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► To cite this version:

Kolja Neuhaus, Corinne Alonso. Distributed DC/DC architecture for an LVDC hydrogen production microgrid based on concentrated photovoltaïc sources. Workshop LIA NextPV 2017, Dec 2017, Tokyo, Japan. 1p., 2017. hal-01702956

HAL Id: hal-01702956 https://hal.science/hal-01702956

Submitted on 7 Feb 2018 $\,$

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In the context of the decrease of fossil fuels and ecological transition, hydrogen production has been identified as a solution for storage consuption of renewable energies. High efficiency solar cells can be used in conjunction with solar concentration to further push the limits of photovoltaïc energy production. In order to maximize this production, high precision solar tracking in addition to optimized conversion devices are needed. In this study, a distributed DC/DC architecture is proposed with a Low Voltage DC microgrid, aiming to optimize energy flows between high efficiency concentrated photovoltaïc production and hydrogen production from electrolyzers.

LVDC microgrid for hydrogen production based on concentrated PV



Distributed converter architecture



CNIS

One Single DC/DC Boost converter for each CPV cell + separate MPPT for each.

Perspectives



Experimental test with small size electrolyzer cells + CPV



Modelizing Electrolyzer cells in collaboration with RCAST, Tokyo (Equivalent circuit models, EIS)

Extrapolating results for bigger scale hydrogen production.

Laboratoire conventionné

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