

TECHNICAL ASSISTANCE REQUEST

We envision a few unique technical challenges across the competition phases.

First, we foresee technical challenge in creating a cost-effective BIPV array. Our micro-BIPV array consists of a network of a BIPV module that serves as a shading device integrated with a PV cell. As a product of a performance optimization algorithm for power production and building energy saving (e.g. heating, cooling, and artificial lighting demand), the BIPV module has a complex geometry, which appears challenges in integrating solar cells with this complex shape (**Fig A**). We will seek assistance and recommendations from leading solar professionals on geometric modification and fabrication techniques so that our BIPV window becomes a cost effective and high performing assembly compared to a traditional BIPV window.

We also expect a challenge as we begin to verify the economic and environmental performance of our new window system. A new window project requires performance certificates in accordance with industry standards. When a full scale working prototype is available, we will need to evaluate the longevity and operability of micro-BIVP array according to UL 1703/UL 61730 PV Module Safety Standards, IEC 60904 Photovoltaic Devices, IEC 61646 Thin-film terrestrial photovoltaic modules, and various ASTM standards. We will need assistance from testing agency who can provide testing equipment and instruments. Once the BIPV array is in the industry compliance, we will integrate the micro-BIPV array into a window assembly. Our research lab facility is able to identify energy attributes such as U-factor, Solar Heat Gain Coefficient, and Visible Light Transmittance which is important in estimating energy reduction in heating, cooling, and artificial lighting load. We also can run thermal cycling test in accordance with AAMA 501. However, our current testing apparatus and instruments in our laboratories have size limitations, and we will see assistance test on 1:1 full-scale mock-ups for real-world applications.

