WHAT IS THE GLOBAL NUCLEAR ENERGY PARTNERSHIP?

What is GNEP?
Announced by the Bush Administration in February 2006, GNEP is a sweeping proposal to promote nuclear power worldwide by establishing a consortium of countries (such as the U.S., France, Japan, Russia, U.K.) that would provide "fuel services" to developing countries. These services include providing fresh fuel, importing foreign spent fuel to the United States, and reprocessing spent nuclear fuel. At its basic core, GNEP is a program to restart nuclear waste reprocessing in the United States. The U.S. Department of Energy (DOE) is responsible for implementing GNEP.

What is Reprocessing?
Reprocessing —incorrectly called "recycling" by the DOE— is simply the separation of uranium, plutonium and other elements from spent nuclear fuel. The plutonium may then be used in fresh fuel for reactors (called plutonium fuel). Currently, there are only a couple of reactors licensed to use plutonium fuel in the United States. None of the existing reactors in the U.S., called light-water reactors, can "burn up" the plutonium, one of the key goals of GNEP. To destroy the plutonium would require an experimental type of reactor, called a fast reactor, of which there are only three operating in the world today. The history of fast reactors throughout the world has been marked by both safety and economic failures.

Why is Reprocessing a Dangerous Proposal?
Reprocessing is expensive and polluting, and poses a serious risk to U.S. national security and global efforts to prevent the spread of nuclear weapons.

- **Polluting:** Reprocessing is the most polluting part of the nuclear fuel cycle. The only private commercial reprocessing facility in the United States, West Valley in New York State, was an environmental disaster, resulting in radioactive waste that is still threatening the groundwater and the Great Lakes watershed more than 30 years later. DOE's 1996 estimate for the cleanup cost for the part of the site that did reprocessing is $5.2 billion. The U.S. also reprocessed to get plutonium for nuclear weapons, which resulted in highly radioactive liquid waste in tanks at Hanford, Savannah River Site, and Idaho National Laboratory that continues to threaten important water resources, including the Columbia and Savannah Rivers and the Snake River Plain Aquifer. The most radioactively contaminated places on the planet, including Hanford in the United States and Lake Karachai in Russia, are from reprocessing waste.

- **Expensive:** The DOE has no estimate for the lifecycle cost of the GNEP program. In the near-term (i.e., the next 5 years), DOE's estimated costs are $3 billion to $6 billion. The U.S. has already spent $466 million since 2001 on a renewed reprocessing and transmutation research and development program. This is not even a drop in the bucket of how much this program will cost. According to a 1996 report by the National Academies of Science, costs of reprocessing and transmutation of spent fuel from existing U.S. reactors "easily could be more than $100 billion" (in 1996 dollars). Approximately $100 billion has already been spent globally trying to commercialize plutonium, about $40 billion of which has been used to reprocess commercial and fast reactor spent fuel.

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- **Proliferation-prone:** The result from global commercial reprocessing has been the separation of 250 metric tons of plutonium, enough to make 30,000 nuclear bombs. Separated plutonium is a serious proliferation risk, because it no longer has the highly radioactive barrier provided by other radionuclides in the spent fuel rod, which hinders theft. DOE has said that it does not want to use old reprocessing technology (called PUREX) that results in separated plutonium. But the two reprocessing technologies (UREX+ and pyroprocessing) that DOE is currently researching are not "proliferation-resistant." The resulting plutonium mixes from these technologies are not sufficient to prevent theft by terrorists. Moreover, both technologies can easily be undone to obtain pure plutonium using the old, 1940s technology (PUREX).

The bottom line is that reprocessing will not solve our country's nuclear waste problem. Reprocessing will not eliminate the need for a geologic repository, and will increase the number of waste streams to be managed. Even in the best case scenario, the DOE plans to store the most radioactive materials at the reprocessing facility for hundreds of years while they decay. The other long-lived waste from reprocessing will be dangerous for tens of thousands of years, and will require geologic storage. There is currently no licensed site in the U.S. for geologic storage, so the waste will remain indefinitely at the reprocessing site.

