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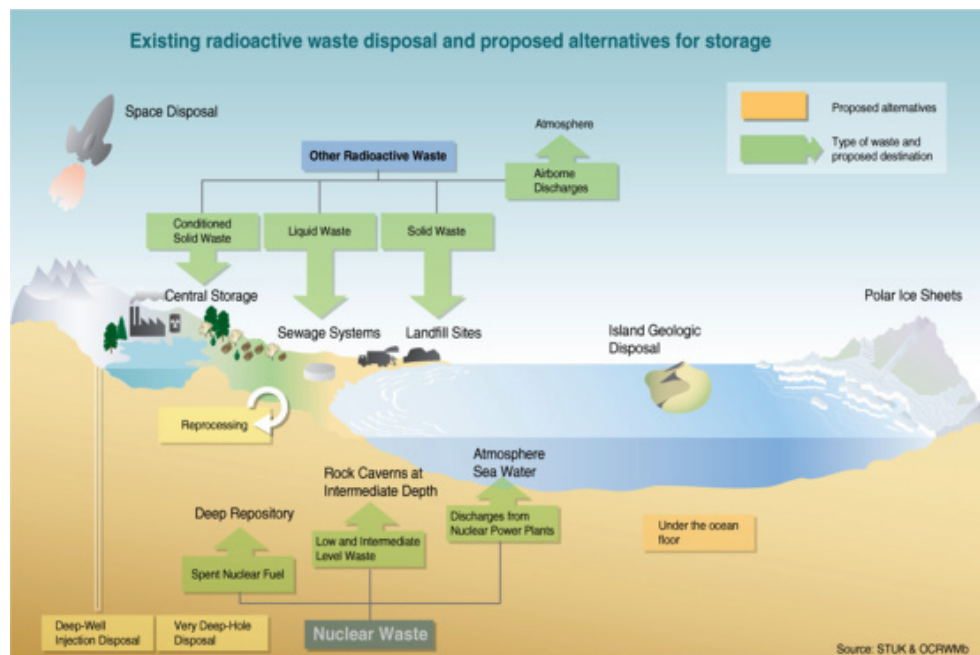
International Atomic Energy Agency (IAEA)
Simulating a Meeting of the Board of Governors

“Sustainable Nuclear Waste Management”

Sustainable Nuclear Waste Management

Driven by an increasing strive for energy, 29 countries currently administer more than 440 nuclear power plants in their energy supply portfolio worldwide. As a result, these countries continuously cumulate vast amounts of nuclear waste. Evidently, only a fraction (up to 10%) of the hazardous nuclear waste, which is produced due to complex nuclear reactions, can be reprocessed. Moreover, given the current technological standards, it is unlikely that these numbers will improve in the near future. The political controversy between pro-atomic politicians, who argue that nuclear power has a high potential to reduce CO₂ emissions and to become less dependent on fossil fuel, on the one hand, and anti-atomic politicians, who emphasize the missing knowledge of sustainable waste management, on the other hand, is one of the most pressing issues nowadays. Besides high risk and insecurity, one of the major problems of nuclear power plants is that the entire nuclear waste material often remains highly radioactive.

When the operation time of the nuclear fuel rods has elapsed, they are substituted and stabilized for transportation either for direct disposal or for reprocessing in special facilities. In the course of reprocessing, only 1-10% of reusable uranium can be extracted from the used fuel rods for new ones while the rest remains highly hazardous nuclear waste. Besides not being able to reprocess the total



amount of nuclear waste, this procedure is highly expensive. In addition, due to the fact that nuclear power is rather a young technology in comparison to the life span of its radioactive waste, a safe storage cannot be guaranteed and the long-term effects on the waste containers and the storage sites cannot be predicted. Taking the reprocessing into account, more than 90% of all nuclear material produced is directly disposed.

Although the tragic incident of Fukushima last year has triggered once again discussions not only on the safety of nuclear power facilities but also on new methods and technologies to dispose atomic waste, no sustainable solutions have been developed thus far. The IAEA committee session at VIMUN 2012 will discuss the problems concerning nuclear waste management from a global perspective with the aim of finding sustainable solutions for managing the growing amount of radioactive waste. The principal issue on the agenda will be the consequences of nuclear power plants regarding the substituted fuel rods, contaminated cooling water, and nuclear air pollution. Another major focus will be the safety issue concerning the reprocessing of nuclear material. Thus, the IAEA will seek to discuss the important problems at hand in order to come forth with a resolution that will help the international community to cope with this fundamental issue.

Nuclear waste repository

After nuclear technologies have been initiated, some form of waste management has to be introduced. However, in many member states, waste management is not organized in a systematic way. Until today, the repository of nuclear waste is still controversial. The most common method that is used by most countries is deep geological repository, which means that a repository is excavated deep within a stable geologic environment. Nevertheless, the potential risks for future generations are still not completely determined. This uncertainty causes a division within countries and on a global level. Ideally, countries should have national policies and technical strategies for the management of radioactive waste. It is normally established by the relevant waste owner or nuclear facility operator, or by the government (institutional waste). Thus, the national policy may be elaborated in several different strategy components, but all relevant parties in the country should be involved and consulted in this process.

Safeguarding Nuclear Materials by Rank

Thirty-two countries that have 1 kilogram or more of weapons-usable nuclear materials are ranked based on their core activities directly related to the protection and accounting of nuclear materials.



Map courtesy of Nuclear Threat Initiative (NTI)

Rank	Country	Score	Rank	Country	Score	Rank	Country	Score
1	Australia	94	13	Belgium	78	23	Japan	68
2	Hungary	89	13	United States	78	24	Russia	65
3	Czech Republic	87	15	Ukraine	76	25	Israel	56
4	Switzerland	86	16	Argentina	74	26	Uzbekistan	55
5	Austria	85	16	Belarus	74	27	China	52
6	Netherlands	84	16	Italy	74	28	India	49
7	Sweden	83	19	France	73	29	Vietnam	48
8	Poland	82	19	Mexico	73	30	Iran	46
9	Norway	81	19	South Africa	73	31	Pakistan	41
10	Canada	79	22	Kazakhstan	71	32	North Korea	37
10	Germany	79						
10	United Kingdom	79						

SOURCE: NUCLEAR THREAT INITIATIVE

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Possible issues for the debate

- ❖ What could be done after nuclear power plants are shut down? How can the nuclear waste be disposed in a sustainable way?
- ❖ Security issues of nuclear waste and international cooperation.
- ❖ Possible research strategies for sustainable nuclear waste management.
- ❖ Guidelines for further development, usage and waste management of nuclear power.

Further reading

<http://www.iaea.org/publications>

<http://nsspi.tamu.edu>

<http://www.nuclearpowerinstitute.org/>

<http://www.greenpeace.org/international/en/campaigns/nuclear/>