

Uranium from coal ash: resource assessment and outlook on production capacities

A. Monnet, S. Gabriel

CEA, Gif sur Yvette, France

E-mail address of main author: antoine.monnet@cea.fr

Sixty years after first investigations on producing uranium from coal ash, this uranium source of supply has regained a strong interest. While the world consumption of coal keeps rising, several papers tackle radiological health issues. They actually point out big uranium-rich coal-ash disposals that coal-fired power plants generate. These disposals could be washed of their radiological hazards as they suggest. Besides, uranium-bearing coal deposits are also viewed as a potentially economic source of supply for the nuclear fuel cycle. Uranium as a by-product of coal used to remain sub-commercial but recent news releases mention the promising pre-feasibility achievements of Spartron Resources. This Canadian company should soon operate the first ash leaching plant in over 40 years. Furthermore, it has shown significant production capacities.

While uranium production from coal ash has remained sub-economic for decades, the emergence of new projects is refreshing the question of resource assessment: how much coal ash do we have? Are they all rich in uranium? Can we produce it all? Spartron has announced that the Yunnan region (China) could produce 145 tU a year from 3 coal-fired power plants. Although these three coal power plants could almost be enough to supply a nuclear one, it is hard to tell how many of the 2300 world power stations could provide uranium. The present study proposes to estimate both the world resources and the production capacities of uranium as a co-product or a by-product of coal.

Based on the distinction between uranium-rich and uranium-bearing coal deposits, a review of some potentially promising ore deposits is covered. A parametric study stresses the main uncertainties in the resource assessment, sometimes outlining what could be the bottlenecks of developing projects. Finally, our technical and economic conclusion is thus established, drawing an outlook on how the reserves of uranium from coal ash could vary.