



## RENEWAIRE ERVS REDUCE UNIVERSITY'S ANNUAL HVAC COSTS BY 40% COMPARED TO CONVENTIONAL EQUIPMENT

*Grand Canyon University now enjoys cleaner and healthier indoor air while energy use and costs are significantly decreased*

### HIGHLIGHTS

#### PROJECT:

- ◆ Grand Canyon University

#### LOCATION:

- ◆ Phoenix, Arizona

#### INDUSTRY:

- ◆ Higher education

#### PRODUCT APPLICATION:

- ◆ HE8XRT RenewAire ERV
- ◆ LE8XRT RenewAire ERV

#### KEY FACTS:

- ◆ HVAC loads reduced by 40%
- ◆ Annual HVAC costs reduced by 40% every year for the life of the ERVs
- ◆ Excel in small spaces due to downsized HVAC equipment
- ◆ Work within limiting parameters of existing HVAC infrastructure



*The campus of Grand Canyon University, Phoenix, Arizona  
Image courtesy of azcentral.com*

### THE PROBLEM

Grand Canyon University (GCU), Arizona's premier private Christian university, was undergoing an expansion in physical size and student body, and was looking for a way to provide better and more effective ventilation for several new and remodeled buildings. Specifically GCU needed a solution that would realize three goals: 1) Enhance indoor air quality (IAQ), 2) Maximize energy efficiency and sustainability and 3) Stay in line with a tight budget and schedule.

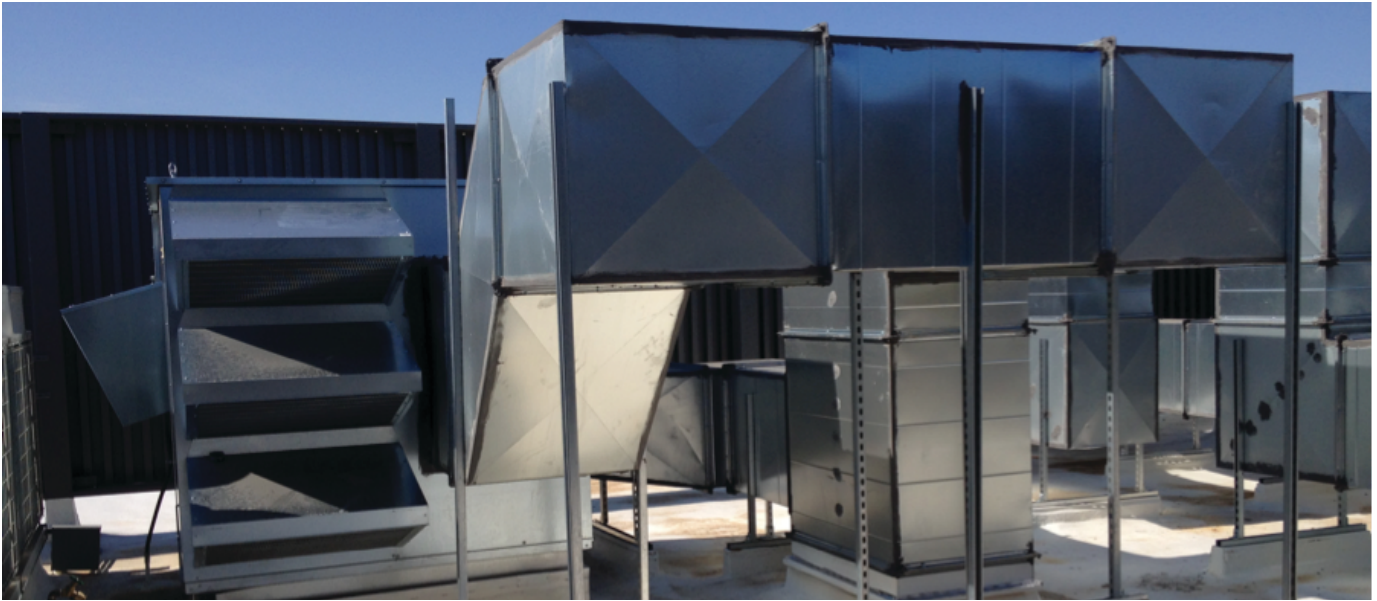
In order to achieve this tall order, the university turned to two ventilation experts, engineer Lawrence (LJ) Black, P.E. of MSA Engineering Consultants and contractor Chris Baardsen of Central Supply & Metal. Both LJ and Chris have extensive ventilation experience, and they knew there was only one solution that was right for the job: energy recovery ventilator (ERV) technology from RenewAire.

