

# Architectural Energy Corporation

## Energy Design and Modeling Services



Architectural Energy Corporation uses state-of-the-art building energy analysis simulations, such as DOE-2, TRNSYS, EnergyPlus, and SUNREL, to undertake whole-building energy analysis of energy efficient design improvements. These simulation tools are used throughout the design process to characterize the energy design problem, identify and evaluate potentially viable energy saving design strategies, optimize an integrated energy design solution, and ensure compliance with the project energy performance goal, local or state energy requirements, or the LEED® energy efficiency prerequisite.

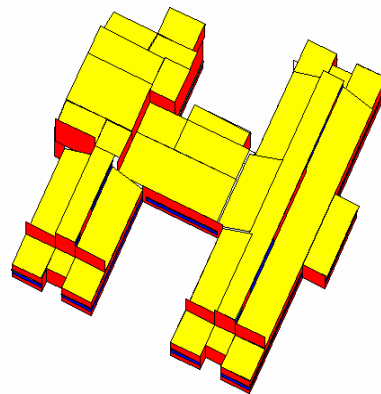


Architectural Energy Corporation energy modeling staff are experts in using whole-building energy analysis simulations to evaluate architectural, mechanical and electrical energy saving design strategies, and have done so on literally hundreds of sustainable design assistance projects throughout the U.S. Because of the importance and value of building energy analysis software in the sustainable design process, Architectural Energy Corporation developed the VisualDOE® building energy analysis simulation software. VisualDOE is a user-friendly version of the DOE building energy analysis software created by AEC for design architects and engineers, and has many advanced modeling features to simplify, yet enhance, the process of whole-building energy modeling.

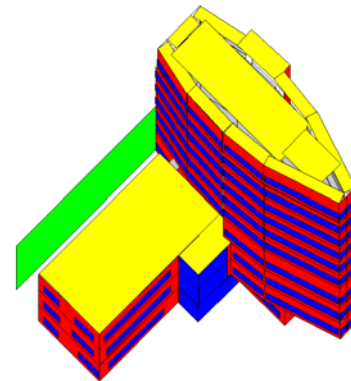


AEC energy modeling staff has performed tens of thousands of energy simulations on a wide variety of building types and in numerous climate regions. Consequently, we understand how to create an accurate model of the proposed design and how to evaluate energy saving design alternatives, including life cycle cost analysis of energy saving design options.

A few examples of the graphic representation of the building energy model and of the output (results) are presented below to indicate the types and forms of energy modeling results generated by AEC energy modeling staff.



K-12 School



Corporate Office Building

Working from 2-D or 3-D CAD files, AEC energy modeling staff create a geometrically accurate representation of the proposed design solution. Next, the building attributes are fully defined, such as occupancy loading, envelope insulation levels, glazing properties, building thermal capacitance, lighting power densities and schedules, mechanical system design and numerous other building characteristics which interact and influence the dynamic energy performance of the building.

