

## DRIVEN FROM THE TOP: GOLD FIELDS' ENERGY MANAGEMENT AND CARBON REDUCTION STRATEGIES

*By Elizabeth Judd, Energy and Mines*

*Editor's Note: The interviewees featured in this case study – Duncan Stevens of Gold Fields and Martin Sprott of A. T. Kearney will present a joint case study at the upcoming Renewables and Mining Conference on June 23-24 at the Hilton Sandton in Johannesburg. [www.energyandmines.com/africa/](http://www.energyandmines.com/africa/)*

Johannesburg-based Gold Fields Limited has identified energy management as a key cost driver for the business. Duncan Stevens, the company's Vice-President of Group Sustainable Development, emphasizes that a mine like South Africa's South Deep, which operates a few kilometers below the earth's surface, "requires a massive amount of energy." He notes that a few years ago, before the company unbundled its other South African mines, Gold Fields was drawing down a significant portion of the energy grid.

Energy is an increasingly pressing concern because the challenges for mining companies are growing, says Martin Sprott, Principal at A. T. Kearney, which has been working with Gold Fields on revising baselines and targets that were developed as part of its existing integrated energy and carbon management strategy in 2012. "Mining companies have exhausted many of the easy to reach ore bodies and so they're going into more remote, deeper, and often riskier, places. They're going up mountains and to islands like the Philippines or deep into Africa and the eastern Congo," he says.

Venturing farther afield often means moving off the conventional energy grid. Sprott points out that



**DUNCAN STEVENS - VP OF GROUP  
SUSTAINABLE DEVELOPMENT,  
GOLD FIELDS LIMITED**

as mining companies begin operating in these remote and challenging locales, "renewable energy is probably one of the most effective ways to power the mines."

### A CORPORATE STRUCTURE FOR ENERGY MANAGEMENT

Gold Fields is walking its sustainability talk by placing senior management in charge of monitoring, measuring, and reporting on the company's energy goals. For instance, Stevens' corporate responsibilities range from collaboratively setting policies and guidelines for sustainable development to working on the reporting of non-financial data and making sure that investors, ESG rating agencies and other key stakeholders are kept updated on the company's sustainability activities, including energy management.

Stevens reports to Senior Vice-President for Sustainable Development, Naseem Chohan, who forms part of the ExCo led by group CEO Nick Holland. Stevens says that the company's energy management decisions are a top priority for the CEO. "Our efforts to be a responsible

and sustainable mining company by reducing our carbon footprint and our energy costs are driven right from the top," he says. "Our CEO is deeply committed to responsible mining, which includes the migration to renewable sources of energy, wherever possible."

Gold Fields used the global consultants A. T. Kearney (ATK) in 2012



**MARTIN SPROTT - PRINCIPAL,  
A. T. KEARNEY**

to assist with developing an integrated energy and carbon strategy. One of the key premises, emphasizes Sprott, was that “by improving and optimising the performance of the operations, you can improve your CO2 performance.”

## ASSESSING POTENTIAL

ATK began its energy assessment of Gold Fields with a baseline of the company’s global operations. In Ghana, for instance, ATK, together with Gold Fields’ in-house experts, looked at the consumption profile for the existing mines, and then researched the power grid and the generation possibilities for hydro, gas, biomass, as well as wind and solar. In the Philippines, where Gold Fields has a project, geothermal was compared with wind and electricity, and in South Africa, electricity, wind, and gas were assessed.

When considering the challenges for switching to other forms of energy, Stevens emphasizes reliability and energy security by, for instance, obtaining a steady supply of a given type of energy for a decent amount of time and at the right price.

Sprott points out that in some of the countries where Gold Fields operates, it’s impossible to underestimate the importance of stability. In remote areas, he notes, the grid tends to be “unreliable” and stoppages are common. “Finding a stable source of power takes a long time,” he says.

Gold Fields is actively involved in negotiating with power providers to improve stability. It has, for instance, entered into agreements with Eskom, the sole power provider in South Africa, to furnish a certain number of hours of notice should the power grid be shut down.

## MEASURING COSTS

Costs are another challenge. “Energy costs are a key driver for us given that energy accounts for about 18% of our operational



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cost base and this is likely to rise in a global context of increasing energy demand and constraints on supply,” says Stevens. He added that “although the unbundling of our mature underground mines in South Africa has considerably reduced our energy intensity, this remains a key area of focus in terms of controlling not only our costs, but also our carbon emissions.” He says that the company is trying to implement as many energy-efficiency projects as are feasible.

To understand the full cost equation, Gold Fields looks at LCOE (levelized cost of electricity) for a given power plant. To do this, the company estimates the total lifetime of ownership and then assesses capital and construction costs. Next, the company considers the cost of power generation, any revenue inflows, and which financial models will be used.

When assessing renewables, Gold Fields looks closely at a mine’s life. For example, the South Deep Mine, which supplies 13% of current production, has a life of mine estimated to be 2060. “In the case of South Deep,” Stevens says, “renewables might be much more viable than some of our other international operations, which have a comparatively shorter mining life.”

Stevens points out that Gold Fields is seeking proven concepts in renewables. When it comes to assessing solar or PV energy, for instance, the power source isn’t constant and so storage becomes a salient issue. “We’re keeping our eyes on renewable energy, in a fast changing renewables landscape, to ensure that we’re ready to implement the right solution,” he says.

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## THE IMPACT OF GOLD PRICING

One of the most significant impacts on the mining industry over the past year has been the decline in the gold price and the subsequent drop in share prices of publicly-listed gold companies,

says Stevens. He notes that lower share prices mean less capital investment – making it more competitive to obtain capital for funding renewable energy projects. “Price is thus one of the key drivers of our energy choices at this point,” he acknowledges.

Going forward, Gold Fields is keeping a close eye on legislation. In particular, the pending carbon taxes, specifically those in Australia and those slated to take effect in South Africa in 2016.

Finally, Stevens says that Gold Fields is always scouting for new technologies and ideas that would enable renewables to power different aspects of an operating mine. Even though running an entire mine exclusively with solar or wind might not yet be feasible, Gold Fields is considering whether it might provide in-pit lighting through photovoltaic cells and other smaller solutions. “We’re constantly scanning the market and trying to keep on top of new technologies,” concludes Stevens.

Hear Duncan Stevens of Gold Fields and Martin Sprott of A.T. Kearney speak at the Renewables and mining Summit, June 23-24, Hilton Sandton, [www.energyandmines.com/africa](http://www.energyandmines.com/africa)

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