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Harvesting solar energy above the clouds for uninterrupted energy production

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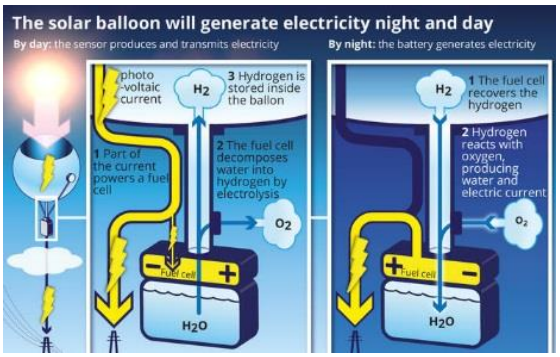
Abstract

Albeit Photovoltaic (PV) solar energy made huge progress technically and has risen recently up to 1% of the global electricity production, there are several factors hindering further progress in the middle to long term. Firstly, the relatively low capacity of flat plate, ground PV means that full capacity of PV modules is used a small fraction of the time. Secondly, the variable nature of solar energy, means that it has to be complemented with energy storage, one of the best option being with Hydrogen as an energy vector, and this imparts additional costs with e.g. Hydrogen storage. Thirdly, the perspective of massive deployment of PV on a large scale imposes to suitably address the footprint of the technology, both in terms of lifecycle (and material usage) and land occupation.

In this presentation we will show how capturing solar energy with balloons floating above the clouds can address most of the above concerns [1,2]. We will also discuss how much could be done with readily available technology. We will then discuss the challenges on the pathway to the realization of solar balloons.



References

[1] *Aerostat for Solar Power Generation*, *G. S. Aglietti, S. Redi, A. R. Tatnall, T. Markvart and S.J.I. Walker, University of Southampton, United Kingdom, Intech, 2009*
[2] https://news.cnrs.fr/opinions/solar-energy-aims-for-the-sky-0