SPACE MINERAL RESOURCES: MARKET MODELING AND PROPELLANT DEMAND FORECASTING. Brad R. Blair[1], Arthur M. Dula[2], and Zhang Zhenjun[3], [1]NewSpace Analytics LLC, PO Box 7, Idaho Springs, CO, 80452, <planetminer@gmail.com>, [2]The Law Office of Art Dula, 3106 Beauchamp Street, Houston, TX 77009, <art@dula.com>, [3]China Institute of Space Law (CISL), Chinese Society of Astronautics, P.O. Box 838, Beijing 100830, China, <zhenjun_zhang@126.com>.

Abstract: A recently published study[1] by the International Academy of Astronautics (IAA) found that space mineral resources (SMR) can serve as an economic game-changer, opening a vast new source of wealth to benefit humanity.

The study examined technical, economic, legal, and policy-related requirements to enable SMR, and offered specific recommendations to international space agencies and commercial enterprise for moving humanity forward into a new era of space settlement and commercial resource development.

A critical element of the study is an entire chapter devoted to systems modeling and analysis, which presents a quantitative model of future space infrastructure and propellant demand. This work is based on a space population forecast stemming from Elon Musk's stated goal to put 10,000 people on Mars within his lifetime. This goal was used to translate technical requirements for human space settlement into a deep space economic forecast based upon the ultimate consumer: the future space colonist. This per-capita approach offers a unique point of departure that can then be decomposed into technical, financial, and policy goals, milestones and objectives.

In principle, the agreement by both entrepreneurs and international space agencies on a baseline human space settlement model can serve to underwrite private business plans as well as facilitate the timing of key technology investments.

References:

[1] Arthur Dula (Editor), and Zhang Zhenjun (Editor), *Space Mineral Resources: A Global Assessment of the Challenges and Opportunities*, IAA Cosmic Study 3.17, Virginia Edition Publishing Company, 27 November 2015, 472 pages, http://www.amazon.com.au/Space-Mineral-Resources-Assessment-Opportunities-ebook/dp/B018OJD95Q