

TESTIMONY OF
PETER MARQUEZ
VICE PRESIDENT FOR GLOBAL ENGAGEMENT
PLANETARY RESOURCES

BEFORE THE SENATE SUBCOMMITTEE ON SPACE, SCIENCE, AND
COMPETITIVENESS

HEARING ON REOPENING THE AMERICAN FRONTIER: EXPLORING HOW THE
OUTER SPACE TREATY WILL IMPACT AMERICAN COMMERCE AND SETTLEMENT
IN SPACE

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Chairman Cruz, Ranking Member Markey, and members of the Subcommittee, thank you for the opportunity to provide comments on the vital role of the Outer Space Treaty to our growing space industry.

I represent a multi-national asteroid mining company. Planetary Resources exists to extract and utilize resources on asteroids that are needed for humanity to; create a truly universal space economy, have a permanent presence in the Solar System, and increase the quality of life for all people living on Earth. Planetary Resources began the age of asteroid mining in 2015 when we launched the first asteroid mining technology demonstration satellite. We have built two follow-on satellites that are currently awaiting launch. In 2020, we will launch and operate the first-ever private deep-space mission where we will also conduct a historic and unprecedented mission to visit, survey and prospect several near-Earth asteroids.

What we do

Our business is to provide resources for people and the products they will need in space.

- We will provide fuel and raw materials that will be integral to any long-term, sustainable and scalable missions to the Moon, Mars, and beyond.
- We will harvest water from asteroids to be used as fuel for spacecraft and satellites, life support for a space workforce, radiation shielding, and to grow food.
- We will extract metal which will, in turn, be 3-D printed into nearly any structure or component needed in space.

Our near-term initiatives are providing fuel to launch providers for refueling their rockets in space with liquid hydrogen and oxygen we extract from asteroids. The refueling of rockets in space allows for significant reductions in launch costs and increased payload capacity for missions to the Moon and Mars. For example, our analysis shows cases where refueling a rocket on a Mars mission can decrease the cost of launching a payload from roughly \$40MM per metric ton down

to \$11MM per metric ton while simultaneously increasing the maximum payload capacity from about 3 metric tons to 26 metric tons. Long-term and permanent exploration is infeasible without space resource utilization.

Longer-term, platinum group metals are also one of our key targets. They are extremely rare on Earth but in nearly limitless supply on asteroids. For example, a single 500-meter platinum rich asteroid contains 175 times the global annual output of platinum or 1.5 times the known global platinum reserves. Our activities will make these previous scarce resources ubiquitous and increase the quality of life for all humanity.

The Context

Less than a decade ago, asteroid mining was still relegated to science fiction novels or movies. In the span of the past few years we have been able to harness a confluence of technical development, increasing scientific knowledge, and reductions in costs to move asteroid mining from fiction to reality. But there is still much to learn and do.

The position we find ourselves in today regarding asteroid mining is not much different than the situation our predecessors found themselves in over 50 years ago. Many of the technologies that would define the space age were still in development and there was uncertainty as to how space activities would evolve. The U.S. had a firm position that private activities would play a key role in the future of space. The Soviet Union, on the other hand, sought to have space operations limited to Governments. If the U.S. had not promoted commercial space activities in the 1960s I would not be here today, my fellow witnesses would not be here, there would be no Blue Origin, no SpaceX, no Virgin Galactic, no XPrize, and none of the hundreds of small businesses that support our commercial space industry would exist.

Today, we find ourselves in a time of opportunity. The breadth of space activities, and the services they provide to people in space and on Earth, is growing exponentially. This period of unprecedented space expansion is a product of the stability that we have had in space since the launch of Sputnik in 1957. Despite global tensions, space has remained a realm of peace and predictability. That stability, in no small part, has been assured by the tenets of the Outer Space Treaty. Through the development of a common agreement with the international community the foundational precepts of the Treaty have kept the space domain safe, stable and sustainable for 50 years.

The Value of the Foundations of the Space Legal Regime

For Planetary Resources to accomplish our mission, we need such stability and predictability, not only in space but also in the domestic and international legal landscapes. This Nation has a history of not only supporting commercial space activities but leading and implementing the international legal structure that allowed it to exist in the first place.

