

Case Study

Solar Curtain Wall



Anyone in solar circles has heard Konarka's claim that their Power Plastic®, being semi-transparent, thin, light-weight, and less dependent on angle of incidence of the sun, could be the perfect addition to curtain walls. Konarka partnered with Arch Aluminum and Glass (now Trulite Glass & Aluminum Solutions) to test this hypothesis, and share the results.

The Challenge: Determine how Power Plastic performs in glass, and on a vertical surface.

The Solution: Build a solar curtain wall made of 64 Power Plastic panels, and test for one year.

If it worked, the benefits would be great: generate energy from a completely new source – glass in a curtain wall – opening all kinds of avenues for marketability; add beauty to previously unused walls, this time a blank side of a warehouse, showing that every kind of wall can be put to good use. Konarka even went farther than this. They challenged traditional thought, that solar should be mounted at an angle on rooftops to be effective, that shading degrades panels, and that any wall other than the south facing wall should be ignored. To Konarka's delight and surprise, Power Plastic stood tall in each of these categories, taller than expected, and the data backs it up.

The Results?

First, Konarka had to succeed with the basics, demonstrate that Power Plastic can be laminated in glass — that the material could handle the heat and pressure, and that electrodes and a structural frame could be applied without any characteristic change in the material. That was handled quite easily. Sixty-four Power Plastic 840 panels were wired, two in series in each section, electrodes and frames were attached, and power was wired into the grid with a grid inverter. Grid connectivity was achieved.

Challenging conventional thinking is a cornerstone of Konarka culture. Knowing that Power Plastic is less dependent on angle of incidence of the sun, they decided to test both the south and east facing walls.

Conventional wisdom would not support this effort, but because Konarka thinks differently, they discovered something that can benefit everyone. They discovered that in a yearly average of data, the east facing wall actually outperformed the south facing wall. At Konarka's manufacturing facility in New Bedford, Massachusetts, curtain walls are being constructed on the south, east and north facing walls to take this data even farther. Being able to use multiple walls for solar is an advantage everyone can enjoy.

Not only did Power Plastic generate significant power from these two walls, but the power generated in both sunny and overcast, cloudy conditions met or exceeded standard NREL predictions.

Why does Power Plastic work so well?

Power Plastic works so well because of two primary reasons:

1. Less dependence on angle of incidence of the sun
2. Superior thermal coefficient

Power Plastic has a chemistry that excels at converting low light to energy. This means Power Plastic starts working earlier in the morning, and carries on later into the afternoon than do alternative solar technologies. It's also more effective on overcast days. (In fact, rooftop tests in Lowell, Massachusetts of Power Plastic, a-Si, c-Si, and CIGS, show Power Plastic outperforming all others in

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Total Energy Harvested over the course of a day. Konarka's superior thermal coefficient means that as the day heats up, Power Plastic performs better; a claim these alternative technologies can't make.

Why Konarka?

Technology advances when someone challenges conventional wisdom. Because Konarka built an east facing curtain wall as well as a south facing curtain wall, and measured both, we now know, that at least for Power Plastic, an east wall is just as valuable as a south wall. In looking at the data, it's easy to see that the results from both walls complement each other making a perfect case for using Power Plastic on multiple walls.

Conventional wisdom also states that shading can degrade solar panels. In this test site, the south side had a large tree creating shade on a number of panels.

What Konarka learned was that there was no degradation of any of their panels due to shading. This revelation further expands the marketplace for Power Plastic.

What began as an experiment to see if Power Plastic could even perform in glass turned into a learning experience that has uprooted conventional thinking.

Power Plastic — organic photovoltaic technology or OPV —

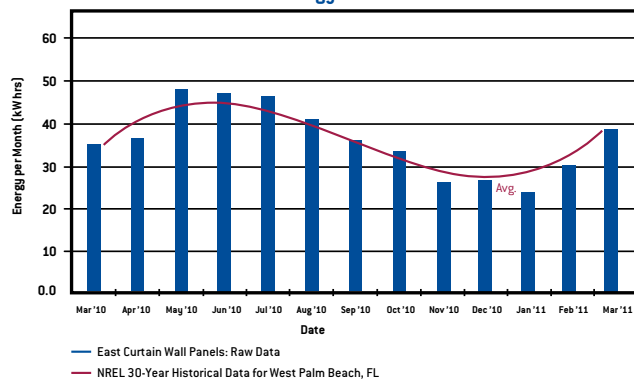
- **Surpasses energy expectations**
- **Performs well in sunny, AND cloudy conditions**
- **Achieves greater overall results on an east facing wall**
- **Harvests more energy over time than alternative solar technologies**
- **Is very easy to install**

Add those discoveries to what we already know to be true, that Power Plastic is beautiful, portable, safe, clean and powerful, and you've got a winning combination.

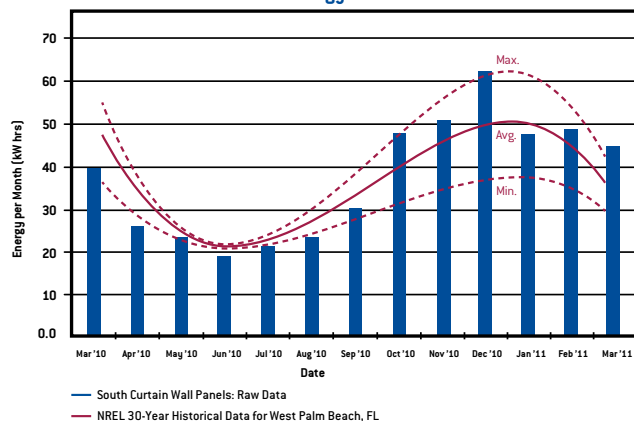
Find Out More Today

The solar curtain wall is just one of many Konarka pilot projects that are reshaping the way we think about energy. To find out more and/or share your ideas, call Konarka at +1-978-569-1400.

East Curtain Wall Panels: Energy Collection



South Curtain Wall Panels: Energy Collection



Average Daily Normalized Energy Production by Month

