

Energy Recovery and Its Role in Indoor Air Quality (IAQ)

Why use Energy Recovery for Ventilation?

Energy Recovery is playing an increasingly important role in meeting the demanding ventilation and Building Code requirements not only for its ability to provide healthy indoor environments but for its exceptional efficiency and is the leading technology for achieving energy conservation.

1. Quick background- Why ventilate at all?

It might be obvious, but before considering energy recovery the first question to ask is, "Why ventilate at all?" What role does ventilation play in general either in a classroom or work environment? In short, ventilation is a key feature for indoor air quality (IAQ).

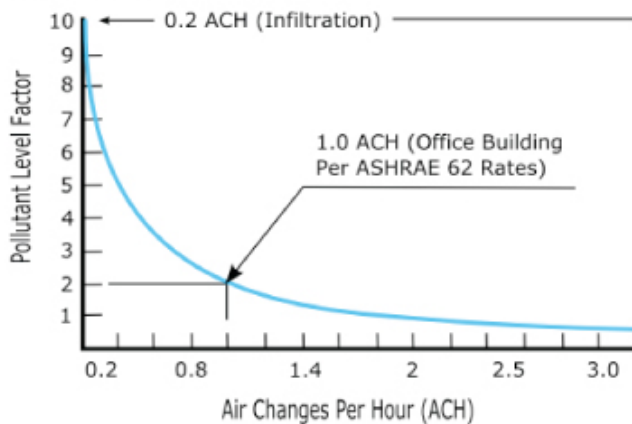
With half of all illnesses attributable to indoor airborne contaminants, the EPA has declared indoor air quality a public health priority. Ventilation with outdoor air is the only strategy that can simultaneously reduce the levels of all indoor pollutants. This strategy,

in general accordance with the Dilution Principle, is shown in the illustration below.

According to the Dilution Principle, each doubling of the ventilation rate results in a 50% reduction in the concentration of all constant source air pollutants evenly mixed

within the space. At one air change per hour, pollutant concentrations are reduced by a factor of five.

The challenge is to introduce the outdoor air at the levels required by the codes while maintaining indoor comfort and conserving energy.



THE DILUTION PRINCIPLE

At one air change per hour, pollutant concentrations are reduced by a factor of five.

2. Ventilation is key to indoor air quality but why add energy recovery?

Over the past few years, Building Code requirements for increased outdoor air ventilation rates have placed new demands on HVAC equipment and on building operating budgets. They require an increasing amount of outdoor air to be ventilated into a space.

Energy recovery ventilation

reduces the load on the system due to outdoor air by taking advantage of the work that has already been done to heat, cool, humidify or dehumidify the space.

Instead of exhausting building energy to the outside, it is temporarily captured on the surfaces of the enthalpy wheel

heat exchanger and then released to pre-heat, pre-cool, humidify or dehumidify the incoming air.

Enthalpy wheels do this with exceptional efficiency and are the leading technology for achieving energy conservation while ventilating for health and comfort.



3. Summary - Change'Air options for energy recovery ventilation

To meet the growing demand for greater efficiency, Change'Air now offers energy recovery wheels in all of our available series units.

Sales over the last year have shown a 300% increase in the design of projects with wheels, year over year.

It's evident that schools are beginning to hear and understand the message

that this technology saves energy dollars.

Energy recovery can now be incorporated into a self contained air to air unit, a water source heat pump or even an under the window console unit! The diagram below shows the dramatic effect a energy recovery wheel has on incoming winter air, warming it from 7 degrees to 53 degrees

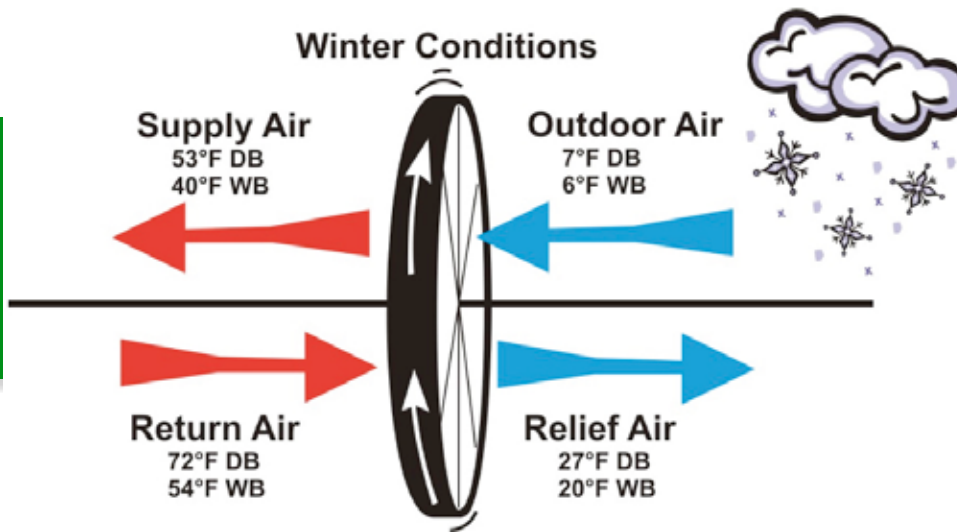
Fahrenheit by just passing through the wheel.

Change'Air offers three different size energy recovery wheels with a range of 150 cfm to 800 cfm of air crossing the wheel. The Freshman, Sophomore, Junior, Senior and Classic units all are available with recovery options.

Payback on energy recovery

option varies on the type and options within the unit and climate it operates in but is generally between three to ten years.

Buying quality equipment for life cycles of twenty years plus and incorporating efficient options such as energy recovery is a smart decision for you and the environment.



DRAMATIC EFFECT OF AN ENERGY RECOVERY WHEEL

The Energy Recovery wheel warms winter outdoor air from 7 degrees to 53 degrees Fahrenheit by passing through the wheel.