# GE Hitachi Nuclear Energy Global Laser Enrichment (GLE)
# Frequently Asked Questions (FAQs)

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## What is the purpose of enriching uranium?

- $^{235}U$ is the isotope of uranium required to sustain the nuclear reaction necessary to power a commercial nuclear power plant.
- Natural uranium ore is comprised primarily of $^{238}U$, with $^{235}U$ only comprising a very small 0.71 percent.
- For light water reactor fuel, uranium is "enriched" to between three and five percent $^{235}U$.

## How is uranium currently enriched?

Currently, there are three processes capable of enriching uranium:

- Gaseous Diffusion: Gaseous uranium hexafluoride is separated by traveling through semi-permeable membranes. This approach is scheduled to be phased out due to the high energy input required.
- Centrifuge: Uranium is separated by centrifugal force in rotating cylinders. This is the primary source of enriched uranium today.

- Lasers: Lasers selectively excite $^{235}U$ allowing isotopes to be separated. Uranium enriched in this manner is being developed by GLE.

**What is laser enrichment?**

- Lasers are the most advanced method of enriching uranium.
- GE Hitachi Nuclear Energy is developing uranium enrichment services capability through its subsidiary, Global Laser Enrichment (GLE). The product of this process is low enriched Uranium Hexafluoride (UF6).
- Uranium Hexafluoride is vaporized into a gaseous form and exposed to a laser beam that preferentially excites the $^{235}U$, which enables separation of relatively enriched product from relatively depleted "tails" material.

**What is Global Laser Enrichment (GLE)?**

- GLE is a subsidiary of GE Hitachi Nuclear Energy (GEH), formed to develop laser technology to enrich uranium for commercial use in nuclear power plants.

**Did GEH develop this technology?**

- In early 2006, GE completed a technology licensing agreement for the laser isotope separation technology with technology developer Silex Systems Limited of Australia. Under this agreement, GEH's GLE business has exclusive rights to commercially develop this third-generation uranium enrichment technology on a global basis. GLE is building a test loop as part of commercially developing the technology.

**Why would GEH commercialize this technology?**

- Current sources of enriched uranium are beginning to go off-line, while at the same time, the U.S. and other nations are moving toward constructing new civilian nuclear power plants. As a result, there is a growing demand for a consistent and secure supply of low enriched uranium.
- GLE would play a vital role in assuring the U.S.'s ability to maintain a reliable source of enriched uranium to fulfill the national requirements for nuclear power generation, national energy security and advanced uranium enrichment technology. The proposed GLE facility would contribute to the attainment of national energy security policy objectives by providing an additional reliable and economical domestic source of enriched uranium.

**What kind of chemicals and materials will be used at the site?**

- No new types of hazardous materials will be added to the plant site.

**What is the anticipated timeline for GLE's test loop and potential commercial facility?**

- Late 2008: Operation of test loop begins.
- Early 2009: Decision to proceed will be made.
- 2012: Projected start up of GLE commercial facility.

**What is low enriched uranium and how is it used?**

- Low enriched uranium (LEU) is uranium enriched to less than 20 percent $^{235}U$. LEU is used to make fuel pellets that are placed in fuel bundles, which are then used by nuclear utilities to generate power in their nuclear power plants.

**Would the Global Laser Enrichment program create jobs in our community?**

- Yes, if the decision is made to build the GLE commercial facility, hundreds of jobs will be created in our community. These jobs would be created between now and 2012 and would include technical, operational and support job functions.

**What benefit would the GLE facility add to the nuclear fuel cycle?**

- GLE would add additional U.S. supply of LEU into the fuel cycle and provide security of supply to U.S. nuclear utilities. GLE would also provide diversity of supply to the global marketplace.

**How large would the GLE facility be?**

- If a commercial facility is built, it will utilize approximately 200 of the approximately 1,700 acres at GE's location in Castle Hayne, NC.

**What is a test loop?**

- A test loop is a closed process loop intended to scale up process equipment, gather process information and validate efficiencies of the process.

**What is the environmental impact of the GLE facility?**

- A full environmental report will be submitted to the NRC for assessment of any potential environmental impacts. It is a mandatory process under the National Environmental Policy Act (NEPA) of 1969. No new types of hazardous materials will be added to the GEH plant site.

**How long will it take to obtain the NRC license to operate the GLE facility?**

- Approval is anticipated within 24-30 months after the application is accepted for review and docketed.