

## Success Story: NetRiver



# Green without compromise, with the industry's most efficient UPS

**Company:**

NetRiver

**Location:**

Lynnwood, Wash.

**Application:**

Data Center

**Challenge:**

Deliver 1.5 megawatts of clean, computer-grade power with exceptional efficiency, scalability and within a small footprint.

**Solution:**

Eaton® 9395 UPSs, Energy Saver System (ESS), PDUs, Rack Power Panels, Service Contract

**Results:**

\$110,000 in annual utility savings; \$100,000 in utility rebates; industry-leading UPS efficiency of 99 percent across all load ranges; scalable power protection with a smallest-in-class footprint

They say the grass is always greener on the other side of the fence — or, as the case may be, on the other side of the data center aisle. The modern twist on the old adage certainly applies to NetRiver, the leading provider of collocation and interconnection services in the state of Washington.

Indeed, since outfitting its 5,600-square-foot Lynnwood, Wash. facility with a comprehensive range of energy-efficient IT equipment last year, NetRiver has been making data center managers green with envy — racking up hefty utility rebates, generating significant energy savings, and garnering prestigious accolades for its commitment to green efficiency.

Delivering a resilient platform that enables carriers, Internet content companies, hosting firms and enterprises to outsource their network operations, NetRiver supports two facilities that function as primary data centers for the company's 100-plus customers. In addition to its recently expanded Lynnwood facility — which delivers 250 to 500 watts per square foot — the firm also operates a 1200-square-foot data center in Spokane.

Prior to revamping the Lynnwood location with a highly efficient Eaton® power protection solution — plus new chillers and variable frequency drives — NetRiver, like many organizations, was feeling the burden of ever-escalating power demands.

"We're talking about megawatts of power here. We have a large baseline consumption," explains Adam Vierra, the company's sales and marketing manager. "When you take that into account over days, months and years, there's the potential for hundreds of thousands to millions of dollars in savings."

NetRiver certainly isn't alone in its quest to slay skyrocketing energy costs. Across the globe, data center managers are feeling the effects of unmitigated expansion of IT gear, coupled with changes in server technology. Over the past decade, gains in efficiency have failed to keep pace with increases in server computing performance, resulting in growing power density as new power-hungry servers consume more and more energy within the data center.

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NetRiver wins  
BetterBricks Award  
from Northwest  
Energy Efficiency  
Alliance (NEEA).



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Bottom line thinking on energy.



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In fact, according to Gartner, energy was slated to be the second highest operating cost in 70 percent of worldwide data center facilities through 2009 — second only to labor expenses. On average, utility bills comprise 20 to 30 percent of a data center’s operating costs, representing the largest single component of total cost of ownership for many organizations.

Even more, for every dollar spent on new IT hardware, an additional 50 cents must be allocated to power and cooling, according to research from IDC. The cost of electricity has already outpaced the price of hardware, with every \$1 million worth of servers consuming \$1.2 million in electricity over a three-year operating life, according to Uptime Institute estimates — a figure that will only amplify as utility rates continue to rise.

With these mounting challenges, data center managers are increasingly being tasked with finding new ways to improve efficiency and reduce costs. For NetRiver, these goals were achieved after the company chose to overhaul its data center’s critical power systems.

Inefficiencies in uninterruptible power systems (UPSs) are a significant contributor to rising energy costs. While the efficiency of a typical UPS generally ranges from 94 to 95 percent, that rating plunges as the load decreases. And because the majority of IT systems use dual bus architecture to achieve redundancy, most UPSs are supporting loads of less than 50 percent, and often as little as 20 to 40 percent.

Yet even small increases in efficiency can translate to thousands of dollars in savings, resulting from the ability to achieve more real power while lowering cooling costs — outcomes that NetRiver has experienced since deploying three 550 kVA Eaton 9395 UPSs equipped with Eaton’s new Energy Saver System (ESS).

ESS enables the UPSs to attain an industry-leading efficiency level of 99 percent, making it the only technology on the market capable of yielding such results. Using ESS, the UPS intelligently adapts to utility power conditions while supplying clean power to the connected equipment. Even more, because UPSs using ESS maintain 99 percent efficiency even when lightly loaded, the technology can deliver gains of up to 15 percentage points in efficiency over traditional models in the typical operating range.

“For every one percent of efficiency gained, we save about \$10,000 per year,” Vierra points out. “That really adds up.”

