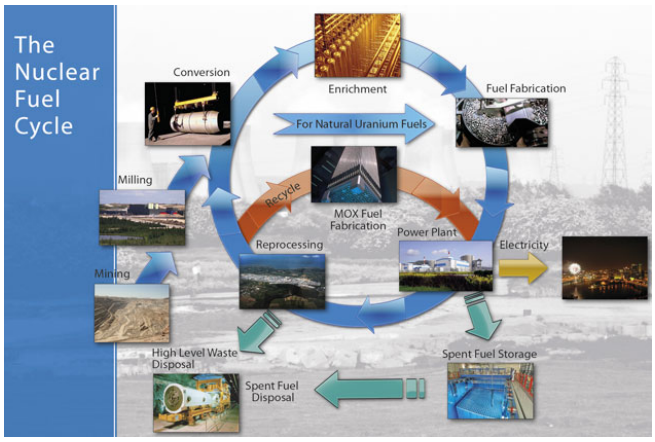
Nuclear Fuel Cycle Option Catalog

In 2014, an evaluation and screening study was completed for the United States Department of Energy which provided information about the potential benefits and challenges of nuclear fuel cycle options (i.e., the complete nuclear energy system from mining to disposal). This information can be used to strengthen the basis and provide guidance for the activities undertaken by the Department of Energy, Office of Nuclear Energy, Fuel Cycle Research and Development program. This catalog includes, but is not limited to, information that was part of the input used in the evaluation and screening study.

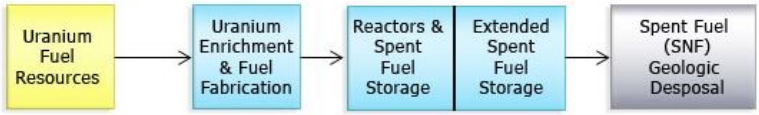


Nuclear Fuel Cycle Strategies

For the purposes of forming the Evaluation Groups that were to be analyzed in the Evaluation and Screening, three fuel cycle strategies were defined: once through, limited recycle, and continuous recycle.

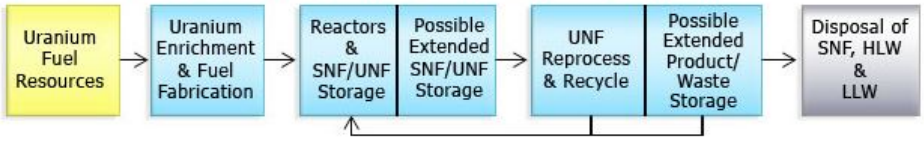
- **Once Through** – A “once-through” fuel cycle uses nuclear fuel only once in the nuclear fission system, followed by storage and disposal. A fuel cycle processes intact spent nuclear fuel for waste management purposes only (e.g., to separate long-lived isotopes from short-lived isotopes and then dispose of them) but does not include re-use of such fuel is considered to be a once-through fuel cycle.

Once Through Fuel Cycle Example Using Enriched Uranium



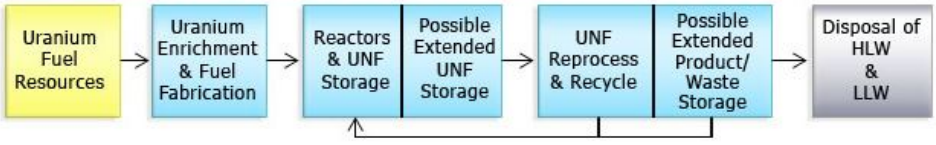
- **Limited Recycle** – A "limited-recycle" fuel cycle recycles fuel one or a few times, either in the same nuclear fission system or another fission system. Spent nuclear fuel, high-level waste, and low-level waste are disposed of in limited-recycle fuel cycle options.

Limited-Recycle Fuel Cycle Example Using Enriched Uranium



- **Continuous Recycle** – A "continuous-recycle" fuel cycle recycles fuel indefinitely, either in the same nuclear fission system or another fission system. Only high-level waste and low-level waste are disposed of; no spent fuel is disposed of in continuous-recycle fuel cycle options.

Continuous-Recycle Fuel Cycle Example Using Enriched Uranium



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