Predicting metal and mineral demand in the future is challenging given current changes in energy markets, technology, new materials, and human needs. Regardless, most scenarios predict continuing increases in demand for infrastructure metals, and rapidly expanding but volatile demand for the critical metals and minerals needed for modern technology and clean energy. Meeting demand increases while striving to satisfy global sustainability goals will be difficult, particularly when reliance on economies of scale results in less metal or mineral products per unit of rock with resultant energy, water and waste challenges.