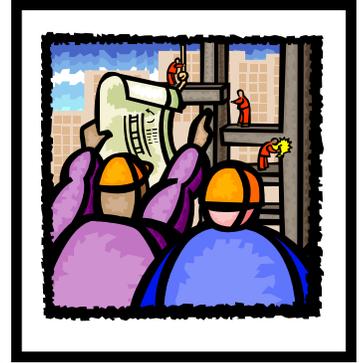




*SUSTAINABLE  
ENVIRONMENT  
for QUALITY of LIFE*



## HIGH PERFORMANCE BUILDINGS

### What is it?

A high-performance building yields energy efficiency, economic savings, and environmental performance at a substantially higher level than standard practice. As a result, high-performance buildings provide occupants a healthy place to live and work and have a relatively low impact on the environment. All this is achieved through a process called whole-building design where all the sub-systems and parts of a building are integrated to work together.

### Costs

Depending on the aggressiveness of the design, experience has shown that it costs no more than 10% more to build high-performance buildings. Some high-performance buildings cost less to construct. In North Carolina individuals and corporations are eligible for a tax credit for investing in renewable energy property. This credit is equal to up to thirty-five percent of the cost of renewable energy property constructed, purchased, or leased by a taxpayer and placed into service during the taxable year.



This Action Item can be implemented as a

- POLICY
- ORDINANCE
- PROGRAM

### Shared Impact and Benefits

- With only 4.6% of the world's population, the United States consumes a full 25% of the world's energy and emits more carbon dioxide than any other country. Our energy is generated primarily by fossil fuels (including coal, oil and natural gas), which are significant contributors to air pollution. But...high performance buildings significantly impact energy use.
- A typical solar powered hot water system reduces 4,500 pounds of carbon dioxide released into the air each year
- A building that uses extensive day lighting techniques will reduce the amount of heat given off by lighting fixtures, thus allowing for a smaller air conditioning system and reduced energy usage
- Benefits of whole-building design include:
  - Reduce energy use by 50% or more
  - Reduced maintenance and capital costs
  - Reduced environmental impact
  - Increased occupant comfort and health
  - Increased employee productivity
- In 1995, \$70 billion was spent on energy use for commercial building—for high performance buildings.

Total energy costs are, on average, about 50% less than those for conventionally designed buildings.

### How long does this take to implement?

It does not require public action to begin to use high performance techniques. Builders can use the existing design process and materials now. The more homeowners are aware of the benefits—both environmental and life-cycle cost—the faster high performance buildings will spread.

## The Bottom Line

High-performance buildings provide healthy living and working spaces while minimizing environmental impacts. Further, energy cost savings translate into economic gain.

**Interested? Read on!**



## Basic Information

The term “High Performance Building” is used to cover a range of design choices. It sometimes is used to refer to energy features and/or construction materials, and in other cases it includes choices from location to siting to site preparation. The term “high performance” does not automatically mean the same as “LEED certified,” but it certainly can include LEED-certified or –eligible construction.

Typical factors included in high-performance building include:

- Maximum use of day-lighting, energy-efficient lighting, motion-sensitive lighting, etc.
- Maximum energy efficiency in heating and cooling systems, including such features as solar panels, solar hot water heating, wall systems that maximize the efficiency of any heating or cooling systems, etc.
- Use of recycled materials in construction, and minimization of construction waste
- Site planning and landscaping to minimize disruption to the surroundings, low-impact design for Stormwater management, minimal loss of tree canopy, etc.
- Use of pervious surfaces where possible in the landscaping.

Some high-performance buildings also incorporate features such as “green” (i.e., planted) roofs.

LEED also gives points toward certification for location of the building along transit corridors, etc., and this is certainly a factor in the long-term environmental impact of the structure.

An important element of operating any high-performance building is ensuring that the building occupants know their responsibilities in ensuring that the building performs to maximum capacity. For example, if all the building materials and energy systems are energy efficient, but no one turns off their computer screens at the end of the day, then energy is still lost.

The initial cost of high-performance buildings may exceed the cost of a comparable square-footage traditionally-built structure. However, it is important to analyze life-cycle costs for both buildings to make a true cost comparison. Often, the additional up-front expense to “go green” produces an excellent rate of return in operating costs.

