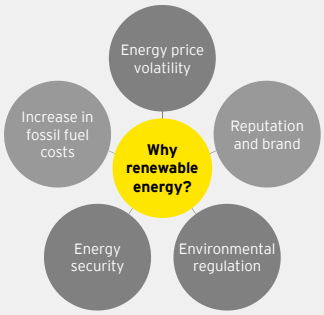
Mining: the growing role of renewable energy

Global Cleantech Center

Energy-related business risks



- US$6 trillion will be invested in renewable energy infrastructure by 2035, compared to just US$1 trillion in nuclear and US$2.75 trillion in conventional energy.[1]
- The dramatic reduction in solar and wind energy costs in recent years means renewable energy is an increasingly attractive alternative to fossil-fueled power, for remote mines not connected to the electricity grid.

Time to rethink traditional energy strategies

Access to reliable and cost-effective forms of energy is a strategic priority for the global mining sector.

The mining industry has traditionally relied on conventional fossil-based fuel sources — diesel, oil, coal and natural gas — to meet its growing energy demand. The industry is now tasked with responding to the challenges of increasing fuel prices while commodity prices tighten, resulting in ever-narrowing operating margins and increased opposition from communities to new conventional energy sources.

- The mining sector is expanding into new and often remote locations as a response to increasing demand from growing emerging markets. This often means having to deal with unreliable power supply from the grid and uncertain power prices. In most instances, grid-connected electricity needs to be supplemented with on-site generation, typically large-scale diesel generation, resulting in a dependency on diesel fuel. The more remote the mine, the more likely off-grid power solutions are required.
- The sector is experiencing volatility in commodity prices and rising fossil fuel prices, placing margins under pressure. With global demand for energy set to increase 36% by 2035, the industry faces greater energy price increases and volatility. Managing costs sustainably is a priority for the sector.
- The mining sector is facing growing demand from governments, customers, communities and other key stakeholders to operate in a sustainable manner. Doing so has a growing influence on the mining industry's "social license" to operate.

Many of the world's largest mining companies are evaluating greater use of renewable energy plants — a trend set to intensify rapidly — as part of a broader strategy to lock in long-term fixed electricity prices and availability while minimizing exposure to regulatory changes, market pricing and external fuels.

[1] "Power sector cumulative investment by type and region in the New Policies Scenario, 2013-2035," World Energy Outlook 2013, OECD/IEA, 2013.

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Building a better working world

Renewable energy to play a strategic role

Site-appropriate renewable energy solutions provide cost-competitive energy while delivering greater energy supply reliability and consistency.

Reliable access to cost-efficient energy sources is a strategic imperative for mining companies. It is essential to their bottom lines and increasingly, their licenses to operate. In parallel, the sector is challenged with meeting growing demand for mineral resources often located in countries and sites where the supply of energy is not always available, reliable or cost-effective.

The transformation of the mining sector is driven by a number of strong converging trends, including:

- Energy security concerns
- A recent history in most countries of rising and volatile energy prices, coupled with a consensus that such trends will continue over the medium-to-long term
- The shift to a resource-efficient and low-carbon economy that will ensure community acceptance

In response, the international mining sector is deploying innovative energy-saving strategies and making substantial industry-wide direct investments into renewable energy infrastructure.

At the heart of recent innovations in corporate mining energy strategies lie the construction and acquisition of renewable energy-generating assets, on- and off-site, and the direct contracting for renewable energy through power purchase agreements.

Renewable energy plants can be developed, funded, built and operated by third-party developers as captive plants, with the mine committing to purchase the generated electricity at a fixed price over a certain time period.

