

PV with Solar Water Heating

What is this Technology?

This “turnkey” project combines normal roof mounted photovoltaic panels with thermal heat extractor panels mounted beneath them, thereby collecting both electric and thermal energy from the same footprint. Additionally, reducing the temperature of a PV panel increases its average efficiency and energy delivered, potentially improving the efficiency of the PV modules..

Why is GSA Interested?



RENEWABLE POWER The EAct 2005 requires that, by 2013, 7.5% of electricity consumed by the Federal Government must come from renewable energy sources to the extent it is economically feasible and technically practicable. Further, EISA 2007 requires 30% of the hot water demand in new federal buildings and major renovations be met with solar hot water equipment, provided it is life-cycle cost effective.



COST EFFECTIVENESS In public building applications, installed costs for conventional PV systems were between \$8 and \$9/watt in 2009, but costs have been rapidly decreasing since 2009. In general, PV systems are not cost effective without considerable financial incentives in the form of rebates and/or the sale of renewable energy credits (RECs). The addition of an integrated solar thermal collector is expected to add \$1.50/watt. A key purpose of this project will be to evaluate the cost/benefit of this integrated technology.



OPERATIONS & MAINTENANCE In a grid-connected commercial system, most of the operations and maintenance (O&M) cost for conventional PV was a result of inverter adjustments in the first 6 months. The solar hot water component of this project will have its own O&M requirements, which are not currently well documented. Anticipated issues include winter freeze protection, scaling in the heat exchanger, and mechanical breakdown of pumps.



APPLICABILITY PV panels are technically feasible in most locations. However, there is little data on the energy production, costs, performance, and reliability of such systems over time in a cold, cloudy environment; this will likely be the first third-party case study of the performance this type of integrated system.

Measurement & Verification

The Green Proving Ground program has commissioned the National Renewable Energy Laboratory to perform measurement and verification (M&V) on photovoltaic power generation with integrated solar water heating at the Thomas P O’Neil, Jr. Federal Building in Boston, Massachusetts. Findings from that investigation will be available in September 2012.