PENNSYLVANNIA
GREEN ENERGY LOAN FUND

Profile on Coventry House

Elkins Park, PA

Coventry House wished to replace the 247 windows and 55 sliding glass doors throughout the building which was built in 1965.

BUILDING AT A GLANCE

- Size: 140,000 gross square feet on seven floors
- Principal Use: Multi-family residential (housing co-op with 62 apartments)
- Date of Construction: 1965

PROJECT TEAM

- Window and Door: MTD Construction (Warminster, PA)
- Elevator: Schindler Elevator Corporation (Morristown, NJ)
- Energy Consultant: Practical Energy Solutions (West Chester, PA)

THE BUILDING

Coventry House is a 140,000 square foot multi-family residential building constructed in 1965, located in Elkins Park, PA. The building has seven floors, with common areas, office space and two small rental (non co-op) apartments on the ground floor and 10 co-op member apartments on each of the six upper floors (60 co-op apartments total). The co-op apartments have one, two and three bedrooms and range from 1,428 to 2,150 square feet.

Coventry House is a very well-maintained building and recent building projects were done with energy efficiency in mind. The roof was replaced (and additional roof insulation was added) in 2012 and the chillers for the air conditioning system were rebuilt in 2012. The boilers were given new efficient, dual-fuel burners in 2010.

The building has one electric meter and one natural gas meter. Energy expenses are recovered from co-op members through a fee that is assessed on the basis of the square footage of their apartments.

THE PROJECT

Coventry House wished to replace the 247 windows and 55 sliding glass doors throughout the building. The windows and doors were all original, with single-pane, clear glass in aluminum frames. After 48 years of use, the windows and doors did not operate well or seal tightly and without weather-stripping or thermal breaks, the metal frames conducted heat easily. The windows and sliding glass doors were replaced with energy-efficient, dual-pane glazing with argon fill and low-e coating with tightly-closing aluminum frames with thermal breaks. The units were manufactured by Graham Architectural Products of York, PA. After receiving and

PROJECT AT A GLANCE

- Type: Energy retrofits in an existing, occupied building
- Total Cost: $971,556
- Energy Conservation Measures:
  Replace 247 windows
  Replace 55 sliding glass doors
  Modernize 2 elevators
- Start Date: January 1, 2014
- Completion Date: March 30, 2015

FINANCING

- Approved Loan Amount: $1,088,879
- Disbursed Loan Amount: $971,556
- Loan Sources:
  GELF: $267,677
  EnergyWorks: $703,879
- Loan Term: 10 years – 14 months interest-only construction loan; 106 months fully-amortizing permanent loan
- Interest Rate: 3.5% for years 1-7; 5.5% for years 8-10

reviewing bids for the window and door work, Coventry House has selected MTD Construction of Warminster, PA as the contractor for the window and door replacement work.

Building superintendent Mario Ruggiero said that before the windows were replaced, almost 80% of residents would complain about the condensation and draft. Since the renovations, he shared, "The new windows and sliding doors make a better seal when they close, which allows them to block both wind and noise, and the condensation is no longer a problem."

The building's previous elevators ran on direct current (DC) electric motors, which required an AC motor to spin a DC generator. The AC motor operated almost constantly so that DC current was available when the elevator was called. The elevator modernization work, performed by Schindler Elevator, converted the elevators to AC motors with variable frequency drive (VFD) technology to eliminate the need for the constantly running DC generator.

THE FINANCING

In 2013 Reinvestment Fund approved a $1,088,879 loan for the energy improvements during construction. The construction loan converted to permanent financing on April 1, 2015. Because the contingency was not used, the final loan amount was $971,556, using $267,667 GELF dollars and $703,879 EnergyWorks dollars.

THE ENERGY, ENVIRONMENTAL AND ECONOMIC RESULTS

Utility bills were collected both before and after the energy project. Natural gas usage was reduced by 40.7% over periods with almost identical Heating Degree Days. The size of this reduction was a surprise because window replacement in such a large building is not normally so effective, but between the reduced air infiltration from the tighter-sealing windows and doors and the reduced radiant heat loss from the low-e double glazing, the residents were able to reduce room temperatures and stay comfortable. The fact that most of the residents are elderly, these comfort improvements were significant.

Electricity usage was reduced by just 0.9%. This too was a surprise as the windows and doors should have resulted in greater air conditioning savings, but apparently the elderly residents used the air conditioning quite modestly. The elevator usage was not large to begin with compared to the other electrical uses in the building, so we did not expect to see a huge impact for the elevator modernization.

ENERGY RESULTS

	Building Baseline Historic Usage	Post-Project Actual Usage	Savings %
Electricity (kWh)	775,000	768,000	0.9%
Natural Gas (ccf)	47,182	27,972	40.7%
MMBTUs (site)	7,456.9	5,473.6	26.6%
MMBTUs (source)	13,356.3	11,223.9	16.0%
Site EUI (kBTU/s.f.)	53.3	39.1	26.6%
Source EUI (kBTU/s.f.)	95.4	80.2	16.0%
ENERGY STAR score	81	88	
Annual Energy Costs	$129,014	$113,209	12.3%

ANNUAL POLLUTION BENEFITS

Reduction of CO2e emissions: 241,970 pounds
Reduction of SO2 emissions: 19.02 pounds
Reduction of NOx emissions: 11.93 pounds
Reduction of CO emissions: 167 pounds
Reduction of Particulate emissions: 15.25 pounds

ENVIROMENTAL EQUIVALENTS

CO2e Emissions of Oil Offset: **255.2 barrels of oil**

CO2e Sequestration by Forests: **103.5 acres of forest**

CO2e Emissions of Cars Offset: **23.7 cars taken off the road for a year**

CO2e Emissions of Homes Offset: **11.6 homes for a year**

REINVESTMENT FUND is a catalyst for change in low-income communities. We integrate data, policy and strategic investments to improve the quality of life in low-income neighborhoods.

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GELF was established by the Pennsylvania Department of Environmental Protection (DEP) with funding from the ARRA provided to DEP through the U.S. Department of Energy. Reinvestment Fund was selected by DEP to manage GELF and to use the $12 million allocation of public funding to leverage an additional $36 million in additional energy financing.

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