

Inflatable Modular Solar Array to Meet the Global Energy Demand

Team: Gina Myers (BioE) Arthur Labarre (CE), Priyaj Mehta (ME), Roger Chen (ME), Weiheng Lu (IEOR)

Advised by: Tarek Zohdi (ME)



Globally, energy is in high demand. Renewables are crucial to a sustainable future and progressive policy aims feature 50% of energy to be from renewable sources. Photovoltaics (PV) are key contributors to this demand, and our design for floating solar modules brings lofty goals into the realm of possibility in the very near future. Floating solar provides immense benefits including **water conservation and protection, preservation of valuable land space, higher yield & performance, lower costs, and rapid ROI.**

Global Energy Usage by Type

Fuel Type	2016	2017	2018	2035
Coal	28	28	27	27
Natural Gas	24	23	24	23
Nuclear	4	4	4	7
Oil	34	34	34	29
Renewables	10	11	11	14

Renewables account for an **increasing percentage** of energy usage and will continue to rise. The yearly potential of solar energy is 96x that of *all* the oil in the world and 26x that of *all* coal. With available technology, it is possible to meet the global energy demand 1100 times over every year.



Floating Solar provides significant economic advantages. We performed a comparative economics analysis between land-based and floating solar. Total costs are for a 2.5MW plant and combine the costs of all solar panels & hardware with land or water acreage.

Inflatable Float

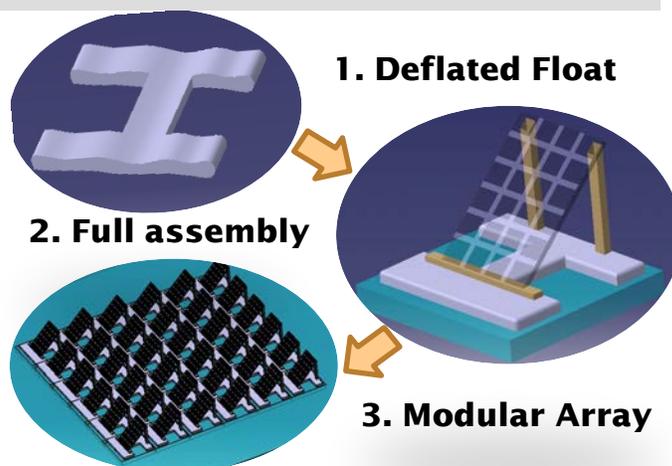
- Transport deflated to reduce costs
 - Lighter, easy to handle and assemble
- Increased efficiency through cooling**
- Cut-out design provides more cooling, resulting in **+20% efficiency**

Adjustable Tilt Angle

- Lengths of interchangeable panel supports can be altered on standardized float

Modular Design

- Easily joined to form large-scale solar farm



A sustainable energy future requires innovations in PV that increase efficiency

Floating PV (FPV) is up to 20% more efficient than land-based systems. It has seen explosive growth, but the potential remains largely untapped. In 2018, total installed capacity of FPV was just 0.3% of the total global PV capacity. Our design accounts for the distinct cost repartitioning of FPV and drastically reduces cost in multiple key areas, which could enable floating solar to compete on the global renewable energy stage.