The US Green Building Council (both through its LEED program and through local chapters) and Advanced Energy (under Resources) are all excellent sources of additional information on high-performance buildings.

## Who’s doing this?

Arlington County Virginia, partnering with Energy STAR saved over \$300,000 in facility energy costs since 2000. The county created an energy manager position, in its Office of Support Services.

Rebuild America, a weatherization and intergovernmental program of the US Department of Energy is a network of partnerships that save money by saving energy. To subscribe to their newsletter: [rebuildorders@rebuild.org](mailto:rebuildorders@rebuild.org) or 252-459-4664.

Advanced Energy helped to improve energy costs and quality of life for 220 subsidized homes with its SystemVision construction standards. SystemVision homes save 30-50% in energy costs and are more comfortable and possibly healthier for families living in them—[www.advancedenergy.org](http://www.advancedenergy.org). For a great example visit Cambridge Homes in Charlotte NC which has a similar Environments for Living program.

The Center for the Environment at Catawba College was build using many recycled and salvaged materials. The building is highly energy efficient. All lights and water are sensor-controlled and even the rainwater from the roof is collected and used for irrigation.—[www.ecoconnections.catawba.edu/facility.html](http://www.ecoconnections.catawba.edu/facility.html).

Mint Hill Middle School, part of the Charlotte Mecklenburg School System was designed to incorporate day lighting and various window tints to create a more energy efficient and natural environment—[http://ncgreenbuilding.org/site/ncg/public/show\\_project.cfm?project\\_id=111](http://ncgreenbuilding.org/site/ncg/public/show_project.cfm?project_id=111).



Imaginon—Charlotte, NC



## FAQ's

**Q: Are there funds available to help convert a non-high-performance building to a high-performance one?**

A: Not generally, although performance contracting is one tool that many private and governmental agencies can use to reduce their energy or water costs. Performance contracting basically "insures" the contracting agency that its energy savings predictions will be met, or the contractor assumes some of the costs. For more information on local government performance contracting, go to: <http://www.ornl.gov/info/esco/legislation/>, which provides the current status of performance contracting legislation and practice in every state.

**Q: Are there operating procedures I can follow in my non-high-performance building to achieve energy savings?**

A: Yes, and many of them are the things your mother probably taught you! They include actions such as:

- Monitor energy and water use through your utility bill
- Switch off lights and other non-data processing equipment when leaving a room
- Set computers to display "sleep" or "power saver" when not in use and turn off at the end of the day
- Set thermostats for cooler temperature in the winter (70 degrees F) and warmer temperatures (76 degrees F) for the summer
- Report leaks and water loss immediately
- When light bulbs burn out, replace them with compact florescent bulbs (CFL) to save energy
- When replacing washers, dryers or other household appliances, buy EnergySTAR approved appliances

**Q: I'm concerned about the initial expense of high-performance building, especially when you get to factors like site location.**

A: It's important that consideration be given to all the impacts of a building, especially if cost is a significant constraint (as it usually is). Siting an otherwise very "green" building that is going to get a lot of consumer traffic, far from where the customer base lives and not on transit, may make the "greenness" of the structure less valuable to the community, than the additional Vehicle Miles Traveled that it generates. As noted above, life-cycle costing is also a critical factor in determining what provides the greatest cost-benefit return. As in anything, sound technical analysis and professional judgment must be used to ensure that the most important performance elements are met.

## Resources

- US Department of Energy, Office of Energy Efficiency and Renewable Energy
- Sustainable Building Information:  
[www.greenprofessionaldirectory.org](http://www.greenprofessionaldirectory.org)  
[www.ncgreenbuilding.org](http://www.ncgreenbuilding.org)  
[www.eren.doe.gov/femp/techassit/waterconserve.html](http://www.eren.doe.gov/femp/techassit/waterconserve.html)
- The US Green Building council, Charlotte Chapter  
<http://chapters.usgbc.org/charlotte/>

### Tracking Progress

Let Centralina Council of Governments know when you've implemented this action by contacting Carol Lewis at 704-348-2730 or [clewis@centralina.org](mailto:clewis@centralina.org)

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