



# UPDATED ENERGY SOLUTIONS FOR MINES: Q&A WITH CATERPILLAR

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**Rick Rathe**  
Global Rental Power Manager  
**CATERPILLAR**

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XQC1600

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**Energy and Mines: How have you seen the energy-services business for mines change over the last few years?**

**Rick Rathe:** Many mines have been working to reduce capital expenditures and are looking more closely at temporary rental or power purchase agreements instead of equipment purchases. We've seen increased interest in shorter-term, temporary power contracts versus investment in fixed power plant installations.

**E&M: What have been some of the fundamental changes that have led mines to look at options outside of diesel for remote operations?**

**RR:** I think the biggest impact has been the rapid decline in the price of renewable energy over the past decade. For many mines, solar and wind energy are now viable options to reduce onsite diesel fuel consumption. Additionally, natural gas and heavy fuel oil (HFO) are viable alternatives to diesel for many mine locations.

**E&M: What is Caterpillar doing to address the changing energy needs of your mining clients?**

**RR:** In our traditional genset products, we've been focused on improving efficiency, lowering the life cycle cost and developing modular, plug and play solutions. A good example of this is our recently announced XQC1600 Power Module. Built off of the Cat 3516C-HD engine platform, this product was designed specifically for optimal fuel efficiency, durability and performance in continuous duty cycle operations like mine sites. The air system and fuel curves on this product have been "tuned" to maximize fuel efficiency and component life at the continuous rating. It is packaged in a 40-foot ISO container and is "ready to run" from the factory. Caterpillar also offers modularized solutions for both natural gas and HFO.

**E&M: How are you addressing the market demand for hybrid solutions that incorporate diesel with renewables?**

**RR:** We've been working for the past five or six years on smaller hybrid energy solutions and are currently focused on microgrid solutions for remote mines and other applications. Fundamentally, we are integrating wind, solar and energy storage with our traditional generator set products and turbines into a seamlessly controlled microgrid solution. We're bringing the best of all technologies together in a microgrid system to lower the overall cost of energy and reduce carbon and gaseous emissions.

All of our projects will start with a site visit and energy audit. One of the best ways to lower the cost of energy is to reduce energy consumption and peak demand. After we optimize the demand side of the equation, we then use analytical tools to determine the optimal amount of solar, wind and energy storage. These predictive tools allow us to provide the best mix of available technologies for the customer's specific site.

All of our microgrid solutions will be remotely monitored. We believe that data coming from the sites will help us optimize performance and also allow us to improve uptime and lower operation and maintenance expense for the customer.

**E&M: What response have you had from your mining clients when you discuss renewables, either diesel or gas hybrid solutions?**

**RR:** The response has been amazing. Our generator sets remain as the core of the system, providing firm, uninterruptable power to run our customers' businesses. Our mining customers rely heavily on Caterpillar for much of their equipment on the mine site already, so our ability to integrate these new technologies is just another way we can provide value. The key to all of this is our dealer service network. It's one thing to integrate the technologies and sell a product; it's the ability to service it and keep it running for the next 20 years that differentiates us from our competition.

**E&M: How do you see this market evolving over the next three-to-five years in terms of new energy solutions for mines?**

**RR:** Today, we typically see PV and wind lowering fuel consumption in the range of 30-70 percent, but it's limited due to the high cost of energy storage. We typically find 10 to 20 minutes of battery ride through as the optimal points in terms of LCOE and payback. We only use energy storage for short term intermittency. As the price of energy storage goes down, we will be able to time shift the excess energy produced from renewables during the day and increase the amount of fuel substitution.

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