## VENTILATION CHALLENGES

In order to reach the overarching goal of enhancing IAQ energy-efficiently, cost-effectively and sustainably, LJ and Chris faced specific ventilation challenges posed by GCU's diverse array of new and remodeled campus buildings that made up the project. These challenges included:

- ◆ **Limited space:** In several buildings, in particular the administrative office, low ceilings meant that there wasn't enough space to install conventional ventilation equipment and ductwork.
- ◆ **Maxed-out, older systems:** When increased outdoor air was required, this placed extra strain on maxed-out, older air-conditioning systems that couldn't handle additional HVAC loads.
- ◆ **Increased outdoor air:** In all indoor spaces, but especially in classrooms and labs, it was essential to ensure enough fresh and filtered outdoor air was coming in to replace stale indoor air. This was particularly true for offices converted to classrooms since building codes required greater amounts of outdoor air for indoor spaces housing students.
- ◆ **Balanced air pressure:** Where applicable, bathroom exhaust had to be incorporated in order to balance static pressure in the building.
- ◆ **Keeping within budget and on schedule:** GCU had laid out a very strict budget and schedule that had to be met.

## RENEWAIRE SOLUTION



Rooftop installation of RenewAire ERVs at GCU  
Image courtesy of MSA Engineering Consultants

RenewAire ERVs use the exhaust air's sensible and latent energy (heat and humidity) – which is discarded by conventional systems – to temper fresh and filtered outdoor air coming in to replace stale indoor air. This process reduces HVAC energy use and costs, decreases monthly operating expenses and generates energy and cost savings year after year. RenewAire ERVs provide cleaner and healthier indoor air through increased and balanced ventilation, a process that realizes the highest levels of IAQ according to the Department of Energy (DOE).<sup>1</sup>

*"I'VE BEEN WORKING WITH RENEWAIRE FOR SEVERAL YEARS, AND THEIR ERVS ARE THE BEST CHOICE IN VENTILATION."*

*-- LAWRENCE (LJ) BLACK, P.E., MSA ENGINEERING CONSULTANTS*

<sup>1</sup> Armin Rudd, Daniel Bergey, "Ventilation System Effectiveness and Tested Indoor Air Quality Impacts," U.S. Department of Energy, Building Technologies Office, February 2014, <http://www.nrel.gov/docs/fy14osti/61128.pdf>.

LJ and Chris knew that RenewAire ERVs would be the perfect solution for the job. "I've been working with RenewAire for several years, and their ERVs are the best choice in ventilation," said LJ. "I've been to the RenewAire factory in Madison, WI and have seen firsthand their innovative manufacturing processes and how robustly the ERVs are built. And from a design standpoint, they simplify the process since the ventilation infrastructure is centralized and streamlined."

Chris added, "My clients love RenewAire since their ERVs are simple to install, easy to use and don't need a lot of maintenance due to their tremendous reliability," he said. "The GCU facilities department saw the value right away because of the significant energy savings and quick payback, especially since GCU's previous ventilation system used a wheel that led to many problems. RenewAire ERVs use a static core, which is as durable and trouble-free as it gets."

The project consisted of the following RenewAire ERV installations, which were all set up on the roof of each building:

- ◆ Engineering building: Six HE8XRT units and two LE8XRT units.
- ◆ Administration building: One LE8XRT unit.

- ◆ Science, Technology, Engineering and Mathematics (STEM) lab: Five HE8XRT units.
- ◆ Classroom building: Four HE4XRT units.
- ◆ Office building: Nine LE8XRT units.

