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CORPORATE EFFORTS

Fairchild Semiconductor is a leading supplier of power semiconductors to the world, with corporate offices and one of its manufacturing facilities located in South Portland, Maine. Our products optimize system power, thereby helping our customers and end-product consumers to reduce energy consumption and reduce their global environmental footprint by reducing the global need for electricity generation and by the corresponding reduction in carbon dioxide (CO_2) emissions. Although end-product energy efficiency is part of our business plan, we also take an active role in reducing energy use in the manufacturing process and take pride in encouraging others to do the same.

We also understand that energy use has an environmental impact associated with it, be it directly (burning fossil fuels) or indirectly (consuming electricity). Top management, along with employees at every site, supports the notion that human beings have contributed significantly to the acceleration of the global warming via the direct release of CO_2 to the atmosphere, or by other emissions that have a global warming potential. Our corporate environment policy sets the stage for every site around the world to commit to continuously reducing their environmental impacts. Greenhouse gas (GHG) emissions are on the top of every site's list. Since 1992, the company has been actively engaged in efforts to reduce our GHG emissions by making voluntary commitments with industry associations and the government, such as Maine Department of Environmental Protection's (DEP) "Governor's Carbon Challenge" and the U.S. Environmental Protection Agency (EPA) Performance Track's "Carbon Challenge."

Most recently, Fairchild became a member of the EPA's Climate Leader's Program. By being a member of Climate Leaders, the company agreed to establish and achieve goals to reduce GHG emissions. In doing so, Fairchild established GHG "inventories" for the three U.S. operations from 2003 (baseline year) to the present. Each year's GHG inventory is sent to the EPA in a summary report. To ensure all sites are capturing all GHG emissions sources that are required to be reported, an inventory management plan was created and is updated whenever sources of GHG are added. In March 2007, Fairchild set a goal of reducing U.S. GHG emissions by 30 percent per manufacturing index from 2003 to 2010.

SITE EFFORTS IN MAINE

Two of the tools Fairchild's manufacturing sites use to drive energy-efficiency programs are environmental management system (EMS) implementation and ISO 14001 registration, an environmental management registration system. To maintain registration, each site must demonstrate that it has effectively implemented and maintain an EMS that meets international standards.

Having an effective EMS program is the catalyst for being able to voluntarily commit to reducing environmental impacts. Each site determines the most significant environmental impacts, and it turns out that every site has established GHG emission reduction goals. The South Portland site has established objectives and targets (1) to reduce GHG emissions from indirect emissions released from the generation of electricity, on site fossil fuel combustion, and process emissions including perfluorocompounds (PFC), nitrous oxide (N_2O) and

fugitive emissions from perfluorinated liquids (refrigerants); (2) to reduce extremely hazardous chemical usage; (3) to reduce hazardous waste generation; and (4) to improve stormwater runoff to Long Creek.

THE KEY IS IN TEAMS

We feel very strongly that to successfully increase our energy efficiency, we need to work as a team. This is why energy and environmental initiatives are tackled in teams that research, share, and implement energy and environmental reduction projects. These teams are comprised of members from the facilities, plant engineering, environmental and process/manufacturing departments and from each of the seven manufacturing sites worldwide.

It is interesting to note that driving energy efficiency is good for business in more ways than one. Generally speaking, people naturally take an interest in reducing energy consumption. We are finding that many of our in-house key leaders are pushing themselves to acquire more knowledge in the subject area of environmental and energy management. Working together in cross functional teams, our employees have collectively gained a much greater understanding of how their complex facilities work as "interconnected systems," rather than as parts and pieces. By having a deeper understanding, our teams have been able to optimize plant efficiency by simply being smarter. Following are a few examples which articulate this concept:

- Maintaining steam pressure just above the plant's critical point. This is accomplished by understanding each system in the plant and how those systems interact with one another and the external environmental conditions.
- Maintaining chilled water temperatures just below the plant's critical point. This requires constant attention to outside environmental conditions in order to manipulate the chiller/free-cooler plant. The plant engineers understand which chillers are the most efficient and sequence them to match loading.
- Temperature and humidity control is maintained at exact requirements. By understanding factors such as the current outside conditions, the weather forecast, which chillers are online and available, supply fan operating conditions, and how each separate area in the plant is currently operating, the plant engineer uses a systems approach to evaluate the situation and makes decisions that will maintain temperature and humidity control and optimize equipment efficiency.

Once the critical system parameter is understood (system pressure, temperature, or moisture, for example), the team typically searches for the one piece of equipment responsible for driving that system parameter (they call it "the search for the weakest link"). This process of continually searching for the weakest link has resulted in tremendous energy savings with virtually no up-front costs other than finding quality-driven leaders.

The team also seeks to incorporate innovation and technology with energy management efforts. For example, our "standard practice" requires us to install electric motors with premium efficiency ratings and variable speed drives; to replace less-efficient heating, ventilating, and air conditioning systems with more efficient models; to employ heat recovery wherever feasible (our engineers call this "BTU chasing"); to use electronic controls and create sophisticated control strategies; to test-adjust and balance systems on an ongoing basis; and to migrate lighting to high-performance fixtures and to consolidate smaller systems into larger centralized systems. In addition to standardizing, the teams have discovered some unique opportunities to improve efficiency. To name just a few, the team at the South Portland site most recently installed high-speed (open/close) doors on loading dock entrances; installed a non-potable water collection system; and installed additional free cooling capacity, which means chilled water is made with Maine's cold outside air.

Looking forward, the Maine team is currently working with the Governor's Office of Energy Independence and Security to explore the feasibility of installing tri-generation at the South Portland site.

Tri-generation is a concept to simultaneously generate three primary energy requirements (electricity, heating, and cooling) from a single fuel input. Although the project is still in its infancy, it appears to have the ability to become viable, especially if the government promotes financial incentive programs for industry, such as the proceeds from the Regional Green House Gas Initiative (RGGI), for projects that support low-carbon-intensity solutions, such as tri-generation.

CONCLUSION

Especially during tough economic times, it is important for business to have constancy in purpose for pursuing energy conservation and pollution prevention measures that mitigate global warming, support sustainability, conserve natural resources, and reduce environmental impacts. Having good people is not enough. To succeed, we need to continually seek deeper understanding of the interconnectedness of our facilities with the organization. Who knows, we may even create a few new jobs along the way.

Joel H. Rouillard coordinates the environmental performance of Fairchild Semiconductor's South Portland manufacturing facility. He is responsible for resolving environmental issues from a holistic perspective. He is also a leader in developing the site's environmental strategies, promoting sustainable efforts such as resource use optimization, pollution prevention, and waste management.