"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[2]

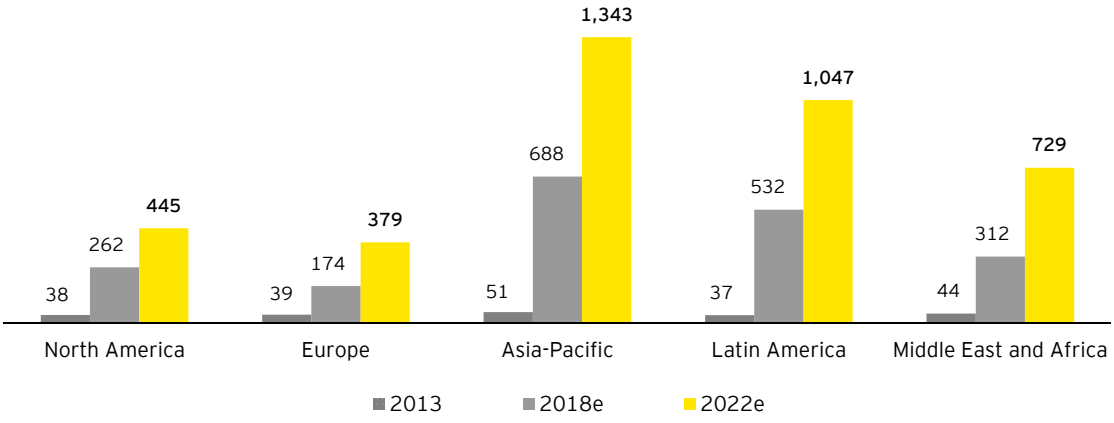
"Solar PV has proven that it can fit the energy needs of a large mine and be integrated into the energy supply for mining companies."

Pablo Burgos, CEO, Solarpack[3]

"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 or Power Projects, Barrick Gold[4]

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, Navigant Consulting, Inc., 2013.

[2] Building a wind farm in arctic conditions: Rio Tinto's Diavik mine By Elizabeth Judd, Canadian Clean Energy Conferences, Renewables and Mining, 2013
[3] Solar PV for Codelco and Collahausi by Elizabeth Judd, Canadian Clean Energy Conferences, Renewables and Mining, 2013.
[4] Renewable Energy & Mining, Renewables and Mining, 2013 (accessed via renewablesandmining.com/blog/, 15 January 2014).

Mining innovators embrace renewable energy

Rio Tinto

- Invested in a 9MW wind farm at Diavik Mine in Arctic conditions
- Aims to generate 10% of 20MW–25MW mine demand from renewables
- Expects to reduce its diesel use by approximately 4 million liters and its CO2 emissions by 12,000 tons

Codelco

- Replaced 85% of diesel demand with 51.8GWh solar thermal energy at one facility
- Stands to save the expense of almost 2 months of fuel annually

Other examples of renewable power adoption

- **Glencore Xstrata:** looking to meet half of its needs from wind power at Raglan Mine (off grid)
- **Collahuasi:** Pozo Almonte solar plant to provide 60GWh clean energy

Source: *Corporate case studies*, Renewables and Mining, 2013.

