

A leading global GREEN university, manages to further substantially reduce its carbon footprint with Rensair's SDCV

ABSTRACT

A leading Irish university with impeccable green credentials has been using Rensair air purification for more than 12 months to provide a good Indoor Air Quality (IAQ) environment in some poorly ventilated buildings across the university's campus. Recently Rensair offered the university its new Smart Demand Controlled Ventilation (SDCV) innovative solution, which optimises existing mechanical ventilation with Rensair air purification. SDCV delivers excellent IAQ whilst also significantly reducing a building's energy consumption and carbon emissions.

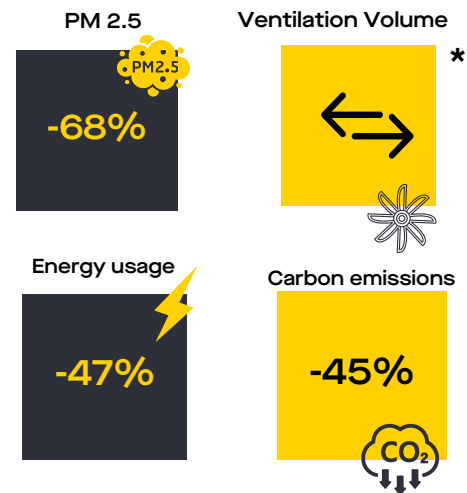
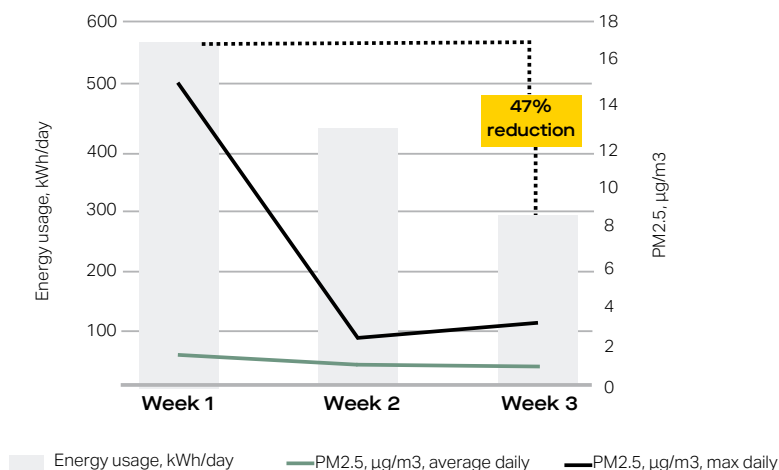
SDCV was installed in buildings, and data was recorded with respect to IAQ and energy consumption. Already excellent indoor air quality was maintained, but significant energy savings were achieved with SDCV, leading to important carbon footprint reductions.

BACKGROUND

The university has a thorough understanding of IAQ and provides an excellent environment across its buildings throughout its extensive campus - indeed in 2021 the university installed air purification systems in poorly ventilated spaces. Ranked the fourth greenest university globally, the university constantly strived to find new innovative ways to reduce their carbon footprint.

The university's Heating, Ventilation and Air Conditioning (HVAC) requirement across multiple buildings consumes a significant amount of energy, a trend seen in many institutions and businesses. Rensair's original Smart Demand Controlled Ventilation (SDCV) solution was installed at the university to maintain an excellent IAQ, optimise ventilation and save energy costs. The ambitious target was to reduce energy consumption and carbon emissions by at least 40%.

RESULTS



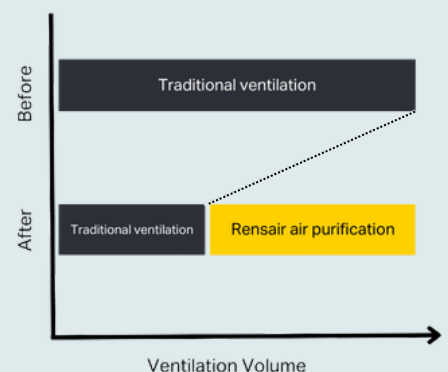
THE SDCV VALUE PROPOSITION

Rensair SDCV ensures excellent IAQ whilst minimising energy consumption and building carbon emissions.

The SDCV solution part-substitutes expensive mechanical ventilation with very cost-effective air purification, using Rensair's patented technology. Air purification delivers one cubic metre of clean air for 9 times less energy than the cost through a traditional HVAC system.

Traditional mechanical ventilation consumes a large amount of energy to condition the air drawn into a room to the right temperature (heated or cooled) and to the correct humidity level. Rensair, on the other hand, simply cleans the air that is already in a room - no conditioning is required.

SDCV also only ventilates strictly according to occupancy rates, thereby significantly reducing wasteful ventilation when occupancy is low.



IMPLEMENTATION

Rensair Core



8

Rooms



2

Maximum occupancy



171

Sensors



Aranet4
CO2 sensors

Energy consumption



Data collected:
AHU supply, Extra fans

Temperature



Measured by:
BMS, IAQ sensors

Fan



Low setting (83 l/s)

Parameter



PM1 & PM2.5 (in $\mu\text{g}/\text{m}^3$)
CO2 (in ppm)

	Dates	Mechanical Ventilation	Rensair Air Purification	Total
Week 1	7 – 8 Feb	100%	0%	100%
Week 2	14 – 15 Feb	69%	31%	100%
Week 3	28 Feb – 1 Mar	54%	46%	100%

CALCULATIONS

	Before	After	Rensair impact
Energy usage	557 kWh/day	293 kWh/day	47 % LESS energy
Air quality	Good	Excellent	Significantly improved
PM.5 Average reading	1.7 $\mu\text{g}/\text{m}^3$	0.6 $\mu\text{g}/\text{m}^3$	68% reduction
PM2.5 Max reading	15.3 $\mu\text{g}/\text{m}^3$	3.3 $\mu\text{g}/\text{m}^3$	79% reduction
CO2 Max reading	726 ppm	784 ppm	Still excellent
Ventilation	Mechanical Only	Mechanical and Air purification	Same volume, new mix
Ventilation volume delivered	10 litres/second/person	10 litres/second/person	Unchanged
Estimated carbon emissions savings	-	-	45% emissions reduction

SDCV improved the Indoor Air Quality. Furthermore the estimated annualised savings, based on the data generated, are :

- **62,029 kWh** reduction in consumption (45.2% reduction)
- **44 tonnes** of CO2e reduction
- Annual saving of **EUR 3,700** in energy spend, based on current client utility prices
- Improved indoor air quality

* During the study the combined air volume from the Mechanical Ventilation and Rensair Air Purification never fell below 1,786 l/s (thus >10l/s/p was always provided).

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