

Quantitative Cost and Schedule Risk Analysis of Nuclear Waste Storage

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EXECUTIVE SUMMARY

This study was commissioned to provide an independent, outside-in estimate of the cost and schedule risks of nuclear waste storage projects. Nuclear waste storage is here defined as special facilities for the wet and dry storage and disposal of high-level (HILW) and low and intermediate-level nuclear waste (LILW).

The study analyzed cost and schedule risk profiles of past, completed nuclear waste storage projects (n = 22), nuclear new builds (n = 194) and underground mining projects (n = 31). The study found:

- The cost risk of nuclear waste storage projects is similar to the cost risk of nuclear power projects;
- The cost risk of underground mining is lower than the cost risk of nuclear waste storage projects;
- The schedule risk of nuclear waste storage projects is similar to the schedule risk in other nuclear projects and similar to underground mining projects;
- For cost risk the study found, based on a reference class of 216 past, comparable projects:
 - Cost overrun will be 67% or less, with 50% certainty, i.e. 50% risk of overrun above 67%;
 - Cost overrun will be 202% or less, with 80% certainty, i.e. 20% risk of overrun above 202%;
- For schedule risk the study found, based on a reference class of 200 past, similar projects:
 - Schedule overrun will be 40% or less, with 50% certainty, i.e. 50% risk of schedule overrun above 40%;
 - Schedule overrun will be 104% or less, with 80% certainty, i.e. 20% risk of overrun above 104%.

The Reference Class Forecasting approach employed in this study allows decision makers to identify the needed uplifts based on their risk appetite. The Reference Class Forecast is based on the assumption that the Swiss Nuclear Waste Storage project is no more and no less risky than past, similar, completed projects.

If the decision makers seek a 50% certain cost estimate this study recommends a 67% cost contingency. This entails a total estimate of approximately CHF 14 billion, which has a 50% likelihood of being sufficient and a 50% likelihood of being exceeded. This is higher than the most recent CHF 12 billion estimate by UVEK¹.

¹ Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation (UVEK)

If decision makers are more conservative and seek 80% certainty of the cost estimate (P80), this study recommends a 202% cost uplift. This entails a total cost of approximately CHF 25 billion.