

# Ultra-Efficient Heating and Cooling at Century-Old Ministry

Dominican Sisters of Blauvelt turn to Green Star Energy Solutions and Fujitsu to retrofit historic convent with ultra-efficient heating and cooling system.

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Jeremy Mika · April 6, 2017

What do you do when you have a 100-year-old building and you are trying to be good stewards of your resources as well as the planet? This is just the dilemma that the Dominican Sisters of Blauvelt found themselves in.

Ministering out of Blauvelt, NY, the sisters occupied a century old convent which ran on antiquated steam heat, window unit air conditioning and zero insulation.

Absolutely pivotal to their ministry and livelihood, the 100,000 square foot convent, which was originally constructed in 1878, houses administrative offices, living spaces, nursing facilities, convalescence care and a large chapel.

Faced with this dilemma, the sisters turned to [Green Star Energy Solutions](#) for help. Green Star specializes in the prioritization of energy efficiency, comfort and safety in developing heating, cooling and insulation solutions for their customers.

"We specialize in making existing buildings energy efficient, comfortable and sustainable," said Joe Novella, Green Star Energy Solutions founder. "At St. Dominic's we were dealing with an uncomfortable space to live and work in that was crippling the sisters with high heating and cooling costs. This is exactly what our business exists for."

Novella and his team work to provide "holistic efficiency" in the homes and businesses of their clients. To do this at St. Dominic's convent, Green Star implemented three months' worth of design reviews in an effort to combat not only the challenges of an antiquated electrical system, but also the unique issues that arise when working in a historic convent.

"The convent has two residential floors, a medical floor, a community floor and a worship floor. It is a very mixed-use type of facility. Our design had to address all of these various applications and we had to ensure that these spaces would remain dust free during installation," tells Novella.

Green Star sets their sights on a retrofit that would allow them to perform work incrementally so that the sisters could carry on their various ministries and day-to-day activities while all of the work of the retrofit was taking place. Tom Esposito, director of business development for Green Star said that this project was very near and dear to the hearts of everyone involved at Green Star and they worked tirelessly to ensure the absolute best outcome for the sisters.

"The primary challenge of the project was maintaining health and well-being of the sisters through it all," he says. "To do this we had to ensure a dust free work area. Many of the sisters have travelled around the world helping the sick and needy and were exposed to illness. They suffered from respiratory issues that the old system only made worse."

Esposito said that Green Star was able to greatly improve the indoor air quality at the convent. This dramatically reduced the respiratory issues for sisters. In essence, they created a system that resulted in the building holding on to moisture in the winter months, when air is cold and dry.

Much like a humidifier, this kept the sisters' health issues at bay and allowed for maximum comfort.

With the health and well-being of residents under control, the next issue that Novella and his team had to navigate through was to design a system that could be installed without demolishing the historical structure and also construct it in a way that would not compromise the original aesthetics of the building.

"We developed a strategy that allowed us to locate all outside units effectively without impacting the church visually or through unwanted noise, says Esposito. "We had to pump 120 tons of heating and air conditioning throughout 100,000 square feet of building while designing the system in such a way as to not diminish the facility aesthetically."

Green Star implemented a plan that allowed for equipment installation without the demolition of any existing masonry in building. Esposito says that overall, the entire retrofit used very little demolition, and equipment was even installed in the chapel that couldn't be seen by the naked eye.



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Of course comfort and aesthetics were not the only issues that Green Star Energy Solutions were looking to correct with the retrofit.

The sisters take their mission to be stewards of the earth seriously, and this mission includes finding the most efficient way to heat and cool their facility.

Coincidentally, this lines up with Green Star's primary mission, so to help in this area, Novella and his team decided that a heat pump would be best to take care of both heating and cooling needs. This electrically driven system does not use any fossil fuels and has an output of nearly four times the energy that is used to drive it.

Green Star decided that the best system to suit the sisters' heating and cooling needs was the Fujitsu Air Stage V2 heat pump. This ultra-high efficient unit allows for climate adjustments in each individual room of the convent.

"With the [Fujitsu system](#) we were able to create a separate zone of heating and air for every single space and make sure that all residents were able to achieve a perfect comfort level," Esposito notes.

Brendan Casey, commercial product manager for Fujitsu, said that this state-of-the-art system works by pulling heat out of the outside air, and it works at temperatures as cool as minus-4 degrees Fahrenheit.

"The St. Dominic's convent project was the absolute perfect application for this product," Casey tells. "The sisters were able to go from an old boiler system that gave them no individual climate control to a system that gives them a very stable temperature in every single room."

Casey says that the Fujitsu system is an extreme improvement in both efficiency and comfort, saving the sisters anywhere between 40 and 60 percent in energy costs. This estimate doesn't even take into account what residents had to do to achieve a somewhat comfortable temperature with the old system.

For example, residents in higher floors would routinely open windows, even in the winter, because their rooms were too hot based on proximity to the boiler system.

With the new system, the sisters have a clean, comfortable indoor environment to perform their many ministries including caring for the disabled, homeless, mentally ill, chemically addicted and orphaned.

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