

# Renewables in mining: futuristic or realistic?



**EY**

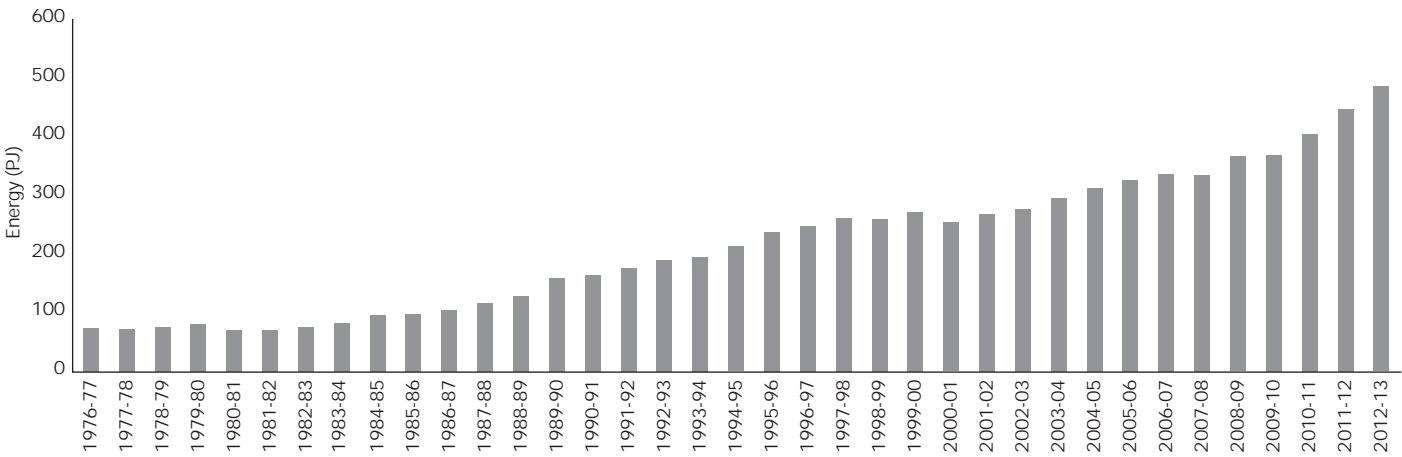
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Mining is an energy-intensive industry, and energy is an essential operational consideration. Energy access is becoming increasingly difficult and expensive in many regions of the world, with global energy prices leaping by 260% since 2000.<sup>1</sup>

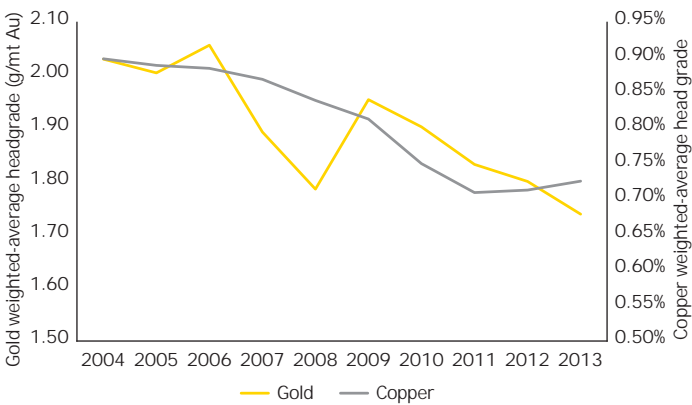
Falling grades require more energy to extract each tonne of mineral. Miners are grappling with these increasing costs while commodity prices tighten, resulting in ever-narrowing operating margins.

Energy consumption by mining in Australia



Source: 2014 Australian Energy Statistics Update, Bureau of Resources and Energy EconomicsSource, SNL Metals & Mining, 2014

Average ore grades over time



Source: 2014 Australian Energy Statistics Update, Bureau of Resources and Energy EconomicsSource, SNL Metals & Mining, 2014

There are also other pressures on energy, such as increased opposition from communities to new conventional energy sources. Chile is at the epicenter of this conflict as environmental opposition exists for any new coal-fired power plant; nuclear energy is not an option due to seismic risks and the community is opposed to expanding hydropower because of the loss of wilderness areas and the impact of high-voltage transmission lines spanning the country.

