Uranium-Rare Earths Opening Address

OVERVIEW OF CURRENT GLOBAL URANIUM SUPPLY AND DEMAND AND INNOVATIONS REQUIRED FOR A SUSTAINABLE URANIUM INDUSTRY

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ABSTRACT

At the beginning of 2021, a total of 443 commercial nuclear reactors were connected to the electrical grid in 32 countries and globally an additional 52 reactors were under construction. Uranium demand is based on both the number of installed nuclear power plants as well as fuel cycle duration, enrichment level, burn-up and advanced fuel technologies.

Global uranium resources and production capability forecasts based on existing and committed production as well as planned and prospective capability, were reported in the joint OECD-NEA/IAEA Uranium Resources, Production and Demand (Red Book) 2020 publication. From a uranium resource perspective, according to the 2020 Red Book publication, total global recoverable identified conventional uranium resources are currently 8.1 million tonnes uranium and in-situ unconventional uranium resources amount to over 39 million tonnes of uranium. Low grade conventional and very low grade unconventional uranium resources (e.g., phosphate and black shale/schist) comprise a large part of this global uranium resource base.

At present, these low grade conventional and very low grade unconventional uranium resources are considered sub-economic to recover. However, these resources may be needed to meet demand requirements for uranium, since the 2020 Red Book analysis of uranium supply versus demand indicates a potential gap in supply from primary uranium producers in the coming decades. Therefore, mining and processing innovations will be required to ensure a sustainable supply of uranium in the future while meeting environmental and social acceptance requirements.

To reduce the environmental footprint of uranium recovery and improve the economics and social acceptance, many low grade conventional uranium projects are currently investigating innovative applications of in-situ recovery (ISR) of uranium. Examples may be found in sandstone type uranium deposits in China, Mongolia, and Russia. In Canada, ISR technology is being investigated in a Proterozoic unconformity type uranium deposit. If successful, this will be the first application of ISR in such deposits.

Other innovative approaches for improving the economics of uranium recovery from low grade and very low grade uranium resources may include the application of beneficiation techniques (e.g., gravimetric or radiometric) to increase the concentration of uranium in the feed to the processing facility, thereby potentially reducing unit operating costs and reducing the environmental footprint by decreasing the amount of tailings produced.

This presentation will provide additional detail on supply and demand forecasts for uranium based on the joint OECD-NEA/IAEA Uranium Resources, Production and Demand (Red Book) 2020 publication as well as provide a more detailed overview of potential innovative applications in the uranium mining and processing industry to ensure a future sustainable supply of uranium for nuclear power that meets social, environmental and economic requirements.

Keywords: Uranium, Mining, Supply, Demand, Sustainability, Innovation, In-Situ Recovery