

WHAT IS THE ECOLOGICAL FOOTPRINT OF SPACE TOURISM?



Space tourism is all over the news these days. It would be easy to think that what happens in space does not affect us. But the reality is that it does, and increasingly in less subtle ways.

The news of today is the competition between Jeff Bezos and Richard Branson, two billionaires who are behind the respective space tourism companies.

Blue Origin, Jeff Bezos, had planned to launch its inaugural flight on the 20th of July. In response, Richard Branson's Virgin Galactic scheduled its own flight for the 11th. Getting ahead by a few days.

Both flights have been surrounded by wide media attention. **And it is true that these flights have been, neither more nor less, enormous marketing maneuvers.** The aim is to call attention to the companies.

Space tourism comes with the promise to "democratize space ". But the phrase, repeated like a mantra, is often devoid of content. Not because space tourism continues to be available only to a certain minority, but also by the ecological impact that can be derived from the generalization of these activities.

The general population is getting used to the idea of using fewer planes and more trains; and eating less meat. Those are just part of the changes we will have to face if we want a just and fair ecological transition. While space tourism emerges as an activity, which is barely accessible and highly polluting.

Reaching space, in the first place, consumes a huge amount of energy. The fact is that we don't have enough energy. Fossil fuels are at the root of climate change. The so-called renewable energy and nuclear energy are also not exempt from problems and limitations.

Reaching space thus emits a huge amount of carbon dioxide. That is to say a big carbon footprint.

Environmental Impact

Although the environmental impact of space launches has not been sufficiently studied, it is known that it is more than just the emissions of carbon dioxide. The release of gas in the high layers of the atmosphere during space travel has negative effects on the ozone layer. A gas frequently issued in flights and seemingly innocuous as water vapor contributes to the greenhouse effect.

There are many types of fuel used and some are toxic and are being released during the flights or its production process. The good news is that most of the new systems of launch are using liquid fuel, which is less problematic in this sense than solid fuels.

The rockets themselves often have different destination orbits around our planet. We have to clarify that, in exchange, Virgin Atlantic and Blue Origin are "suborbital" flights. That is to say, they do not go into orbit, but they reached 80 and 100 km of height respectively, experience zero gravity for a short period of time, and fall to Earth.

A suborbital flight requires a lot less energy than going into orbit. For this reason, its cost is more affordable, and its carbon footprint is lower.

Currently, about 100 rockets are launched each year. Their combined carbon footprint remains less than the 100,000 aircraft that fly every day globally. But space tourism is experiencing very strong growth. Its environmental impact thus could become very relevant.

Luxury Tourism and Emissions of Carbon Dioxide

The international awareness and regulation of environmental impact is therefore one of the aspects in which the management of space activities will have to improve. While it is true that launching one satellite to orbit Earth has a greater impact than a tourist suborbital flight, the satellites can be of benefit to many people. Whereas a tourist flight is a luxury for a limited number of people.

To put it in numbers. It is estimated that each flight on Virgin Galactic and Blue Origin emits about 60 and 90 tons of carbon dioxide, respectively. That is, about 8 and 15 tons per passenger.

In comparison, on average, globally every person emits about 4.8 tons of carbon dioxide annually. This figure is very different between rich and poor countries. In the United States, the figure is 15 tons. In Spain, it is 5.4 tons. Although these data can vary considerably according to different sources. China is a big polluter, but when its per capita emissions are considered, the value is 7.4 tons.

A Questionable Footprint

Therefore, the carbon footprint of these suborbital flights is not extremely high compared with that of other activities. Since it is accessible only to a minority, each passenger emits in only a few minutes, the same amount of carbon dioxide as 2 or 3 people on average during an entire year.

Remember that in addition to this carbon footprint what needs to be added are other environmental impacts of space tourism, such as that of erosion of the ozone layer.

All this comes together to remind us of the need to reorient our way of thinking and operating in the world to move toward one world which is more just and sustainable. Space, well managed, can bring positive changes for all of us. But we must not let ourselves be dazzled by the optimism based solely on the development of technology.

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