Indeed, the data center’s projected savings of 1.5 million kWh per year translates to \$110,000 slashed from its annual utility bill. But that is just the beginning. To reduce the capital outlay required to install the equipment, NetRiver worked with its local utility company, Snohomish County PUD, to secure valuable incentives. The PUD offers technical advice and cash incentives to customers who install qualifying energy efficient equipment in new and existing facilities. Incentives are based on anticipated annual electricity savings and vary by project type.

In addition to receiving funding for installing a pair of 250-ton high-efficiency chillers and new variable frequency drives — which are yielding efficiency savings of 23 percent alone — the PUD allocated almost \$100,000 in funding for the Eaton UPS solution.

From Snohomish PUD’s perspective, it was a worthy investment. “NetRiver strives to be one of the greenest data centers, and selected the most energy-efficient solutions,” says Sinh Tran, senior energy efficiency program manager for the utility. “We believe in supporting customers who seek and employ innovative energy efficiency solutions.”

Tran acknowledges that he was initially skeptical about the legitimacy of ESS technology. “At first I wasn’t very optimistic,” he admits. “But we have metering data that shows that the manufacturer’s claimed efficiency was achieved. We got the energy savings that we were looking for, and are pleased with the results.”

“The Eaton model allowed us to hit that 99 percent metric right off the bat,” Vierra confirms. “And we hit 99 percent efficiency at just 20 percent of load.”

**The 550 kVA Eaton 9395 UPS beat all the competition in footprint, weight and freight.**

Manufacturer	kVA	Density (kW per ft <sup>2</sup> )	Weight (lb.)	Footprint (ft <sup>2</sup> )	Dimensions (HxWxD, in.)	Cross-country freight cost
Eaton 9395	550	29.6	2977	16.7	73.6x32.7x73.7	\$893
Competitor A	500	24.1	6900	18.7	69.0x39.0x82.0	\$2,070
Competitor B	500	24.0	5226	18.8	80.7x33.5x76.7	\$1,568
Competitor C	500	23.9	5512	20.9	94.0x32.0x71.0	\$1,654
Competitor D	500	23.1	5795	19.5	72.0x39.0x78.0	\$1,739
Competitor E	600	20.6	6373	29.1	99.8x42.0x80.8	\$1,912
Competitor F	500	15.1	6930	29.9	114.2x37.7x79.7	\$2,079

“We were selected in the category of multi-disciplinary team, so they are recognizing us along with our partners who helped develop and implement the solution,” Vierra explains. “We chose the newest technologies because they fit the bill and met all our requirements. The whole package deal for us has been great.”

Equally impressed with the solution was BetterBricks, the commercial building initiative of the Northwest Energy Efficiency Alliance (NEEA), which is supported by local electric utilities. Through the BetterBricks initiative, NEEA advocates for changes to energy-related business practices in Northwest buildings and seeks to help business professionals understand the power of energy efficiency and make a real difference in their buildings and businesses. In March 2010, the organization awarded NetRiver’s data center a BetterBricks Award for leading the way in energy efficiency.

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It was the need for an additional 1.5 megawatts of clean, computer-grade power that initially prompted NetRiver’s management team to consider the Eaton product line for its data center expansion. But high efficiency and bolstered power capacity were just two of the company’s prerequisites for a UPS solution.

“Our criteria were pretty stringent,” Vierra acknowledges. “In addition to cost and efficiency, the footprint was something we really looked at.”

As a collocation provider, NetRiver is ultra-conscious about making the most of every square foot. “Space is very, very expensive for us,” Vierra says. “We rent out space at about \$35 a square foot per month, so any amount we can save as rentable for customers is a huge advantage.”

Scalability was another key consideration, since NetRiver can incur unexpected, large increases in power consumption as new customers are added. With that in mind, the company desired a solution capable of easily scaling to match its unpredictable future growth.

After NetRiver evaluated options from several UPS vendors, the Eaton 9395 emerged as the clear frontrunner. “The 9395 had the smaller design, the transformerless technology, and basically all of the advantages you’d want in a UPS,” Vierra explains.

Boasting the smallest footprint of any UPS in its class — up to 60 percent less than competitive units — the 9395 units occupy minimal real estate in NetRiver’s data center. Furthermore, as the company’s power needs increase, the units can be expanded in building-block increments by adding additional UPS modules — especially valuable since NetRiver is preparing to undergo yet another expansion.

The trio of 9395 UPSs with ESS has also dramatically transformed the company’s power usage effectiveness (PUE), a metric used to describe the energy efficiency of a data center that was created by members of the Green Grid, an industry group focused on data center energy efficiency. PUE is determined by dividing the amount of power entering a data center by the power used to run the computer infrastructure within it, and is expressed as a ratio with overall efficiency improving as the quotient decreases toward one.

