



Florida Department of Transportation Research

A Comprehensive Solar Energy Power System for the Turkey Lake Service Plaza
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The Florida Turnpike Enterprise (FTE) envisions using solar energy to potentially supply energy needs for its service plazas. To determine the technical and financial feasibility of this goal, FTE selected the Turkey Lake Service Plaza, in Ocoee, Fla., for a case study. In addition to restaurants and shops, the plaza also houses FTE headquarters and Florida Highway Patrol turnpike operations.

A multidisciplinary research team from the University of Florida collaborated with FTE and Florida Department of Transportation (FDOT) to assess photovoltaic (PV) systems, including solar lighting, solar water heating, and electric energy storage systems. They studied the potential for mounting panels on roofs and noise walls, in parking areas, on the ground, and above retention ponds.

Researchers also examined how the plaza could showcase innovative solar technologies such as solar artwork, umbrellas, electric vehicles, and charging stations to provide opportunities for the public to learn more about solar power technology.

The study evaluated two scenarios for implementing a solar energy system at the Turkey Lake Service Plaza: Net Zero Energy and Maximum Energy.

The Net Zero Energy scenario would meet all annual electrical energy needs of the facility and eliminate monthly electrical utility payments. The Maximum Energy scenario would generate 2.5 times the amount of energy required to operate the plaza and create an opportunity to sell excess energy. Present market conditions provide favorable prospects for financing either scenario.



An artist's rendition depicts Turkey Lake Service Plaza's transformation into a world-class solar destination.

Researchers identified two financing options: FTE ownership and leasing. In the FTE ownership option, FTE would finance and operate the solar installation. Financing could be generated from a bond issue, carbon and renewable energy credits (RECs), and sponsorships.

In the lease option, a private developer such as a utility or other company would finance and operate the solar installation. Financing would be derived mainly from American Recovery and Reinvestment Act 2009 grants, investment tax credits, sale of electricity, carbon and REC credits, and accelerated depreciation.

This project has shown with grants, tax credits, and other incentives, it is feasible to enhance Florida's energy infrastructure and provide a model for the large-scale adoption of solar technologies in the state.

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For more information, visit <http://www.dot.state.fl.us/research-center>.