Energy digitization: The quiet revolution

Solar, wind and batteries may take most of the spotlight when it comes to the green energy transition in mining, but digitization is an equally important part of the equation. Manoli Yannaghas, Managing Director at VoltVision, explains how data analytics and centralized energy monitoring are key to achieving a net zero world.

Energy and Mines: How does energy management support decarbonisation and electrification across multiple sites?

Manoli Yannaghas: I often describe what we do as the quiet revolution. Everybody talks about solar and batteries and hydrogen, and that's great. But if we're going to reach net zero, we've got to be looking at how efficient the operations are that we have in place today. Even though it's not sexy or exciting, cumulative small wins add up, and are essential to making the big step towards net zero.

At the moment most people get data out of their SCADA [Supervisory Control and Data Acquisition] systems, which are not designed to give raw power usage data. The result is that the knowledge and understanding of what power is doing across the network is not visible or accessible to the right people at the right time, resulting in inefficiencies.

VoltVision's data and AI platform ViViD effectively shows the mine operator what their power is doing: where they are receiving it from, how it is behaving over the whole network, and exactly where it is being used. We help our clients identify inefficiencies in granular detail so they can make the changes needed to save small amounts of energy in lots of different places. These multiple 'quick wins' add up very quickly. Obviously when you reduce your power use you also reduce your CO_2 as the two go hand in hand. By doing this we help our clients reduce their energy consumption and CO_2 by up to 10%.

The other thing to consider is the impact of making large CAPEX infrastructure investments, such as building a solar plant, before making your mine as power efficient as possible. Baking in inefficiencies means you will waste 10 or 11% of your CAPEX.

E&M: What exactly does it mean to digitize energy management for mines? What are the main steps and equipment involved in this process?

MY: It's a two-phase process.

The first part is data extraction. We've designed a way to retrofit our V-CUBE IoT onto existing equipment. In most cases we don't

need to visit the site: we courier the device and program it from the UK. Access is either through the meters or the HV relays. Relays are mini-computers that watch a particular part of the network to look for faults or issues. They collect massive amounts of data but every 10 seconds they delete it. So, what we do is extract the data from the relay before it's deleted and send it to the cloud. That gets us over 2,000 live, high-resolution data points in milliseconds. For data extraction we don't need any new equipment other than the V-CUBE, it's a low-investment retrofit (all OPEX).

The second part of the process is the transformation of vast quantities of raw power data into actionable information, using our own our cloud-base AI platform, ViViD. VoltVision takes this data and reduces it down to something really useful so clients can access the insights they need in near real-time. We've used our data and electrical backgrounds to design ways to avoid drowning them in charts and tables, instead our insights are presented in user friendly dashboards. What stands VoltVision apart, is our ability to cherry-pick relevant data from multiple sources, analyze and form patterns and relationships from it

and show our clients the minimum amount of information with the maximum impact.

We set up alerts about maximum demand, for example, so you can investigate and take swift action. Our data is also time-stamped at source so it's auditable and can inform SBTi programmes. This is really important when it comes to ESG reporting. When mining companies want to make changes to the power network, like integrating a solar plant or reducing the use of diesel powered generators, they can see very clearly the drop in CO2, and accurately report it.

E&M: What are some of the key takeaways from VoltVision's work with African mines on energy management and digitization?

MY: We have digitized all of Endeavour's west African mines. We did the installation across six mines in four months with no one visiting the site, which is an amazing achievement. We then conducted a deep analysis on two of those mines, and saved them a significant amount of OPEX: on one mine alone, we saved about 7-9% of their static power cost.

They've now got dashboards in all those mines, with Scope 1 and Scope 2 monitoring. Because we can see where every kilowatt comes from, we can also calculate its cost from a CO2 perspective. We have reduced their costs and their CO2 by 15 to 20,000 tons a year.

We've also reduced the amount of power they're using on one of their crushing circuits by about 20%, because they were able to better understand the implications of the harder mixes versus softer mixes on their cost profile. All in all, the return on investment for these two mines was paid back in under a month.

E&M: Why is this digitization necessary for mines' transition to net zero?

The mining sector already accounts for at least 4% of global energy consumption and the growing demand for minerals and metals, for technologies like renewable energy, will only increase consumption in the coming years. Mining plays a fundamental part in facilitating the green energy transition but it must do this as sustainably as possible - in other words decarbonising others whilst decarbonising itself. A key requirement in achieving this is uncovering every single inefficiency and to do that you need transparency. Digitization is about really understanding what you're doing in the moment and making sure it's as efficient as possible.

Manoli Yannaghas will be presenting the case study The Quiet Decarbonisation Revolution: Maximising Efficiencies at Existing Operations, June 14 at the *Energy and Mines* Australia Summit 2023, Optus Stadium.

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