

Energy Star

A Minnesota power company leads by example by pursuing LEED Platinum certification for its new Maple Grove headquarters. Its customers will be invited to visit the complex to learn how an ultra-electricity-efficient building works.

BY CAMILLE LEFEVRE

Is a sustainably designed electric-company headquarters an oxymoron? "Absolutely not," says David Saggau, president and CEO of Great River Energy (GRE) in Maple Grove. "We're a cooperative, formed in 1999, and we have one of the most aggressive environmental policies of any utility out there. Our environmental-stewardship record is born of a cultural desire to sustain the environment, and that starts at the top, with me. But the 1.7 million people we supply electricity to have also, collectively, decided what our footprint on the world should be."

At the same time, Saggau continues, "Conservation is good business. From purely a business standpoint, our cheapest kilowatt is the one we don't have to produce." So when GRE was ready to build a new headquarters, Saggau asked Minneapolis architecture firm Perkins+Will to design a LEED Platinum (the highest level in the U.S. Green Building Council's rating system) showcase of "how to build sustainably at reasonable costs to reduce electrical-energy consumption," he says.

That wasn't all. Saggau also challenged the architects to "incorporate at least one energy-efficiency feature that's never been used in

any building before. Because for this research to evolve, people need to take the risks and push the envelope." Perkins+Will's sustainable-design guru, Doug Pierce, AIA, had a simple reply: "We can do that!"

The resulting innovation utilizes nearby Arbor Lake as a geothermal heating and cooling system that, in combination with under-floor displacement ventilation, dramatically improves indoor air quality and workplace productivity. The first-of-its-kind heating and cooling system, just one of the building's more than 100 green initiatives, will help the four-level, 166,000-square-foot, glass-clad complex operate approximately 50 percent better than what Minnesota code mandates.

Two renewable energy sources—a mid-scale commercial wind turbine and a solar photovoltaic array—will produce 12 to 15 percent of the total energy needed by the building when it opens this spring. Three-story atriums in the middle of the building (black-box functions like restrooms and mechanicals were pushed to either end) bring daylight deep into the structure, "thus making the building more energy efficient while creating a dynamic and healthy work environment," Pierce explains.

TBD - Two renewable energy sources—a mid-scale commercial wind turbine and a solar photovoltaic array—will produce 12 to 15 percent of the total energy needed by the building when it opens this spring.



“In a sustainably designed work environment, every part of the building has to perform multiple roles to achieve optimal system-wide efficiency. In other words, every component in the design contributes synergistically to functional goals, operational goals, economic goals, sustainability goals, and ultimately to a beautiful future for our planet.”

—Architect David Dimond





“The building will be open to anyone who wants to see any of the energy features we have. It’s going to be an educational lab for smart construction. And one of the most energy-efficient buildings in the world.”

—David Saggau, president and CEO of Great River Energy

PERKINS+WILL

TBD - The building utilizes nearby Arbor Lake as a geothermal heating and cooling system. The first-of-its-kind system will help the four-level, 166,000-square-foot, glass-clad building operate approximately 50 percent better than what Minnesota code mandates.



PERKINS+WILL



LUCIE MARUSIN



LUCIE MARUSIN

GREAT RIVER ENERGY HEADQUARTERS

Location:

Maple Grove, Minnesota

Client:

Great River Energy

Architect:

Perkins+Will
www.perkinswill.com

Principal-in-charge:

Dave Dimond, AIA

Project lead designer:

Dave Dimond, AIA

Sustainable design planning:

Doug Pierce, AIA

Energy modeling:

The Weidt Group
www.twgenergy.com

Mechanical and electrical engineer:

Dunham
www.dunhameng.com

Landscape architect:

Close Landscape Architects
www.closeandarch.com

Construction manager:

McGough Construction

Size:

166,000 square feet

Cost:

\$42 Million

Completion date:

March 2008

Renderings:

Perkins+Will

In addition, the building's poured-in-place concrete structure replaced more than 50 percent of the Portland cement with fly ash (a post-industrial waste recycled from coal-fired power plants). Ninety-five percent of construction waste was diverted from landfills, while recycled and locally manufactured products and Forest Stewardship Council woods were used throughout. The project is saving more than two million gallons of water annually by using water-efficient faucets and fixtures, as well as rainwater to flush toilets and irrigate landscaping. That's a 90 percent reduction in city water use over a similar office building.

The list goes on. Spectrally selective glass, sunshades, and light shelves were incorporated into the south façade, while glazing in the east and west façades was reduced to control glare and solar heat gain. And the building uses new super-energy-efficient "green" elevators that reduce energy use by 60 percent over traditional hydraulic elevators.

But the building is more than just a compendium of energy-saving strategies and technologies, says project principal and lead designer David Dimond, AIA. "In a sustainably designed work environment, every part of the building has to perform multiple roles to achieve optimal system-wide efficiencies," he explains. "In other words, every component in the design contributes synergistically to functional goals, operational goals, economic goals, sustainability goals, and ultimately to a beautiful future for our planet."

So not only will the new GRE headquarters reduce carbon emissions by more than 1,800 tons annually (with 1,500 tons reduced by energy-design features and 300 tons via on-site renewable systems), according to Tom McDougall, Assoc. AIA, of the Weidt Group, which modeled the building's energy systems; the building, sited on a 12.5-acre former gravel pit, will also include an education center that demonstrates for visitors the building's many green technologies. The center will feature real-time measurements of energy use, renewable energy production, water use, and rainwater collection.

"If people don't spend time in our building, seeing how things work, we've missed the point," Saggau says. "The building will be open to anyone who wants to see any of the energy features we have. It's going to be an educational lab for smart construction. And one of the most energy-efficient office buildings in the world."

Indeed, the building's highly visual demonstration of the cost-effectiveness of sustainable design to a broad audience of consumers may turn out to be its greatest achievement. "The magic of this building, what I'm most excited about, is that the incremental cost of building LEED Platinum versus run-of-the-mill construction is five percent," Saggau enthuses. "Meaning, in the long term, we have a six-year payback on the cost of the building. As a nation, and certainly as a state, we've got to mandate construction along these lines because we're running out of resources." **AMN**