MINE POWER

SUSTAINABLE POWER SOLUTIONS FOR MINING APPLICATIONS

5 REASONS WHY YOUR MINE SHOULD INVEST IN RENEWABLES

Five years ago, the Rocky Mountain Institute launched their Sunshine for Mines initiative, with the goal of increasing renewable energy penetration of the mining industry

In 2018, RMI published this list of five reasons why mines should invest in renewables. These reasons are just as valid today.

READ MORE ON PAGE 2

INCREASED ENERGY COSTS, EXTRACTION CHALLENGES ACCELERATE PUSH FOR RENEWABLES

A variety of factors are coming together to increase demand for cheaper, cleaner sources of energy for mining.

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FEATURED ARTICLE: TAKEAWAYS FROM *ENERGY AND MINES* WORLD CONGRESS

The February issue of *Energy and Mines* caught our eye, with key takeaways from their recent World Congress in Toronto. The consensus from the event: "Whether or not miners will decarbonize their energy sources and processes is no longer a question — it is a given. The focus is now on how they will achieve this."

"(This) is the result of a combination of factors: renewable energy is now cheaper than conventional energy; diesel and grid electricity prices are volatile and generally too high to sustain mines increasing energy requirements as they dig deeper and ... and investors are putting pressure on mining companies to decarbonize their operations."

READ MORE ON PAGE 3

UNIQUE MIRRORS CONTRIBUTE TO LOW O&M FOR 247SOLAR PLANTS

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READ MORE ON PAGE 3

5 REASONS WHY YOUR MINE SHOULD INVEST IN RENEWABLES

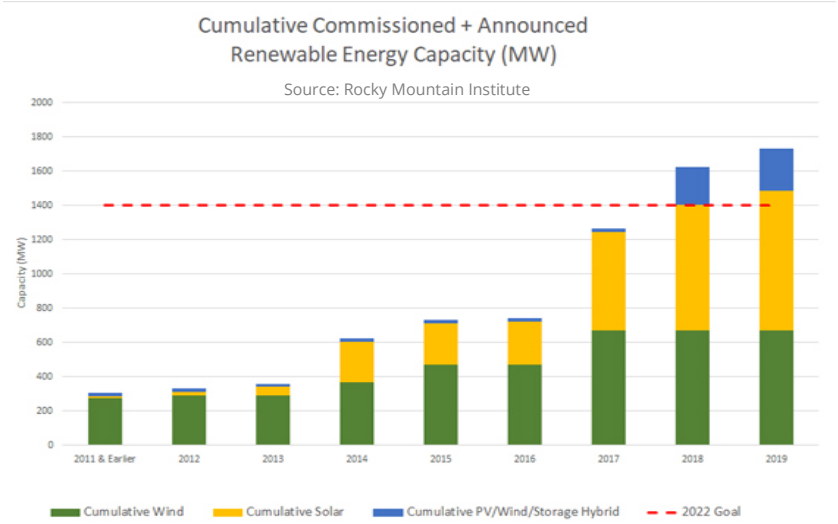
MINES NEED SOLUTIONS TAILORED TO THEIR UNIQUE NEEDS, AND THE SOLUTIONS ARE HERE

Five years ago, the Rocky Mountain Institute launched their *Sunshine for Mines* initiative, with the goal of increasing renewable energy penetration of the mining industry from just over 600 MW to 1.4 GW by 2022. The good news is the 2022 target has already been exceeded, and by the end of 2019, almost 5 GW of renewable capacity was either installed or planned.

In 2018, RMI published a list of five reasons why mines should invest in renewables. They are just as valid today, so if your company has not yet invested in renewables, here are five great reasons to get started.

1. The price is right
2. Creative financing solutions exist
3. The technology is ready (incl. 247Solar Plants™)
4. Your employees want it
5. Renewables can be a hedge against risk

Read RMI's post for more.



"If we don't do something different on energy, we won't be in business in 10 years.".

Nick Holland
CEO, Gold Fields

INCREASED ENERGY COSTS, EXTRACTION CHALLENGES ACCELERATE PUSH FOR RENEWABLES

A variety of factors are coming together to increase demand for cheaper, cleaner sources of energy for mining. Energy requirements are increasing. For example, in Australia, total energy consumption within the mining sector increased 12% from 2016 to 2017. In addition, as keynote speaker Nick Holland, CEO of Gold Fields, put it at the recent Energy and Mines World Congress, "Mines are getting deeper and more remote. Rock is getting harder; we need more energy to crush it. Energy cost has grown exponentially, and in five to ten years, it will be a lot more expensive still. Carbon taxes are happening. If we don't do something different on energy, we won't be in business in 10 years." 247Solar Plants™ offer a modular, scalable solution for reliable round-the-clock electricity.

