HYDROMX®
Energy Saving Nano-Solution

CASE STUDY: DATA CENTER

Project Name: Cass County Electric Cooperative
Location: Fargo, ND
Type: Data Center

The Cass County Electric Cooperative building in Fargo, North Dakota houses a large co-location server room which requires 60 tons of continuous cooling. Cass County serves nearly 60,000 meters in a 10-county area in south-eastern North Dakota.

Cass County Electric Cooperative
A Touchstone Energy® Cooperative

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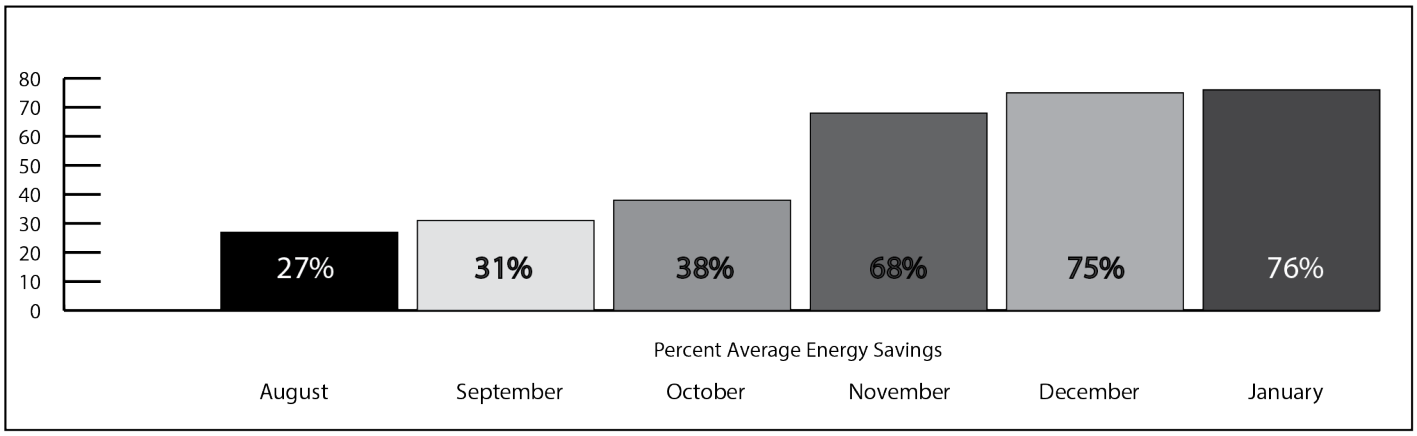
Three 30-ton CRAC units with a N+1 design were selected. Two units carry the required cooling load and one unit remains in standby, only used if one of the two primary units fail. Each CRAC unit is water cooled with its own fluid cooler, hydronic cooling loop, redundant pumps and free cooling coils to off load the mechanical cooling when the ambient temperature is low enough to allow partial free cooling.

Challenge: Data centers are known to consume massive amounts of energy per square foot. Cass County Electric Coop prides itself on being energy efficient. After the discovery of Hydromx's heat transfer fluid Cass County was eager to put it to the test and reduce energy consumption.

Solution: The heat transfer fluid was replaced in one of the three units from 35% ethylene to 50% Hydromx. The second operational unit remained the control with 35% ethylene and the third unit remained untouched. A continuous measurement and verification analysis software was added to monitor the identical units. The software monitored multiple points of BACnet data which includes:



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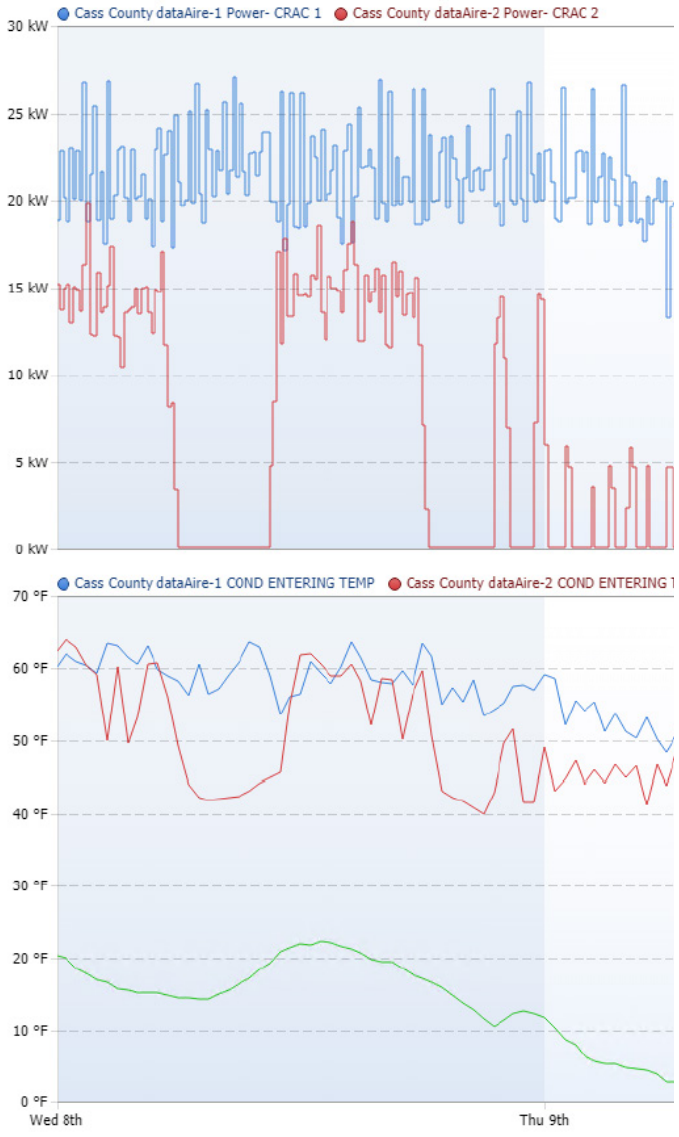
compressor amps, stage-1/stage-2 cooling, free cooling valve position and entering & leaving fluid temperature. Since the Hydromx installation, data was collected at 5-minute intervals on the two operating units with identical loads.

Results: The results of the first six months of performance are shown below. The savings range from 27% in August to 76% in January. Even with August's impressive 27% reduction in energy consumption, the savings continued to climb resulting in increased free cooling hours thanks to Hydromx's improved thermal diffusivity (the rate at which the fluid absorbs and releases heat) which is great than glycol and water.

As a result, Hydromx improves the efficiency of the equipment it is exchanging heat with. With the above performance savings and a blended KWH rate of 0.10, the payback has been calculated to be 9 months for a retrofit installation (approximately 6 months for a new installation). The new installation payback assumes the cost reduction of the original 35% ethylene glycol along with the initial glycol installation.



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About Hydromx

Hydromx is a nano-technology heat transfer fluid that saves a significant amount of energy. Hydromx's propylene glycol outperforms not only other glycols, but it also outperforms water by minimum of 20%.

Hydromx has been proven in multiple installations to save 20-35% energy in heating and cooling systems around the world. The energy savings of the HVAC equipment is thanks to Hydromx's innovative, nano-thermal-technology that increases its thermal diffusivity (rate at which the fluid absorbs and releases heat) and surface area. Hydromx is 100% safe. It recently received NSF's incidental food contact "HT-1" category registration. This first installation showed a 25% energy savings and ROI in less than 3 years. Since that time, Hydromx has been used worldwide to save energy in heating and cooling systems.

For more information, visit www.hydromx.com

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