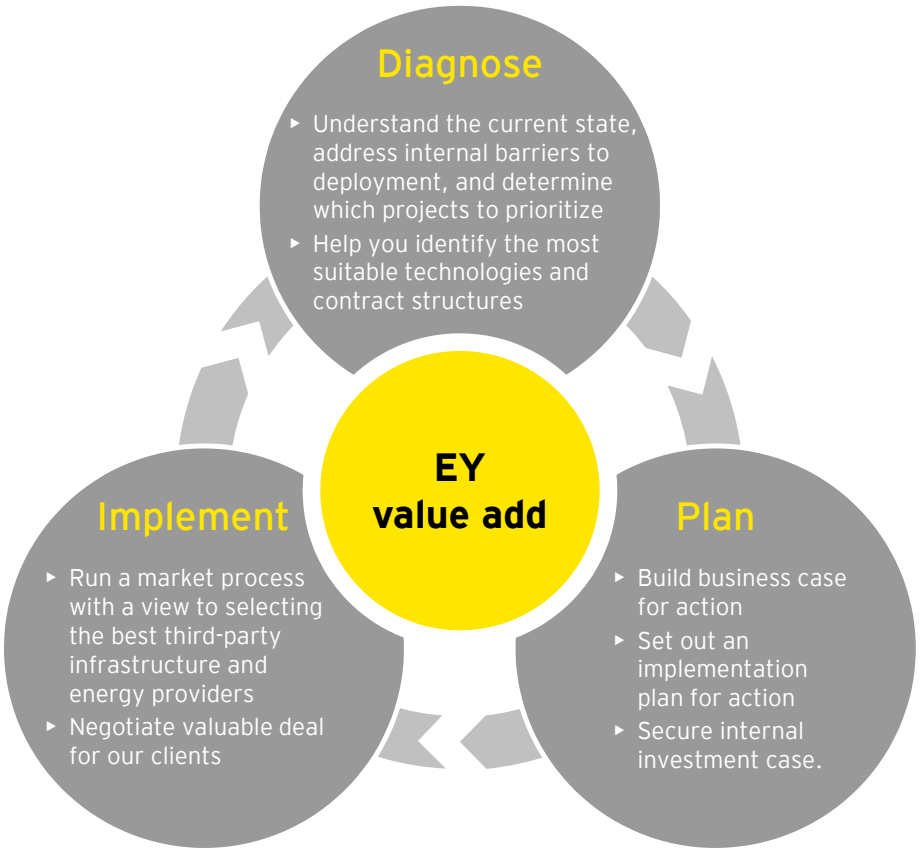
The issues

These are critical times for the mining industry. Yet, the scale and pace of renewable energy deployment across the sector is slower than the business case warrants. Causes include:

- Not utilizing third parties to develop, fund and deliver renewable energy assets
- Renewables seen as "non-core," with significant internal resource/opportunity cost
- Limited over-arching divisional or regional energy strategy
- Lack of clear strategic view or response to approaches by renewable energy developers

How EY can add value

EY can act as the single interface to assess the possible savings and oversee the procurement, implementation, financing and off-take for the related infrastructure, helping you achieve a permanently competitive cost of electricity to the mine, on appropriate terms. EY has one the world's largest global corporate finance teams dedicated to the renewable energy sector. We work with developers, investors, utilities and banks to help fund, deliver and structure related infrastructure.



Our values and credentials

From strategy development to implementation assistance, our global network offers you a worldwide multidisciplinary team of professionals in assurance, tax, transactions and advisory services who understand the corporate resource and energy agenda, key challenges and leading solutions.

Our services addressing the resource and energy agenda are informed by unique insight into renewable energy markets stemming from our extensive transaction experience and our ongoing market analysis in the quarterly Renewable Energy Country Attractiveness Indices.

EY's Renewable Energy Country Attractiveness Index

Our Renewable Energy Country Attractiveness Index (RECAI) ranks the attractiveness of 40 nations around the globe for investment in renewable energy generation infrastructure. Published since 2003, this widely quoted quarterly publication is an important reference for industry specialists and investors worldwide. Visit ey.com/recai to learn more.

EY is working with some of the world's largest companies to help develop and implement their renewable energy strategies. Key to the value we bring is our ability to develop a robust and credible financial case for action.

Global Pharma Company

Renewable energy strategy design and financial modeling to build a business case for board approval

EY provided strategic advice

Global Financial Services Institution

Advice on developing an international strategy to reach a renewable energy target and implementation assistance

EY provided strategic advice

Global Telecom Corporation

Strategic advice on 12 global renewable energy markets, with potential for self-generation or green procurement; overview of greenhouse gas reporting guidelines

EY provided strategic advice

With an extensive worldwide team, we understand energy issues from a comprehensive global perspective and at the local level, wherever your facilities or operations are located.

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From start-ups to large corporations and national governments, organizations worldwide are embracing cleantech as a means of growth, efficiency, sustainability and competitive advantage. As cleantech enables a variety of sectors, old and new, to transform and participate in a more resource-efficient and low-carbon economy, we see innovation in technology, business models, financing mechanisms, cross-sector partnerships and corporate adoption. EY's Global Cleantech Center offers you a worldwide team of professionals in assurance, tax, transaction and advisory services who understand the business dynamics of cleantech. We have the experience to help you make the most of opportunities in this marketplace, and address any challenges. Whichever sector or market you're in, we can provide the insights you need to realize the benefits of cleantech.

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