

## Introduction

We use the “green” word with increasing frequency, in both our professional and personal lives. Definitions abound and vary by the speaker and his or her goals. Even when we narrow the discussion to green schools or even green classrooms, the term can be applied to a number of areas, from an active recycling program to low-emitting construction materials.

The end game is sustainability—that theoretical place characterized by a net zero use of resources. As we narrow our focus, however, our goals become a little more concrete. In particular, as we consider the schools’ mechanical systems and HVAC equipment, two primary areas of emphasis emerge: energy efficiency and the quality of the indoor environment. In fact, the major systems used for assessing the “greenness” of buildings use only a handful of major criteria, always including these two.

If you have had dealings with your school’s mechanical systems, you are probably accustomed to discussions of energy management and efficiency. You may also be hearing more talk of indoor air quality. Suffice it to say that those of you involved in school construction decisions should be educating yourselves on the measures that lead to more sustainable operations. Doing so, enables you to ask better questions and better qualify service providers.

The remainder of this discussion focuses on energy and air quality issues as they relate to HVAC equipment. In particular, we’ll discover how the Change’Air line of equipment, as well as the services of our representatives, can assist you in your sustainable building goals.

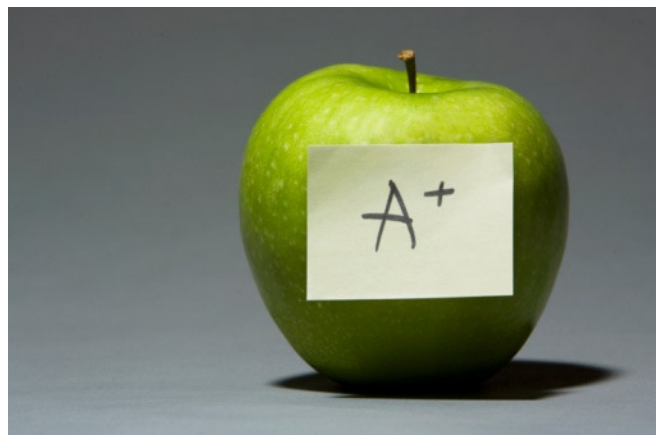
## Seeking a Better Grade

If you are pursuing a building accreditation of some sort, you will want to know how we can contribute to the rating system point structure. More points mean greater acclaim for your school and for the school officials involved.

First, let’s recap the major building certification systems in use. Three primary ones are noteworthy: LEED®, Green Globes, and Energy Star.

The LEED (Leadership in Energy & Environmental Design) comes from the U.S. Green Building Council ([www.usgbc.org](http://www.usgbc.org)). It can be described as a benchmark for the design, construction, and operation of high performance green buildings. Certified, Silver, Gold, and Platinum levels denote the buildings overall success in greening. LEED is the world’s most popular system, in use in over 40 countries.

Green Globes ([www.greenglobes.com](http://www.greenglobes.com)) is a product of Canada and the Canadian Standards Association. It is also used within the USA under the Green Building Initiative ([www.thegbi.org](http://www.thegbi.org)). In turn, GBI is working with ANSI (the American National Standards Institute) to make Green Globes an ANSI standard.



Finally, the EPA (U.S. Environmental Protection Agency) has adopted its Energy Star program ([www.energystar.gov](http://www.energystar.gov)) to entire buildings. The scope of the Energy Star program is narrower than the systems mentioned above. It is a scope that should be familiar to you due to home appliances you may have that are Energy Star approved.

For convenience, let's focus on the LEED system.

LEED assigns points to specific criteria within the categories of (1) Site Selection & Development, (2) Water Efficiency, (3) Energy & Atmosphere, (4) Materials & Resources, and (5) Indoor Environmental Quality. Again, Energy & Atmosphere and Indoor Environmental Quality are areas of prime importance to this discussion.