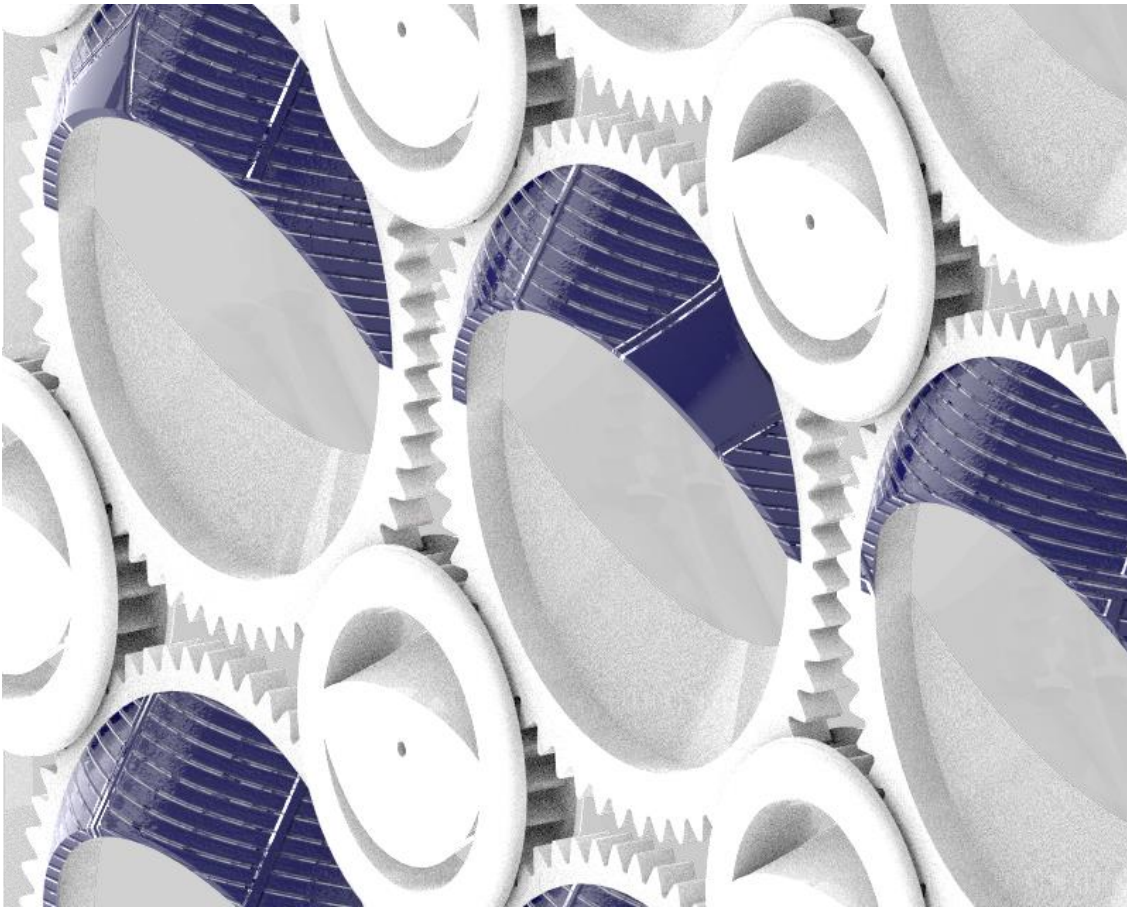
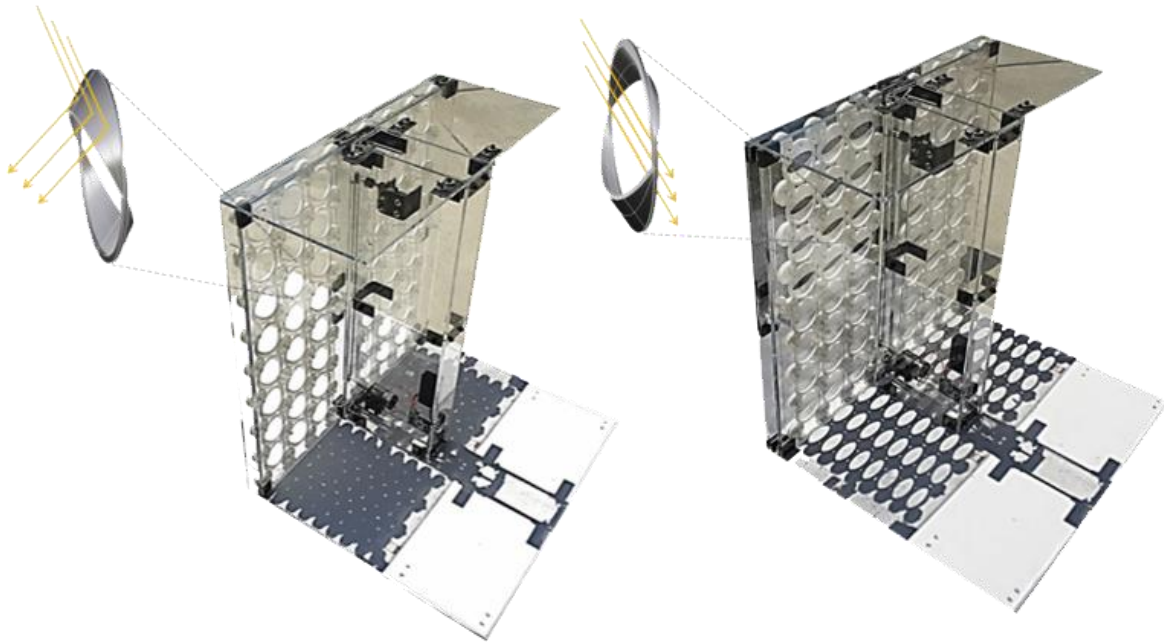


Fig A. Micro-BIPV array integrating a solar cell with a complex geometry. The team is looking for a cost-effective fabrication technique(s) for solar cell integration. In addition, the team seek assistance to carry out performance testing of the BIPV array in accordance with UL, IEC, and ASTM standards