

## ECONOMIC INCENTIVES AND TAX CREDITS FOR SPACE MINING: ANALOGIES AND IDEAS.

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**Introduction:** Space mineral development, whether from asteroids, the Moon or other planetary bodies, is not only a major challenge from a technological prospective but also from an economic one. It is often dismissed out of hand as being too expensive to even consider. Yet these ideas keep being resurrected; like a phoenix, rising from the ashes of previous incarnations.

This presentation looks at the types of economic incentives that could advance the development of space mining. Are there incentives available in terrestrial mining that could be applied to space resource development? What projects are currently or have been analogous? What types of incentives or tax credits have historically led to the successful completion of large mining projects?

**Economic Incentives:** Economic incentives and tax credits are established by top-down government policy aimed at creating desired results. These valuable policy tools are created: to support nascent industries and help them to develop and mature; to achieve national competitiveness and leadership in innovative industries; and to motivate or stimulate consumers, businesses or other participants in the economy such as investors or lenders to make a decision or to take action. Most incentives are explicitly produced through government policy to achieve a desired end but they can also be created in the private sector through pricing mechanisms (such as price reduction sales, coupons and/or rebates), patronage or prizes. Within government; policy, policymakers and politics are so intricately intertwined that one must examine these relationships and determine how they interact. Policies which are straightforward with stated, measurable goals can easily be assessed as to how successfully they accomplish their purposes without significant undesirable side effects. Many policies however are qualitative with goals that are fuzzy and cannot easily be measured to determine success or impact. Often appropriateness (and success) depends on the political viewpoint of the policy maker. Political will can be fleeting and fickle, changing with the minds (and inhabitants) of Congress, Senates or Parliaments. Politicians tend to be short sighted, focused on their election cycle and thus can be incapable of making decisions on policies with long ranging implications. It can also be difficult to distinguish policy goals from political ones or to see the perhaps hidden, political agendas behind policies that may

initially appear apolitical e.g. jobs in certain districts/ridings, etc.

While economic incentives affecting space access also may affect space mining, the focus will be on mining specific incentives.

### **Incentives in the Terrestrial Mining Industry:**

One of the most pertinent analogies for space resource development may lie within the Canadian resource exploration sector. Mining, whether terrestrial, lunar, on an asteroid or other planetary body, is a very high-risk proposition. Prospectors may start with the best geological inferences and still end up with nothing. It is also a very capital-intensive industry, in both the exploration and the development stages. The higher the price of a commodity, the more exploration that begins to occur and the more development projects that become feasible. It will take VERY high prices for space resource development to become viable for Earth use but given resource scarcity and concern over the environmental impact of many types of mining on Earth, that possibility exists. For resource utilization in space, the economics will differ. Resource extraction prices that are lower than launch costs could create a new and distinct market.

In Canada, federal and provincial tax incentives are often available to encourage mineral and oil/gas exploration. There are major benefits to society for these activities, particularly to the infrastructure development of rural and remote communities and employment opportunities for their residents. Mining has been responsible for the founding and continued existence of many Northern communities. It could easily form the basis for communities on other worlds as well.

To encourage investment in exploration and mining in Canada, the federal and some provincial and territorial governments offer tax incentives. In October 2000, the federal government introduced a 15% non-refundable tax credit known as the Investment Tax Credit for Exploration (ITCE). This is in addition to the existing 100% deduction of eligible exploration expenditures (CEE). These "super" flow-through shares, as investors know them, have been used successfully in the past to help finance discoveries. Between October 2000 and December 31, 2003, over \$750 million in flow-through financing was raised for

exploration in Canada. Approximately \$1.7 billion<sup>1</sup> was raised in 2006. The program has stalled and been reinstated several times and is currently set to expire in 2011 though pressure continues to be exerted to make these credits permanent. This financial incentive encourages exploration within the country, with the intention of replenishing mineral reserves that have been depleted by mining.

These tax credits are especially valuable to small exploration companies without current earnings who would otherwise have substantial challenges raising capital. Without earnings to offset the tax credits, those credits would be worthless to them but by issuing “flow-through” shares to investors they can raise capital and their investors can then use the tax deduction against their own personal income. Because the investment is 115% deductible against other income, it attracts many investors and perhaps encourages them to take risks they might otherwise not consider.

**Property Rights and Regulatory Issues:** It is crucial to ensure that title is secured for exploration and extraction to the mining property being explored before beginning. In Canada and many nations, these “claims” are filed with the territorial/state governments. It is not always necessary to own the land itself as long as you have secured the mineral rights. While private property rights and a capitalist approach may not technically be considered an economic incentive, they are crucial to attracting investors in any endeavor. Ownership leads to better care, attention and development than renting or communal property. “No one ever returned a rental car waxed.” Owners invest in what they own both to maintain and make improvements. Land grants and property rights spurred the settlement and growth of the United States and Canada. Patent rights are a crucial element in the development of most technologies. Without these rights and protections, most inventors would not have spent the time, energy and perseverance needed for many of the noted breakthroughs throughout the years. Space resource development needs that perseverance, innovation and strong commitment of time and energy for progress to be realized.

Hernando de Soto, author of *The Mystery of Capital: Why Capitalism Triumphs in the West but Fails Everywhere Else*<sup>2</sup> and President of the Institute of Liberty and Democracy in Peru (regarded by *The Economist* as the second most important think-tank in the world), discusses the impact and importance of formal property systems – including property rights, records and titles with legal rules governing the process. The

effects of a formal property system allow for an asset to become its economic concept or value and to be used for its productive potential i.e. to be borrowed against, used as collateral etc.

Property rights as they relate to space often appear confusing. The Outer Space Treaty<sup>3</sup> talks on one hand of the “common heritage of mankind” and “for the benefit of all peoples” while affirming that “non-governmental entities, including private individuals, companies, and organizations, have the right to conduct activities in space in accordance with international space law, and subject to the authorization and continuing supervision of the appropriate State Party”. The term “common heritage” remains undefined and “for the benefits of all peoples” suggests a communist rather than capitalist economic model leading to the apparent contradictions. This lack of clarity makes it very confusing to potential investors. Providing economic certainty in the form of clearly defined and assured property rights would be an incentive to those entrepreneurs and investors. The structure of terrestrial mining rights could provide a framework to provide property rights while avoiding sovereignty claims.

Almost all activities, especially commerce, are subject to regulations of one kind or another. It is important for regulators to act in as least restrictive a manner possible while ensuring safety is maintained. An open and enabling approach to regulating space mining acts, if not as an incentive at least not as a disincentive to future commercial mining activity.

**Additional Information:** If you have any questions or need additional information regarding this abstract, Please call Eva-Jane Lark at (613) 798-4230 or alternatively send an e-mail message to [evainter-views@gmail.com](mailto:evainter-views@gmail.com).

#### References:

<sup>1</sup>Prospectors and Developers Association of Canada  
*PDAC's Position on Canada's 'Super' Flow-Through Program*

<http://www.pdac.ca/pdac/advocacy/financial/flow-through.html> Accessed December 12, 2010

<sup>2</sup>De Soto, H. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. Basic Books, New York, 2000 ISBN 0-465-01614-6.

<sup>3</sup>United Nations Office for Outer Space Affairs Home page

<http://www.unoosa.org/oosa/SpaceLaw/outerspt.html>