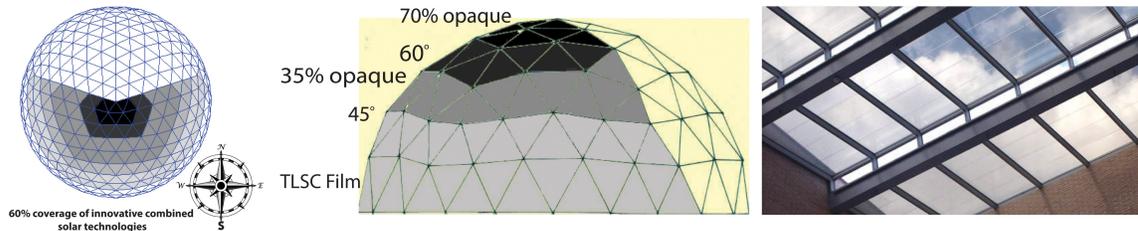


Biodome Solar Power Systems

Building-integrated transparent photovoltaics, will be arranged with more opaque panels to progressively block the sun going up the south face of the dome. The lowest band, from ground level to 45° will be totally transparent, with a 35% opaque band in the middle and 70% opaque from 60° up to the peak.

The partially opaque solar panels starting at a 45° angle up the dome will filter the noon sun beginning in the latter part of April. In the spring and summer greenhouses capture too much heat and sunlight, and cooling becomes a necessity. Having photovoltaic panels that will absorb 35% of the incoming sun from late April to late August improves the heat balance of the Biodome, while generating electrical power. Panels filtering 70% of the sunlight begin at 60° up, decreasing the high noon sun intensity even more from late May to late July. The solar panels cover the south facing two thirds of the dome.



Thin Layer Solar Collection (TLSC) film is used from the base of the dome up to 45° and is totally transparent because it only interacts with UV and Infrared light, letting the visible wavelengths pass through. The film directs these wavelengths to the edge of the panel where the solar cells are located.

The 35% and 70% opaque panels are Onyx Solar transparent micro-etched panels of silicon solar cells. These let light through by partial removal of the otherwise completely opaque standard silicon layer. The resulting solar cells appear like a neutral density filter for a camera. The far right image above shows their 70% opaque product line from promotional materials.

	Winter	Summer
TLSC	24.61 Kwh/day	49.23 Kwh/day
Onyx	184.60 Kwh/day	369.20 Kwh/day
Total	209.21 Kwh/day	418.50 Kwh/day

Power output calculations in the adjacent table show the seasonal variation. Figures were arrived at using efficiency specifications in 2015 of 1% for the TSLC film and an averaged 9% for the Onyx Solar products.

Two additional standard rooftop solar installations will be on the south-facing roof of the north entry building, positioned to extend beyond the dome on each end. These enhance the green technology showcase function of the Biodome by providing real time power output comparisons of 5 different types of solar panel product lines.