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*-- CHRIS BAARDSEN, CENTRAL SUPPLY & METAL*

## THE RESULTS



*Rooftop installation of RenewAire ERVs at GCU  
Image courtesy of MSA Engineering Consultants*

Faced with substantial ventilation challenges, the RenewAire ERVs were able to overcome these and achieve the following results:

- ◆ **Excel in small spaces:** In the administration building where there was limited ceiling space that would not allow for traditional outside-air ductwork, RenewAire ERVs enabled the team to use the ceiling space as a plenum (an enclosed space inside a building used for airflow) for the outside air to the indoor areas, thus reducing the amount of ductwork above the ceiling, maintaining high ceilings and lowering construction costs.
- ◆ **Work within existing systems:** Where code requirements called for increased ventilation – thus placing a larger load on existing air-conditioning systems than could be handled – RenewAire ERVs were able to reduce these additional loads to the point where the older systems could still function properly, which eliminated the need for system replacements and upgrades.



- ◆ **Balance static pressure:** In the classroom building that required the inclusion of bathroom exhaust in order to balance static pressure, RenewAire ERVs made this possible due to zero exhaust air transfer.
- ◆ **Remove indoor air contaminants:** In all indoor spaces, but particularly in labs and classrooms where internally generated contaminants are consistently produced, RenewAire ERVs now provide the increased and balanced ventilation that's necessary to remove contaminants and odors, which are then prevented from reentering.

*"I'VE BEEN TO THE RENEWAIRE FACTORY IN MADISON, WI AND SEEN FIRSTHAND THEIR INNOVATIVE MANUFACTURING PROCESSES AND HOW ROBUSTLY THE ERVS ARE BUILT."*

*-- LAWRENCE (LJ) BLACK, P.E., MSA ENGINEERING CONSULTANTS*

In addition to solving each ventilation challenge, the RenewAire ERVs achieved several more results, including:

- ◆ **Reduce HVAC loads by 40%:** By passively recapturing otherwise-wasted energy, RenewAire ERVs reduce HVAC loads for GCU's ventilation infrastructure by 40% compared to conventional equipment.
- ◆ **Decrease annual HVAC costs by 40%:** This reduction in loads decreases annual HVAC costs by 40% compared to conventional ventilation equipment, which is savings that will be generated every year for GCU the life of the ERVs, which are built to last for over 25 years.
- ◆ **Downsize HVAC equipment:** Load reduction leads to HVAC equipment being downsized. This means that ductwork can be minimized throughout the building, which allows the ventilation infrastructure to fit inside small spaces.
- ◆ **Streamline operations:** All of the RenewAire ERVs are installed on the roofs of each building, thus creating central ventilation locations for each facility and streamlining operations.
- ◆ **Cleaner and healthier indoor air:** The RenewAire ERVs are now providing cleaner and healthier indoor air for GCU's students, staff and faculty alike, thus promoting improved health, cognitive function, productivity and wellbeing.
- ◆ **On budget and schedule:** Due to RenewAire ERVs competitive pricing and simple installation process, the GCU project was completed within the allocated budget and on schedule.
- ◆ **Short payback period:** Low costs and sizable HVAC energy savings mean the payback period of the ERVs will be short for GCU.

LJ and Chris commented on the results achieved by the RenewAire ERVs. "The whole project was a success, but the most important result is the fact that GCU is very happy," said LJ. "RenewAire ERVs make the whole process so simple – from specification, to installation, to operation and to maintenance," he continued. Chris said, "A happy client makes my job easier, and RenewAire ERVs' dependability and ease of operations make this possible."

*"RENEWAIRE ERVS ARE TOP-NOTCH – THEY MAKE MY JOB EASIER AND LEAD TO HAPPY CLIENTS."*

*-- CHRIS BAARDSEN, CENTRAL SUPPLY & METAL*

## IN SUM

With another successful RenewAire ERV project in the books, LJ and Chris both summed up their thoughts while looking ahead. "RenewAire was a tremendous partner in the GCU project, and I'm already planning several future projects for their ERVs," said LJ. Chris concluded, "RenewAire ERVs are top-notch – they make my job easier and lead to happy clients, and I know that I'll be collaborating with them over the long-term."

For over 30 years, [RenewAire](http://www.renewaire.com) has been a pioneer in enhancing indoor air quality (IAQ) in every type of home and building via enthalpic-core, static-plate Energy Recovery Ventilators (ERVs) that optimize energy efficiency, reduce HVAC loads and generate significant cost savings. For more information, visit: [www.renewaire.com](http://www.renewaire.com).