



Green from the Start: Sustainability and Sketch Up

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The building sector is responsible for the majority of CO2 emissions on an annual basis. Sustainable building design is an opportunity for us to directly address this issue. The most important decisions are made early in the design process, and designers need instantaneous information to act on the environmental impacts of their design ideas. Creating schematic environmental design tools that work with Sketch Up helps create and document sustainable designs.

Energy modeling has become commonplace, with designers seeking to obtain high performance design solutions for their projects. The question that very rarely gets asked is "How far can this building go without needing a mechanical HVAC system?". Chhaya 2.0© is an excel based design tool that helps designers optimize glazing size and orientation, shading and natural ventilation to extend the period that the building can run passively. It used TMY2 weather data and a series of interactive matrices to help the user come up with optimal design solutions. The use of slider bars to allow the user to increase window sizes as well as shades in each direction and ventilation rates allows the architect to enter the world of the engineer with instantaneous interactive feedback to building shell decisions.

The shading information from Chhaya can be easily added to a Sketch Up model and imported into various daylighting analysis programs such as AGI 32. This allows heat gain and glare control to be quickly understood and optimized, further reducing energy used for electric lighting as well as reducing cooling loads.

The impacts of energy use can be assessed by importing sketch up information in to a program such as "Greenfoot" which calculates a buildings carbon footprint as well as the amount of land necessary to offset these emissions. Capacity analysis can also show how to balance water collection and consumption, as as other building impacts.

Green design makes a difference, and you can be part of the solution. Try out our tools at the following url and get to work on our sustainable future!

<http://bet.rmi.org/our-services/resources.html>

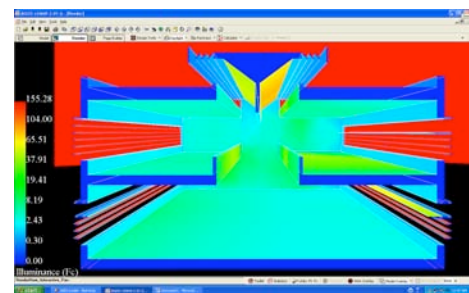
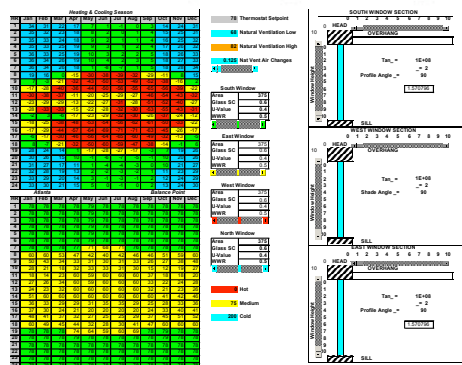
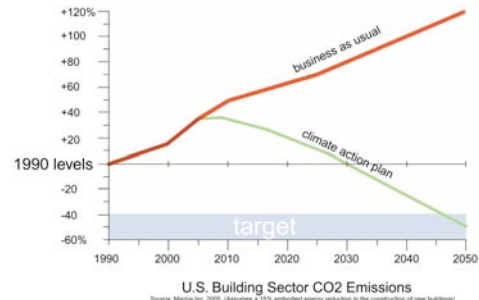


Fig. 5: A screenshot of the comprehensive version of Greenfoot, showing the design sliders