

Germany's Reasons for Changing the Nuclear Fuel Cycle Policy- and actual developments

Situation before 1998 (1)

- 1989 Stop of the planned reprocessing plant in Wackersdorf, caused by high costs, unsolved technical and safety questions and strong resistance in the region
- Safety problems within the operating Hanau MOX-fabrication plant lead to final stop of MOX fabrication in Germany
- Transports of nuclear fuel and vitrified waste to Gorleben interim storage facility lead to major demonstrations

Situation before 1998 (2)

- Electric utilities discuss on growing costs of reprocessing, but didn't see the possibility to change to final disposal due to the legal situation
- Ongoing debate on safety issues of fuel cycle facilities

Reasons for Changing Fuel Cycle Policy (1)

- Reprocessing leads to higher costs compared with direct final disposal. Main problems:
 - the difficulties of technical processes
 - the additional costs of MOX fabrication
 - Potential of additional costs of waste reconditioning
 - Costs for decommissioning of reprocessing plant
- Reprocessing leads to a complicate pattern of transports, related with specific questions

Reasons for Changing Fuel Cycle Policy (2)

- Reprocessing has specific safety problems:
 - Reprocessing plants have the highest release of radioactivity in normal operation of all nuclear facilities
 - The entrance storage facility and the storage facility for liquid high level waste solution can be a source for major releases of radioactivity in case of accident
- Handling of separated plutonium causes specific problems related to safety and proliferation
- It is unclear, whether it is possible to recycle all separated plutonium



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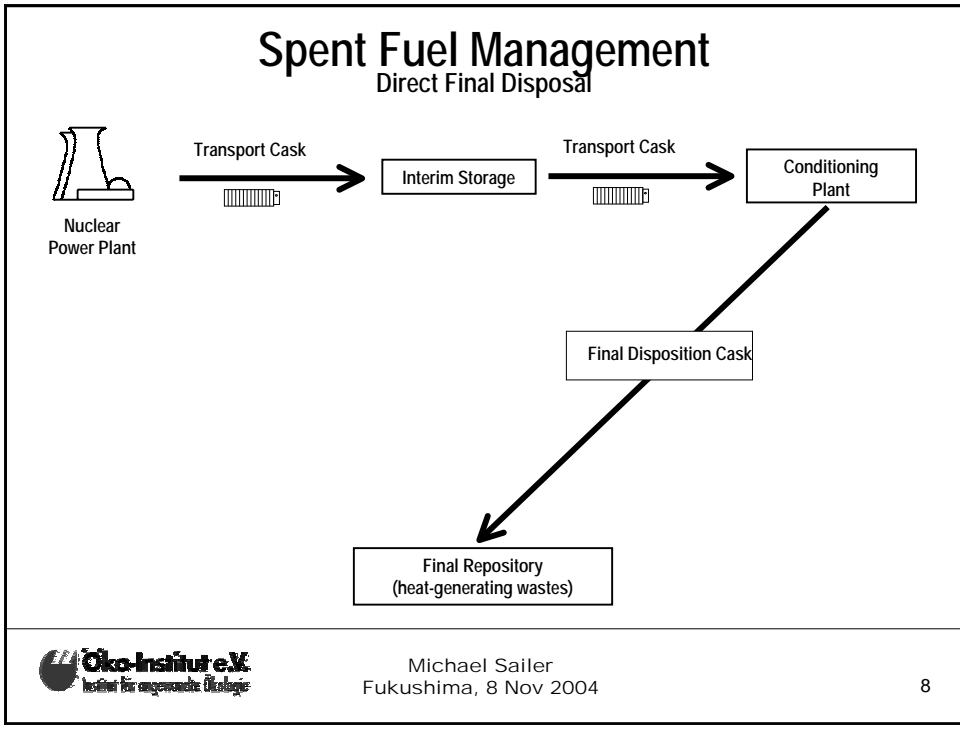
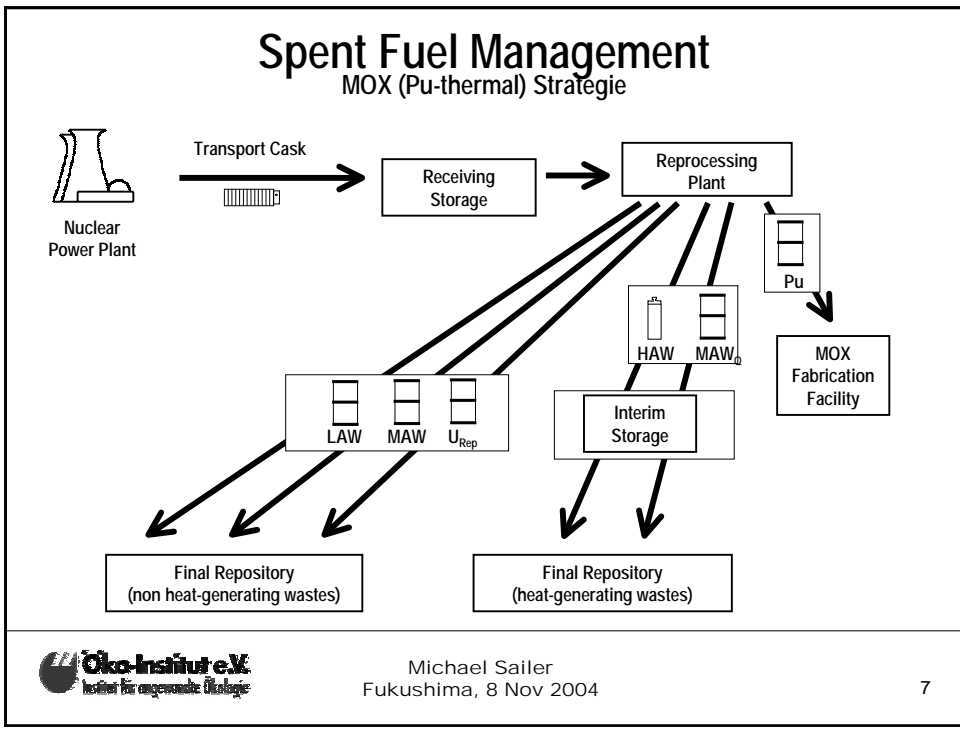
Reasons for Changing Fuel Cycle Policy (3)

