

SFERA-III

Solar Facilities for the European Research Area

Testing of benchmarking techniques.

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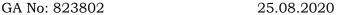
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Executive Summary

This report outlines several experimental campaigns carried out within the SFERA III consortium which were focused on using concentrated solar energy to drive fuel production processes. The main goal of this report is to illustrate how the benchmarking methods developed in task 8.2 were applied to experimental campaigns on solar fuel production reactors within the consortium. The benchmarking techniques involve the calculation of performance indicators, which include the energy efficiency, the feedstock conversion, the fuel selectivity and upgrade factors in the case of biomass gasification. Standardising the performance indicators used within the consortium, and the broader solar thermochemical fuel production community, is an important step to allow for direct comparison between different approaches, and ultimately to better align the efforts of this research field. The test campaigns reported include; a solar methane reforming process tested in collaboration between ETHZ and IMDEA, pilot scale two step thermochemical hydrogen production reactors tested by CIEMAT and DLR, and a solar biomass gasification reactor investigated by CEA and CNRS. As well as applying the benchmarking techniques, potential routes to improving the performance are also discussed.

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