

Residual Dust Benefits; BIPV vs BAPV (PV-5)



A joint India-U.S. research consortium funded under the *Joint Clean Energy Research & Development Center (JCERDC)*

Scientific Achievement:

- Experimental comparison of panels at various dust deposition densities and wind speeds
- Dust deposition intensities at various tilt angles
- Testing non-water-based cleaning mechanisms
- Testing hypothesis of residual dust aiding overall photovoltaic performance (due to consequent lower cell temperature)
- Testing a whole-building BIPV/BAPV integrability index

Significance and Impact:

- Residual dust following mechanical cleaning of dust (e.g., palm broom) could aid PV output and do away with the need for water-based cleaning.
- BAPV systems are more viable than BIPV in tropical conditions when looking at whole-building performance including building climatic-response and PV performance.
- In-plane winds could aggravate dust settlement.

Research Details:

- Experimental work on a 5.25-kWp BIPV facility at IISc.
- A dedicated three-PV-panel concurrent system to study dust settlement, influence of wind, and operating cell temperatures.

Publication: R.R. Gayathri Aaditya, R.R. Rao, M. Mani, Integrability Comparison between BIPV and BAPV in Tropical Conditions: A Bangalore Case-Study, poster presentation, PVSC2017, Washington DC (2017).

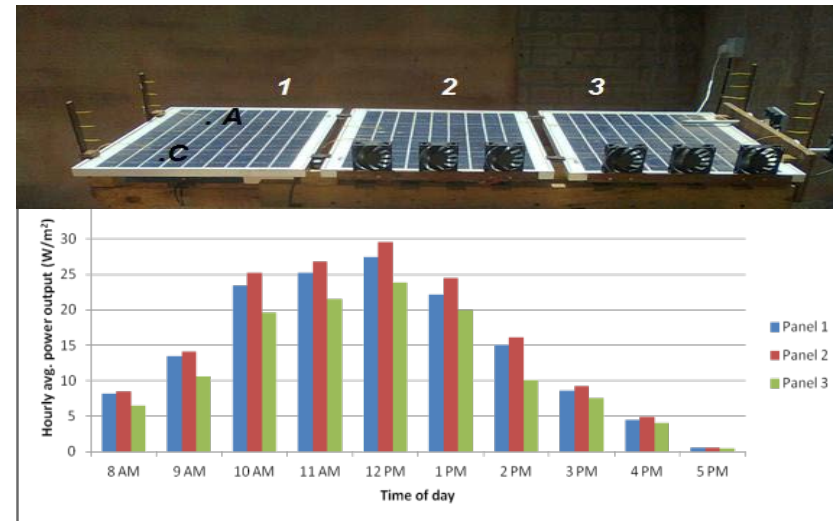
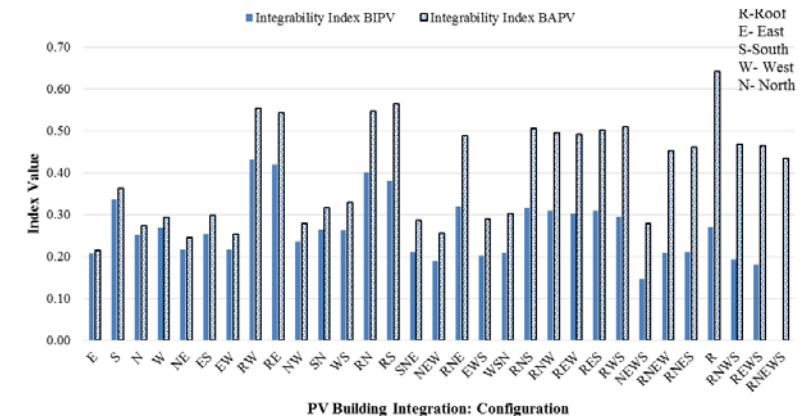


Fig. 1. PV panel power output (Panel 1 no wind; Panel 2 with 5 m/s wind, cleaned daily; Panel 3 with wind speed, cleaned monthly)



Contact: Monto Mani (monto@astra.iisc.ernet.in)

