

SmartMove...

SUCCESS STORIES FROM THE TOLLING INDUSTRY



Agency

E-470 Public Highway Authority

Project

The Solar-Powered Toll Road

Purpose

To reduce energy use, cut operating costs, boost sustainability and improve safety along a 17-mile stretch of highway.

Vital Stats

- 714.9 kilowatts of solar-electric (photovoltaic) generation across 18 highway ramps, several toll plazas, a main support site and E-470's headquarters office and data center.
- Fixed electricity price of 6.2 cents per kilowatt hour, compared to a market price of 11.5 cents as of April 2014.
- Two-year energy cost savings of \$80,000. Projected 20-year savings of more than \$1 million.
- 24,000 tons of carbon dioxide emissions avoided over 20 years, the equivalent of 61,000 barrels of imported oil.
- Winner of IBTTA's 2013 Toll Excellence Award for Social Responsibility, as well as the association's coveted President's Award for Excellence.

History

In 2006, E-470 Public Highway Authority began exploring alternative energy solutions, due to a 33 percent increase in energy costs over four years. E-470 quickly saw that a photovoltaic (solar-electric) system could be a viable alternative to relying on the conventional electrical grid.

In 2011, E-470 partnered with Adamas Energy Investments, solidifying a 20-year power purchase plan to install one of the largest photovoltaic systems on any U.S. toll road. With Adamas investing \$2.8 million to purchase

and install the equipment, E-470 had no responsibility for capital costs. Adamas qualified for a federal tax credit, and E-470 gained the benefit of fixed, predictable energy costs over 20 years.

E-470 currently has a 714.9-kilowatt photovoltaic system installed along the highway, supplying energy for its headquarters building, 18 toll ramps, two toll plazas, one maintenance site, 18 signs and 15 surveillance cameras. So far, E-470 has saved over \$124,159 in energy costs, and is continuing its effort to install solar electricity across the remaining 30 miles of the toll road.

Results

E-470's Solar Powered Toll Road is one of the largest renewable energy installations on any tolled facility in the United States, and one of the few that rely extensively on solar. The system supplies:

- 100 percent of electricity needs at toll plazas, and on 18 ramps along the 17-mile segment;
- 14 percent of electricity requirements for E-470's headquarters facility, including its data center;



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- Enhanced safety, thanks to the installation of flashing, solar-powered wrong-way driver signs on exit ramps;
- 100 percent of the power requirement for surveillance cameras at two remote locations, where grid electricity would be too expensive to supply. The units have enough battery storage to last a week, “so if we get a seven-day storm, which I’ve never seen in Colorado, the cameras will still work,” said E-470 Operations Manager Walt Arnason. “We’ve had zero problems at these two locations.”

All told, the photovoltaic arrays supply one-third of the agency’s electricity needs. In the summer months, the system generates a surplus and turns the power meter backwards. E-470 draws on that surplus in winter to avoid paying a higher rate for conventional energy from the Xcel Energy grid.

E-470 provided the land for the solar panels, and the investors supplied the capital. The agency has no responsibility for operating or maintaining the equipment, since the vendor handles day-to-day operations. E-470 can exercise an option to buy out the system after six years, a decision that could save the agency even more money.

At more than a million kilowatt hours per year, the system is “sized correctly for what we need,” Arnason said: Under E-470’s agreement with the local utility, Xcel Energy, the tolling agency would actually pay a premium if it fed too much power back into the grid.

Key Success Factors

E-470 Operations Manager Walt Arnason said the deal was a win for all concerned. The investors got to write off the depreciation on the equipment, and E-470 gained a fixed electricity price of 6.2 cents per kilowatt hour for the first seven years, with a minimal annual increase over the remaining life of the agreement. With retail electricity prices at 11.5 cents as of April 2014, E-470 is “already saving dollars by going with this approach,” he said.

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