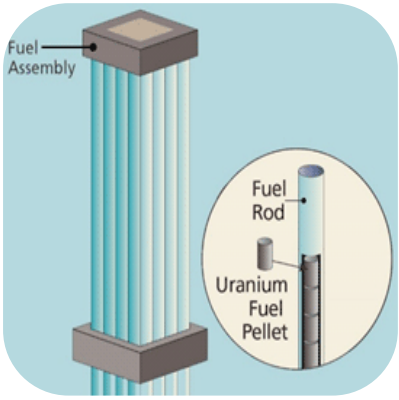
NUCLEAR INNOVATION ALLIANCE

Fact Sheet on Nuclear Waste

What is nuclear waste?

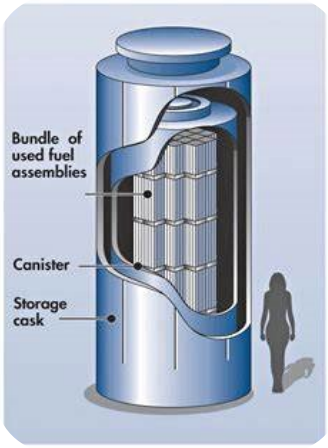
- Nuclear power plants use energy generated from fission reactions in a nuclear reactor to generate carbon-free electricity
- This reaction creates spent fuel byproducts that are often referred to as "nuclear waste"
- Spent fuel assemblies (shown to the right) contain spent nuclear fuel, which consists of ceramic uranium fuel pellets stored in fuel rods



Source: U.S. Nuclear Regulatory Commission

How is nuclear waste managed?

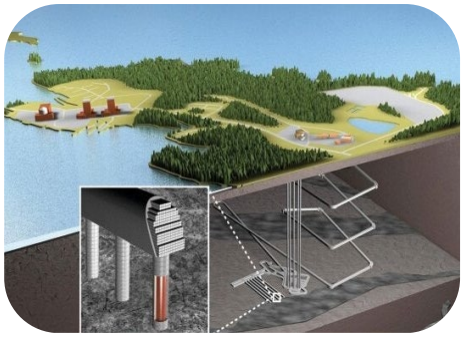
- Spent fuel assemblies are removed from the reactor, stored in spent fuel pools for cooling, and then transferred to dry storage casks
- Dry storage casks are moved to an independent spent fuel storage facility (ISFSI), also known as a concrete storage pad, near the nuclear power plant
- Dry storage casks are reinforced canisters made of stainless steel and concrete, designed to withstand extreme conditions such as earthquakes, tornadoes, and floods, in order to protect the environment and the public
- The spent nuclear fuel stored in dry casks is substantially less radioactive than when it is removed from the reactor, and the radioactivity continues to decrease over time



Source: U.S. Nuclear Regulatory Commission

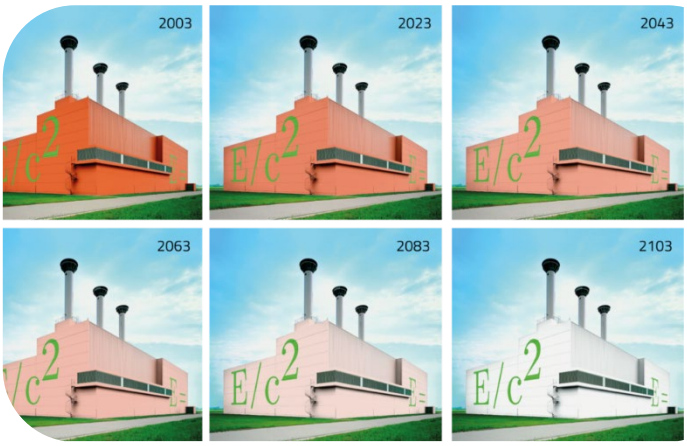
What's next?

- Dry storage casks are safely managed at or near their respective nuclear power plant until a permanent or interim storage location becomes available
- While the U.S. has no permanent national repository yet, Canada, Sweden and Finland are taking innovative, consent-based approaches to create a final repository for their spent fuel inventories
    - The U.S. can base future repository programs on these models



Onkalo spent fuel repository. Source: Nuclear Energy Agency

- The U.S. Department of Energy is planning a federal consolidated interim storage facility that will help manage the nation's spent nuclear fuel until a permanent repository is established
    - Commercial spent nuclear fuel would be transported to a centrally located site selected through consent-based siting practices
    - COVRA, a company based in the Netherlands, operates a complex that not only stores nuclear waste but also serves as a public museum and art gallery



CORVA spent nuclear fuel storage facility. This facility is repainted every 20 years to visualize how spent fuel and high-level waste gradually become cooler and less intense over time. Source: COVRA

COVRA art gallery and nuclear waste storage facility. Source: COVRA