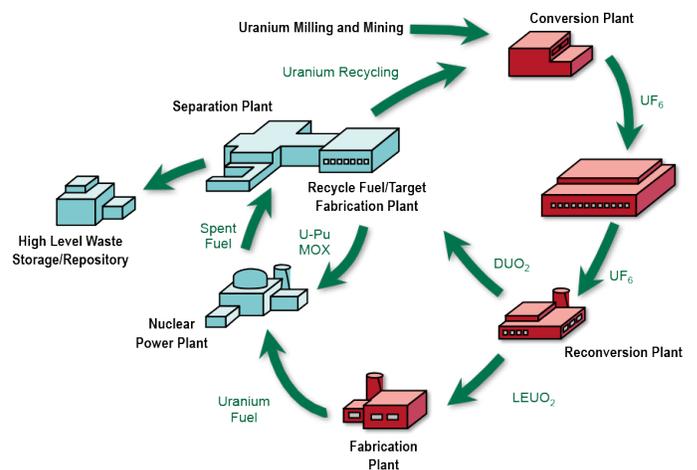
The American Nuclear Society recognizes that if the world is to produce sufficient electricity to meet the demands of a growing population with improving standards of living, nuclear energy will play a substantial role, particularly if used fuel is recycled to maximize utilization of natural uranium resources. Nuclear energy is a proven technology that will be part of the mix of technologies used by future generations due to its enormous energy potential with near-zero emissions of greenhouse gases. Alternative low-emission energy sources by themselves will be insufficient to meet these needs during this period of rapidly increasing electricity demand.¹

Nuclear fuel recycling² involves separating the uranium and plutonium from used nuclear fuel and reusing these materials in the fabrication of new fuel. If used in conjunction with advanced fuel cycles and reactors, recycling has the potential to significantly enhance resource utilization by reclaiming most of the unused energy in used fuel (~95 percent) and minimizing the volume of radioactive waste requiring disposal in a geologic repository.

The two concerns most frequently raised about nuclear fuel recycling are: (1) costs, and (2) nonproliferation uncertainties. With regard to the life-cycle cost of nuclear energy, both national and international evaluations³⁻⁷ have shown that the capital and financing costs for new reactors dominate, and that differences between direct disposal and used fuel recycle costs are not a significant contributor to life-cycle costs. Furthermore, enhanced methods are available for recycling used nuclear fuel that enable more radionuclide components to be recycled and reduce the amount of waste that must be placed in a geologic repository.⁸

Nonproliferation analyses^{9,10} demonstrate that existing safeguard regimes and advanced safeguards-by-design can be applied effectively to a nuclear fuel recycling facility to meet IAEA guidelines

in a cost-effective manner.¹¹ Furthermore, effective extrinsic (institutional) measures to counter proliferation and security threats are necessary regardless of the nuclear fuel cycle technology chosen.¹²



The Blue Ribbon Commission on America's Nuclear Future¹³ concluded that it is premature to seek consensus on recycling used nuclear fuel and instead recommended storage of used nuclear fuel pending the development of a geologic repository. ANS recognizes that interim storage of used nuclear fuel is a necessary but not permanent solution to the problem of nuclear waste. Moreover, ANS takes the position that continued research and development of nuclear fuel recycling without a policy and plan for deployment will not make the technology a practical reality. Transitioning to a policy that allows and encourages used nuclear fuel to be recycled will significantly enhance resource utilization and radioactive waste

management, and will ensure that the United States can influence international fuel cycle decisions in the current era of expanded, global nuclear power deployment.

Therefore, the American Nuclear Society, as a matter of policy, endorses the following:

- An energy policy and legal framework that addresses a comprehensive and sustainable program for the U.S. nuclear fuel cycle, which includes used fuel recycling and geologic disposal.
- Directed development of fuel recycle options in parallel with advanced nuclear reactor systems.

References

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