

Creating Renewable Energy and Earning ROI

BY CHRIS GRAY AND BILL HARRIS

DEPLOYMENT OF SOLAR ENERGY, and its accompanying return on investment (ROI), has increased rapidly in the last few years. The Solar Energy Industries Association (SEIA) reports that in 2009, the United States ranked fourth in the world for new solar electric installation, behind Germany, Italy and Japan. It further details that in terms of both new grid-tied installed capacity and cumulative capacity, only the state of California leads New Jersey, albeit by a large margin in both categories.

Attractive federal, state and local incentives, coupled with accessible technology, have decreased the time to achieve ROI. The parking industry, led by a number of early adopters, has adapted this technology, taking advantage of rooftops and surface parking to create clean, renewable energy.

Surface applications include carports that not only generate electricity but also provide shading for cars, and represent a visible commitment to renewables – a potential marketing advantage as well.

California State University, Fresno, for example, recently completed a 1 megawatt project with 10 PV-topped metal panel canopies covering more than 700 spaces, which saves the university upwards of \$13 million in avoided costs over the 30 year life span. To top it off, these parking lots generate additional revenue by providing “premium” spaces.

Pairing solar installations with energy efficient lighting upgrades and electric vehicle charging stations creates further cost and energy saving synergies. This article will profile three notable installations to showcase the truly amazing potential of solar technology related to parking in the next decade, and the benefits to those owners willing to make the leap.

Hamilton Station (NJ) Park & Ride, NJ Transit Hamilton Train Station

Opened in the fall of 2006, this 2,023-vehicle, multiple-level facility provides parking for daily commuters traveling and working up and down the Northeast corridor.

To continue its ongoing commitment to energy reduction and renewable energy generation, Nexus Properties, through its energy services division Nexus Energy Solutions, began a

series of projects to reduce utility consumption along with associated costs.

Beginning in 2009, a lighting retrofit project replaced existing metal halide and incandescent light fixtures with energy efficient florescent, LED and other lighting technologies. This phase alone resulted in more than a 50% reduction compared with previous annual consumption.

A 654-kilowatt solar array will generate 90% to 95% percent of today's energy needs for the facility. A structural canopy will be permanently mounted to the roof level of the garage to house the arrays and provide shade for vehicles. Electric vehicles that opt to plug into “docking stations” will have the vehicles' fuel source replenished while they utilize mass transit.



Hamilton Station park and ride with solar array installed on the roof.

This second phase of the energy reduction project will generate approximately 784,000 kilowatt-hours of electricity annually, enough to power almost 50 homes each year. Through federal incentives, solar renewable energy credit sales and energy production, this solar installation has achieved ROI in less than four and a half years on a pre-tax basis.

The initial lighting project paid for itself in less than one year. During the estimated 30-year useful life, the initiative is expected to produce a positive cash flow of more than \$3 million.

Pocono (PA) International Raceway Inc.

Pocono Raceway in northeastern Pennsylvania is now reportedly the world's largest solar-powered sports facility. It features a 3 megawatt solar farm of almost 40,000 photovoltaic (PV) modules on 25 acres – land that used to be parking area for spectators.

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Driven by the impending deregulation in the electricity markets in Pennsylvania, which promised to raise rates considerably, the decision to go solar was both environmentally sustainable and financially sound. Additionally, all project materials were American-made, pleasing both the company and racing fans.

The array will supply power to cover all facility needs, including garages, concessions, suites and media spaces. During the winter months when the track is essentially closed, power will flow back to the grid.

Expected to have a six- to eight-year payback on the investment, the \$16 million project is designed to eliminate the raceway's \$250,000 annual electricity bill – and to power 1,000 nearby homes. This utility-scale system, visible even from space, took empty parking spaces and turned them into a boon for the raceway, the community and the parking industry.

Denver International Airport (DIA)

Green Park DIA, jointly developed by Greenscape Capital Group and ProPark USA, seeks to earn acclaim as “the world’s greenest parking facility.” The \$18.6 million project near Denver International Airport features sustainable buildings and more than 1.4 million square feet of parking, as well as alternative power sources including solar arrays.

Scheduled to be complete late this year, the project will utilize energy from a 16.9 kW ground-mount solar PV system, as well as from eight wind turbines. These strategies – combined with elements including significantly reduced lighting power densities in the parking areas and more energy efficient mechanical systems – are projected to result in a total annual cost savings of 70%.

The facility will also integrate solar charging stations for electric vehicles, as well as other sustainable strategies for stormwater infiltration, water efficient landscaping and energy-efficient LED lighting.

These three installations for both garage and surface applications demonstrate that PV energy, tied to parking resources, has tremendous potential to provide ROI. Private corporations as



The Green Park DIA near Denver International Airport will utilize numerous strategies for energy reduction including a ground-mount solar PV system and wind turbines.

well as public institutions recognize the financial and environmental benefits, and have taken advantage of the confluence of technological innovation, tax incentives, and the movement toward greater sustainability.

The solar market will continue to evolve and develop rapidly. Reductions in the cost, and the potential integration of PV directly into building materials, will generate additional possibilities to reduce our dependence on fossil fuels and their expense, and generate clean, renewable energy to power homes, buildings and parking facilities.

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