In emerging and frontier countries, the need for alternative energy sources is further amplified as mining and metal companies have to compete with both governments and communities for these scarce resources. Rarely does the economic value created with energy use come into allocation decisions. This has a direct impact on the industry's all-too-important social license to operate.

The role that renewables will play is not as remote or futuristic as you may think. The arguments for large investments in renewable energy go beyond sustainability and social responsibility, and have now become a solid economic reason for miners.



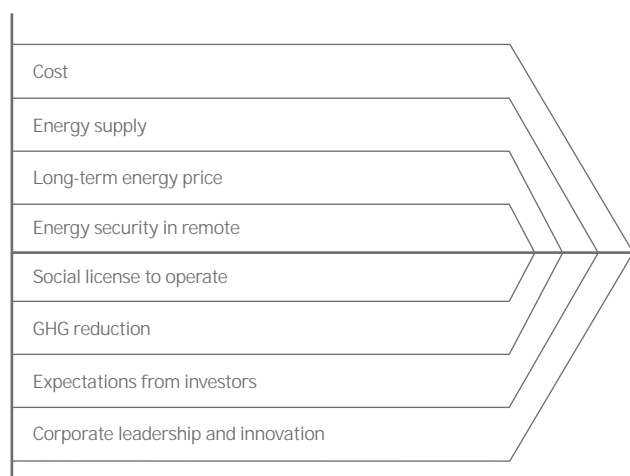
## Mitigating risk

An alternate energy strategy can help companies achieve energy security, reduce exposure to energy price volatility and improve energy price prediction. Many of the world's largest mining companies are evaluating greater use of renewable energy plants – a trend set to intensify rapidly. This is part of a broader strategy to lock in long-term fixed electricity prices and availability while minimizing exposure to regulatory changes, market pricing and rising residential demand.

## Sustainability commitments

Companies can enhance reputation and brand by meeting the sustainability expectations of customers, investors and other stakeholders. Companies can also avoid long-term carbon and environmental penalties by complying with current and future regulatory requirements; and be well-positioned to adopt regional or national carbon cap and trade programs.

### Business value for corporates adopting clean energy



#### Delivering attractive economic returns

##### US\$1.1b

Annual savings for 53 Fortune 100 companies reporting on climate change and energy targets to CDP

##### US\$400m

Annual savings for 20 Fortune 100 companies with targets that ended in 2012

Source: "Power Forward 2.0: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value," World Wildlife Fund, Ceres, Calvert Investments and David Gardiner and Associates, 2014.

Source: "Mining: the growing role of renewable energy," EY, 2014

## Remote locations

Despite having extensive energy requirements, many mines are located in remote locations far from the power grid. Therefore, miners often deal with transporting diesel fuel over extremely long distances to feed on-site generators. The more remote the mine, the more likely alternative power solutions are required. Chile is a key example where mining operations are located remotely and at altitudes a long way from electricity supply source; thus, transport of energy on-site is especially expensive. In the process of solving

these operational issues, Chile's mining industry emerged as one of the leaders in embracing the potential of renewable energy.

For example, last year Chilean Codelco's Gabriela Mistral mine started receiving power from the huge Pampa Elvira solar project, a massive installation of 2,620 solar panels covering more than 36,000 sq. m in the middle of the Atacama Desert. The solar plant, one of the largest in the world, generates 51,800MWh of energy a year and covers about 85% of the mine's energy needs.<sup>2</sup>

