

Technical Methods

<i>Technical Methods</i>	<i>Some of the Things We Know</i>	<i>Some Challenges</i>
<p>Disposal (to isolate used fuel from humans and the environment, with no intention of retrieval)</p>	<ul style="list-style-type: none"> • Studied for 30 years in Canada (disposal in Canadian Shield). • Requires high up front costs, lower continuing costs. • Requires transportation (sites have not been identified). • Environmental assessment panel - on balance technically sound, more work needs to be done on social acceptability. • Relies on both engineered systems and geology to act as barriers. • Over thousands of years contaminants may migrate into groundwater and ecosystem. 	<ul style="list-style-type: none"> • How effective will the engineered and natural barriers be over the long-term? • What if society wants to retrieve it in the future?
<p>Storage (to maintain the used fuel in a way that will allow access for retrieval or future use)</p>	<ul style="list-style-type: none"> • Water pool storage has been in place for 30 years (at reactor sites). • Since early 1990's dry storage facilities created that last 50 - 100 years. • Research in Canada and internationally to design facilities that would last 300 - 500 years, may need to rebuild after that. • Requires transportation if centralized. • Relies on sound physical structures and ongoing investments and monitoring to ensure safety and security. 	<ul style="list-style-type: none"> • Will future generations have the knowledge to safely manage the used fuel? • Will they have the social and political stability to monitor it?
<p>Treatment (to change the characteristics of used fuel, to reprocess it for further use or to reduce the toxicity/hazard)</p>	<ul style="list-style-type: none"> • Some countries reprocess used fuel (Canada does not). • Creates less volume of waste but still highly radioactive and toxic. • Makes plutonium and uranium more accessible, creates greater security risks. • International research to reduce toxicity of used fuel - not currently practical. • May require significant investments, no guarantee of success. 	<ul style="list-style-type: none"> • Will society (today and tomorrow) be stable enough to manage security risks? • Will new technologies become a practical reality and will they be affordable?