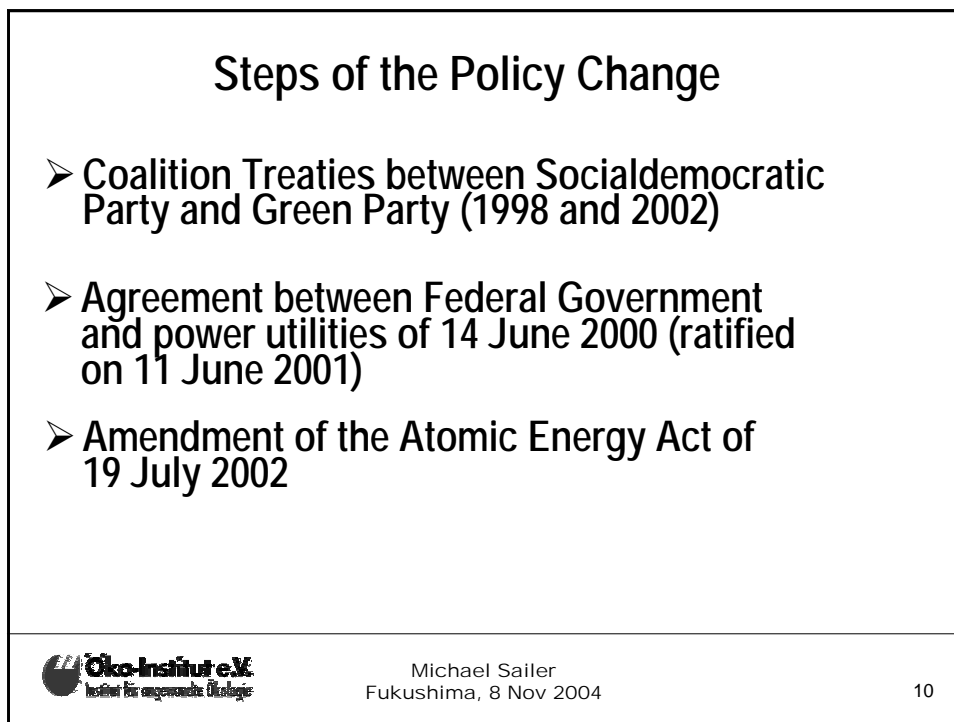
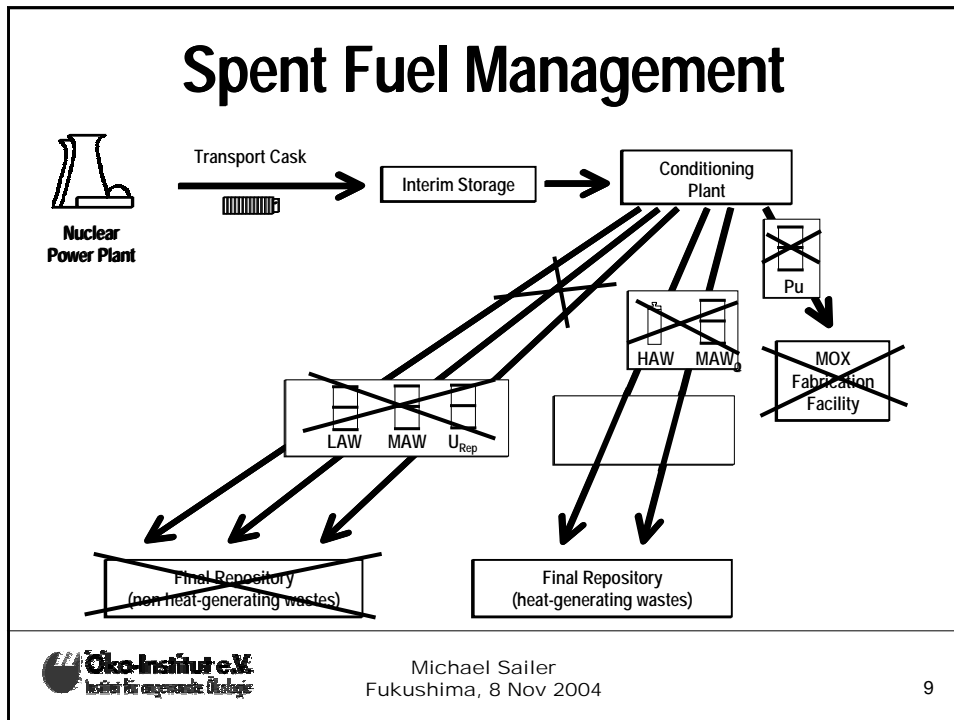
- The use of plutonium in MOX-fuel has specific problems, e.g.
 - change of nuclear behavior of reactor core
 - longer cooling time of spent fuel
 - higher content of transuranium-isotopes in spent MOX fuel
- Reprocessing lead to amounts of additional waste – different types of low and medium level waste, for which separate treatment has to be found regarding interim storage, (re)conditioning and final disposal
- The waste streams of final direct disposal are much easier to handle, because only spent fuel itself is to handle



