

# Group IV Semiconductor's bright idea — silicon based lighting that uses 90% less energy and lasts up to 50 times longer than incandescent bulbs

*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

After four years in research and development, Group IV is a frontrunner in the race to create commercial silicon solid-state lighting (SSL). Group IV's microchip bulbs are long-lasting semiconductor devices. The same basic materials found in SSL are used to make the chip sets for today's electronic devices — everything from computers to cell phones.

### 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.



After four years spent in research and development, Group IV is a frontrunner in the race to create commercial silicon SSL. Group IV's microchip light bulbs are long-lasting semiconductor devices, instead of gases or filaments, that generate light far more efficiently than conventional bulbs and much more economically than LED alternatives. The same basic materials found in SSL are used to make the chip sets for today's electronic devices — everything from computers to cell phones.

No toxic mercury or phosphor is used in Group IV's all-silicon alternative and the entire bulb will be recyclable. The life span of Group IV's product is estimated at 10,000 hours. The company has concentrated its development on producing a low-cost new microchip light bulb because, if the new bulb isn't as affordable as a compact fluorescent, nobody will buy it.

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%."

### Why Ottawa

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Group IV investors include companies located near Ottawa. Montreal, Quebec-based Garage Technology Ventures Canada

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(Garage Canada) invests in Group IV technology. Garage Canada was founded because unexploited opportunities and synergies exist in technology markets in Silicon Valley and Canada. Sustainable Development Technology Canada (SDTC) is also an investor and works with the company.

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 23-employee firm can be considered the ultimate “green” company. Its lighting technology is actually recycled technology from the city’s telecommunications market.

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## **Business advantage**

The SSL solution is a powerfully bright idea. In 2011, regulations 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 microchip light bulb technology to lamp manufacturers, such as Phillips and General Electric, for use in commercial and consumer products. The company’s product development is also tied to dramatically reducing the cost of solid-state lighting. Group IV plans working prototypes of its SSL technology to be ready by 2010 with the made-in-Ottawa light bulbs appearing on store shelves by 2011.

To prepare for near-future 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, silicon based 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.

## **Contact information**

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