



Promoting Cooperative Solutions for Space Sustainability

THE POLICY CONTEXT FOR SPACE RESOURCES DEVELOPMENT

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7th joint meeting of The Space Resources Roundtable (SRR) and
the Planetary & Terrestrial Mining Sciences Symposium (PTMSS)
Golden, CO June 8, 2016

swfound.org

- Secure World Foundation *is a private operating foundation* that promotes cooperative solutions for space sustainability
- **Our vision:** the secure, sustainable and peaceful use of outer space that contributes to global stability on Earth
- **Our mission:** SWF works with governments, industry, international organizations and civil society to develop and promote ideas and actions for international collaboration that achieve the secure, sustainable, and peaceful uses of outer space for the socioeconomic and environmental benefits to Earth



SWF-Hosted Panel Discussion of
“Asteroids, Mining, and Policy: Practical
Consideration of Space Resource Rights”

Washington, DC May 5, 2016

“Non-traditional” Space Applications

Rapid expansion in the number & types of commercial space applications is challenging existing policy context for space activities



Image Source: NASA

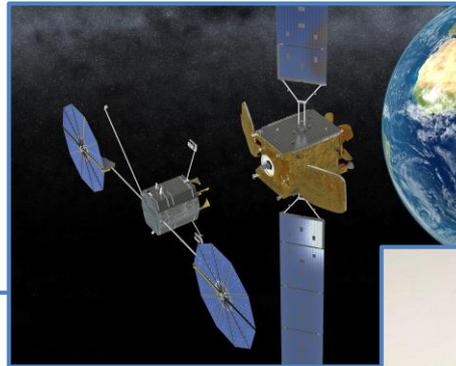


Image Source:
Orbital ATK



Image Source: Planetary Resources



Image Source: SpaceX

Governmental policy and regulation must be developed to support these activities...and others

Window for Action

- Business plans and economic returns will be affected by policy and legal regimes relating to the commercialization of off-Earth resources
- Both governments and private enterprise are facing a condition of uncertainty – risk – in defining space resources activities
- There is interest in working jointly to reduce that uncertainty to define market conditions and respect international obligations
- Coordination of national and international law will help states establish the conditions under which socio-economic benefit could result from space resources development

Space Resources – Current Status

Technology / Business

- “Mining” of in-space resources is technically feasible
- Fundable business plans have been presented
- Several years (at least) away from commercial-scale operations
- Market focus on in-space applications
- Timeline for return on investment is long: more risk?

Policy / Legal

- Overarching legal context: the Outer Space Treaty (1967)
- Individual countries beginning to implement national regulatory frameworks for space resources development
- Central issue: can commercial entities legally own celestial resources?
- What is the meaning of “appropriation?” Of “use?”

Policy’s role: providing certainty and respecting legal obligations

Outer Space Treaty of 1967

(104 State Parties)

- ARTICLE I: “Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States...”
- ARTICLE II: “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”
- ARTICLE VI: “The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.”

International law provides a framework under which all space activities are conducted but does not currently address space resources with any specificity

National Legislation & Policy Action

United States

- Commercial Space Launch Competitiveness Act of 2015 (CSLCA)
- Affirms legal right of U.S. companies to possess, own, use, and sell space resources
- Explicitly recognizes Article II and states no claim of sovereignty
- Acknowledges need for – but not does provide – accompanying licensing regime
- Further executive and legislative action forthcoming

Luxembourg

- Policy and funding commitment to support space resources companies
- National space law focusing on space resources in-work
- 200M EUR initial budgetary commitment to supporting space resources

United Arab Emirates

- Public statement of interest in supporting space resources development

National law – in particular the U.S. legislation – has led to some concerns in the international community

- Represents U.S. unilateral “land grab” in space (e.g. represents a claim of sovereignty)
- Will this lead to economic imbalance? How can benefits be shared?
- Preferences for addressing through international regime, rather than country-by-country domestic law
- Position that the Moon Agreement represents the appropriate legal regime

UN COPUOS Legal Subcommittee agenda item for 2017: “General exchange of views on potential legal models for activities in the exploration, exploitation, and utilization of space resources.”