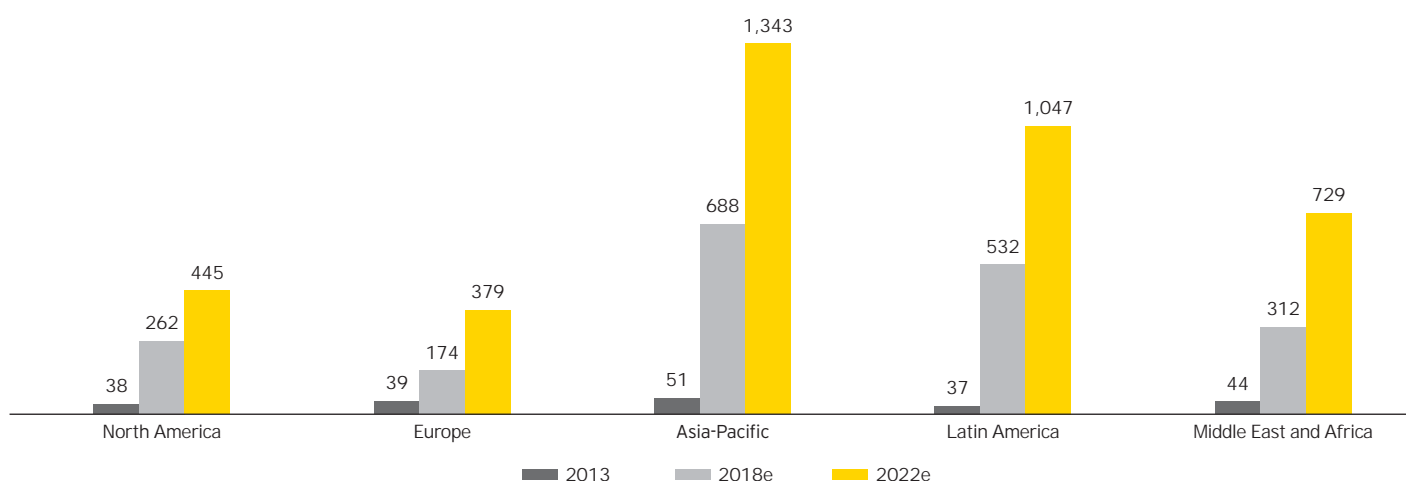
## Trigger for change

Today, the pace of innovation in energy in terms of sources, management technologies and financing solutions is incredible. The innovations have led to annual declines in renewable energy costs, and companies are increasingly taking control of their energy requirements through on-site renewable energy

generation, efficiency technologies and microgrids. This has created a significant opportunity for cost savings and operational optimization.

Companies are increasingly embracing renewable energy as a viable power option in its energy mix. For example, Rio Tinto is constructing a 1.7MW solar-diesel hybrid energy plant in Australia to offset its diesel usage.<sup>3</sup>

Renewable energy investment in the mining industry (base case, US\$m), world markets: 2013–22



Source: "Renewable Energy for the Mining Industry Revenue by Technology, Aggressive Investment Scenario, World Markets: 2013-2022," *Renewable Energy in the Mining Industry*, 2013, via Navigant Consulting, Inc.

There are some inflexible attitudes in parts of the engineering community within the sector that are relatively dismissive of possible change as they're thinking in an old paradigm of renewables being highly experimental and difficult to finance. However, rapid changes with regard to the substitution of conventional sources with renewables will challenge the engineering community to take a fresh look at the latter.

The big turning point will be improving battery technology in both scale and cost so renewable energy from solar power and wind can consistently power mining's 24-hour operational cycle. What will really make an impact are the technological improvements that bring down costs and improve reliability, and these improvements are likely to be delivered in the next two to three years.



"We are aiming to generate 10% of our 20–25MW mine electrical load with renewables ..."

Liezl Van Wyk  
Manager of Business Improvement,  
Diavik Diamond Mine<sup>4</sup>

"Renewable energy cost structures have reduced to the point that, particularly for isolated mines, in some cases, they have become more economic than diesel-fired generators."

Scott Fraser  
Director of Power Projects,  
Barrick Gold<sup>5</sup>



# Endnotes

1. "CFO Series - Why energy and access to water are a CFO issue," EY, <http://www.ey.com/GL/en/Issues/Managing-finance/EY-CFO-program-why-energy-matters-to-cfos>, accessed 11 August 2014.
2. "Miners urged to harness solar," *The Australian*, 9 July 2014.
3. "Rio Tinto to implement solar power at QLD mine site," *Australian Mining*, 22 May 2014, <http://www.miningaustralia.com.au/news/rio-tinto-to-implement-solar-power-at-qld-mine-sit>, accessed 17 July 2014.
4. "Building a wind farm in arctic conditions: Rio Tinto's Diavik mine By Elizabeth Judd," *Renewables and Mining*, 2013, via Canadian Clean Energy Conferences.
5. "Renewable Energy & Mining," *Renewables and Mining*, 2013, [renewablesandmining.com/blog/](http://renewablesandmining.com/blog/), accessed 15 January 2014.





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