The U.S. National Space Policy was founded on these legal principles. Indeed, every President since Eisenhower has espoused the same principles for space exploration and utilization which, in turn, became the foundation of our international legal environment and the Outer Space Treaty.

Given its central role in assuring peace and stability in space, our success relies very much on the Outer Space Treaty. The consistent interpretation and application of the Treaty by the U.S. Government provides a predictable environment in which we can flourish. Since the dawn of the space age, as new technologies and capabilities have arisen, the Treaty has proven to be a flexible foundation for space activities. Indeed, one of the keys to the Treaty's enduring relevance is that its framers did not attempt to regulate specific space activities. To do so then—or today, for that matter—would be a recipe for obsolescence. Instead, the Treaty establishes certain foundational principles, and a basic legal framework within which space activities have been addressed through dialogue among States and implementing legislation by national legislatures.

Perhaps the most crucial dimension of the Outer Space Treaty for our company is the Treaty's enabling framework for space resource utilization. At this moment in time, as Planetary Resources brings utilization of asteroid resources ever closer to humanity's reach, there are active discussions in the international community about how to interpret and apply the Outer Space Treaty to these historic activities. The United States comes to these negotiations from a position of strength. For one, the U.S. Government played a leading role in the Treaty's formation. Yet it is the unbroken consistency of the United States' interpretation of the Treaty, over fifty years and across the past twelve Presidential administrations, that is the key to our credibility in this process.

The Importance of Domestic Legislation in the Context of the OST

For Planetary Resources, the value of the international legal framework for space is clear – without it we would be trying to operate in an anarchic reality. However, for that regime to be meaningful and responsive to the advancement and expansion of space technologies, its tenets must be appropriately interpreted and implemented by effective national legislation.

Relevant to space resources, the United States has Title IV of the Commercial Space Launch and Competitiveness Act (CSLCA) which recognizes the legal right to own resources extracted from asteroids, in full accordance with international law. Planetary Resources strongly thanks the Senate, and specifically, this Committee's Members and staff in developing and passing this law.

The leadership of the U.S. Government, nationally and internationally, and the steadfast support to commercial space activities created technological advances that increased our scientific knowledge, economic prosperity, and international security. That support continues today as evidenced by this hearing today and the Committee's continued strong interest in nurturing this industry that is critical to both national security and economic competitiveness.

The Space Resource Utilization Act of 2015 is an excellent example of the ways the Congress can support innovative, new commercial space activities by building atop the Outer Space Treaty's basic foundation. We are confident that U.S. diplomats, strengthened by the United States' unmatched consistency in interpreting the Treaty, will continue to engage with the international community and find common direction on the interpretation of the Treaty in a manner that promotes innovative, ground-breaking commercial space activities.

Conclusion

Internationally, the 1967 Outer Space Treaty is the backbone of the stability and predictability of not only the legal landscape, but space operations themselves. Article VI ensures that all operators, public or private, from all countries, operate according to a common set of basic rules. This legal level playing field for all spacefarers is allowing new space industry to flourish across the globe.

Planetary Resources is proud to be part of one of those new industries. Utilizing asteroid resources fundamentally changes our ability to operate in space. Here in the United States, our large, and growing team, spans five states in addition to our presence in the Grand-Duchy of Luxembourg. Our investors are from all corners of the globe and our customers are on Earth and in space. This is an exciting time.

Space is a global endeavor with profound national-level implications. We consider that the two legal pillars of a stable international legal regime agreed to by all global players, the Outer Space Treaty, coupled with effective domestic legislation that can be responsive to technological advancements, as typified by the 2015 CSLCA will allow us to effectively prosper, and will allow others to operate and compete on a level playing field.

None of this is to say that the Treaty is perfect in every way, or that the Congress's work in enabling a robust and globally competitive commercial space sector is complete. We are concerned however, that opening up the Outer Space Treaty will leave our industry worse off and will, overall, be to the detriment of national and international security.

We look forward to continued successful U.S. engagement with international partners to interpret and apply the Outer Space Treaty to evolving circumstances, and the continued support of the Congress in developing timely domestic legislation to support space technology developments.

Our simple message is that our focus should continue to be building upon the foundation of the Outer Space Treaty, rather than putting that foundation at risk.

I thank you Mr. Chairman.