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ARTICLE

Sustainable Lighting Design

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In our inaugural Issue of Light Talk Newsletter issue, we are featuring an article by Deborah Gottesman, of Gottesman Associates in Toronto Ontario. Her firm provides services in all facets of light, design, energy management, studies, system analysis, education, and project management. Deborah's portfolio includes work with the Royal Conservatory of Music, the University of Toronto and Indigo Books, among others. This article is an excerpt from a speech she gave to the Ontario Association of Architects in 2008 and addresses ongoing concerns about the use of low voltage and incandescent technology in our industry. To find out more about Deborah's work please visit www.gottesman.ca



The International Association of Lighting Designers defines sustainable lighting as design that meets the qualitative needs of the visual environment with the least amount of impact on the physical environment. To meet the qualitative needs of the visual environment, we define what should be lit, then put the right amount of light where it is needed. We consider the important lighting principles such as visual task requirements, contrast, uniformity, colour, and glare for example.

Minimizing our impact on the physical environment is the next step; how can the needs of the visual environment be met with the lowest energy consumption. This goes beyond selecting the light source with the highest efficacy and highest efficiency luminaire.

$$E = P * t$$

kilowatt hrs = watts of lighting * time (hours of use)

Energy is power consumed over time. In order to achieve true energy efficiency, lighting control must be considered. Compare a compact fluorescent luminaire that is left burning continuously to a (higher wattage) halogen that is in use 25% of the time and it can be dimmed when in use. The energy consumption of both systems would be almost identical. Furthermore, the lighting controls have extended the installed life of the halogen lamp to equal that of the compact fluorescent. In this situation, the overall environmental impact of the halogen is much lower than that of the compact fluorescent. (Interesting considering which lamp is soon to be "banned").

Lighting consumes many resources through its life cycle: materials, packaging, transportation, among others. They may be easy to list, but their environmental impact is often difficult or impossible to establish. For example, how much energy was used to manufacture, package and ship each subcomponent in each fixture? It is still prohibitively time consuming to attempt to quantify. So what to do until we figure this out? First, take some comfort in the fact that more than 80% of the "input" into a lighting system over its life cycle is energy consumption. Then, do whatever you can to reduce the impact, by using local product, or product containing recycled components, as long as those choices don't compromise the overall design.