In terms of Energy and Atmosphere (EA), you'll see hard-to-win points for "optimizing energy performance" based on ASHRAE 90.1 prerequisites. (ASHRAE is the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, [www.ashrae.org](http://www.ashrae.org).) All Change'Air equipment, in conjunction with other energy-efficient components can contribute to these goals.

"On-Site Renewable Energy" (EA 2), and associated technologies such as geothermal can also garner valuable points. Products such as the Change'Air water source heat pump can contribute here.



Change'Air can also contribute to EA Credit 4, Enhanced Refrigerant Management, through the use of our R-410A refrigerant option.

The Indoor Environmental Quality section (EQ) offers even greater potential for Change'Air contributions to LEED credits. ASHRAE 62.1 provides the framework for this section.

EQ Credit 2, "Increased Ventilation" provides for obvious application of Change'Air products as our line is known generically as unit ventilators. Moving air to ensure proper ventilation and air quality is our core competency. Our Change'Air manufacturing representatives can also assist you in the IAQ

Management Plans (EQ 3.1 and 3.2), thereby helping your school earn up to two additional points.

Still other points are made more achievable by Change'Air products and the assistance our representatives in EQ 6.2 (Thermal Comfort Controllability), EQ 7.1 (Thermal Comfort Design), and even EQ Credit 10 (Mold Prevention).

Each point increases the likelihood of certification and higher levels thereof. It should be noted, however, that Change'Air equipment and the work of our representatives are mere contributing or supporting factors to point achievement.

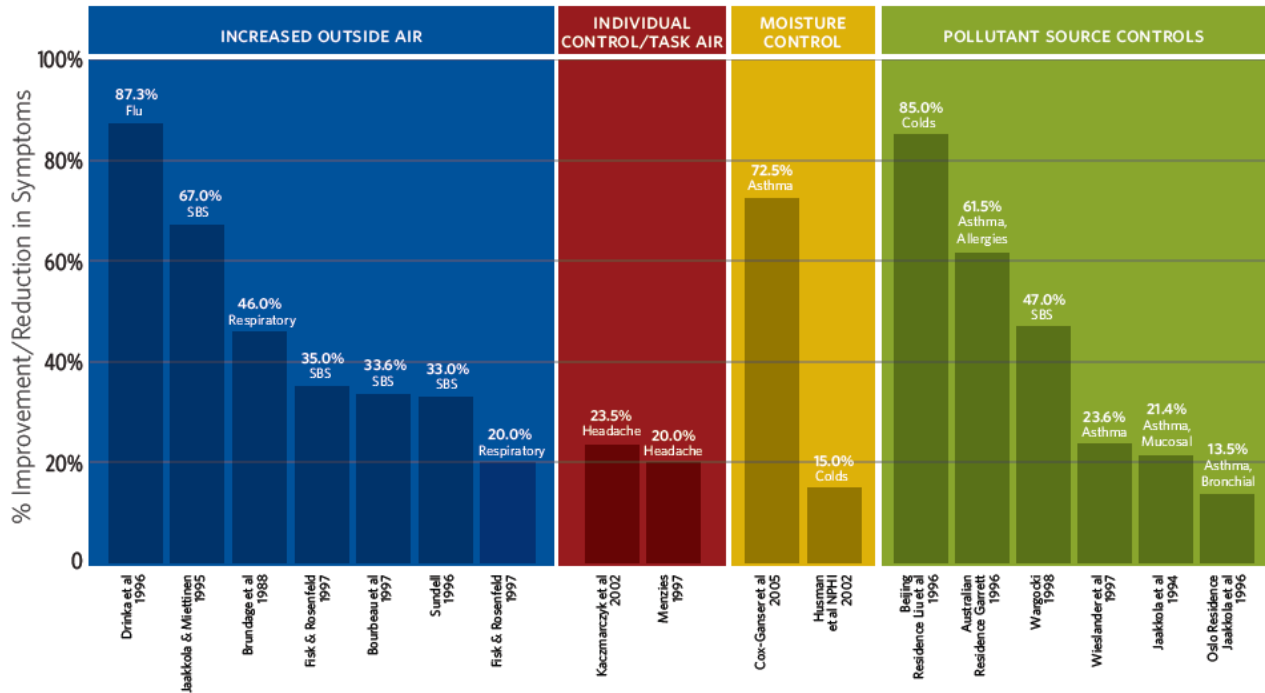
A newly launched USGBC web site at [www.buildgreenschools.org](http://www.buildgreenschools.org) helps schools and those involved with them learn how to build green. You will want to familiarize yourself with its content. Of particular note is a document describing the rating system criteria. Here's a direct link: [http://www.buildgreenschools.org/documents/leed-s\\_ratingsystem.pdf](http://www.buildgreenschools.org/documents/leed-s_ratingsystem.pdf).

