



2007 New Jersey Clean Energy Leader

Ferreira Net Zero Project w/ Live Data Systems

Clean Energy Market Innovator

PROJECT INFORMATION

Organization

- Ferreira Construction & Noveda Technologies - Live Data Systems

Location

- Branchburg, NJ

Project Name

- The "Net Zero Electric" Project at 31 Tannery

Project Contacts

- Joseph Grabowski, VP
- Edward H. Brzezowski, Director of Engineering

Technologies

- 223 kW Output Solar Photovoltaic System
- Solar Thermal Domestic Hot Water
- Full Radiant Heat
- High-efficiency A/C Units
- Condensing Gas-Fired Boiler Plant
- Integrated Web-based Building Controls

NJCEP Incentive/Rebate

- \$877K for 223 kW PV system
- \$71K from NJ SmartStart for energy efficiency

PROJECT SAVINGS

Annual Energy Benefits

- 80% reduction in energy use
- Avoids over 530 metric tons of CO₂ emissions
- For 2007, reduced carbon footprint by 90%+

Annual Savings

- \$80K+ in energy savings
- \$60K in Solar Renewable Energy Certificates

Project information, savings, and environmental benefits were provided by the project manager.



“The biggest thing we have going on is the combination of energy efficiency and renewable energy with a state-of-the-art monitoring system.”

*Edward Brzezowski
Director of Engineering
Ferreira Group*

Background

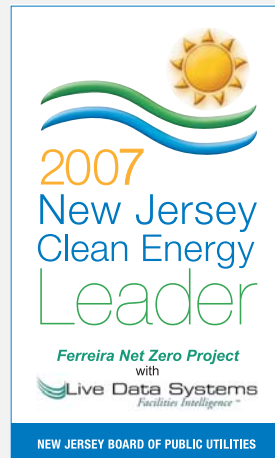
Ferreira Construction, known for its bridge and roadway construction expertise, had outgrown its original 4,500-sq. ft. building in Readington Township, NJ, and was already leasing additional space in 2004. New headquarters were needed on a much larger scale. When designing its new 41,508-sq. ft. shop/office building in Branchburg, NJ, the company decided to include energy efficient and renewable energy technologies in the new construction, and also to investigate available financial incentives.

Challenge

Due to the building's geographic location, the construction qualified for funding under New Jersey's Clean Energy Program (NJCEP) of \$71,000 for energy efficiency measures. Ferreira also qualified for \$877,000 from NJCEP toward the installation of 1,276 solar photovoltaic panels, which make up a 223 kW PV system. Additional efficiency measures were funded solely by the company, including HVAC, control systems, and domestic hot water systems.

Solution

Energy efficient and renewable energy technologies were installed and implemented in several areas of the new construction. The resulting new headquarters became the first Net Zero Electric Energy commercial building in the United States, and was recognized by Governor Jon S. Corzine. The solar electric system and solar thermal panels for hot water consumption have reduced the buildings' energy-use operating costs by 80%! And, since the PV system went live, the building has met 100% of its electricity needs and Ferreira is collecting \$60,000 per year for its Solar Renewable Energy Certificates (SRECs).





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The condensing gas-fired boiler plant, sporting a burner that is a low NO_x model, serves approximately 80 radiant zones.

In-slab radiant heating was installed instead of numerous ceiling-mounted gas-fired heaters. And separate electric and boiler rooms were installed in the shop area. The overall radiant system includes 16 main manifolds with 9 miles of cross-linked high-density polyethylene tubing.

After the various technologies were set up, the project leaders developed a way to track efficiency. The resulting computerized monitoring system has allowed for continuous improvement in efficiency and operation. Integrated web-based building controls with the site's CO₂ and NO_x sensors and pervasive wired/wireless technology systems for voice, data, and video show real-time operation of the building's environmental controls. These monitoring systems – The Sunflow Monitoring and Facility Intelligence software – are now the focus of Live Data Systems, a new company that is helping others manage their energy use and become more energy smart.

When Ferreira set out to install the in-slab radiant heating system, they found similar size projects in the Midwest, but none of them had any 'real-time' data. During the construction period, Ferreira installed additional sensors and metering to track the performance of the radiant slab and condensing boiler plant to share the information and results with interested parties.

Benefits

Ferreira Construction's new headquarters – without all the energy efficient and renewable energy initiatives in place – would traditionally incur an electricity and gas bill over \$80,000 more per year than what Ferreira is currently paying. The energy savings translate into over 530 metric tons of CO₂ emissions not being released into the atmosphere each year.

The monitoring software – which is now being marketed to other interested parties – enables users to see that the solar electric systems they have installed are operating at their full capacity, thus enabling them to maximize the systems' efficiency, improve maintenance, and provide tracking of usage and performance. And the Ferreira Group headquarters now also serves as a physical showroom to help others see what energy efficient and/or renewable energy technologies they could install in their businesses, schools, and homes.

The Ferreira Net Zero Project is consistent with the NJCEP's focus on performance-based technologies and incentives. For its leadership in this field, it received the 2007 New Jersey Clean Energy Market Innovator Leadership Award.

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To learn more about New Jersey's Clean Energy Program, and to find out why **clean energy is smart business**, go to NJCleanEnergy.com.

