

“How should society promote sustainability in the growing cis-lunar economy?”: The role of Space agencies, NewSpace companies and individuals

“We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people.” This is an excerpt from John F. Kennedy’s famous speech- *We choose to go to the Moon*[1]. And although much can be debated about how much of this endeavor was motivated by the space race between two cold war rivals rather than scientific progress, it’s pretty evident that the current NewSpace race is aimed at having a sustainable human presence on the lunar surface. To ensure that, however, it is critical to have policies and regulations in place which encourage sustainability and a circular economy on the Moon. Vidvuds Beldavs subtly puts this in his article[2], “political imperatives cannot motivate sustainable space development”

The current NewSpace race is driven by commercial companies which is in stark contrast to the space race which landed humans on the Moon in 1969 that involved national space agencies. Programs such as NASA’s Commercial Lunar Payload Services (CLPS) serve as a catalyst for commercial companies to innovate and launch their products (literally and figuratively) into space and bear a testament to the successful PPP (public-private partnership) model that this industry has been able to achieve.

For starters, cis-lunar is the space between LEO and the Moon. In addition to LEO and GEO, there is a huge untapped potential in the Near-Earth objects and the lunar surface. For the sake of simplicity and to better understand society’s role in promoting the cis-lunar economy, we categorize the role of three sections of society: Government and national agencies, private companies, and individuals.

The government and the national agencies play a pivotal role in promoting sustainability not only through the PPP model but also by enforcing policies and regulations to ensure a sustainable cis-lunar economy. The technologies developed for LEO and GEO will eventually be transferred to the lunar orbit and the lunar surface. Hence promoting in-space inspection, servicing, repair, and eventual manufacturing shall play an important role in sustainability. The first step in this direction was taken by the White House on April 2022 when it established the [ISAM National Strategy](#) for in-space servicing, assembly, and manufacturing activities. The government, especially for nations with an established space agency need to continuously review policies that are no longer applicable in the current NewSpace ecosystem. The new regulation by [the FCC which mandates satellites to deorbit within 5 years](#) instead of 25 years is one such example of molding laws to better suit the current industry needs. Also, efforts such as establishing the [space sustainability ratings](#) play an important role in encouraging the private sector to innovate for a safer and sustainable space. There can also be proposals for a debris tax (similar to a carbon tax) which shall prohibit companies from polluting the space environment. In summary, it is imperative that the foundation of the cis-lunar economy: which is the LEO and GEO economy is headed in the right direction in terms of sustainability. Once the government and national agencies ensure this, similar laws and policies could be mandated for other cis-lunar activities as well.

The second entity which are the private and the commercial companies are equally important for ensuring cis-lunar activities. If the government has the power to mandate laws for sustainability, the

NewSpace companies have the power to ensure technological innovation in that direction. Companies such as ispace are already expected to enter the NewSpace economy soon and are slated to [launch this November](#) for the Moon's surface. More private companies are expected to follow suit in this decade. Given enough funding, it then becomes important for the companies to invest in technologies that shall enable a circular economy. For LEO and GEO, in-space services companies such as Astroscale and D-orbit shall pave the way for the future generation of companies. There are also a few space habitats (private space stations) that are proposed for this and the next decade. They will play an important role in driving the research in the field of growing food in zero gravity, and production of key elements such as water. In the next decade, private companies will be present on the lunar surface for the extraction of minerals and water. High importance should be given to developing key technologies that shall enable these activities without harming the in-situ environment of the Moon.

Last but not least: the individuals, you and me. The Artemis generation (which is this generation that gets to see the first woman step foot on Moon), especially students and young professionals have the power to raise awareness of sustainability on international platforms. Projects such as the [Sustainability Projects from UNOOSA](#) are important mediums through which the youth can play a major role. Participating in conferences, and submitting abstracts on ways to implement cis-lunar activities are some other ways to make your voices heard on a global forum. There are many important learnings that space veterans can impart to the next generation as well. It's only when people like you and me take initiative and proactively help shape the cis-lunar activities that, will ensure a more sustainable future not only for the cis-lunar economy but also for the space economy in general.

All three sections of society have an important role to play in ensuring a sustainable cis-lunar economy. A space economy that extends well beyond Moon is a certainty that will happen during our lifetime. However, how we manage the cis-lunar economy shall decide how we establish our future human colonies on Moon, Mars, and beyond. History is being written now!

References:

[1]<https://www.jfklibrary.org/learn/about-jfk/historic-speeches/address-at-rice-university-on-the-nations-space-effort>

[2]<https://www.thespacereview.com/article/4127/1>