

Group IV Semiconductor develops low cost silicon based energy-saving solid-state lighting

The wide-spread use of Group IV's SSL microchip technology will significantly reduce greenhouse gases and criteria air contaminants and cut global demands for electricity

Fast facts

Corporate profile

Group IV is a frontrunner in the race to create silicon based solid-state lighting (SSL). Group IV's semiconductor bulbs will be highly efficient, contain no mercury and use the same low cost materials and high volume production processes that are used to make the chip sets for today's electronic devices.

Why Ottawa

Ottawa is an international centre of excellence in optoelectronics. Ottawa's wealth of expertise is prized by the Group IV Semiconductor team — and gives the company access to Ottawa's National Research Council Canadian Photonics Fabrication Centre, a world-class facility. Group IV's management team contributes to the collective tech know-how in the Ottawa region, for the benefit of all.

Business advantage

US\$12 billion is spent globally every year on lamps for general illumination. Yet conventional lighting is grossly inefficient. Remarkably efficient and versatile, Group IV's solid-state lighting could save some 860 TWh of electricity per year and eliminate 200 million tons of annual carbon emissions worldwide. These huge numbers are tied directly to cost savings for consumers and businesses.

The enormous opportunities for solid-state lighting (SSL) technology inspired the formation of Ottawa's Group IV Semiconductor in 2003. The world's dependency on light to live and work in comfort and safety accounts for as much as 20% of all electricity consumption.



Group IV is a frontrunner in the race to create all-silicon solid-state light engines. Using semiconductor processes, instead of gases or filaments, to generate light, these devices can be far more efficient than conventional bulbs and have lower costs than LED alternatives. The same low cost materials and high volume production processes used for silicon-based SSL are used to make the chip sets for today's electronic devices — everything from computers to cell phones.

Unlike compact fluorescent bulbs (CFLs), no mercury is used in Group IV's all-silicon alternative. The company has concentrated its development on driving down the cost of the solid-state bulb because if the new bulb isn't as affordable as a compact fluorescent, nobody will buy it and the energy savings potential will not be realized.

James Fraser, writing about Group IV for his Energy Blog, adds, "While compact fluorescent bulbs (CFLs) have caught on lately with their promise of energy savings, they're still only about 20% to 25% efficient. Lamps with SSL technology, by comparison, can achieve efficiency levels as high as 80%."

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Group IV investors include Canadian VC's, Garage Technology Ventures Canada and BDC Venture Capital. Sustainable Development Technology Canada (SDTC) and Canadian energy giant EnCana Corporation are providing funding for the development and demonstration of the Group IV technology.

Group IV's management team has decades of experience in Ottawa tech companies like Nortel, Newbridge, JDS Uniphase, OpTel Technologies, Mitel and Zarlink. This team knows the value of doing business in Ottawa and their backgrounds in engineering, advanced technology planning, semiconductor components market development and semiconductor optoelectronic and microelectronic technology contribute to the collective tech know-how of the Ottawa region — for the benefit of all.

According to the Ottawa Citizen's Vito Pilleci, the 27-employee firm can be considered the ultimate "green" company. The company's lighting technology is actually "recycled" from Ottawa's world-leading infrastructure and know-how in optoelectronics for telecommunications.

Business advantage

The SSL solution is a powerfully bright idea. In 2011, regulations effectively outlawing the sale of traditional

incandescent bulbs in Ontario, Australia and Britain come into effect. The U.S. is considering the same ban. A Forrester Research study states, "more than 50 percent of adults in the U.S. will pay more for a product simply because it is environmentally friendly."

Consumers and corporations are sensitive to rising energy costs and the pressure to use greener sources of energy. Conservation makes sense, but requires some effort to put into practice when homes, businesses and public spaces are increasingly dependent on electronic systems and devices. SSL offers the means to cut back on energy consumption and its associated costs as SSL devices use 90% less energy and last up to 50 times longer than incandescent light bulbs.

US\$12 billion is spent globally every year on lamps for general illumination. Yet conventional lighting is grossly inefficient. Compact fluorescents produce large amounts of waste heat — about 75% of the electricity used is lost in this way.

Remarkably efficient and versatile, solid-state lighting could save some 860 TWh of electricity per year and eliminate 200 million tons of annual carbon emissions worldwide. These huge numbers are tied directly to cost savings for consumers and businesses. That's an undeniably compelling business case.

Future growth plans

Group IV's objective is to sell high-efficiency silicon light engines to lamp manufacturers, exploiting the industry's transformation from the energy-wasting light sources of the past to the efficient solid-state technology of the future. Group IV plans working prototypes of its SSL technology to be ready by 2010 with the made-in-Ottawa light bulbs ready for commercialization soon thereafter.

To prepare for manufacturing and deployment, Group IV is collaborating with California's Applied Materials Inc., a global leader in nanomanufacturing technology solutions. Low-cost and highly efficient, solid-state light solutions significantly reduce greenhouse gases (GHGs) and criteria air contaminants (CACs) by cutting down on the need for electricity generation and contribute to a more sustainable future.

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