



**SUPERIOR**

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## Office of the Mayor

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**Mayor Dave Ross**  
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Superior, WI 54880  
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May 6, 2010

Great Lakes and St. Lawrence Cities Initiative  
Attn: Pam Kaput  
177 North State Street, Suite 500  
Chicago, IL 60601

Dear Ms. Kaput:

Please consider the City of Superior (population 27,100) as a candidate for the Wege Small Cities Sustainability Best Practices Award. In 2008, the City installed a Solar Bee aeration system (description attached) at our main Wastewater Treatment Facility.

The Solar Bees are powered by the sun, a completely "green" energy source and have generated savings in energy costs to the rate payers of the City's waste water enterprise fund. This project meets the triple bottom line criteria established by the Great Lakes and St. Lawrence Cities Initiative for the Wege Award.

The savings generated by the use of solar power provide both an economic benefit to the rate payers that fund the treatment of the waste water and a social equity aspect in that the savings are passed on to all 9,827 rate payers equally. This project has also allowed the City to model environmental stewardship with a shift to "green" energy for its operations. In fact, the project was so attractive to Focus on Energy (an organization dedicated to renewable energy projects) that they provided 25% of the project cost.

If the City of Superior is the successful Wege Award recipient, we intend to use the \$5000 prize to establish a public/private partnership to encourage the installation of low-flow toilets in our community. The funds would be used to leverage private investment in water conservation with a match for the purchase of low-flow toilets.

We are pleased to have an opportunity to show leadership as a small community and we believe our project models a best practice for other Great Lakes communities. You may contact Mary Morgan (715-395-7279 or [morganm@ci.superior.wi.us](mailto:morganm@ci.superior.wi.us)), or myself, if you need additional information.

Sincerely,

Dave Ross  
Mayor

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**City of Superior, Wisconsin  
Environmental Services Division of the Department of Public Works**

**Solar Bee Aeration System Installation (July of 2008)**

**Project Description**

The 90 million gallon overflow basin for Combined Sewage Treatment Plant (CSTP#2) co-located at the main wastewater treatment facility in the City of Superior provides storage volume and biological treatment for combined sewage. The basin utilizes aeration stabilization where microorganisms use oxygen to degrade organic material. The original aeration system for the basin was one of the largest energy users in the treatment process. In 2008, the original aeration system was near the end of its life cycle and required major upgrades or replacement. The City of Superior installed four Photovoltaic Mixing Units (Solar Bees) to achieve aeration requirements and improve treatment efficiency. Solar Bees are solar powered mixers which continually bring the water from the bottom of the pond to the top. As the low-oxygenated water from the bottom of the pond comes to the surface, oxygen is absorbed through contact with the air. This mixing of the pond accelerates the normal purification process. Surface re-aeration is significantly more efficient than forcing air to the bottom of the pond in pipes, then letting it bubble up through the water with the hope that the water absorbs the oxygen as the air passes through it.

Because the Solar Bees were predicted to yield substantial energy savings, the project was attractive to Focus on Energy, a program which works with eligible Wisconsin residents and businesses to install cost effective energy efficiency and renewable energy projects. The City was successful in securing a Focus on Energy grant for 25% of the project cost.

**Project Benefit**

Energy savings are based on changing the number of aeration blowers and the blower run time strategy to reduce both total kilowatt hours usage as well as demand kilowatts. Future wet weather management strategies will most likely bring more flow to CSTP#2. Higher flows coupled with more stringent effluent limits truly necessitated maximizing the treatment efficiency of the pond. The fact that the Solar Bees are powered by the sun, a completely "green" energy source, gave the City of Superior the opportunity to show environmental stewardship at no additional financial cost.

The Solar Bees cost approximately \$160,000 to install. In 2009, the first full year of Solar Bee operation, the kWh energy savings represented \$18,000. Based on the first few months of 2010, the savings are expected to increase to \$20,400 annually. A conservative estimate, not including the Focus on Energy grant funds, would yield an 8-year payback. When factoring in the grant, the payback will take place in 6 years.

The City of Superior is pleased to offer these "green" savings to its 9,827 wastewater rate payers.