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ENERGY

Buildings consume approximately 37% of the energy and 68% of the electricity produced in the United States annually. Combustion of fossil fuels produces about 75% of the country's energy. Production of electricity though the use of fossil fuels such as oil and coal requires extraction, transportation, refining, power generation, and distribution — processes that result in a variety of adverse environmental impacts. To put this further into perspective it is worth noting that in New England the energy use mix is approximately 80% fossil fuel. The 20% of remaining energy is derived from a combination of nuclear fission and renewable sources such as wind farms.

It is widely known that conventional fossil-fuel-based methods of generating electricity are major contributors to global climate change. And until alternatives to conventional fossil-fuel-based electricity generation advance to the point where they are both safer and more effective, the best way to reduce the impact that energy production exacts on the environment is to find ways to reduce energy use overall.

One of the greatest triumphs of EAST HALL is that it uses 32% less energy than a typical building of the same size and type. This remarkable energy reduction has been accomplished through a number of building energy efficiency measures. A significantly more efficient building envelope features a white, Energy StarTM roofing material to reflect heat during the summer, low E - high performance insulated glazing at all windows and an innovative polyurethane spray foam insulation/air and vapor barrier assembly that was comprehensively applied at the exterior wall. This composite building envelope construction is in itself 32% more energy efficient than a code compliant building of the same size and type. In addition, the building's mechanical systems and equipment have been designed and selected to help further reduce the overall building energy consumption. Four energy recovery units serve the building, capturing exhausted air from the building spaces and using this air to transfer energy (heating or cooling) to the fresh outside air being supplied to the building. High efficiency air cooled chillers were selected to reduce the chiller energy consumption by 15%, thereby reducing the overall building energy load. The individual fan coil units that serve the apartment spaces all have variable speed motors on the fans to reduce fan speed when the load in the space is not at peak to reduce fan energy. High efficiency boilers were installed to reduce the boiler energy consumption by ~18%. Variable frequency drives were installed on all the hot and chilled water pumps and on the energy recovery unit fans to optimize energy efficiency of that equipment. Lastly all the building's mechanical systems are controlled by a building automation system to further optimize building system performance and reduce the overall building energy consumption. Daylighting occupancy sensors tell the already efficient indoor light fixtures to dim when there is sufficient sunlight entering the building and to turn off when there is no one in the room.

All the HVAC and fire-suppression systems are specified with zero use of CFC, HCFC, and halon-based refrigerants to avoid further ozone depletion.

The building envelope construction and mechanical/electrical/plumbing systems account for a reduction of 533,788-kilowatt hours and 34,957 therms of natural gas per year. This energy reduction is the equivalent energy needed to power 146 average sized homes per year. To put this in financial terms, this reduction in energy use is

saving WPI close to

$120,000

a year in energy costs.