

New Business Models for Space Exploration (14)
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SPACE MINING: ISRU AS A DRIVER FOR A NEW ECONOMIC SPACE EXPLORATION MODEL

Abstract

Recently, various types and styles of Public-Private Partnerships, Commercial, and Entrepreneurial models have been proposed and, in some cases realized, as a means to support Space Exploration. As we start to look towards the expansion of the global economic sphere to include the Moon, Near Earth Objects, and potentially Mars, the major question which arises from this premise is: What is the role of governments versus commercial industry and how can they contribute to each other's success? There has been some work done attempting to establish economic models which would be compelling enough to existing industry that they would buy in to the concept. For exploration activities beyond LEO, however, it seems that the majority of the models use ISRU as a means of paying down the costs and establishing an economic basis. Publications by Dr. John Lewis (Mining the Sky) and Mark Sontner (Economic Feasibility of Mining the Near earth Asteroids) to mention a few, proposed that the economic foundation of commercial ISRU can be established if there is an easily accessible consumer base. This is the Achilles heel for commercial In Situ Resource Utilization activities. The terrestrial mining industry is all too familiar with the concept of finding a spectacular gold deposit, only to leave it sitting for decades because the ore is either too difficult to access given the technology of the day, or the product is too difficult to get to market. Many examples of this can be found in virtually any mining company's archives. In the sense of space exploration, for example, the cost analyses show that an entire mission could be paid off by the delivery of a few tonnes of a precious commodity to earth. This model collapses when one realizes that this act alone would plunge the price of the commodity so low as to negate any potential benefit to the mining mission. The question phrased above, then, could be reworded as follows: What is the role of governments vis-a-vis commercial industry and how can they complement each other in the establishment of anchor customers and the mitigation of Non Recurring Engineering costs. This paper proposes to examine this question and suggest some models from terrestrial mining which might be used as a guide for the way forward.