## Beyond a Better Grade

Whether or not your school is pursuing a certification, you should understand that Change'Air ventilation technologies contribute to energy savings, occupant comfort, and occupant productivity.

Examine the adjacent illustration. It comes from a landmark 2006 report, *Greening America's Schools: Costs and Benefits* by Gregory Kats. Find a pdf of the full report here: <http://www.cap-e.com/ewebeditpro/items/O59F9819.pdf>.

## Health Gains from Improved Indoor Air Quality



The heights of the bars indicate a drop or reduction in the associated affliction as the school took measures to improve air quality. (SBS refers to Sick Building Syndrome.) The columns represent 17 different studies.

Beyond a reduction in ailments, green buildings actively promote health and learning benefits. For example, individual room temperature control is a hallmark of building green. In study after study, teachers are shown to believe that individual room control of temperature improves both teaching and learning. And the numbers support their belief with statistical gains of up to 15% in student productivity (mean of 3.6%).

Further, improved attendance and even higher test scores have been statistically attributed to green schools.

And then there's the bottom line. Green schools and classrooms use an average of 33% less energy than conventional construction. When all costs are considered, including such factors as the health benefits and employment impact, green schools contribute a cost savings of about \$70/square foot. That's more than 20 times the higher, initial construction costs for green schools over conventional construction (typically around \$3/square foot more).

## Continuing Education

Exploring the plethora of green related information has become an essential element of success for the school facility professional. So, start educating yourself. Another helpful site, for example, is The Green School Initiative ([www.greenschools.net](http://www.greenschools.net)). Their 40-page report is worth the read: <http://www.greenschools.net/greenschools.pdf>.

No matter how much you learn, however, you'll want the guidance of experts as you consider the complexities of HVAC system design and operation. One thing is certain—the popularity of building green continues to strengthen. And the school classroom represents the leading edge of these efforts with generation “G” already pulling some of the strings.

Change'Air products, together with the service offering of our representatives, can feed your green hunger with innovative solutions and relevant information. We invite you to stay tuned for further information and tools as we make our march toward greener classrooms.

## About Change'Air

Change'Air Products and Services Limited ([www.changeair.com](http://www.changeair.com)) designs and manufactures ventilation technology products geared specifically for the educational market (K-12, college/university). Creating the proper indoor air quality while reducing energy consumption, is a primary company goal. The product line includes semi-custom vertical and horizontal air handling units and is complemented with control options including BACnet and LON open protocol communications. All products are manufactured in Ontario, Canada and made available through manufacturer's representatives throughout North America.



*Engineered Excellence for Greener Classrooms*

54117 Best Line Road • Alymer, Ontario • N5H 2R3 • Phone: 519.866.3930 • Fax: 519.866.3798

4161 Legion Drive • Mason, Michigan • 48854 • Phone: 517.676.0700 • Fax: 517.676.4367

Email: [sales@changeair.com](mailto:sales@changeair.com) • Web: [www.changeair.com](http://www.changeair.com)

© 2008 Change'Air Products and Services LTD