



Architect's Corner:High performance homes offer more than energy efficiency

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STATEN ISLAND, N.Y. --

The cold season has an uncanny ability to sneak up on us, making its presence felt in between beautiful fall days and causing us to adjust thermostats to engage our home's heating system for the first chilly nights.

Doing so reminds us to check the different house components that will ensure our comfort level as temperatures inevitably move lower. So, we rush to the hardware store to purchase air filters, caulking, insulation and weather-stripping and make a call to the boiler technician for a pre-season checkup.

Energy conservation has become an important part of homeowners' consideration since the energy crises of the 1970s raised our consciousness of the subject. New York City has set gas emissions reduction goals of 30 percent by 2030, mandating a new energy code, PLANYC 2030, that is imposed on all alterations and new building construction.

Germany's Passive House Institute is setting the highest standards today for what are known as "passive homes." The basic idea of a passive house is to reduce the energy usage of a home by 90 percent over traditional code built homes.The American Institute of Architects (AIA) has introduced an energy modeling guide for architects to predict and reduce energy usage in buildings.

Clearly, we are in the midst of a green global movement that aims for a reduction of energy usage that will indirectly bring other many more pleasant gains, including lower bills, lower carbon emissions, more comfortable buildings and, of course, a cleaner planet.

The most celebrated advancements in energy efficient homes are barely visible. Architects understand that the building envelope is the most important factor in achieving energy efficiency as set forth in PLANYC 2030.

To distill the concept of a great building envelope into one word, think of super-insulated. The performance of the latter is akin to the insulation employed in a cooler or thermos. Whether you wish to keep your coffee hot or your soda cold, the same container will perform the task of maintaining the prevalent temperature longer. Such containers possess very thick insulation compared to their volume. □

SUPER-INSULATED HOMES □

Similarly, today's new super-insulated homes have thicker walls to accommodate larger quantities of insulating material. The standard blanket insulation requires more space in wall cavities versus rigid or foam types. The accepted value of thermal resistance in walls — R19 — is a timid attempt compared to the thermal values for building components in these super- insulated structures, which is R50.



Photo Courtesy of AIA, Staten Island Chapter

A sun room can give hours of pleasure and capture the sun's heat for the rest of the house.

But, high-performance houses don't differ only in the amount of their insulation. They also are of superior construction. Air infiltration is a serious consideration for such structures, which basically are airtight so the volume can be controlled. Furthermore, the amount of air exchanges and their temperature are controlled mechanically as common heating systems.

Windows and doors also need to have higher thermal resistance values to complement the walls, roof and cellar floors to complete the envelope.

These changes from traditional construction practices carry a high cost, but they do bring returns — and lower energy costs are just the icing on the cake. Super-insulated, high energy efficient houses are much quieter than what we are accustomed to, and, thanks to the insulating barrier, sudden changes of outdoor temperature are not easily felt. This means that those suddenly occurring very cold or hot days will have a much harder time penetrating the building skin and causing discomfort. High performance homes bring a level of comfort not found in current structures and at a fraction of the monthly cost.

Saving energy occurs in two ways: First, you can use less energy through conservation, i.e., turning off the TV when you're not in the room, or second, through energy efficiency, which means using less energy to accomplish the same amount of work.

NYC.gov offers many helpful tips for lowering your energy usage, reducing your carbon footprint and saving money. We've listed some of them below, considering areas of the home that have the largest carbon footprint. □

HEATING AND COOLING □

*Install a programmable thermostat.

*Make sure your house is properly insulated. If you have fewer than six inches of insulation in your attic, you would benefit from adding more.

*You can save 10 percent or more on your energy bills by reducing the air leaks in your home with caulking and weather stripping.

*To help your furnace run more efficiently and cost effectively, keep air filters clean.

*For windows with direct sunlight, close blinds in the summer to keep the heat out. Open them on winter days to let the warmth in.

*Small room fans are an energy-efficient alternative to air conditioning.

*For an energy audit of your entire house, consider the Home Performance with ENERGY STAR® program. □

WATER HEATING

*Check faucets for leaks that can cost you hundreds of dollars each year.

*Install a high-efficiency showerhead and save up to \$50 a year.

*Install faucet aerators to decrease water use. □

LIGHTING □

*Let the sun shine in. Use daylight and turn off lights near windows when possible.

*Replace your frequently used incandescent bulbs with CFLs (compact fluorescent bulbs) and save from \$12 to \$20 per year.

*Use lighting controls such as outside motion detectors and timers.

*Turn off lights when you leave the room.

*Always use the lowest wattage bulb that still gives you the light you need.

*Keep lightbulbs clean. It increases the amount of light from the bulb and reduces the need to turn on more lights.

Safety note: Burned out CFLs, which contain a small amount of mercury, should be disposed of properly. To locate a collection site in your area, or to learn what to do if a CFL breaks, visit www.nyserda.ny.gov/teachers

Architect's Corner, written by members of the Staten Island Chapter of the American Institute of Architects (AIA) appears twice a month in Home. You can contact the organization at aiasiny.org.

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