ROST International Trading Limited

247Solar has appointed UK based ROST International Trading to assist in developing their business. Founded in 2014 by partners Stuart Whitelock and Paul Foster, ROST operates in the Renewable Energy, Energy and Water industries.

Contact Stuart Whitelock
www.rostinternational.com

TAKEAWAYS FROM ENERGY & MINES WORLD CONGRESS

WHETHER OR NOT MINERS WILL DECARBONIZE IS NO LONGER A QUESTION

The February issue of *Energy and Mines* caught our eye, with its insightful summary of key takeaways from their recent *World Congress* in Toronto. The consensus from the event, according to E and M: "Whether or not miners will decarbonize their energy sources and processes is no longer a question — it is a given. The focus is now on how they will achieve this."

This reality, they say, "is the result of a combination of factors: renewable energy is now cheaper than conventional energy; diesel and grid electricity prices are volatile and generally too high to sustain mines increasing energy requirements as they dig deeper and deeper to find minerals, and investors are putting pressure on mining companies to decarbonize their operations."

A couple of trends were of particular interest to us, as they represent opportunities to which our 247Solar Plants™ are well suited.

BEYOND THE LIFE OF THE MINE

"For the first time," the authors say, mining stakeholders are realizing that "installing solar or wind capacity on site can be about more than powering the mine for the duration of operations. First, clean energy and electrification can be a powerful argument in community negotiation before building new facilities. Aside from making the site itself cleaner and quieter, these technologies can continue to power the community long after the mine is gone." "(This) can be an additional source of returns if the mining company owns the assets."

Unlike PV, wind, or diesel gensets, which produce only electricity, 247Solar Plants can produce up to 1.6 million BTU of industrial-grade heat, to support a variety of industrial processes and provide yet another revenue stream. This enhances financing prospects by reducing risk and extending the value of the investment beyond the useful life of the mine.

MOBILE ELECTRIFICATION

Another area of significant discussion involved the electrification of mobile equipment. Besides the obvious advantage of reduced emissions, converting mine fleets to electric power offers additional benefits. Newmont Goldcorp cited their fully electrified underground fleet at Borden for providing a safer and more pleasant environment for workers, as well as reducing ventilation costs.

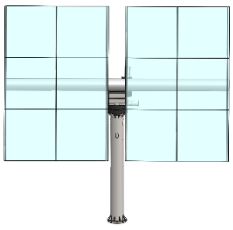
Because they are modular, 247Solar Plants can be constructed in a phased manner. Capacity can be added in increments of 400kW over time as additional equipment and facilities are brought online, which can allow for staged financing.

A FLEXIBLE, ADAPTABLE SOLUTION

The article concludes with the observation that "there is no silver bullet for mine site decarbonization." "A case-by-case analysis is always required, and ... the challenge is how to integrate the different choices regarding cost, reliability and carbon footprint." The modular, scalable design of 247Solar Plants, the fact that they store the sun's energy inexpensively as heat, instead of as electricity in costly batteries, and that they don't require backup gensets, makes them uniquely suited to a variety of mining applications. Contact us to learn more.

UNIQUE MIRRORS CONTRIBUTE TO LOW O&M FOR 247SOLAR PLANTS

247Solar has engaged CASEN of China to produce the heliostats (solar mirrors) and associated control systems for its first operational demonstration plant, under construction in Ouarzazate, Morocco. These innovative mirrors are pole mounted and do not require concrete foundations, making them suitable for deployment on uneven ground. They operate wirelessly and have a built-in solar power source, meaning that no wiring is required for installation which significantly reduces installation costs. The mirrors can be fully rotated through both horizontal and vertical planes, a critical capability in desert environments, where wind, dust, moisture, and extreme temperatures create maintenance challenges for conventional heliostats. "CASEN's unique technology will be a significant contributor to the low CAPEX and O&M costs that are a hallmark of our 247Solar Plants," says Bruce N. Anderson, 247Solar CEO.



FOR FURTHER READING

Topics of interest at the intersection of mining and sustainability.

McKinsey & Company:
Climate risk and decarbonization: What every mining CEO needs to know

Bloomberg:
Miners Ditching Diesel Seek to Cut Costs as Well as Emissions