The Lunar Commerce Portfolio Report
Technical Session Presentation for the 62nd Session of the Legal Subcommittee of UN COPUOS
Gidon Gautel, Co-Chair, Lunar Commerce Economics Group - 20 March 2023
AGENDA

- Lunar Commerce & Economics Working Group
- Lunar Commerce Portfolio
- Results & Next Steps
- Following the Working Group
Lunar Commerce & Economics Working Group
A Forum for International, Interdisciplinary Discussion

• Founded in early 2021 to promote discussion around potential lunar markets

• Original scoping activities involved over 200 people comprising 53 nationalities

• First package of work, the Lunar Commerce Portfolio, delivered by a team of 3 co-chairs, 9 market leads, and more than 30 international researchers, spanning more than 15 nationalities
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The Lunar Commerce Portfolio

Introduction

What is it?

• Comprehensive report comprising 2 years work by international team of volunteer analysts
• Uses public domain sources, and is fully referenced
• A descriptor of lunar economic markets, their suppliers, customers, and value chains
• A model of lunar, commercial markets and interactions

Who are its intended users?

• Businesses, investors, insurers
• National space agencies
• International bodies and regulators
The Lunar Commerce Portfolio

Approach

9 Lunar Market Sectors
(Surface & Orbit)

1. Transport to/from Moon
2. Transport on the Moon
3. Communications & Navigation
4. Energy & Power
5. Supplies & Services
6. Construction & Manufacturing
7. Mining & Resource Extraction
8. Habitation & Storage
9. Agriculture & Food

6 Information Formats (for each sector)

- Sector description
- Potential customers
- Potential suppliers
- Value chains
- Market sector drivers
- Market sector constraints

Key common driving assumptions

Demand model revenue forecasts

“Early Phase” Annual revenue steady-state potential

“Mature Phase” Annual revenue steady-state potential

Scenario choice
The Lunar Commerce Portfolio

Approach

6 Information Formats (for each sector)

<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector description</td>
<td>Potential customers</td>
</tr>
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<td>Market sector drivers</td>
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</tbody>
</table>

Key common driving assumptions

Scenario choice

“Early Phase” Annual revenue steady-state potential

“Mature Phase” Annual revenue steady-state potential
## The Lunar Commerce Portfolio

### Common Driving Assumptions

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Early</th>
<th>Mature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual personnel missions</td>
<td>1 – 9</td>
<td>1 – 40</td>
</tr>
<tr>
<td>Annual cargo missions</td>
<td>0</td>
<td>40 – 1</td>
</tr>
<tr>
<td>CLPS-like missions per year</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Resident people on surface</td>
<td>2 – 4</td>
<td>40 – 120</td>
</tr>
<tr>
<td>Resident people in orbit</td>
<td>2 – 0</td>
<td>0</td>
</tr>
<tr>
<td>Number of bases</td>
<td>0</td>
<td>2 – 4</td>
</tr>
<tr>
<td>Tourists in lunar orbit</td>
<td>4</td>
<td>100 – 3,200</td>
</tr>
<tr>
<td>Tourists on lunar surface</td>
<td>0</td>
<td>10 – 125</td>
</tr>
</tbody>
</table>
Phases and Scenarios Define Activity Level on the Moon

**Phases**

- **Early Phase:** From now to 2030

- **Mature Phase:** That period when there is a permanent human presence on the Moon, self-sustainable with the necessities of life, and not dependent for them on a logistical supply chain of deliveries from the Earth

**Scenarios**

- **Sorties:** Continuous campaign of single missions to various locations

- **Research Stations:** One or more stations similar to McMurdo Station in Antarctica

- **Sustainable Community:** At least one permanent human presence on the Moon self-sustainable with the necessities of life independent from Earth

- **Exports to Earth:** Moon is fully open for business. Financial returns provided by export of PGM’s, KREEP, He3, etc., to Earth.
The Lunar Commerce Portfolio

Demand Model Sums Across Market Teams
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Results & Next Steps

Version 1.0 Results

• For the Mature Phase, aggregated total revenue numbers range from an average annual $4B ("Sorties" scenario) to approx. $31B per annum ("Resources for Earth" scenario), depending on the external factor changes

• Considerable uncertainty remains

• Results particularly sensitive to assumptions around number of people in orbit and on the surface, and to the assumed export demand for resources

• There is a need for statistically valid market research – e.g., for lunar space tourism

• There is a need for putting experimental test results in the public domain – e.g., related to mining yields
Results & Next Steps

Next Steps

• Working partnership with NDA Bocconi’s Space Economy Evolution Lab: An independent research center which offers a multidisciplinary perspective within the space sector
  • Improve data and assumptions
  • Explore policy implications
  • Provide tailored analysis for industry

• Feedback requested from user community (Lunar Commerce User Group)

• Focused efforts at improving data and assumptions – e.g., through focused market research efforts

• Subsequent updates of the Lunar Commerce Portfolio will be issued, as data sources are improved
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- Following the Working Group’s Efforts
Following the Working Group’s Efforts

How to use and feed into our work

Download V1.0 of the Lunar Commerce Portfolio

Join the Lunar Commerce User Group

Reach out directly!