



RENEWAIRE ERVS REDUCE HOTEL'S ANNUAL HVAC ENERGY USE BY 34% COMPARED TO CONVENTIONAL EQUIPMENT

ERVs provide Hilton Garden Inn with cleaner and healthier indoor air while reducing heating and cooling loads

HIGHLIGHTS

LOCATION:

- ◆ Hilton Garden Inn, Dayton South/Austin Landing, Ohio

INDUSTRY:

- ◆ Hospitality (Hotels)

PRODUCT APPLICATION:

- ◆ HE2XRT RenewAire ERV
- ◆ HE4XRT RenewAire ERV
- ◆ EV450IN RenewAire ERV

KEY FACTS:

- ◆ Reduced annual HVAC energy use by 34%
- ◆ Ran flawlessly with no defrosting needed
- ◆ Replaced 150 bathroom fans (potential points of failure) with only seven ERVs



*Hilton Garden Inn located in Dayton South/Austin Landing, Ohio
Image courtesy of Booked.net*

OVERVIEW

In preparing to build the 125-room, five-story Hilton Garden Inn located in Dayton South/Austin Landing, Ohio, a conventional, fan-only ventilation system had initially been considered by the hotel's owners. However, that all changed after Steve Coppock of the Habegger Corporation and Mike Flynn of R.A. Flynn and Son presented the owners with another option: energy recovery ventilation.

Energy recovery ventilation preconditions the outside air coming in with the exhaust air's energy, which creates a comfortable indoor environment while at the same time enhancing indoor air quality (IAQ) and generating

substantial energy savings. "There's no reason to waste the energy in outgoing air by discarding it into the atmosphere," said Steve, a commercial application engineer. "This energy should be used to temper incoming air, which reduces heating and cooling loads while maximizing the quality of the indoor air."

Mike Flynn, the project's contractor, supported this notion. "Conventional systems throw away the energy of exhaust air on a daily basis, but it makes much more sense to recapture it and reuse it," he said. "When you combine this preconditioning ability with a considerable

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reduction in system tonnage expenditure, this equates to significant energy savings for owners. And most importantly, the indoor air is cleaner and healthier for occupants. That’s why I like energy recovery ventilation.”

How would this lofty goal of providing clean and healthy indoor air energy-efficiently and cost-effectively be achieved? Steve knew the perfect technology for the job and recommended RenewAire Energy Recovery Ventilators (ERVs). “RenewAire ERVs are the complete package: they provide high-quality indoor air while minimizing energy use, and are incredibly reliable — it’s a win-win,” said Steve.

VENTILATION CHALLENGES

As buildings become more airtight due to better construction methodologies, the need for effective ventilation is growing — especially since Americans spend about 90% of their time indoors. Without proper ventilation, internally generated contaminants build up and cause deficient indoor air quality (IAQ), which can lead to serious health problems. In fact, the Environmental Protection Agency ranks indoor air pollutants as a top-five environmental risk.

Over the last 30 years, the overall airtightness of buildings has increased extensively. For example, according to Sam Rashkin, Chief Architect in the U.S. Department of Energy’s Building Technologies Office, homes are now 50-80%, on average, less leaky than 20-30 years ago. Sam states that from 1985-1995, typical new home construction would leak about 7-10 ACH50 (air changes per hour at a pressure difference of 50 Pascals). Today, he says we’re at about 3-5 ACH50 for code homes and about 1-3 ACH50 for high-performance homes.

Indoor air contaminants are a chief concern for hotels because high levels can cause sickness in guests and staff alike — and newer hotels, such as the Hilton Garden Inn, are most at risk due to increased structural air-sealing integrity. Contaminants include dust mites, mold, humidity, asbestos, carbon dioxide, radon and other toxic gases and vapors, to name a few. Their sources are varied, but many are off-gassed from construction materials, furniture, fabrics, carpets, cleaning supplies and even indoor occupants, among others.

Another ventilation challenge arose because of the limited amount of space inside the hotel for ductwork, which would primarily be placed in the ceiling. And the space that was available would also have to be shared with plumbing pipes, electrical equipment and sprinklers. Therefore, the ventilation solution needed to be extremely efficient, as well as have a small footprint, in order for the installation to be successful.

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RENEWAIRE SOLUTION



Rooftop units of the hotel's HVAC system
Image courtesy of Steve Coppock, Habegger Corporation

Steve knew that RenewAire ERV technology would be the best option for this project, and he and Mike put five ERVs on the roof and two ERVs above the ceiling in different spots. They replaced 150 bathroom fans with vents connected to ceiling ducts to remove exhaust air and replenish rooms with clean, preconditioned outside air. The RenewAire ERVs now run 24/7 in concert with Carrier rooftop units and split systems, Reznor makeup air systems and Mitsubishi mini-split systems.

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"I've worked with RenewAire for close to five years and I like everything about the company," said Steve when asked why he chose RenewAire. "The static-core ERV does exactly what it's supposed to — bring in outdoor air economically and

energy-efficiently in order to create a cleaner, healthier and more comfortable indoor environment. Plus there's zero airstream crossover, high humidity levels aren't a problem, there's no need to defrost and the ERVs thrive in both the hot and cold temperatures of Ohio."

Mike was glad Steve had suggested RenewAire. "This was my first time working with RenewAire and it was excellent from the start," said Mike. "Customer service is top-notch, delivery was on time and there weren't any issues. The ERV's ease of use is the best part — it's easy to install, easy to control, easy to maintain and doesn't require much space, making my clients — the building owners — very happy. The icing on the cake is the clean and healthy indoor air that's produced."

