

Scalably Manufacturable Solar-fuels Generators
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The Joint Center for Artificial Photosynthesis (JCAP) was established in 2010 as a U.S. Department of Energy (DOE) Energy Innovation Hub. The JCAP mission is to demonstrate a scalably manufacturable solar-fuels generator, which uses Earth-abundant elements and (with no wires) robustly produces fuel from the sun 10 times more efficiently than (current) crops. Progress within JCAP towards building solar water-splitting prototypes will be presented in the context of the following questions/criteria:

- What are the critical characteristics of a solar fuels generator prototype?
- What is the value of building prototypes? Should constraints such as utilizing only Earth-abundant elements be relaxed for early-stage prototypes?
- How should solar fuels generators, or components of them, be benchmarked?
- Is co-generation of hydrogen and oxygen an acceptable approach to solar water-splitting at scale?
- What are the critical dimensions and component properties of PEC-based water-splitting generators based on simulation and modeling?
- What are the inherent advantages of acidic or basic electrolytes? Is water-splitting in buffered solutions a worthwhile approach?
- How important is the “no wires” constraint. Should the solar fuels community build integrated PV-electrolysis generators and compare their performance to PEC generators?
- What are the advantages and challenges of building water-splitting prototypes that utilize water vapor rather than liquid water?

This presentation will also highlight unique JCAP capabilities and opportunities for collaboration.