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A TECHNO-ECONOMIC ANALYSIS OF THE SPACE SOURCED VOLATILES MARKET WITHIN  
THE EARTH-MOON SPHERE OF INFLUENCE

**Abstract**

Asteroids constitute a wealth of metals and volatile resources. As humanity continues to grow on earth and to expand into space, asteroid resources and the extraction thereof will play an important role in satisfying the demands of the resulting economy. Past studies have analysed humanity's near-term colonisation and utilization of near-earth space in terms of technical parameters and resource requirements. A different set of studies has concentrated on technical and cost parameters for the near-term extraction of space resources from asteroids and planetary bodies. Bringing these two viewpoints together, we model the future market for volatiles in space, considering parameters around a base scenario in which there are humans on Earth, on the moon and on stations orbiting the moon and earth, as well as private sector asteroid miners and government funded lunar surface operations both supplying volatiles. The model is based on a competitive market situation and the results are used to determine possible equilibria in the quantities of volatiles provided by these two sources, the number of asteroid miners that will compete in this market, the profitability of these asteroid miners and a price range for volatiles in the chosen scenario.