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Main Items of the Policy Change

- Phase out of nuclear power plants (shut down of the last NPP around 2022)
- Periodical safety review of nuclear power plants every 10 years
- End of reprocessing → no more transport of spent fuel to reprocessing plants after 30 June 2005
- Mandatory construction of interim storage facilities at each nuclear power plant site

Actual Situation – Nuclear Power Plants

- 18 nuclear power plants at 13 sites in operation. Phase out between 2005 and 2022
- 2 plants out of operation (Muelheim-Kaerlich no restart, Stade final stop Nov 2003)
- Next final stop: Obrigheim in 2005

Actual Situation – Interim Storage

- Licences for 12 interim storage facilities at all relevant nuclear power plant sites
- Whilst licencing process several 10,000 intervenors. Main argument: No final disposal facility available, also fear of terrorism
- Start of operation of the interim storage facilities in 2004 resp. 2005
- Technology: Dry storage (air cooled with natural convection) in massive metallic casks. Proof against terror attacks.



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Actual Situation - Reprocessing

- Transports of spent fuel to reprocessing plants as long as utilities feared to have no operational storage capacities at time
- Only few additional transports to reprocessing plants are expected from now to 30 June 2005
- Leftover of former reprocessing policy: transports back to Germany of vitrified high level waste and other reprocessing wastes for the next 15 years or more
- Dealing with separated Plutonium from reprocessing



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Actual Situation – Final Disposal

- Proposal for a new site selection procedure for a final disposal site in Germany by AkEnd in Dec 2002
- Proposal for a new law implementing the site selection procedure is under preparation by the Federal Ministry of Environment (BMU)
- Federal government states that a disposal facility for high level waste and spent fuel will be available around 2030

Thank you very much