

Executive Summary

Through the course of a year, a building consumes mass quantities of energy, much of which is often wasted through inefficiencies in design, use, and operating practices. While building use and operating practices can not be controlled by the building design team, limits on energy consumption are possible through careful planning and an attention to detail in the design process. To achieve an energy efficient project, the engineers, architects, and other team members must collaborate with all of the building systems and components to produce a functioning, coherent whole. In an effort to expedite this process, the building industry has created a series of design tools that will conscript energy saving components, monitor possible energy consumption, and provide a basis of comparison to the performance of other building projects.

As the building energy performance directly affects life cycle costs as well as the environment, an analysis of building energy performance is a key component of the evaluation of any building project. Therefore, the Eberly Campus Community Center has been subjected to an in-depth energy performance analysis incorporating several rigorous proscriptive codes, a comparison and rating tool, and an entire building energy simulation program. These tools are industry standard and include the LEED New Construction rating system, ASHRAE Standard 90.1-2004, and the Trane Trace 700 energy modeling program. After an extended use of the above tools, a comprehensive snapshot of the energy use of the community center has been constructed.

Applying the analysis of the project energy use, there are several glaring comparisons to be drawn. While the energy model has dutifully computed the building loads and has ejected the building energy use, the energy standards and the LEED rating system reflect unfavorably upon the energy usage of this campus building. Unfortunately, the study of the Standard 90.1-2004 in reference to the Eberly Campus Community Center proves that the building design is not code compliant in nearly every examined system. As well as the code compliance results, LEED rating system has the project performing at a substandard level: about 15% of the idealized building comparison case. After this rigorous study of the project energy performance, it becomes painfully obvious that the community center is performing below the level of the current industry standard. Energy saving measures should be considered in future modifications and be applied whenever the design permits.