A tool for a fair, competitive and sustainable space industry,

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I am honoured to have the opportunity to share with you my statement on ***A tool for a fair, competitive and sustainable space industry***. Today I am expressing my remarks as the Executive Director of the EPFL Space Center and the Vice-President of the Space Sustainability Rating Association.

Space Sustainability is often described as a broad concept. For the purpose of my statement today, and in the context of the sustainability of outer space, I have been using the definition by the UN Committee on The Peaceful Uses of Outer Space that defines it is: "The long-term sustainability of outer space activities as the ability to maintain the conduct of space activities indefinitely into the future."

We have a broad interest to address environmental impacts both on Earth and in space in the long term. At the moment, as a start, our SSR system is devoted to in-space sustainability, in particular the challenge of space debris, with the hope to expand to broader realms in the future.

I would like to refer to the current Targeted Consultation on EU Space Law as part of the commission priorities for 2024, which depicts three policy options. In one of the options, the document proposes "a non-binding space label to promote adherence to non-binding standards, best practices and guidelines".

How do we contribute to Sustainability of Outer Space for a *fair, competitive and sustainable space industry and what are the tools*?

First, I will present the EPFL- Ecole Polytechnique Federal de Lausanne Sustainable Space hub and how we intend to measure, understand and act toward space sustainability. Then I will focus on the Space Sustainability Rating, which has the potential to become the Space Label in the space law project I mentioned before. I will address our perspective on how this tool can be used by policy makers for a more sustainable European space sector.

1. What is the contribution of EPFL to space sustainability?

eSpace - EPFL Space Center is a pioneer in space sustainability. With the Clean Space Initiative, initially proposed to deorbit Swisscube, which eventually spun off from EPFL as the ClearSpace-1 mission to recover the Vega Secondary Payload Adapter (VESPA), the Center can draw on a decade of experience in space sustainability.

For us, it is of the utmost importance to develop frameworks to measure and understand what we call space sustainability and assess the performance of actors and technologies towards this concept in order to avoid greenwashing. We work with industries to develop missions that have more eco-friendly technologies, and also allow policy makers to make informed decisions based on evidence provided by our community. In particular, we are leading a consortium of the key European Universities under an ESA program to develop a tool and a methodology to perform a Life Cycle Assessment of space transportation systems and incorporate them into eco-design practises. We also hosted the Space Sustainability Rating that we spun off last year to perform assessments of the

sustainability of space missions. It is especially important to assess future impacts of new missions early in the design phase, in order to support space agencies and industry in their sustainability goals.

In that context, we are also launching a professional course on Space Sustainability, with a special focus on how to to design and operate missions and space business with sustainability considerations in mind.

2. What is the Space Sustainability Rating? An example of a space label

Now I would like to dive a bit deeper to provide you with more insights on the Space Sustainability Rating (SSR). The SSR is a non-profit organization that has a Steering Committee and Members with a large geographical diversity. As mentioned, the SSR is on a mission to encourage space actors to design and implement sustainable and responsible space missions for the long-term sustainability of the space environment. The non-profit supports space actors such as governments, space agencies, and commercial companies in understanding the impact of their activities on the space environment, identifying opportunities to minimize them, and taking an active role in making space safer and more sustainable for all.

The SSR is a new, innovative, way to incentivize safer conditions for operating in space that doesn't discourage or shame operators. Rather, it offers an acknowledgment of actions that space operators are taking to ensure safer missions. It is an initiative that seeks to foster voluntary actions by satellite operators to reduce the risks related to space debris and on-orbit collisions providing: 1. A rating system informed by transparent, data-based assessments of the level of sustainability of space missions. 2. Practical guidance on how to improve sustainability performance and practices; and 3. A platform for action-focused collaboration centered on the rating system to support research and leverage best practices.

The rating is a voluntary system. The fees are flat and the same for all operators, no matter their size, to ensure transparency of the rating. Operators are provided with support to understand the SSR methodology, to collect the necessary inputs to perform a rating, as well as a technical analysis and recommendations on how to improve the rating score. In order to complete a rating, an operator has to complete a questionnaire and provide technical data about the mission.

In total, six official ratings have been performed. Four are for European actors and two are underway, including three constellations and three nano to mini single satellite missions[1]. Beta tests were performed with right actors, including a variety of type of missions (in satellite number and size), type of actors, and operator's geographic origin.

Today, the SSR association has eight members from Europe – Stellar, Alter, Endurosat, Neuraspace – and others from the US and Asia-Pacific Region.

The Advisory Board is composed of 30+ members from the industry, academia and space agencies such as the university of Leiden, Airbus, Clearspace, European Southern Observatory, the Luxembourg Space Agency, UN Office for Outer Space Affairs for example.

[1] Spacecraft mass classes in accordance with definitions of the FAA The Annual Compendium of Commercial Space Transportation: 2018, Table 11 (p. 100).

I would like to acknowledge that the elaboration of the Space Sustainability Rating is the result of an extensive academic collaboration with colleagues from MIT, UT at Austin, Bryce Tech, and the ESA Space Debris Office initiated at the Future Global Council for Space within the World Economic Forum.

3. **How can a Space Label be used to incentivize space sustainability while ensuring a fair and competitive industry?**

From discussions with rated companies, we learned that receiving a rating brings many important advantages. When building their business case to perform a rating, companies have mentioned the following elements - Enhancing Reputation and Trust, Competitive Advantage, Attracting Investors, Regulatory Compliance, Risk Mitigation, Long-term Viability, and Marketing and Public Relations. Furthermore, a Space Sustainability `Rating can significantly improve satellite operations.

When operators and large system integrators are developing the business case for performing a rating, they are also seeking incentives to perform it. The following policy options could be developed along with the SSR have been identified, and are also in line with the EU Space Law:

- Financial and economic incentives;
- Support for current and potential regulations;
- Altered procurement processes;
- Public perception; and
- Marketing and environmental, social, and governance-style corporate reporting.

Two studies are on-going on how the SSR, as an example, can go along with policy development for Earth-space sustainability in the future and how national governments can use the SSR while developing their space traffic management framework. The results of these studies are shared in international fora such as the OECD Space Forum, the Paris Peace Forum working groups, the ESA Zero Debris Charter and IAA Space traffic management working group.

To conclude - I have presented to you how EPFL Sustainable Space Hub supports the development of tools to support a fair, competitive, and sustainable space industry. We develop tools to understand the impact of space missions on the environment to the design and operation of more sustainable missions. With the Space Sustainability Rating, we act to design and implement sustainable and responsible space missions for the long-term sustainability of the space environment. Our mission is to support actors in the industry to turn their commitment into real action by using our performance tools demonstrating their efforts. We hope we can continue our work with governments and policy makers.

Thank you, for your kind attention.