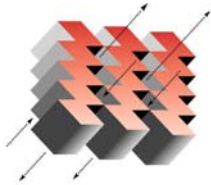
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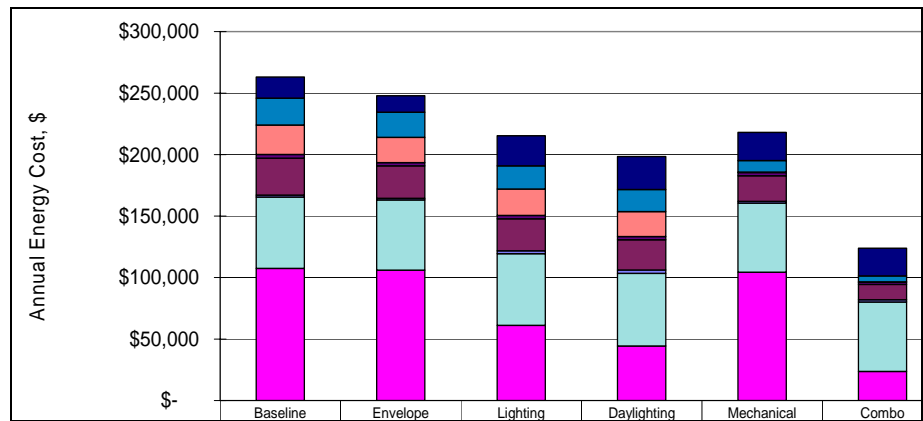
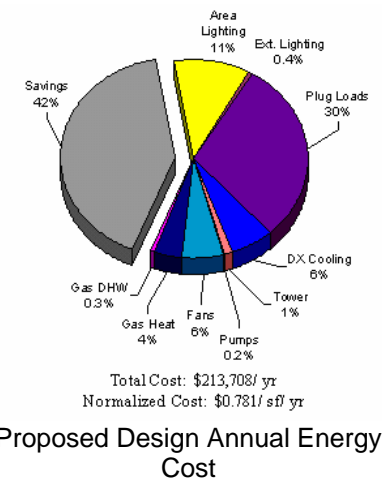
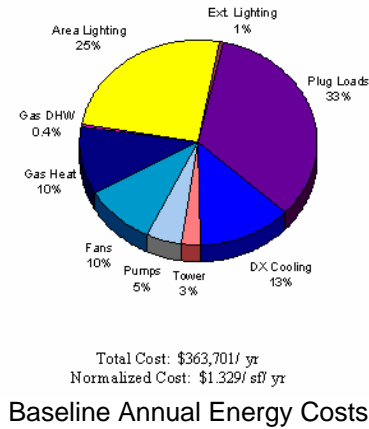
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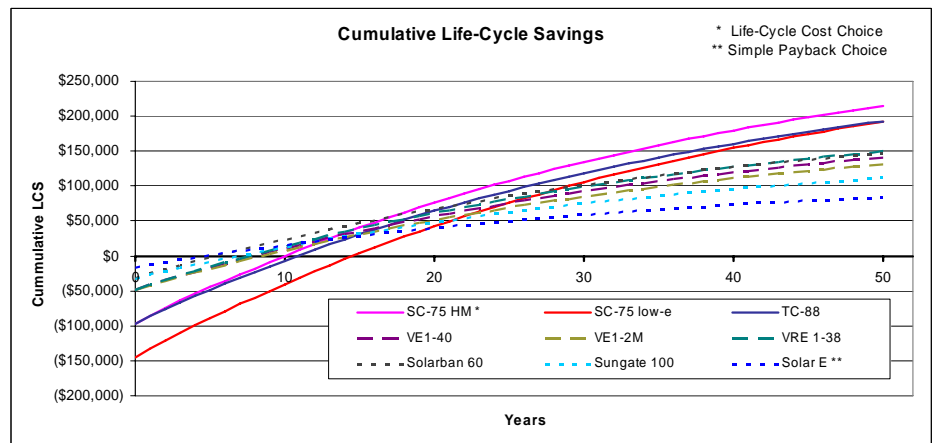


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During the Pre-Design Phase, a baseline (reference) energy model, based on the local energy code, ASHRAE 90.1 energy standard or other energy performance metric, is created and run using local climate and utility cost data as a means to evaluate energy saving design strategies, and to establish a realistic energy efficiency goal. Envelope, electric lighting, daylighting, HVAC and other energy saving design alternatives are analyzed to assist the design team select and integrate the most beneficial energy saving design strategies.



The energy model can also be used to calculate the energy savings of alternative design solutions, such as different glazings in the figure below, and to calculate the life cycle cost/savings of the alternative design solutions.



Energy modeling is an essential part of the sustainable design process. It allows the design team to make informed decisions on a variety of energy saving design strategies, and to integrate and refine these strategies into an optimized whole-building design solution.

AEC energy modeling staff are an invaluable resource to the design team throughout the design process as energy saving design strategies are evaluated, selected and integrated into the final design solution.