In addition, RenewAire was brought in for the job because its ERV technology consists of a static core as opposed to a wheel. "Wheels plug faster, fail faster, are less reliable and aren't able to achieve zero airstream crossover like a RenewAire system," said Steve. Mike agreed, "Wheel systems break down often, and all of their moving parts require considerable maintenance," he said. "I prefer system simplicity, which is exactly why I like RenewAire's static-core ERVs."

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RESULTS



Rooftop ductwork of the hotel's HVAC system
Image courtesy of Steve Coppock, Habegger Corporation

The hotel opened for business in March 2013, and since that time several notable results have been achieved, including:

CLEANER AND HEALTHIER INDOOR AIR

First and foremost, the hotel's guests and staff are breathing, day and night, cleaner and healthier indoor air, the quality of which now meets the strict guidelines for ventilation and acceptable IAQ as set forth by ASHRAE Standard 62.1. This is good for everyone's health, as well as for the hotel's business, which Mike appreciated, "I enjoy projects like this when you can install a product that really works — it matters for my clients since it boosts their bottom line."

"A RENEWAIRE ERV'S ABILITY TO TEMPER OUTSIDE AIR COMING IN WITH THE ENERGY OF THE EXHAUST AIR GOING OUT, ALONG WITH EQUIPMENT DOWNSIZING DUE TO THE ERV'S TREMENDOUS RELIABILITY AND SMALL FOOTPRINT, SIGNIFICANTLY REDUCES HEATING AND COOLING LOADS AND LEADS TO MAJOR ENERGY SAVINGS."

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ANNUAL HVAC ENERGY USE REDUCED BY 34% COMPARED TO CONVENTIONAL EQUIPMENT

RenewAire ERVs reduced the hotel's annual HVAC energy use by 34% compared to conventional equipment, even while running continuously to produce cleaner and healthier indoor air. "A RenewAire ERV's ability to temper outside

"THE PROOF OF WHY AN ERV MAKES SENSE IS IN THE DRASTICALLY REDUCED OPERATING EXPENSES GENERATED FROM LESS ENERGY USED BY THE HVAC SYSTEM. THIS HOTEL CAN NOW BE CONSIDERED A HIGH-PERFORMANCE BUILDING BECAUSE OF ITS CLEAN INDOOR AIR AND EFFICIENT USE OF ENERGY. IT'S PHENOMENAL HOW COMFORTABLE THE HOTEL'S INDOOR ENVIRONMENT IS, WHICH IS ALL THANKS TO THE RENEWAIRE ERVS."

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air coming in with the energy of the exhaust air going out, along with equipment downsizing due to the ERV's tremendous reliability and small footprint, significantly reduces heating and cooling loads and leads to major energy savings," Mike explained.

Steve continued, "The proof of why an ERV makes sense is in the drastically reduced operating expenses generated from less energy used by the HVAC system," he said. "This hotel can now be considered a high-performance building because of its clean indoor air and efficient use of energy. It's phenomenal how comfortable the hotel's indoor environment is, which is all thanks to the RenewAire ERVs."

MINIMAL MAINTENANCE & MAXIMUM RELIABILITY

The ERVs require only minimal maintenance and are remarkably reliable, which is good news for Steve and Mike. “RenewAire ERVs are so simple to use and maintain, and are so reliable — I haven’t seen one core failure ever — it’s just too good to be true,” said Steve. Mike added, “The maintenance is straightforward, which is something that building owners appreciate since in-house teams can service the systems.”

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A SUCCESSFUL INSTALLATION DESPITE LIMITED SPACE AVAILABLE

The combination of the compact size of the ERVs and the nominal amount of HVAC equipment needed gave Mike the ability to overcome the challenge of

limited space in the ceilings available for ventilation ductwork. “The efficient sizing and operations of the RenewAire ERVs made a reduction in CFM possible,” said Mike. “We were therefore able to decrease equipment size and get through the small spaces.”

SEEKING LEED CERTIFICATION

The installation of the ERVs has made it possible for the hotel to now seek LEED certification. “The owners are seeking LEED certification, which is only possible because of the installation of the ERVs,” said Mike. RenewAire ERVs have enabled many buildings worldwide to achieve certifications for efficient use of energy with such prominent organizations as LEED, Passive House, Green Globes, ENERGY STAR and the WELL Building Standard, to name a few.

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NEXT STEPS

The success of the Hilton Garden Inn means that both Steve and Mike already have additional RenewAire projects in the pipeline. “I look forward to continuing my work with RenewAire since their ERVs can achieve so much,” said Steve. “Take this hotel for example — it’s pretty compelling when you can replace 150 potential points of failure with just a few ERVs and a duct system, which results in exceptionally fresh indoor air and impressive energy savings.”

Mike’s first time working with RenewAire ERVs went above and beyond expectations. “I recommend RenewAire ERVs hands down because they deliver on what’s promised, and you don’t have to baby the equipment,” he said. “This has been an enjoyable project and I’m very happy with the final product. Going forward, I will definitely continue to work with RenewAire.”

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For over 30 years, [RenewAire](http://www.renewaire.com) has been a pioneer in enhancing indoor air quality (IAQ) in commercial and residential buildings of all sizes. RenewAire’s fifth-generation, enthalpic-core, static-plate Energy Recovery Ventilators (ERVs) provide clean, healthy indoor air in a sustainable manner by optimizing energy efficiency, reducing loads and minimizing emissions — all at a low cost. For more information, visit: www.renewaire.com.