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Renewable energy opportunities rise as costs slide and solutions grow

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Photo by: Reuters

TORONTO (miningweekly.com) – Despite the tie-up between the renewables market and the mining sector being dynamic and exciting, the high levels of upfront capital expenditure (capex) needed to install and operate renewable components and storage solutions remained a significant impediment to uptake.

“There’s a lot of uncertainty during project phases. The bank will sometimes say they’ll not finance renewables; that it doesn’t work; or the risk is too high. That’s when we see renewable projects not being realised,” noted Schletter VP of engineering and product development **Wolfgang Fritz** at a recent Canadian German Chamber of Industry and Commerce renewables in mining conference.

OPPORTUNITY KNOCKS

But renewables could represent a proverbial gold mine, with the mining sector spending around

\$50-billion a year on energy, including electricity and diesel, and remaining focused on reducing costs and improving productivity – both areas that renewables taps into.

“Forecasts over the next five years are roughly for 5% to 8% of that spending to be on renewables. It’s around a \$4-billion opportunity,” said director of Energy & Mines **Adrienne Baker**.

But while much of renewables technology is proven and well established, the economics of installation and subsequent operational expenditure (opex) has remained prohibitive for many companies, particularly the smaller and midtier ones. “If the upfront capex is too high, then it kills a renewable project,” said Baker.

However, capex solutions could often be found through closer engagement between renewables suppliers and mining companies, especially through the bidding process via requests for proposals (RFPs) and when determining power purchase agreements.

These processes could be lengthy, as planning renewables for a project can take time. Baker noted Gold Fields’ RFP for a 40 MW solar project at its South African South Deep mine as an interesting example of this.

The company announced in June 2014 that it was assessing its options regarding renewables. It then worked closely with the Carbon War Room, Sir **Richard Branson**’s think tank on climate change.

The results of their collaboration were presented in July 2015, identifying business cases for renewables at the company’s various sites and with the South Deep mine highlighted. Baker noted its life of mine (LoM) was 69 years.

“An RFP was then issued on November 9, with 130 companies expressing an interest and about 30 companies then officially submitting proposals,” she said.

Other companies Baker cited included AngloGold Ashanti, Rio Tinto, and Sabina Gold & Silver. “There are lots of projects happening but it’s a long process that must be based on strong relationships.”

Longer LoM was usually needed for higher upfront capex costs to be recouped and the renewables to then deliver savings. Most companies have found that renewables installation makes little sense if the LoM is only for a few years.

However, this could change as renewables technology and storage solutions become cheaper. Some companies have already managed to embed renewables on a shorter-term basis that could offer useful templates for others to explore.

Baker cited Mandalay Resources, which has a five-year PPA for a Chilean concern, as an example. “They will revisit the PPA on a year-on-year basis and the developer is convinced that the diesel savings will be significant.”

CASE STUDY

U3O8 Corp was considering renewable options for its Laguna Salada uranium/vanadium project, in Argentina, with an initial resource of ten-million pounds of uranium. Its evaluation of renewables for this project was illustrative of the efforts made by many smaller companies when considering alternative energy.

“We’re about halfway between discovery and a mine decision, so it’s not like we have to make a choice by tomorrow,” said U3O8 Corp president, CEO and director **Richard Spencer**.

The project would involve cutting trenches through the deposit as the resource lies within near-surface gravel. The collected material would be sieved and washed, with the uranium- and vanadium-bearing silt placed in slurry and pumped to a central processing facility.

The fluid would then be heated to about 80°C and the uranium and vanadium extracted using baking and washing soda. Laguna Salada would be linked to the grid and have an estimated 7.6 MW power draw, with about 3 MW provided by liquid petroleum gas. The energy capex would stand at \$7.4-million, with an opex of \$5-million per year.

However, the company has also explored the use of wind, studying the installation of ten wind turbines with a 15 MW capacity. “But the problem is capex, which would stand at \$30-million,” said Spencer, adding that a storage system of 10 MW, with a capex of \$40-million, would also be required.

While that setup would deliver a competitive opex of around \$2-million a year, the up-front capex would be nonviable for a company the size of U3O8.

PUSH AND PULL

However, increasing Laguna Salada’s resource would greatly assist the economics of renewables. “If we double the resource, the net present value (NPV) goes up by three times; if we triple the resource, the NPV rises by six times,” Spencer said. “There’s a large gearing on the economics of this deposit in relation to its size.”

The company also might look to a deal with suppliers of vanadium-redox batteries, whereby the project’s by-product vanadium was sold through offtake but also used as payment-in-kind for battery installation and operation. “I give you the vanadium, you give me the power,” Spencer said.

In general, storage solutions are expected to fall in price as they became more efficient. “Elon Musk at Tesla says that, when the Gigafactory starts producing, lithium-ion batteries are going to come out at \$100/KWh. That could be a game changer if achieved,” said Spencer.

A push factor towards renewables would be the additional imposition of carbon taxes and tighter carbon emissions caps. “Changes are coming and it’s a great opportunity to get ahead of that,” said Spencer .

He further noted that mine technology suppliers were already reacting to this and entering the renewables space, including companies like Caterpillar. “It’s going to be those kinds of companies that create the bridge. They don’t want to be selling diesel generator sets forever; they can see that the end of that is coming and have already started to adapt.” 

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