

The End of Cheap Uranium

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Historic data from many countries demonstrate that on average no more than 50-70% of the uranium in a deposit could be mined. An analysis of more recent data from Canada and Australia leads to a mining model with an average deposit extraction lifetime of 10+- 2 years. This simple model provides an accurate description of the extractable amount of uranium for the recent mining operations. Using this model for all larger existing and planned uranium mines up to 2030, a global uranium mining peak of at most 58 +- 4 ktons around the year 2015 is obtained. Thereafter we predict that uranium mine production will decline to at most 54 +- 5 ktons by 2025 and, with the decline steepening, to at most 41 +- 5 ktons around 2030. This amount will not be sufficient to fuel the existing and planned nuclear power plants during the next 10-20 years. In fact, we find that it will be difficult to avoid supply shortages even under a slow 1%/year worldwide nuclear energy phase-out scenario up to 2025. We thus suggest that a worldwide nuclear energy phase-out is in order. If such a slow global phase-out is not voluntarily effected, the end of the present cheap uranium supply situation will be unavoidable. The result will be that some countries will simply be unable to afford sufficient uranium fuel at that point, which implies involuntary and perhaps chaotic nuclear phase-outs in those countries involving brownouts, blackouts, and worse.

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