

“Greening” the light bulb

by Anne Phillips

DID YOU KNOW THAT 20 percent of all electricity generated is used to power light sources – like light bulbs? But only 5 percent is used to create light; and, 95 percent of it is lost to heat. That’s inefficient, and expensive – expensive enough to drive scientists, entrepreneurs and government organizations to search for lighting solutions that use energy more efficiently.

One of those initiatives is the solid state lighting project, a three-year, \$9.1 million venture unveiled in September 2006. Backed by Group IV Semiconductor Inc., Sustainable Technology Development Canada (STDC) and Encana Corp., the project aims to develop a light bulb that is 90 percent more efficient than traditional incandescent bulbs. (To learn how they work see home.howstuffworks.com/light-bulb.htm.)

Recent innovations in light bulb technology have already brought to market the more energy-efficient compact fluorescent

light bulb will provide a cool white light that uses 10 times less energy than current incandescent bulbs and will last up to 25 years (50,000 hours).

The potential energy savings and long life of these new bulbs could certainly inspire procurement professionals, building managers and construction engineers to consider purchasing them, even if the cost was considerable. Life cycle analysis could well make a substantial investment worthwhile over time... and maintenance costs would definitely be reduced.

On the cost front, one of the key goals of Group IV is make the new lights affordable. When asked what affordable meant, Group IV CEO Stephen Naor, said the project was hoping to “develop a commercial product that was priced comparably to the prices people currently pay for light bulbs today and that could be used in existing light fixtures.” Being a cool light, it would be useful in situ-

50,000 hours (20 or more years) has enough built-in obsolescence to sustain their infrastructure and the sales cycle of the product. Current manufacturing processes and sales cycles are structured around incandescent bulbs that burnout at roughly 1,000 hours or less, and the newer compact fluorescents, which would be replaced around 5,000 hours.

But who knows what the cost of producing and delivering electricity will rise to and that puts increased pressure on everyone to change the way we do things... including changing the light bulb.

Natural Resources Canada Minister Gary Lunn, present at the announcement of the solid state lighting project, said, “This [research] is a sound investment for Canadians... one new source of energy, currently untapped, is to [capture or reduce] the energy wasted [by current technologies]. Technology will help Canada become a leader in the environment.”

This research has been ongoing over the last three years as Group IV worked with its consortium partner, McMaster University, the Ontario Centres of Excellence and the National Research Council’s Canadian Photonics Fabrication Centre in Ottawa. As always, researching big ideas requires big money. STDC, a not-for-profit foundation of the federal government, will contribute \$2.1 million, Encana’s Environmental Innovations Fund will provide \$2.5 million and Group IV has leveraged the remaining \$4.5 million of needed project funding from other sources, including McMaster University. With its funding partners in place Group IV Semiconductor Inc can now continue its work on developing a “greener” and affordable light bulb. *mw*

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light bulb (More info can be found at www.earthesy.com/live_energyeff_lighting.htm) that is four times as efficient as the incandescent one and lasts longer – about 5,000 hours instead of the usual 1,000 hours. The new compact bulbs last longer, but they are more expensive at the point of purchase. So, people looking for savings will have to look at their electric bill, not the grocery bill.

The solid state lighting project hopes to go well beyond the efficiencies and savings generated by compact fluorescent technology by replacing the traditional incandescent light bulb filament with a small silicon chip in which the electricity will convert electrons to photons directly to create light. The new

ations where heat is an issue such as freezers, fridges and display cases.

Obviously this will take some time to do but the potential environmental benefits of a product priced so the average consumer would choose it... given the cost of groceries and electricity... could be immense. As well, this technology would not only benefit Canada, but would be useable worldwide.

Group IV and its partners plan to work with light bulb manufacturers to incorporate solid state lighting (SSL) into their products. The potential market is huge, and using silicon would lower costs over other SSL solutions. However, the manufacturers will also need to consider whether a bulb that lasts for

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