[Note these are just suggested pull quotes - no need to use all]

Pull Quotes:

“We have some mine operators who tell us they know the economic case for renewables may not quite be there yet, but they want to hedge against anticipated future fuel costs and start implementing large-scale projects phase by phase.”

“Mine operators who analyzed hybrid solutions a few years ago are now surprised when they learn that the economics have improved so much because of cost reductions and system improvements. For one recent customer, their analysts discovered that the payback period is now roughly half what it was only three years ago.”

“By taking advantage of the reserve to optimize energy usage for the varying loads across the site’s 24-hour cycle, the customer has projected a payback period of under two years.”

“A mine can install some PV now, and then install a little more later along with energy storage and a master controller as prices continue to fall.”

“B2Gold is a very progressive company that plans for the long term. Not only are company executives looking to improve the performance of the mine and the company’s bottom line, but they are also supremely focused on improving the lives of residents in nearby communities.”

Why Are More Mines Integrating Renewables?

By Melodie Michel, Energy and Mines

Rob Schueffner, Hybrid Energy Solutions Manager for Caterpillar Electric Power, explains how the financial benefits and reliability of renewable energy solutions available for mines today are quickly matching the environmental benefits.

As costs continue to fall, mine operators see a strong business case for adding renewable energy solutions to the power mix at their mine sites. While solar power may not completely replace more traditional means of generating power in the short term, mining companies see the increasing benefits. Renewable energy combined with emerging energy storage, control, and management technologies can not only achieve a mine’s sustainability goals, but also substantially reduce their operating costs while improving system reliability and resiliency.

As Schueffner reports, mines can realize energy savings starting at 5 percent for easy and quick solutions that can extend up to 50 percent for installations that employ the full array of the latest fuel-saving power technologies available today.

“The ability to check many boxes is what makes hybrid energy solutions so attractive for many mines,” Schueffner says. “Mine operators who analyzed hybrid solutions a few years ago are now surprised when they learn that the economics have improved so much because of cost reductions and system improvements. For one recent customer, their analysts discovered that the payback period is now roughly half what it was only three years ago.”

An Integrated Approach

One key to realizing these returns is advanced technology and systems integration, and this is where Schueffner believes Caterpillar and the Cat dealer network stand out. While many early microgrid installations were disparate components cobbled together by multiple vendors, Caterpillar now brings all the latest technology and market expertise in renewables under one roof to design, install, and commission a seamlessly integrated system that starts delivering returns immediately.

Caterpillar has decades of experience in providing solutions for thousands of surface and underground mine sites around the world, including power solutions that run on a variety of fuels. As Schueffner reports, knowledge of the rugged environments where Cat products operate has enabled engineers to develop hybrid energy solutions used by the U.S. military over the past decade. “We draw on a potent combination of mining knowledge, engineering expertise in harsh environments, and a broad mix of power solutions to help us develop the right hybrid energy solution for mines,” Schueffner adds.

Scaling Up

Every mine is different, and many variables must be considered when determining which renewable energy solution will work best for a particular mining operation. Geographic location, peak sun-hours, government subsidies, and energy production costs – including the purchase, transport, and storage of fuel – all must be factored into the equation. Given the long period of time that mines are typically in operation, customers are also considering projected costs over the entire life of the mine, according to Schueffner.

“We have some mine operators who tell us they know the economic case for renewables may not quite be there yet, but they want to hedge against anticipated future fuel costs and start implementing large-scale projects phase by phase,” Schueffner observes.

In sharp contrast to the substantial capital investment required for building or updating traditional powerhouses, hybrid energy solutions allow for a scalable approach. Schueffner said that it is fairly easy to achieve fuel savings of 5 percent simply by adding energy storage to mitigate fluctuations in output power by regulating ramp-up controls, absorbing spikes in power demand, and injecting power for sudden power needs.

Projecting Cost Benefits

“One customer has projected the cost benefits of using the Cat Energy Storage System (ESS) as a virtual spinning reserve that enhances the efficiency of the entire powerhouse,” Schueffner says. “By taking advantage of the reserve to optimize energy usage for the varying loads across the site’s 24-hour cycle, the customer has projected a payback period of under two years.”

At the next level, solar photovoltaic panels can be installed to reduce fuel consumption by about 20 percent without making significant modifications to the powerhouse. This can serve as a simple and effective way to hedge against future increases in fuel costs, Schueffner says.

By adding the Cat Microgrid Master Controller, mining customers can increase solar PV production and more energy storage for grid stability to achieve fuel savings of more than 40 percent. Finally, the addition of Caterpillar’s latest, most efficient diesel, natural gas, and HFO generator sets can help mining operators cut their fuel costs by more than half. Even greater fuel savings may be achievable as renewables increase in efficiency and drop in cost.

“A mine can install some PV now, and then install a little more later along with energy storage and a master controller as prices continue to fall,” Schueffner says. “This phased-in approach can help mine operators enjoy immediate savings while progressively reducing fuel consumption as the economics improve.”

BOX
Join Caterpillar and 100+ miners exploring alternative energy options at the Energy and Mines World Congress, Toronto, December 10-11, 2019. http://worldcongress.energyandmines.com

[Note: THIS TEXT BELOW COULD BE A SEPERATE BOX]

Demonstrated Savings and Reliability

Africa is an attractive market where Caterpillar is introducing hybrid energy solutions for mines. Recently, Caterpillar and Cat dealer Barloworld were selected by Vancouver-based B2Gold Corp., to supply 7 MW of solar power at the Otjikoto Mine in the Republic of Namibia.

The full system, including Cat photovoltaic solar modules and the Cat microgrid master controller (MMC), is being used to reduce reliance on a heavy fuel oil (HFO) power plant. B2Gold executives and government officials celebrated the opening of the facility in May.

Company officials have reported that the introduction of solar power is expected to reduce Otjikoto’s HFO consumption by approximately 2.3 million litres and lower its associated power generation fuel costs by approximately 10 percent in 2018 alone.

“B2Gold is a very progressive company that plans for the long term. Not only are company executives looking to improve the performance of the mine and the company’s bottom line, but they are also supremely focused on improving the lives of residents in nearby communities,” Schueffner observes.

In the near future, Schueffner believes renewable microgrids will become increasingly commonplace in the mining industry. While fuel prices will dictate the speed of the transition, the capital expenditure required to install hybrid systems will continue to fall, making a stronger business case for renewables.

“As hybrid technology advances, improvements in efficiency and power density will continue to enhance system reliability, resiliency, and overall performance while driving the accelerated adoption of these solutions in mining,” Schueffner says.

ENDS