“We’re actually at 1.3 for PUE, which is pretty phenomenal,” Vierra reports. “Most companies are between 1.7 and 2. We’re at the lowest reported PUE that I have seen. If we had adopted any other UPS, our operating costs would have been much higher and our PUE would have been much higher,” he adds. “When you can get a better UPS design and more efficiency across all loads — as well as a small footprint — it makes for an easy decision-making process at the end of the day.”



NetRiver, Lynnwood, Wash., data center.

In addition to the UPSs, NetRiver complemented its overall power protection solution with three Eaton Power Distribution Units (PDUs) and five Eaton Rack Power Panels (RPPs) — dual-fed quad panels that bring high-density power distribution closer to IT enclosures to streamline cabling while providing a more adaptable infrastructure.

The PDUs and RPPs are equipped with the Eaton Energy Management System (EMS), which continuously measures the current on all breaker levels. With real-time insights into power conditions throughout the data center, managers can more effectively prevent overload conditions, optimize power distribution and track each customer's energy usage.

The final touch to NetRiver's comprehensive power protection solution was the addition of an Eaton service contract. "The technology is great," Vierra says, "but the service aspect is important as well, because that is what keeps the data center completely protected. When we need something, Eaton service technicians are available and prompt," he reports. "And that's very important, because we are tied to very stringent Service Level Agreements (SLAs) for our customers."

Snohomish PUD's Tran hopes more companies will follow NetRiver's lead in an effort to increase efficiency. There are a lot of opportunities for improvement, he emphasizes, considering most data centers operate 24x7.

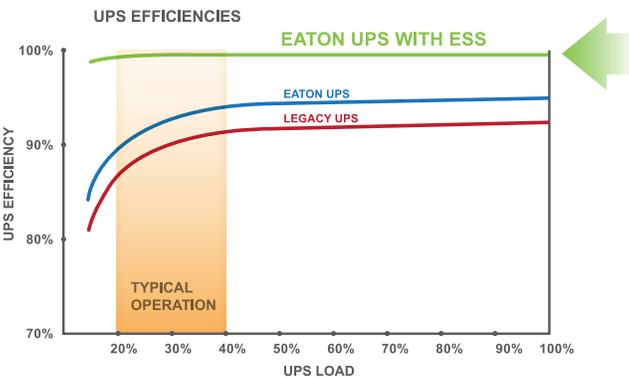
"Due to their continuous operation, data centers are significant energy users," Tran says, "so they should select the best equipment that they can. Using ESS whenever possible represents a lot of savings, as it makes the UPS up to 99 percent efficient, greatly reducing energy use and costs."

Vierra agrees, noting that NetRiver's power consumption comprises about 35 percent of its overall operating costs. "It's pretty significant," he acknowledges. "There's a lot of overhead for data centers and a lot of opportunity to add money directly to your bottom line by reducing energy costs."

But for NetRiver, the high-efficiency UPS solution is an investment that will pay for itself many times over. "For us — from the rebate standpoint as well as the energy savings on a yearly basis — it will clearly pay back," Vierra says.

In fact, the energy savings from Eaton's ESS typically recovers 100 percent of the cost of the UPS cost over just a three- to five-year time period. At a 250kW load, for example, the savings represents \$4,000 per year per point of efficiency gain. Even more, from a green perspective, backing up that same load with an ESS UPS is equivalent to removing 29 cars from the road.

Vierra offers another analogy. "It's like going to those places in the mall where you put your change in and get only part of it back," he says. "With the Eaton UPS, it's like putting 100 pennies in and you get 99 cents back. Because we use billions of pennies, so to speak, it really adds up."



"The Eaton model allowed us to hit that 99 percent metric right off the bat ... and we hit 99 percent efficiency at just 20 percent of load."

- Adam Vierra, sales and marketing manager

Even at light loads, where you would expect efficiency to be much lower, this UPS maintains a consistently high efficiency profile.

### Energy Efficiency Calculator:

Click here to see the energy impact a 99% efficient UPS has on utility costs.

[www.powerquality.eaton.com/calculator/](http://www.powerquality.eaton.com/calculator/)

Learn more about Energy Saver System at [www.eaton.com/ESS](http://www.eaton.com/ESS)

**Eaton Corporation**  
Electrical Group  
8609 Six Forks Road  
Raleigh, NC 27615  
Toll free: 1.800.356.5794  
[www.eaton.com/powerquality](http://www.eaton.com/powerquality)

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