

Clean metals from the seafloor - One of the biggest disruptions facing the base-metals industry

Anthony O'Sullivan, DeepGreen Resources, London, United Kingdom

The UN forecasts that in 2050 there will be nine billion people on our planet.

There is a global focus on clean renewable technologies for power generation and storage, and for transport. These new technologies are more metal-intensive, particularly for copper, nickel, cobalt, and manganese. The global resource quality for these metals has been declining over the last 20 years, at the same time as a marked decrease in discovery rates for Tier 1 deposits. With burgeoning demand for cobalt-intensive Lithium Ion batteries, cobalt resource security concern is developing, particularly as the majority of the world's cobalt is sourced from high-sovereign-risk jurisdictions.

The world's largest single resource of copper, nickel, and cobalt lies on the seafloor within the Clarion Clipperton Zone (CCZ) in the East Pacific Ocean as polymetallic nodules. Published estimates of more than 20 billion tonnes of nodules containing more than 40 million tonnes of cobalt and 200 million tonnes of nickel metal, are sufficient to provide more than one hundred year's of current global production for both of these metals. Average resource grades (NI 43-101) of 1.3% Ni, 1.1% Cu, 0.2% Co and 29% Mn have been reported.

In the 1970s, a number of consortia comprising Lockheed Martin, Inco, Kennecott, Noranda, Mitsubishi, RTZ, Billiton and others demonstrated that it is technically feasible to collect and lift nodules to the surface and to process them to produce metal. However, there was neither a means of securing title to the resources, which lie in international waters, nor regulations under which to operate.

The United Nations Convention on the Law of the Sea, which came in to force in 1994, created the International Seabed Authority with the mandate to regulate the development of the resources of the international seabed area for the benefit of humankind. The ISA has developed exploration regulations and issued exclusive exploration contracts to 16 contracting groups in the CCZ starting in 2001. The ISA plans to issue the exploitation regulations, which will govern, among other things, the environmental and fiscal regime under which production would occur.

Contractors operating in the international seabed area have announced NI 43-101 compliant resource statements, whilst others have undertaken environmental baseline studies and some trial harvesting in preparation for commencing operations when the regulations are issued.

These are the metals for our sustainable future.