

Nuclear Latency (NL) Dataset
Country Coding Sheets

NORWAY

COW COUNTRY CODE: 385

List of Country's Enrichment and Reprocessing (ENR) Facilities

1. Plutonium Laboratory at Kjeller
2. Kjeller Pilot Uranium Reprocessing Plant

Detailed Facility-Specific Information and Sources

1. Plutonium Laboratory at Kjeller

- a. *ENR type (diffusion, centrifuge, EMIS, chemical and ion exchange, aerodynamic isotope separation, reprocessing).*

Spent fuel reprocessing.

- b. *Facility size (laboratory, pilot, commercial).*

Laboratory.

- c. *Is the facility under construction or in operation? If under construction, list the construction years. If in operation, list the years of operation.*

The nuclear program and facilities at Kjeller were commissioned in 1948. Shortly thereafter, Norway began conducting laboratory-scale reprocessing activities at Kjeller. It separated a few milligrams of plutonium for the first time in 1954. We consider this to be the first year in which the lab operated. It is unclear when work at the lab ended, but we assume that it was in 1961 – the year that the larger pilot plant went into operation at the same site.

- d. *Was the facility developed covertly? If so, identify years that facility was covert.*

No.

- e. *Was the facility placed under IAEA safeguards? If so, identify the years that the facility was safeguarded.*

No.

- f. *Was the facility placed under regional safeguards? If so, identify the years that the facility was under regional safeguards.*

No.

- g. *Did the facility have a military purpose?*

Work on this facility occurred when Norway was *considering* the nuclear weapons option. However, there does not appear to have been a concerted effort to acquire the bomb at this time. We therefore do not code this as a military plant. It certainly carried military significance, though. Norway seemed to close the door on getting nuclear weapons shortly after producing its first plutonium, which also happened to be when it joined NATO (1954).

- h. *Was the facility multinational? If so, identify the other countries that were involved.*

No.

- i. *Was the facility built with foreign assistance? If so, list the supplier(s) and what they provided.*

There was close cooperation with the Netherlands at Kjeller in the 1950s, and there were initially plans to jointly build a reactor. Although it is possible that the Dutch contributed to the lab-scale reprocessing facility, we did not find any definitive evidence of this. There was also close cooperation with Yugoslavia, and joint reprocessing experiments reportedly occurred at Kjeller in the 1950s. We consider this collaboration to constitute foreign assistance.

- j. *Sources:*

Forland, Astrid. 1997. "Norway's Nuclear Odyssey: From Optimistic Proponent to Nonproliferator." *The Nonproliferation Review*. Winter: 1-16.

NTI, "Institute of Nuclear Sciences – Vinca." <http://www.nti.org/facilities/519/>.

Sixth annual report for July 1956--June 1957 of the Netherlands'-Norwegian Joint Establishment for Nuclear Energy Research.
<http://www.osti.gov/scitech/biblio/4315086>.

2. Kjeller Pilot Uranium Reprocessing Plant

- a. *ENR type (diffusion, centrifuge, EMIS, chemical and ion exchange, aerodynamic isotope separation, reprocessing).*

Spent fuel reprocessing.

- b. *Facility size (laboratory, pilot, commercial).*

Pilot.

- c. *Is the facility under construction or in operation? If under construction, list the construction years. If in operation, list the years of operation.*

The pilot reprocessing facility went into operation in 1961 and shut down in 1968.

- d. *Was the facility developed covertly? If so, identify years that facility was covert.*

No.

- e. *Was the facility placed under IAEA safeguards? If so, identify the years that the facility was safeguarded.*

No, the facility was shutdown prior to the NPT approval. The IAEA has been involved with the decommissioning however.

- f. *Was the facility placed under regional safeguards? If so, identify the years that the facility was under regional safeguards.*

No, Norway is not a member of Euratom.

- g. *Did the facility have a military purpose?*

Norway's nuclear program initially had a military dimension. However, it had probably decided not to seek nuclear weapons by the time this facility entered into operation. Muller and Schmidt (2010, 157) note that Norway's nuclear weapons activities ended in 1951-55.

- h. *Was the facility multinational? If so, identify the other countries that were involved.*

Yes, the facility was multinational as it was a joint venture between the Netherlands and Norway. Sweden was also involved in the project: Lundby states that "The Norwegian-Dutch "Purex" part and the Swedish "Silex" part were connected in 1964 to increase the purification capacity" (20).

- i. *Was the facility built with foreign assistance? If so, list the supplier(s) and what they provided.*

Yes. The facility was built to be a "Nordic" collaboration. Norway and the Netherlands collaborated on the experimental reprocessing facility and Swedish researchers made use of the facility in the 1960s. In 1964 Sweden's AB Atomenergi completed a nearby facility that was connected to the original reprocessing plant in order to increase the purification capacity of the plant. It is unclear the extent of assistance that the Netherlands and Sweden provided.

- j. *Sources:*

- Forland, Astrid. 1997. "Norway's Nuclear Odyssey: From Optimistic Proponent to Nonproliferator." *The Nonproliferation Review*. Winter: 1-16.
- International Atomic Energy Agency. "Integrated Nuclear Fuel Cycle Information Systems." <https://infcis.iaea.org>. Accessed 06/08/2015.
- Lundby, John Erling. 1994. "Decommissioning of a Uranium Reprocessing Pilot Plant." *Tema Nord*. 594.
- Mattsson, Hakan. 2010. "Plans for Decommissioning of Nuclear Facilities in Norway." Norwegian Radiation Protection Authority. http://www.nks.org/download/nks_r_decom_sem_september12_16_2010/25/paper.pdf. Accessed 06/29/2015.
- Mueller, Harald and Andreas Schmidt. 2010. "The Little Known Story of Deproliferation," in William Potter and Gaukhar Mukhatzhanova, *Forecasting Nuclear Proliferation in the 21st Century*, Vol. 1. Stanford: Stanford University Press.
- Organization for Economic Cooperation and Development: Nuclear Energy Agency. 2006. "Norway." *Radioactive Waste Management Programmes in OECD/NEA Member Countries*. OECD Publishing.
- Zentner, M.D., G.L. Coles, and R.J. Talbert. 2005. "Nuclear Proliferation Technology Trends Analysis." Pacific Northwest National Laboratory. Report 14480.