Moving Towards Implementation

- Discussion in international fora likely to continue
- Consolidation of opinion around position that development is legal
- Increasing focus on “authorization and supervision” aspects
- Further domestic law and policy action
- Further policy definition of impact, benefit, and use case



Luxembourg: “intention to set out a formal legal framework which ensures, that private operators, working in space, can be confident about their rights to the resources they extract, i.e. rare minerals from asteroids”

Regulatory Elements to be Addressed

Domestic

- Who is the licensing authority?
- How is non-interference defined and enforced?
- How are space resources missions registered, and does that represent a claim system?
- Trade and taxation policy on goods produced

International

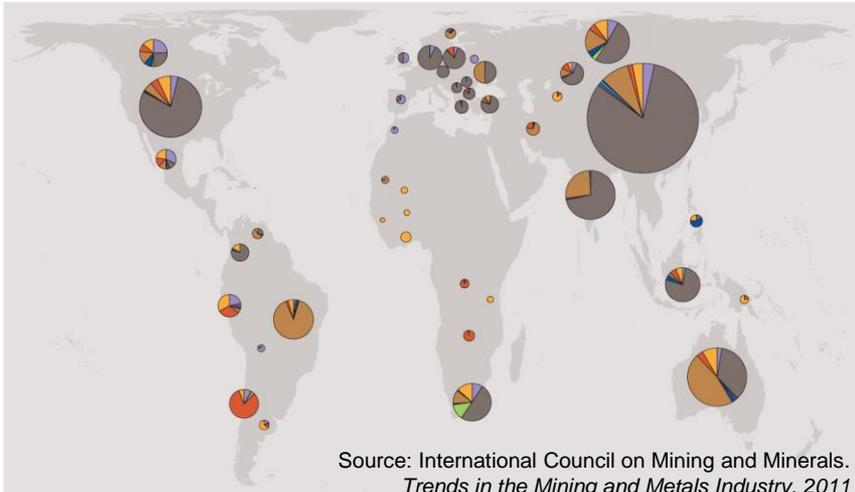
- At what point does consumption/extraction of an asteroid become appropriation?
- How is non-interference adjudicated between entities from different jurisdictions?
- Terms of trade

Regulation and governmental oversight is part of an overall market framework that provides stability and confidence for businesses and investors

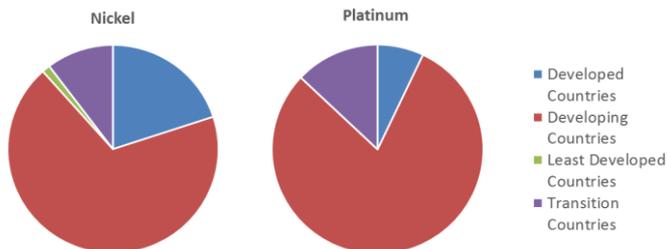
Impact Case – Relationship to Terrestrial Mining

Global Mining Activities, 2011 (by Total Value of Production)

Metal shares of total value Gold Copper Iron Nickel Lead Zinc PGMs Coal Other



Production, 2013 by Development Status



Source: World Mining Congress, *World Mining Data 2015*

- Terrestrial mining centers of activity correspond to concentration of expertise in mining operations
- Traditional mining is concentrated in developing countries – while space resources activities are likely to be lead from the developed world
- How will space resources impact economic benefit associated with traditional production?
- How will policy and business approaches leverage existing mining human capital?



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Achieving Benefit from Space Resources Policy and Business Questions

- How is the link between space resources development and socio-economic benefit affected through policy and business planning?
- What is the relationship between scientific & commercial use?
- Do policy and regulatory approaches need to make distinctions in lunar vs asteroid uses?
- Consistency vs. divergence in national policy and regulatory regimes; will there be “flags of convenience?”
- Given timing and uncertainties, what level of regulation is appropriate?



THE HAGUE SPACE RESOURCES GOVERNANCE WORKING GROUP

- The Hague Space Resources Governance Working Group has been established to respond to the need for coordination on these, and other issues
- Industry, government, and civil society participation from across the globe
- Two-year working period beginning in October 2015
- Outcome will be identification, formulation, and recommendation, of “building blocks” for the governance of space resource activities

The Working Group aims to build consensus on regulatory “concepts needed to enable, support and co-ordinate the use of space resources and be acceptable for space-faring nations and other interested states”



Source: USAToday

**Dagger from King Tut's Tomb, analyzed to
contain iron from a meteorite**

**We've been using space
resources for a long time...**

...accessing them in space is new

Questions and Discussion?

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