What is the International Experience with Reprocessing?
Reprocessing is not a new idea. A few other countries in the world, including France, Russia, India, and soon Japan, reprocess their commercial spent fuel. The UK also reprocessed until its reprocessing plant had an accident in 2005. All of these programs are heavily subsidized by their governments.

- **France:** A July 2000 report commissioned by the French government concluded that reprocessing is uneconomical—costing about $25 billion more than a "once-through" fuel cycle—and will do little to reduce the amount of long-lived radionuclides in the waste. France is building up a stockpile of separated plutonium (representing a dangerous nuclear weapons proliferation risk), because its utilities do not want to use the costlier plutonium fuel in their reactors.

- **Japan:** The Japanese company, Japan Nuclear Fuel Ltd., has started up tests on its Rokkasho reprocessing plant, which cost $20 billion (three times more costly than initially estimated) and took 12 years to build. The region in which the plant is located is a major producer of agricultural and marine products. The radiation levels in seaweed are predicted to increase 2000 times. Major supermarkets in central Japan have said they will not buy the products even if contamination levels are low. The company operating Rokkasho is also in deep debt.

- **India:** India tested a nuclear weapon in 1974 that was made with plutonium separated by its reprocessing plant. The reprocessing technology was provided by the United States.

- **UK:** The UK used to reprocess at the government-owned THORP reprocessing plant, until it had an accident in 2005 that forced the plant to close and it may never reopen. The leak of 20 tons of uranium and plutonium led to the plant's operator calling on the government to permanently close the facility, which has been losing money even when operational. The

THORP technology is the same technology that EnergySolutions is proposing at Atomic City, ID; Barnwell, SC; and Roswell, NM.

It is important to understand the difference between what these countries are doing and is being proposed under GNEP. France and other reprocessing countries use the separated plutonium in light-water reactors, and end up with spent plutonium fuel that is hotter than regular spent fuel, making it too difficult and expensive to reprocess again. These countries are not destroying plutonium in the process, and must eventually store the waste in a geologic repository. There is massive public opposition to the proposed repository sites.

The necessary technologies for the GNEP program, including reprocessing that is "proliferation-resistant," fast reactors and transmutation fuel, are still in the early stages of research. Experts estimate that these technologies are many decades away at best.

What are Fast Reactors?

Fast reactors are essential to implementing GNEP. Countries, including the United States, have been trying to develop fast reactors for 50 years and the results have all been technical and economic failures. Without fast reactors, the U.S. will end up in the same place as other countries: spending hundreds of billions of dollars to end up with spent plutonium fuel that must be put in a geologic repository.

If GNEP were implemented, a fast reactor would have to be constructed for every 3 or 4 light-water reactors (the kind of reactor used in the United States now). The history of fast neutron reactors throughout the world has been marked by serious safety failures, including fires, explosions, leaks, and a partial meltdown. There have been over twenty of these reactors built worldwide since 1951 in seven countries, all of which have been funded by governments. In the United States, a small fast reactor, Fermi 1, had a partial nuclear meltdown in October 1966 and a sodium explosion in 1970. The reactor was closed in 1972. Only three fast reactors still operate in the entire world, one of which slated for shutdown in the near-term.

What Does the GNEP Proposal Mean for My Community?

DOE is proposing to transport spent fuel to your community for indefinite storage. The facilities that DOE wants to build are extremely expensive and depend on hundreds of millions of dollars in annual funding by Congress. A proposal to build a fast reactor at Clinch River in Tennessee was stopped by Congress when the costs escalated from an estimated $400 million to $8.8 billion. A site in Morris, Illinois is now the largest nuclear waste dump in the country after 772 tons of spent fuel was transported to the site for reprocessing in a plant that never operated due to major equipment failures and technical problems. If GNEP were fully implemented, spent fuel from around the world would be shipped to your community.

Even if the reprocessing plant became operational, *radioactive waste from reprocessing would remain indefinitely in your community*. DOE is proposing to leave the most radioactive materials at the reprocessing facility for hundreds of years while they decay. The longer-lived radioactive waste would have to stay onsite until a geologic repository is opened. In other words, the GNEP site will become an indefinite nuclear waste dump.

For more information, contact Michele Boyd, Public Citizen, mboyd@citizen.org